PRESERVE AMERICA
Explore and Enjoy Our Heritage

SECTION 3 TRIENNIAL REPORT

National Aeronautics and Space Administration (NASA)

Executive Order 13287

Fiscal Years 2006 to 2008

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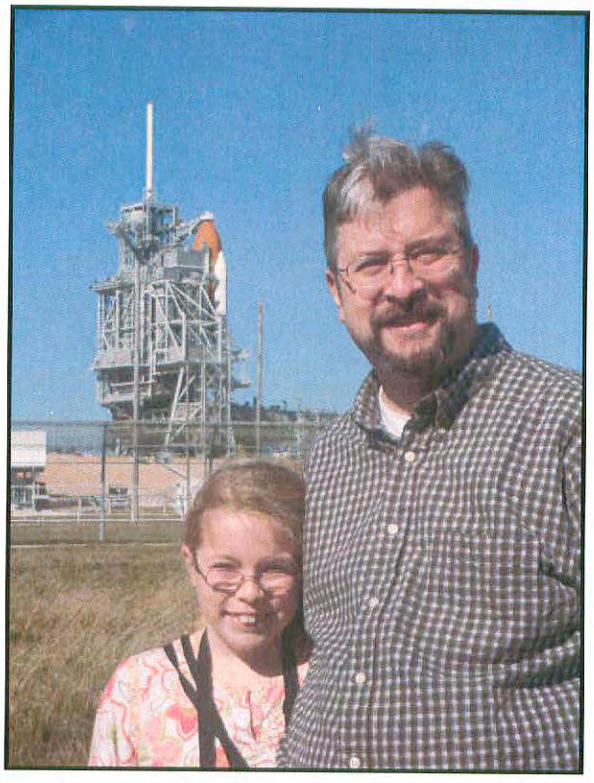

In tribute to David Byrd (1964-2008)
of the California Office of Historic Preservation,
a valued member of NASA's Preservation Team.
(Photo of David Byrd with daughter, Catie,
at Kennedy Space Center, December 2007)

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ACHP	Advisory Council on Historic Preservation
ADA	Americans with Disabilities Act
AIAA	American Institute of Aeronautics and Astronautics
AIRS	Atmospheric Infrared Sounder
ARC	Ames Research Center
ARM	Archaeological Resource Managers
ARPA	Archaeological Resources Protection Act
ATM	Apollo Test Mount
CITE	Cargo Integration Test Equipment
CoF	Construction of Facilities
CRM	Cultural Resource Management
CRMP	Cultural Resource Management Plan
CxP	Constellation Program
DFRC	Dryden Flight Research Center
DoD	U.S. Department of Defense
EAPO	Environmental Affairs Program Office
EARSeL	European Association of Remote Sensing Laboratories
E&E	Energy & Environment
EMD	Environmental Management Division
EMP	Environmental Management Plan
EMS	Environmental Management System
EO	Executive Order
ERD	Environmental Resources Document
EULA	Enhanced Use Lease Authority
FCI	Facilities Condition Index
FERPD	Facilities Engineering and Real Property Division
FPO	Federal Preservation Officer
GDSCC	Goldstone Deep Space Communications Complex
GIS	Geographic Information Systems
GLAST	Gamma-ray Large Area Space Telescope
GRACE	Gravity Recovery and Climate Experiment
GRASP	GeoRobotic Analytical Sampling Project

GRC	Glenn Research Center
GRIN	Great Images in NASA
GSFC	Goddard Space Flight Center
HABS	Historic American Building Survey
HPO	Historic Preservation Officer
HPWG	Historic Preservation Work Group
IT	Information Technology
JPD	Johnson Policy Directive
JPL	Jet Propulsion Laboratory
JSC	Johnson Space Center
KSC	Kennedy Space Center
LaRC	Langley Research Center
MAA	Mississippi Archaeological Association
MAF	Michoud Assembly Facility
MASER	Microwave Amplification by Stimulated Emission of Radiation
MDD	Mate-Demate Device
MOA	Memorandum of Agreement
MSFC	Marshall Space Flight Center
NACA	National Advisory Committee for Aeronautics
NAGPRA	Native American Graves Protection and Repatriation Act
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act
NETS	NASA Environmental Tracking System
NHL	National Historic Landmark
NHPA	National Historic Preservation Act
NODIS	NASA Online Directives Information System
NPR	NASA Procedural Requirements
NPS	National Park Service
NRHP	National Register of Historic Places
O&C	Operations and Checkout Building
ODURF	Old Dominion University Research Foundation
PA	Programmatic Agreement

PBS	Plum Brook Station
RPI	Real Property Inventory
SEMAA	Science, Engineering, Mathematics and Aerospace Academy
SHPO	State Historic Preservation Office
SLF	Shuttle Landing Facility
SOI	Secretary of the Interior
SRB	Solid Rocket Booster
SSC	Stennis Space Center
SSFL	Santa Susana Field Laboratory
SSP	Space Shuttle Program
VAHS	Virginia Aeronautical Historical Society
VASC	Virginia Air and Space Center
WFF	Wallops Flight Facility
WSSH	White Sands Space Harbor
WSTF	White Sands Test Facility

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SECTION ONE INTRODUCTION

1.1 EXECUTIVE SUMMARY

This report is submitted to the Advisory Council on Historic Preservation (ACHP) by the National Aeronautics and Space Administration (NASA) in compliance with Executive Order (EO) 13287, entitled *Preserve America*. Section 3 of EO 13287 requires NASA to submit a triennial report on its progress in identifying, protecting, and using historic properties in the Agency's ownership. NASA submitted a baseline report in 2004 and a progress report in 2005. EO 13287 has served as a catalyst to the development of NASA's Cultural Resource Management (CRM) Program. The initial Section 3 reports identify program needs and provide benchmarks from which progress is measured. This is the first of NASA's triennial reports: it covers progress made by the Agency for the fiscal years 2006 to 2008. It strives to answer the ACHP questions on the 2004 baseline report and includes a review of the specific commitments and goals reported in the 2005 progress report.

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In August 2007, the ACHP issued guidelines for preparation of this report entitled Advisory Guidelines Implementing EO 13287, "Preserve America" Section 3: Reporting Progress on the Identification, Protection, and Use of Federal Historic Properties. These guidelines present sixteen questions designed to collect basic information on Federal agency historic preservation programs and their effectiveness in implementing the provisions of EO 13287. This report responds to the sixteen questions and showcases the tremendous growth and progress of NASA's CRM Program. It should contribute to the ACHP's ability to demonstrate the value of EO 13287 in supporting Federal stewardship in the ACHP report due to the President in February 2009.

This triennial report embraces the four ACHP themes related to the management of historic assets that are especially relevant to NASA's mission:

- Enhancing and Increasing NASA's Inventory of Historic Properties
- Integrating Stewardship into Agency Planning
- Building Partnerships
- Managing Assets

Enhancing and Increasing NASA's Inventory of Historic Properties

NASA has greatly expanded its inventory of historic properties during the reporting period. It has made great strides in increasing awareness of the Agency's responsibility to identify and evaluate historic properties. NASA surveyed approximately 575 individual resources during the reporting period and evaluated their eligibility for listing in the National Register of Historic Places (NRHP). The inventory of historic properties more than doubled during the reporting period.

NASA has worked diligently to inventory its resources with the goal of supporting mission and enhancing stewardship of its assets. This has been especially important during this reporting period as NASA prepares to sunset the Space Shuttle Program (SSP) in 2010 as directed by the President's New Vision for Space Exploration unveiled in 2004. NASA's CRM Program has played and continues to play a critical role in supporting the transition to the new space exploration program, Constellation (CxP).

NASA also developed a new module under the NASA Environmental Tracking System (NETS). NETS represents NASA's first centralized database of historic properties. Beta tested in 2007, the module was put into production in 2008. Though data validation continues, the module highlights

NASA's inventory, providing a valuable resource to support awareness and stewardship of NASA's diverse inventory of architectural and archaeological resources. Though only a few new archaeological resources were identified during the reporting period, the CRM NETS module facilitated the first consolidation of the Agency inventory of archaeological sites. NASA Headquarters (Headquarters) now knows it has identified 266 archaeological resources in its portfolio.

NASA is a world leader in Geographic Information System (GIS) and has begun to apply its expansive GIS capabilities to manage historic facilities and archaeological resources. Such capabilities include mapping, 3-D modeling, and virtual tours of NASA's historic properties. For archaeological resources, the combination of GIS and remotely sensed data provides information used to develop predictive models for site location, thereby increasing the efficiency and effectiveness of site identification. The relational databases that serve as the backbone of a GIS provide NASA managers with readily available information on a range of important and related attributes for each relevant site or asset.

Two prominent examples of applying GIS to CRM are Stennis Space Center (SSC), Mississippi, and Langley Research Center (LaRC), Virginia. The GIS application at Stennis serves as a tool to manage onsite archaeological resources. The Stennis Historic Preservation Officer (HPO) has showcased this capability both nationally and internationally. LaRC's GIS team has prepared a 3-D model of one of Langley's National Historic Landmarks (NHLs), the Gantry. Several CDs including interactive timelines of historic properties have also been produced. Headquarters and Centers now have CRM websites sites that include links to multiple tools and resources.

In 2008, compliance with the National Historic Preservation Act (NHPA) is recognized as directly supporting mission success. The HPOs now have the management tools to present CRM responsibilities to mission managers. These tools illustrate the "power of information" discussed by Senior Policy Officials earlier this year that have proven to be the catalyst for increased awareness and responsiveness within NASA. The HPOs have also capitalized on the 50th Anniversary as a means to showcase NASA's diverse range of historic resources.

Integrating Stewardship into Agency Planning

For NASA, stewardship means integrating historic properties into both planning and practice. NASA has policies and procedures for implementing CRM compliance activities in accordance with its mission and organizational structure. The integration of compliance responsibilities into resource and mission planning has fostered growth in NASA's stewardship during the reporting period.

- NASA coordinates the CRM Program centrally via an Agency program manager, the Federal Preservation Officer (FPO), and provides that person resources to advance and monitor program status
- NASA coordinates the CRM Program locally for all NASA sites and historic properties, through designated Center Historic Preservation Officers, each provided with appropriate resources to understand and implement their role and responsibility
- NASA incorporates education about the CRM Program into relevant facilities' training programs provided to Master Planners and Real Property Managers and in CRM training materials, such as the guide to NASA's historic districts
- NASA has incorporated the requirement to consider historic preservation in master planning and capital project development programs
- NASA is working to expand the use of Programmatic Agreements (PAs) to streamline Section 106 compliance coordination

While responsibility for management and compliance activities associated with NASA

historic resources rest with the Centers, NASA Headquarters role has increased significantly over the past 3 years. In January 2007, Headquarters established the FPO as a dedicated position. The new FPO has focused on developing NASA's CRM Program. In 2006, the current FPO established and continues to co-chair NASA's Transition Historic Preservation Work Group (HPWG) with the SSP Office, directed towards addressing historic preservation needs associated with the transition from the SSP to CxP (Transition). With the sunsetting of the SSP in 2010, Headquarters proactively funded an Agency-wide survey and evaluation of 331 assets that supported the SSP. The survey results established the eligibility of 121 of these assets for listing in the NRHP for their significance within the context of the SSP. Though many of these resources are less than 50 years of age, their significance to America's space program met the test of exceptional importance required under Criterion Consideration G. The results of the SSP survey were presented in Headquarters and Center meetings involving all levels of management. In addition to fostering management awareness internally and enhancing stewardship, the study is recognized overall as a valuable resource in telling the story of the Space Shuttle.

Headquarters took the lead in the development of the Agency's CRM program and policies, drafting the CRM NASA Procedural Requirements (NPR) in 2007. The draft NPR has been circulated for internal review and is scheduled to be revised and re-circulated for additional review in 2009. Once issued, the NPR will provide much needed guidance for NASA's HPOs and managers. To further enhance stewardship of its cultural resources, in 2005 NASA developed an Environmental Management Plan specific to Agency-wide, as well as Center-wide, cultural resource programs. The plan encourages regulatory compliance and national consistency with program requirements.

Enhancing stewardship also involves educating and inviting the public to appreciate NASA's historic resources. Heritage Tourism combines aspects of historic preservation education with economic development. Although many of NASA's properties are not accessible to the public due to recognized security and safety constraints, many NASA Centers have found opportunities to develop Heritage Tourism initiatives. These range from annual open houses to established tours offered year round at the four main space operations centers: Kennedy Space Center (KSC), Florida; Johnson Space Center, Texas; Marshall Space Flight Center, Alabama; and Stennis Space Center, Mississippi. For example, the Johnson Space Center has joined with the non-profit *Space Center Houston* for onsite tours that attract 750,000 to 800,000 visitors annually. More than 1.4 million visitors tour the KSC Visitor Complex each year. As the gateway to a working space center, admission includes inspiring tours venturing deep into NASA's spaceport facilities, daily astronaut encounters, IMAX® space films and the U.S. Astronaut Hall of Fame. In 2007, the Shuttle Launch Experience opened at the complex. The launch simulation takes visitors on their own journey to Earth's orbit. Under the guidance of NASA and veteran space shuttle astronauts, this experience duplicates the sensations of going into space. Additionally, NASA continues to enjoy a cooperative agreement with the Smithsonian Institution, Washington, D.C., supporting on-going and planned exhibits at the National Air & Space Museum in Washington D.C. and at the Steven F. Udvar-Hazy Center, VA.

The ACHP recently adopted a policy statement to encourage greater public understanding of the nation's archaeological heritage resources. With the policy statement, "Archaeology, Heritage Tourism, and Education," the ACHP aims to "foster public understanding and appreciation of archaeological resources through heritage education programs and, where appropriate, heritage tourism initiatives while encouraging their conservation for future generations in a spirit of stewardship." NASA already supports this policy through space archaeology. As a NASA archaeologist, Tom Sever, points out, "Much of human history can be traced through the impacts of human actions upon

the environment. The use of remote sensing technology offers the archaeologist the opportunity to detect these impacts which are often invisible to the naked eye." While much of this research has been focused on the study of ancient civilizations in South and Central America, NASA is using GIS to enhance resource management and to incorporate cultural resources into education and heritage tourism endeavors at its Centers.

Building Partnerships

Though utilization of NASA's historic properties is often not the primary reason for a partnership, many partnerships provide a means to expand the use of underutilized or abandoned assets. An example of such a partnership is the agreement between Langley Research Center and Old Dominion University for the use of the Full Scale Wind Tunnel. Partnerships have also enabled the continued use of historic assets that no longer support the NASA mission. Several Centers have overcome safety and security priorities to enable historic restrictions to be leased. Examples include several buildings in the historic district at Ames Research Center (ARC).

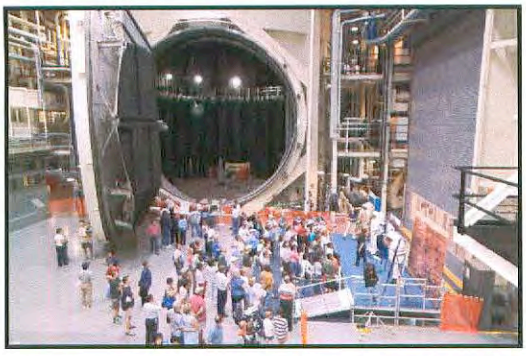
In an economic setting of limited program funding, building partnerships in order to achieve preservation goals is particularly important. NASA proactively engages in educational partnerships. These partnerships range in length, from a single event to decade-long missions, and in size from one elementary school to the Department of Education. NASA manages an extensive series of education programs, addressing the science and mathematics needs of teachers and students from pre-kindergarten to post-graduate school. Several NASA Centers sponsor an Educator's Resource Center, including one established on the Choctaw Tribal Reservation in Mississippi. Building on the Education Resource Center, Stennis Space Center management expanded its collaboration with the Choctaw Nation in business, social, and historical events. NASA often includes archaeological and historical information in the outreach and education materials that the Agency makes available through its education network. Recently, the HPO at Stennis, who is a professional archaeologist, was elected southern Vice-President of the Mississippi Archaeological Association (MAA). In that role, he was able to partner with the U.S. Department of Agriculture Rural Development Mississippi to disseminate a document entitled "Archaeological Resources for Teachers" through the NASA network involved in teachers' workshops.

Another successful partnership is the cooperative agreement between LaRC and the Virginia Air and Space Center (VASC), Hampton. In addition to serving as LaRC's visitor center, VASC also houses LaRC's Education Resource Center. The center helps educators access and utilize NASA science, mathematics, technology, and instructional products and provides educators with in-service and pre-service training and demonstrations of NASA educational technologies. VASC also serves as the primary interface for NASA Regional Educator Resource Centers located within the five States served by NASA LaRC (Kentucky, North Carolina, South Carolina, Virginia, and West Virginia). Additional information on building partnerships to preserve and promote NASA's history is included throughout this report.

Asset Management

NASA may be unique among Federal agencies in that the majority of its historic assets are highly technical facilities designed for expansion and engineered for future reuse. NASA historic asset management begins with identification and evaluation to determine the historic significance of cultural resources present. Traditionally, NASA considers the best use for its assets and favors modification and reuse of resources, regardless of historic status. Adaptive use of facilities is part of the NASA culture. When planning for construction and expansion, the reuse and adaptation of the existing infrastructure is always the priority. For example, inventory originally built for the Apollo Program was used and when necessary modified, to support the SSP. These assets will be utilized to support the new space program, Constellation, as possible.

Marshall Space Flight Center's HPO reports that it uses facilities "because they are best for NASA's Mission, not because they have been deemed historic." Some resources, such as NASA's NHLs, are managed under PAs or under a Center's facility management plan.



Visitors review a spacesuit exhibit in front of Chamber A, a space simulator and NHL, Johnson Space Center, 2005

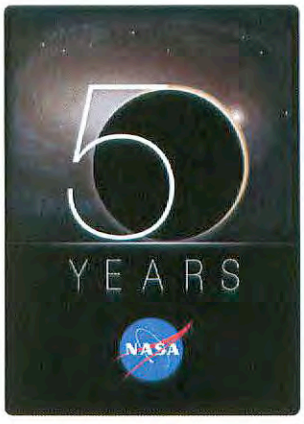
1.2 NASA MISSION AND HISTORIC PRESERVATION

Since its establishment in 1958, NASA's perspective has been uniquely future-oriented and focused on scientific research and technological development. NASA's mission statement provides a basis for understanding its forward-looking culture:

- To advance and communicate scientific knowledge and understanding of the earth, the solar system, and the universe
- To advance human exploration, use, and development of space
- To research, develop, verify, and transfer advanced aeronautics and space technologies

As an Agency on the cutting edge of science and technology, NASA has a major role in American history. NASA takes enormous pride in its history and its accomplishments, from its space program and its civilian and military aerospace research. In celebration of NASA's 50th Anniversary in 2008, Administrator Mike Griffin conveyed the following message to the American public:

> *"A half century ago, a new Federal agency was created to accomplish feats of exploration and discovery unparalleled in human history. The men and women of NASA have been responsible for such epic achievements as landing 12 human explorers on the moon, sending robots to scout the solar system from Mercury to Pluto, and making revolutionary discoveries about the nature of our universe. Closer to home, people have reaped enormous benefits from NASA's communications, weather and Earth monitoring satellites, and the agency's continued commitment to excellence in aeronautics research. Our quality of life has been improved by thousands of new technologies derived from NASA research."*



A highlight for NASA in 2007 was the visit from Queen Elizabeth II and Prince Philip, Duke of Edinburgh. The Queen visited the United States to participate in the celebration of the 400th anniversary of the settlement of Jamestown, Virginia, in 1607. The Queen and Duke began the Royal visit with a tour of Jamestown, the site of the first permanent English settlement in America and ended with a visit to NASA's Goddard Flight Research Center. The visit celebrated the on-going space partnership between the United States and United Kingdom, and representing the future of human exploration. This is consistent with how NASA is celebrating its 50th Anniversary in 2008, recognizing its past and

the importance of its history as the foundation from which future success is built.

Queen Elizabeth II speaking with Astronaut Michael Foale at the NASA Goddard Space Flight Center

Queen Elizabeth II and NASA Administrator Michael Griffin planting a tree at NASA Goddard Space Flight Center

While NASA takes great pride in its technological and scientific accomplishments, its mission-driven focus has not always promoted the physical preservation of its unique and irreplaceable historic and cultural assets. At its ten NASA Centers, the prevailing culture is and remains mission-driven, with a focus on the future, so in many instances NASA's Centers consider reuse of resources for current missions to be the best use. Historic preservation, therefore, must be balanced with the positive reuse and adaptation for current and future missions. NASA's managers often choose to reuse and adapt existing assets for new programs and in this way they maximize the functional value of the resource and minimize costs. In many cases, construction of new facilities is neither feasible from a land-development perspective nor economically realistic. As a result, NASA has traditionally recycled its historic resources to support future missions whenever these assets met the new technical requirements. In fact, the need to evolve assets to accommodate specific needs from one program to the next has been incorporated into the basic design of many of NASA's facilities, and may be viewed as a character-defining feature.

Sections Two through Six of this report demonstrate how the actions of NASA and its centers intersect with the four ACHP themes: Enhancing and Increasing NASA's Inventory of Historic Properties, Integrating Stewardship in Agency Planning, Building Partnerships, and Asset Management. Section Two discusses Agency-wide program development, including topics such as staffing, policy, database development, and communication. Sections Three through Five discuss NASA's efforts to identify, protect, and utilize its historic resources during the reporting period. These sections also present the challenges and obstacles that NASA faces in balancing mission objectives with preservation goals. Issues, as well as positive outcomes, that emerge from these discussions will help foster and direct Headquarters' cultural resources policy development for the next EO 13287 triennial report.

SECTION TWO AGENCY-WIDE PROGRAM DEVELOPMENT

2.1 NASA AGENCY PROFILE

The National Aeronautic and Space Administration (NASA) is an Agency of 18,000 employees and 40,000 contractors. NASA's mission is to pioneer the future of space exploration, scientific discovery, and aeronautics research. Operations to implement NASA's Mission are overseen by four Mission Directorates.

Aeronautics

Pioneers and proves new flight technologies that improve our ability to explore and have practical applications on Earth.

Exploration Systems

Creates new capabilities and spacecraft for affordable, sustainable human and robotic exploration.

Science

Explores the Earth, moon, Mars, and beyond; charts the best route of discovery; and reaps the benefits of Earth and space exploration for society.

Space Operations

Provides critical enabling technologies for much of the rest of NASA through the Space Shuttle, the International Space Station, and flight support.

2.2 NASA CENTER PROFILES

NASA operations are divided among ten NASA Centers that range greatly in acreage (175 acres to 140,000 acres) and number of facilities (33 to 833 buildings). Currently, NASA's inventory of real property stands at approximately 5,000 assets. Among these assets, approximately 3,600 are classified as buildings.

Distribution of NASA Centers

The new *Vision for Space Exploration* issued by President George W. Bush in 2004 led to an Agency goal of "Ten Healthy Centers." This referred to a balancing of goals and resources to ensure the successful execution of the President's new vision. As a result, the responsibilities of aeronautic and space exploration missions have been redistributed between the Centers. Table 1 lists NASA's 10 Centers and facilities under their management.

Aerial view of Johnson Space Center

Table 1: Ten NASA Centers/Facilities Profile

No	Acronym	Name	Location
1	ARC	Ames Research Center	California
2	DFRC	Dryden Flight Research Center	California
3	GSFC	Goddard Space Flight Center	Maryland
*	WFF	Wallops Flight Facility (GSFC)	Virginia
4	GRC	Glenn Research Center	Ohio
*	PBS	Plum Brook Station (GRC)	Ohio
5	JPL	Jet Propulsion Laboratory	California
*	GDSCC	Goldstone Deep Space Communications Complex (JPL)	California
6	JSC	Johnson Space Center	Texas
*	WSTF	White Sands Test Facility (JSC)	New Mexico
7	KSC	Kennedy Space Center	Florida
8	LaRC	Langley Research Center	Virginia
9	MSFC	Marshall Space Flight Center	Alabama
*	MAF	Michoud Assembly Facility (MSFC)	Louisiana
*	SSFL	Santa Susana Field Laboratory (MSFC)	California
10	SSC	Stennis Space Center	Mississippi

* Managed by one of ten Centers

NASA manages historic resources located in ten States. The approximate size of the site (acreage), age (date of acquisition), and inventory is summarized in Table 2. Many of NASA's Centers evolved from installations transferred to the National Advisory Committee for Aeronautics (NACA), and then to NASA when the latter Agency was created in October, 1958. Over the past five decades, additional land has been acquired, some sites with existing infrastructure and some sites that were undeveloped. For example, The War Department built Michoud Assembly Facility (MAF) in 1943 to produce armored tanks; today MAF is the principal assembly facility for the Space Shuttle's External Tank. What is now Marshall Space Flight Center (MSFC) was carved out of the Army's Redstone Arsenal in Huntsville, Alabama. MSFC is accessible only through the Army base. Compared to other facilities, Marshall has little room to expand and must depend on existing space and maximize its available infrastructure. Some Centers expanded over time, such as Lewis Field, a component of the Glenn Research Center (GRC) in Ohio. At Lewis Field, property was acquired in 1940 when some 200 acres were donated by the Cleveland Airport. This additional land incorporates today's Central and South campuses. In 1952, 10 acres were acquired for the North campus. In 1958, 140 acres of farmland was purchased to create the West campus. In 2001, approximately 30 acres in the South campus were returned to Cleveland Hopkins International Airport to accommodate runway expansion.

Plum Brook Station, also managed by GRC, was formerly operated as a munitions manufacturing site and was acquired by the War Department before World War II. In 1956, NACA acquired approximately 500 acres from the Department of Defense (DoD) in order to build the Reactor Complex. To support the development of the Apollo program, the remaining 5,900 acres of the Plum Brook site were acquired by NASA in 1963 from DoD.

As Table 2 demonstrates, the age of NASA's infrastructure varies greatly. Some Centers exclusively contain resources less than 50 years of age. In contrast, LaRC, the original NACA headquarters and birthplace of NASA, celebrated its 90th birthday in 2007, and accordingly includes many resources over fifty years of age.

Aerial view of ARC

2.3 HISTORIC PRESERVATION OFFICERS

Each of NASA's ten Centers has a designated Historic Preservation Officer (HPO). Three of the Centers oversee operations at large component facilities, as well. The three component facilities are: Wallops Flight Facility (WFF) in Virginia, administered by Goddard Space Flight Center (GSFC) in Maryland; White Sands Test Facility (WSTF), New Mexico, administered by Johnson Space Center (JSC) in Texas; and Michoud Assembly Facility (MAF) in Louisiana, administered by MSFC in Alabama.

Dr. Marco Giardino, SSC HPO

Table 2: NASA Centers/Facilities Profile

Center	Established	Operated by	Collocated with Other Federal Agency or Existing Management Relationship	Acreage	No. Facilities
ARC	1940	NASA	No	2,000	288
DFRC	1954	NASA	Edwards Air Force Base (Air Force)	850	87
GRC	1940	NASA	No	320	152
PBS	1956	NASA GRC	No	6,400	238
GSFC	1959	NASA	No	1300	33
WFF	1959	NASA	No (NOAA and Navy are tenants)	6,200	124
JPL	1958	JPL	No	175	138
GDSCC	1958	JPL	Fort Irwin (Army)	32,280	133
JSC	1962	NASA	No	1631	400
WSTF	1963	NASA	White Sands Missile Range (Army)	55,680	160
KSC	1958–1964	NASA	Cape Canaveral Air Force Station (Air Force)	140,000	833
LaRC	1917	NASA	Langley Air Force Base (Air Force)	788	207
MSFC	1960	NASA	Redstone Arsenal (Army)	1,841	239
MAF	1964	Boeing	NASA owned, contractor operated	832	40
SSFL	1975	NASA MSFC	Department of Energy (and Boeing)	Included in MSFC (451)	Included in MSFC (33)
SSC	1962	NASA	No (NOAA and Navy are tenants)	13,800	255
			TOTAL	**264,000 approximate**	**3,600**

Due to their large size and the fact that they are located in different States than their reporting Center, each of the component facilities warrants the designation of an onsite Facility HPO. Consequently, NASA's Cultural Resource Management (CRM) Program is administered by 13 HPOs. In addition to the three major component facilities, the HPOs also oversee the CRM program at three additional facilities (Plum Brook Station [PBS], Goldstone Deep Space Communications Complex [GDSCC], and Santa Susana Field Laboratory [SSFL]). Throughout this report, data will be presented in alphabetical order, by Center name, with the major component facilities and the three additional sites listed under their respective administrative Center. ARC and MSFC have designated Archaeological Resource Managers (ARMs) who also oversee archaeological resources. Though the ARM responsibilities are shared with other NASA Center non-CRM assignments, Headquarters views the HPOs as the Center's primary point of contact for the CRM Program.

2.4 CRM STAFFING AND TRAINING

One of the commitments NASA made in prior Section 3 reports was to assess the Agency's CRM staffing needs. In times of tight budgets, existing missions have been curtailed and planned missions have been scaled back, postponed, or even cancelled. In this funding climate, staffing has also been downsized. Currently, NASA has few full-

time dedicated CRM positions and there are no immediate plans to expand the number of positions. However, as NASA's CRM program has grown and as the mission has changed, so have the resources dedicated to the program. For example, the SSP and CxP have recently dedicated funding for the NHPA requirements of the transition from one program to the next.

The HPO position was created in 2005 but not as a dedicated position. It remains a Center responsibility to designate and provide CRM training to a Center staff person. For HPOs, CRM experience is preferred, but it has not been made a requirement. Table 3 summarizes the NASA HPO qualifications. Among the 13 HPOs, four have a CRM background. Those HPOs without a CRM background, however, are building a foundation of CRM knowledge in their current roles.

The Stennis HPO is one such example of an HPO who is a CRM professional. He is an archaeologist who also serves as the Vice-President of the State's archaeological society, building partnerships that integrate NASA technology and NASA archaeology into the broader education, outreach, and professional activities. In 2008, he presented an invited lecture on "NASA airborne remote sensing for cultural resources management" at the 1st International Workshop on "Advances in Remote Sensing for Archaeology and Cultural Heritage Management," held in Rome, Italy and sponsored by the European Association of Remote Sensing Laboratories (EARSeL). He also serves as a member of the scientific committee for the "Remote sensing for Archaeology and Cultural Heritage," a subset of EARSeL.

All HPOs have a primary, non-CRM position. The Agency's Federal Preservation Officer (FPO) is the only NASA employee who maintains a dedicated CRM role. The percentages of time allocated to CRM activities by the HPOs and ARMs typically range from 25 to 50 percent of their workload. Additionally, NASA Headquarters has benefited from the hiring of a new National Environmental Protection Act (NEPA) coordinator during the current reporting period. As an archaeologist, she has provided tremendous assistance, including populating NASA's new CRM database with archaeological data. She has also provided valuable guidance to the HPOs and ARMs on archaeological and tribal issues.

NASA manages its historic resources from the bottom up. All Agency undertakings are managed by the 13 HPOs and the two ARMs in the field. The FPO is the only staff member dedicated to CRM activities at Headquarters and is responsible for the development of CRM policies and procedures for the Agency. NASA does not require HPOs to meet the professional qualification standards established by the Secretary of the Interior (SOI). However, four of NASA's 13 HPOs meet SOI professional qualification standards in their respective disciplines (three architects and one with a PhD in archaeology). Even though all HPOs are responsible for compliance activities associated with historic resources at their Center or component facility, they utilize qualified consultants as appropriate in conducting CRM activities, such as the identification and evaluation of historic properties. Although the current NASA FPO does not meet the SOI professional qualification standards, she has many years of experience in CRM for Federal agencies. The FPO does not personally manage any historic resources, and utilizes SOI-qualified CRM contractors to support the ongoing development of the CRM program managed by the FPO.

NASA Headquarters intends to make CRM training a requirement for all designated HPOs. Although this training policy is not yet in place, the Centers have recognized this need as a priority. All 13 HPOs have taken CRM courses, mainly dealing with Section 106 of the National Historic Preservation Act (NHPA). Any time the Center designated HPO changes, Center management must provide written confirmation that the CRM designee would assume the responsibility of overseeing the Center's historic resources and management program. Several Centers have experienced an influx of Section 106 compliance

activities associated with the sunsetting of the SSP and the establishment of the new exploration program, Constellation. This activity is expected to continue into the near future. All HPOs have access to qualified CRM contractors, and several HPOs maintain on-site CRM contract support.

Table 3: NASA HPO Qualifications

	Center/Facility	HPO Office	Years of CRM Experience	CRM On-Site Contract Support
1	ARC	Facilities	10	Yes
2	DSFC	Environmental	11	No
3	GRC	Facilities	2	No
	PBS	N/A		
4	GSFC	Facilities	6	No
5	WFF	Facilities	17	No
6	JPL*	Environmental	3	No
	GDSCC	N/A		
7	JSC	Facilities	6	No
8	WSTF**	Environmental	3	No
9	KSC	Environmental	3	Yes
10	LaRC	Operations	10	Yes
11	MSFC	Facilities	15	No
12	MAF	Operations	3	No
	SSFL	N/A		
13	SSC	Operations	34	No

Shading indicates facility without HPO, managed by offsite HPO
* JPL is served by NASA HPO and JPL HPO
** Facility with HPO position description

2.5 CRM PROGRAM DEVELOPMENT

During this triennial reporting period, NASA has continued the intensive process of formalizing its Agency CRM Program. The 2004 Section 3 report acknowledged that much work remained in the development of NASA's CRM Program. The 2005 Section 3 Report outlined many of the goals and objectives NASA had established in the development of the Agency's CRM Program. This section describes NASA's ongoing effort to meet its CRM goals and objectives. While a great deal of progress has been made, much work remains to be accomplished before NASA will achieve a fully developed and operating CRM program. NASA's primary objective is to establish an integrated CRM Program that ensures compliance with historic preservation laws and regulations while supporting NASA's missions. NASA is well on its way toward meeting this important objective. The success of NASA's integrated CRM Program ultimately will be measured by the acceptance and incorporation of the CRM responsibilities in mission planning by all project and program managers.

The section below provides a summary of the major Agency CRM activities. Included in this update are the commitments made by NASA in the 2004 and 2005 Section 3 Reports. The Advisory Council on Historic Preservation (ACHP) provided comments on NASA's 2004 Section 3 Report after NASA completed its 2005 Progress Report. Questions not

answered in 2005 are addressed in this report. This section also provides an overview of the Agency's program development managed by NASA Headquarters with a focus on the progress made in the key program areas of policy, database development, training, and implementation. In the preparation of this triennial report, NASA utilized the ACHP's Section 3 report guidelines issued in August 2007. The ACHP guidelines included 16 questions which were divided into three categories representing the major themes of Executive Order (EO) 13287: Identification, Protection, and Use of historic resources.

2.6 CRM PANEL INFORMATION

2005 NASA Commitment: *The CRM Panel is scheduled to meet quarterly via teleconference and have one face-to-face meeting each year.*

NASA Headquarters formed the CRM Panel in August 2005 in conjunction with NASA's Environmental Management Panel and NASA's Energy Efficiency Panel. The Panel is comprised of NASA's HPOs and CRM stakeholders. The primary objective of the Panel is to address priority needs of NASA's Environmental Management System (EMS) in accordance with EO 13287. Progress in meeting these aspects is tracked via tasks, and quarterly updates are provided to NASA management under the EMS. The Director of Environmental Management Division was designated NASA's CRM Senior Policy Officer in 2007. NASA's FPO serves as the CRM Panel Chair and is responsible for scheduling and hosting quarterly tele- or video-conferences, as well as annual face-to-face meetings.

The responsibilities of the CRM Panel include:

- Develop a Charter that builds upon existing process and reporting responsibilities (Federal regulations and EOs)
- Develop processes and resources to support NASA missions
- Support timely development of CRM Program components
- Meet regularly and ensure cross-functional and Center representation

First Annual CRM Panel Meeting, June 5–8, 2006

NASA Headquarters sponsored the first CRM Panel meeting, held June 2006 in Portland, OR. Though not all HPOs attended, all Centers were represented, including stakeholders from the Legal Office and from the CxP office. Constellation is NASA's new exploration program scheduled to replace the SSP. At the panel meeting, David Banks of the National Park Service (NPS) Headquarters gave a presentation on the SOI Section 110 (NHPA) Guidelines. The Deputy State Historic Preservation Officer (SHPO) of Oregon provided the State's perspective on Federal stewardship, encouraging State involvement early in both program and project planning. The SSC HPO provided an overview of Archaeological Resources Protection Act (ARPA). The 1-day Panel meeting was hosted in conjunction with NASA's biannual Energy & Environment (E&E) Conference. As part of the conference, one of the most important sessions focused on the risks non-compliance with historic preservation regulatory obligations pose to the accomplishment of the NASA Mission. Eleven risks were identified as having a potential or direct impact to mission scheduling and costs. These eleven risks were eventually consolidated into two CRM Risks, which have been incorporated into NASA's Advanced Risk Management process.

NASA manages risks based on the potential impact to the four key aspects of a mission: Safety, Performance, Schedule, and Cost. Currently, CRM is not considered to pose a risk to mission safety or performance; the two identified risks associated with non-compliance with historic preservation law—schedule and cost (see Section 2.10.2, Advanced Risk Management)—are ranked high.

Second Annual CRM Panel Meeting, August 21–24, 2007

NASA Headquarters sponsored the Second Annual CRM Panel Meeting, hosted by LaRC. The CRM Panel meeting was held independently since no E&E Conference was scheduled for 2007. The CRM meeting is regarded as a significant milestone, since it was only the second time that NASA had held an Agency-wide CRM meeting since the Agency's inception. The first meeting took place in 2004, prior to the formation of the CRM Panel.

The 2007 4-day panel meeting focused on program development and the results of the SSP surveys. Speakers included John Fowler, Executive Director of the ACHP, who provided an important overview of EO 13287; Jody Cook, NPS Southeast Regional National Historic Landmarks Program Manager, who discussed the NHL program; Kathleen Kilpatrick, Virginia SHPO, who spoke to the group on the topic of Federal stewardship within the Commonwealth of Virginia; and Brian Lione, Deputy Federal Preservation Officer for DoD, who provided an overview of the DoD's CRM program.

The 2007 NASA Environmental Quality Group Award was also presented during the conference. The Blue Marble Award (a 4-inch glass globe representing the Earth) was presented to the team lead, KSC HPO, Mario Bussaca. The Cargo Integration Test Equipment (CITE) Stand Historic Property Mitigation Team's review process helped ensure funding from the State of Florida ($35 million) for modifications to the Operations and Checkout Building (O&C).

As part of the panel meeting, LaRC hosted a tour of the Center's historic properties, as well as a trip to the archaeological excavations at the Jamestown Fort. The Association for the Preservation of Virginia Antiquities conducted a tour of Jamestown, and Dr. William Kelso, Director of Archaeology, addressed the CRM Panel participants. The tours, featuring LaRC's Heritage Tourism efforts, were showcased in the Center's *Exploration Then & Now* initiative.

John Fowler, ACHP Executive Director, stands in the center of CRM panel participants, Full Scale Tunnel, LaRC

Third Annual CRM Panel Meeting, September 22, 2008

NASA Headquarters sponsored NASA's 3rd Annual CRM Panel Meeting, held September 22, 2008. As with the 2006 meeting, the CRM Panel meeting consisted of a 1-day meeting preceding the biannual E&E Conference. In addition, CRM was included as one of the break-out sessions during the Conference. A "Focus of the Panel" meeting covered the progress of NASA's CRM Program, and included discussions on the NASA Procedural Requirements (NPR), the status of the database, and an update on training efforts. The agenda included Center presentations that showcased HPOs' successes and challenges. HPOs were encouraged to continue sharing documents and ideas. The Panel provided a forum for discussion of CRM priorities associated with the transitioning from the SSP to the new exploration program, Constellation.

2.7 CRM POLICY DEVELOPMENT

2005 NASA Commitment: *NASA will develop a historic preservation program that meets regulatory requirements under Section 110 of the NHPA.*

As for other Federal agencies, EO 13287 has served as a catalyst for the development of NASA's CRM program. While NASA's Centers continue to be responsible for complying with Federal preservation regulations, NASA Headquarters has taken the lead in the development of the Agency's CRM program and policies. The following outlines the primary initiatives which have taken place during the triennial reporting period.

NASA Headquarters began drafting the CRM NPR in April 2007. Once finalized, the NPR will provide NASA managers with explicit direction on the procedures for complying with Federal historic preservation laws, EOs, guidelines, and standards. The initial draft was presented at the 2007 CRM Panel meeting. In response to participant comments, the NPR document will be divided into two documents, the Procedural Requirements and the Supporting Guidance Document. Dividing the document will keep the NPR focused on the requirements, while the guidance document will provide templates and sample documents that can be readily revised and expanded as needed. The revised CRM NPR will be completed in 2009 and circulated to the CRM Panel. Once comments from NASA's CRM stakeholders have been addressed, the proposed CRM NPR will be circulated to Center management for review and concurrence, utilizing NASA Online Directives Information System (NODIS). Headquarters anticipates publishing the final CRM NPR by Fiscal Year 2010. Once distributed, the NPR will provide much needed policy and guidance for the HPOs, including the definitions of their roles and responsibilities within their Center and with respect to NASA Headquarters. By the next triennial report, NASA Headquarters anticipates reporting an expanded and consistent CRM Program management operating at the Centers.

2.8 CRM DATABASE

2005 NASA Commitment: *NASA will design and populate an automated cultural resource database and expand the existing archaeology database to support an Agency-wide CRM program.*

Development of NASA's Agency-wide CRM database began in April 2007. Previously, historic resources data were maintained by the Centers, typically depending on hard-copy filing of records and documents. One exception to this practice was NASA's Real Property Inventory (RPI), which was expanded in 2004 to include the historic status of real property assets in accordance with EO 13227, *Federal Real Property Asset Management.* The new CRM database was developed as an additional module under the NASA Environmental Tracking System (NETS). This Web-based system expands NASA's existing NEPA, energy management, and environmental remediation modules. Prior to 2007, the only CRM information maintained in NETS consisted of forms that were completed online to prepare the annual Federal Archaeological Activity

Summary report. Called the ARPA module, the data therein are limited to responses to the NPS annual archaeological reporting questionnaire. Focusing on archaeological activity completed with the past year, the ARPA module did not include a comprehensive database of NASA's archaeological resources.

Development of the initial CRM NETS module was completed in August 2007 and presented to NASA's HPOs and CRM stakeholders at the 2nd Annual CRM Panel Meeting held the same month. The participants' comments were incorporated into the subsequent development of the module, completed in March 2008. Upon final review and acceptance by NASA Headquarters, the module was placed in production in May 2008. The database was initially populated with data taken from the RPI and made available to the CRM and Information Technology (IT) programming contractors involved. A data call was issued in May 2008 to all HPOs to validate data in NETS two databases, representing archaeological resources and historic buildings. Though the process of data population and validation continues, the available data are summarized in Section Three of this report.

NASA completed the development of the Agency's archaeological resources database in the summer of 2008. For the first time, NASA Headquarters was able to assess the range of archaeological resources existing throughout the Agency. NASA Headquarters became aware of the number of historic and prehistoric sites located throughout its Centers that are associated with Native Americans. With this information readily available, the Agency can be more proactive in reaching out to tribes regarding the management of certain sites. For example, NASA has recently prepared informational brochures about the Painted Caves located on NASA's field laboratory in Santa Susana, CA, to help prevent vandalism and desecration of this important Native American site by making information about the caves available to the public while limiting public access. NASA's FPO attended the annual National Association of Tribal Historic Preservation Officers meeting in October 2007, which provided valuable information on database management and protection of sensitive information relating to tribal lands and sites of importance to Native Americans. During this meeting, NASA Headquarters learned of innovative partnerships that NASA Centers have established with tribes. Educational and protection efforts further relationships with the tribes, enhancing the ability of NASA managers to work effectively when faced with undertakings that may affect Native American resources.

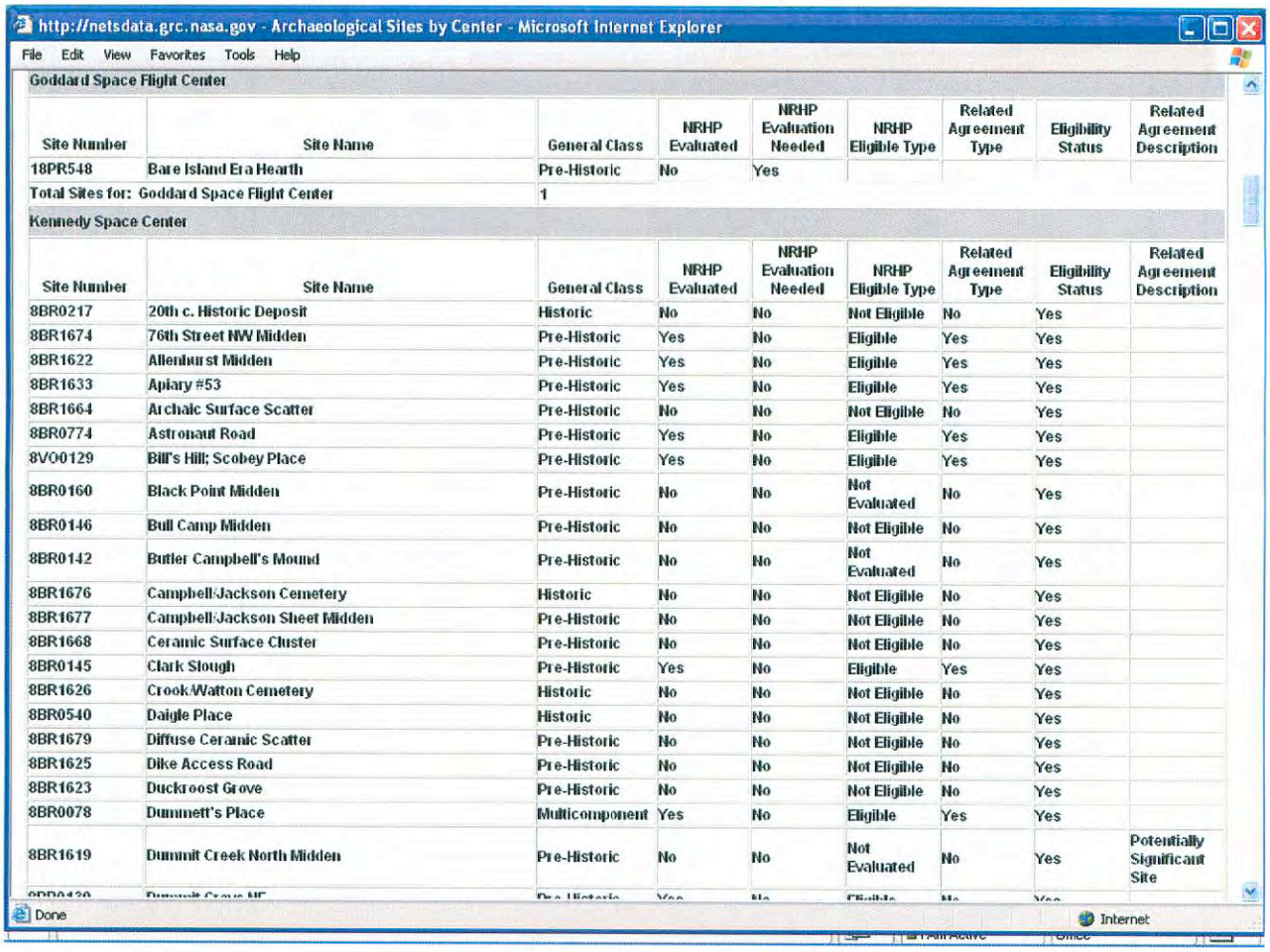
2.9 GIS DEVELOPMENT

2005 NASA Commitment: *In its 2005 Section 3 Report, NASA committed to the application of computer-based capabilities to CRM and to the development of a Geographic Information System (GIS) incorporating predictive modeling of historic resources. NASA has accomplished this goal and will continue to make these resources publically available through websites.*

A majority of NASA's centers use GIS for program and project management, as well as for planning missions. GIS is now utilized by most of the NASA environmental offices and its application to CRM is well established in two Centers: LaRC and SSC. The SSC HPO provided an overview of their office's capabilities in CRM GIS applications during the CRM Session at the 2006 E&E Conference and the LaRC GIS Team Lead gave a presentation on using GIS to support CRM activities during the 2008 E&E Conference.

GIS Development at Stennis Space Center, MS

NASA's SSC continues to develop processes and databases that utilize remotely sensed data already collected by a variety of sensors, including sub-surface instruments like Ground Penetrating Radar, for use in GIS. This project has enhanced the Agency's capability to identify, evaluate, and manage National Historic Landmarks (NHLs), National Register of Historic Places (NRHP) properties, and archaeological sites. Using the



http://netsdata.grc.nasa.gov - Archaeological Sites by Center - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Goddard Space Flight Center

Site Number	Site Name	General Class	NRHP Evaluated	NRHP Evaluation Needed	NRHP Eligible Type	Related Agreement Type	Eligibility Status	Related Agreement Description
18PR548	Bare Island Era Hearth	Pre-Historic	No	Yes				
Total Sites for: Goddard Space Flight Center		1						

Kennedy Space Center

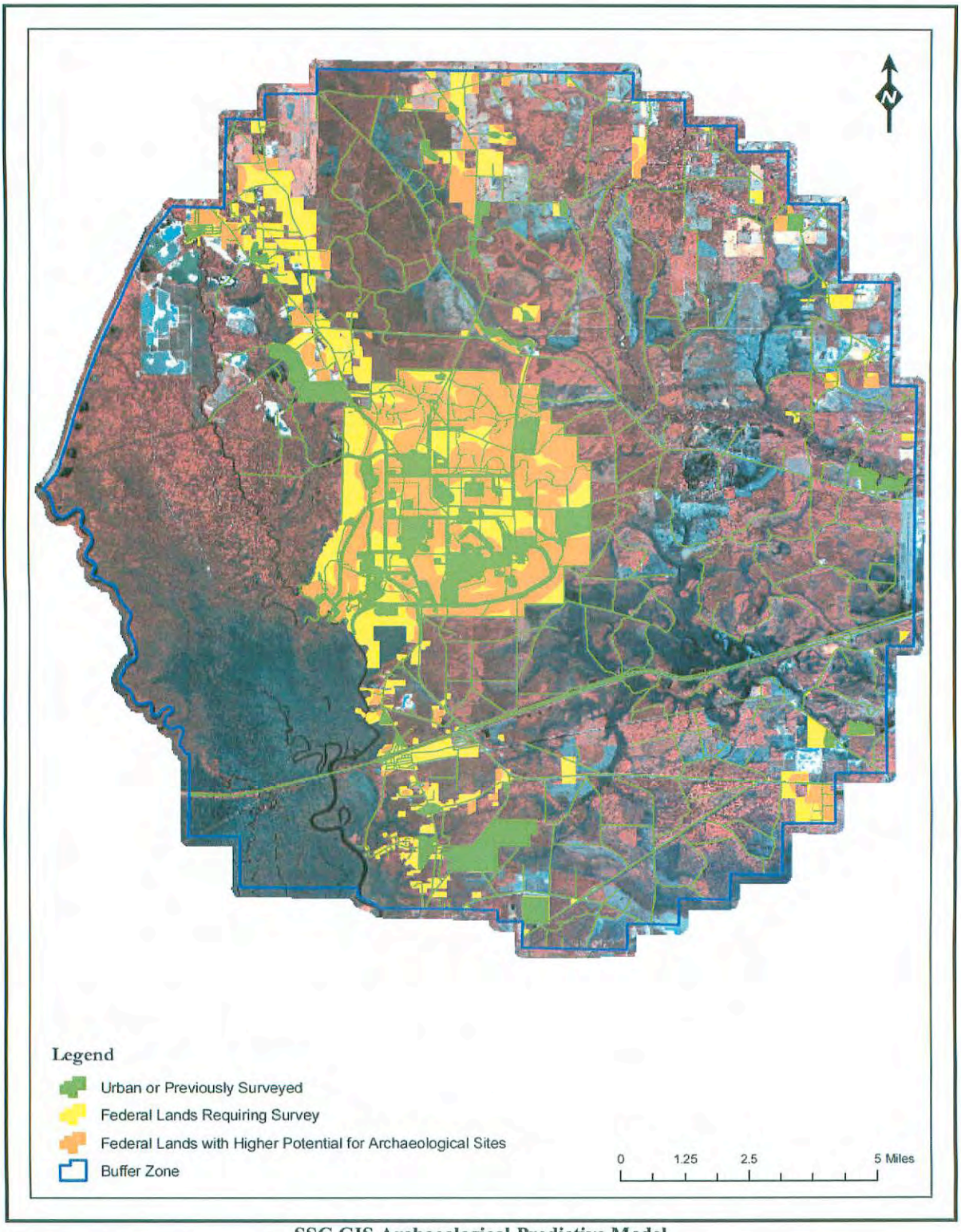
Site Number	Site Name	General Class	NRHP Evaluated	NRHP Evaluation Needed	NRHP Eligible Type	Related Agreement Type	Eligibility Status	Related Agreement Description
8BR0217	20th c. Historic Deposit	Historic	No	No	Not Eligible	No	Yes	
8BR1674	76th Street NW Midden	Pre-Historic	Yes	No	Eligible	Yes	Yes	
8BR1622	Allenhurst Midden	Pre-Historic	Yes	No	Eligible	Yes	Yes	
8BR1633	Apiary #53	Pre-Historic	Yes	No	Eligible	Yes	Yes	
8BR1664	Archaic Surface Scatter	Pre-Historic	No	No	Not Eligible	No	Yes	
8BR0774	Astronaut Road	Pre-Historic	Yes	No	Eligible	Yes	Yes	
8VO0129	Bill's Hill; Scobey Place	Pre-Historic	Yes	No	Eligible	Yes	Yes	
8BR0160	Black Point Midden	Pre-Historic	No	No	Not Evaluated	No	Yes	
8BR0146	Bull Camp Midden	Pre-Historic	No	No	Not Eligible	No	Yes	
8BR0142	Butler Campbell's Mound	Pre-Historic	No	No	Not Evaluated	No	Yes	
8BR1676	Campbell/Jackson Cemetery	Historic	No	No	Not Eligible	No	Yes	
8BR1677	Campbell/Jackson Sheet Midden	Pre-Historic	No	No	Not Eligible	No	Yes	
8BR1668	Ceramic Surface Cluster	Pre-Historic	No	No	Not Eligible	No	Yes	
8BR0145	Clark Slough	Pre-Historic	Yes	No	Eligible	Yes	Yes	
8BR1626	Crook/Watton Cemetery	Historic	No	No	Not Eligible	No	Yes	
8BR0540	Daigle Place	Historic	No	No	Not Eligible	No	Yes	
8BR1679	Diffuse Ceramic Scatter	Pre-Historic	No	No	Not Eligible	No	Yes	
8BR1625	Dike Access Road	Pre-Historic	No	No	Not Eligible	No	Yes	
8BR1623	Duckroost Grove	Pre-Historic	No	No	Not Eligible	No	Yes	
8BR0078	Dunnnett's Place	Multicomponent	Yes	No	Eligible	Yes	Yes	
8BR1619	Dunnit Creek North Midden	Pre-Historic	No	No	Not Evaluated	No	Yes	Potentially Significant Site

Done Internet

Screen Shot from the NETS Archaeological Resources Database

products developed under this project, any NASA manager can develop and graphically display predictive models based on a specific set of natural and cultural parameters. For example, archaeological research has identified several physical conditions that were preferred for human habitation throughout history and prehistory, such as elevation, proximity to water, fertility of soils, and distance to transportation routes. After entering these parameters in a GIS query, a model is derived that classifies the probability for archaeological resources in an area as high, medium, or low. Consequently, NASA facilities managers can identify the level of archaeological survey that may be necessary for project planning. Implementation of GIS predictive modeling will greatly facilitate preparing the infrastructure to accommodate new programs like Constellation.

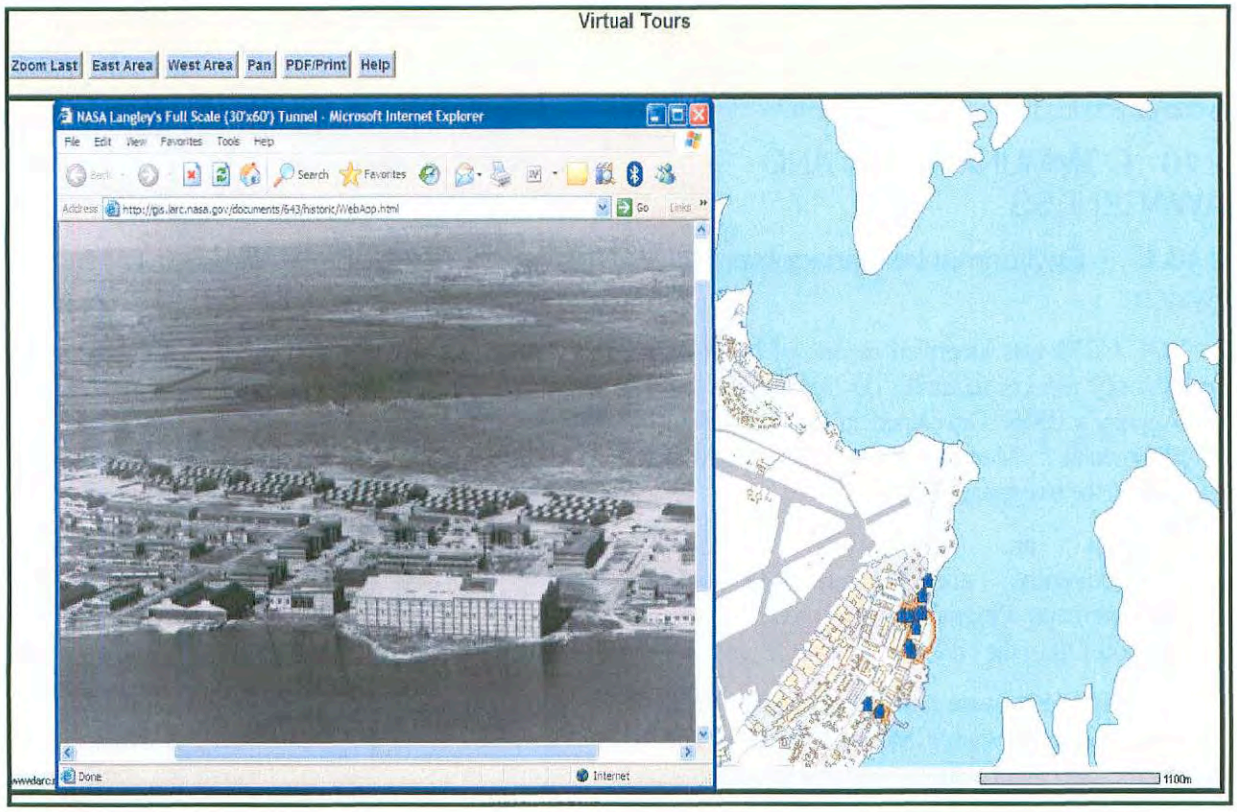
The SSC HPO, Dr. Marco Giardino, was an invited speaker at the European Association of Remote Sensing Laboratories(EARSeL) Conference entitled "Advances in Remote Sensing for Archaeology and Cultural Heritage Management," in 2008. Dr. Giardino presented his paper *NASA Airborne Remote Sensing for Cultural Resources Management* and served as a member of the group's Scientific Committee and provided guidance as it relates to CRM. Additional information on EARSeL is available at: http://www.ibam.cnr.it/earsel/workshop/Workshop.htm.



SSC GIS Archaeological Predictive Model

GIS & Website Development at Langley Research Center, Virginia

The LaRC GIS Team has continued the development and implementation of a Web site to provide comprehensive information on LaRC's history and cultural resources for use not only as a management tool, but also to increase heritage tourism in support of its history and historic properties. The website provides information in a variety of formats, including written and oral histories, documentary photographs, interactive maps using GIS, historical maps dating to 1863, video clips of wind tunnel tests, and virtual reality ground level and aerial views of the properties. Currently, the website offers information on 36 buildings and historic sites, including LaRC's NHLs. A NASA-only version of the website (http://gis-www.larc.nasa.gov/masterplan/section7/landmarks.html) is linked to the Center's Master Plan for use by LaRC project planners and management. A public version (http://gis.larc.nasa.gov/historic) includes an educational module for teachers and students that addresses the Virginia Science and Social Studies Standards of Learning for grades 5-8. The educational module includes virtual astronaut training in which students can chose either the Gemini or Apollo missions. The website has proven to be extremely popular, tallying nearly 4,000 hits from January through June 2008.



Langley GIS website

Langley's GIS capabilities have proven to be very useful as a mitigation measure for the Center's historic properties. In order to mitigate the loss or modification to a historic property, and in accordance with the stipulations of agreement documents with the Virginia SHPO and the ACHP, the GIS team records the history of the property and details the construction and operation of the facility prior to demolition or modification. The information

is then entered on the CRM website to disseminate the history of the property to the public.

The historic property recordation project has been completed in house by the LaRC GIS Team, as well as student interns. The virtual tour information is generated by stitching together images captured with a 35 mm spherical lens camera. The GIS Team has also performed laser scanning, obtained aerial photography (from helicopter), and prepared a 3-D model of the Gantry, one of LaRC's NHLs. Additionally, hundreds of historical films of wind tunnel tests and research projects are being scanned to digital format by an offsite contractor. Digital clips are selected and edited by the student interns for inclusion on the website. When completed, these products greatly enhance the potential for heritage tourism through virtual tours, potentially informing and educating large segments of the general public while preserving the security of the LaRC.

2.10 COMMUNICATION AND AWARENESS

2.10.1 Environmental Management System

In 2004, CRM was identified as one of NASA's four priority aspects requiring development under the Agency's EMS. Developed in 2005, a CRM Environmental Management Plan (EMP) established the two main objectives:

- Develop an Agency-wide Historic, Archaeological, and Cultural Resource Management Program in accordance with Section 110 of the NHPA
- Establish a Site-wide Historic, Archaeological, and Cultural Resource Management Plan for each Center and Facility

The EMP set into motion the establishment of a long-term CRM program. Full implementation of a new program that works to achieve these overarching objectives extends beyond the reach and funding availability of the current EMP. The immediate focus of the EMP is to identify the needs and program components to be developed,; specifically, a standard historic, archaeological, and cultural resource management program outline and framework.

The 2005 CRM EMP identified a series of targets to enhance CRM across NASA. The text of this initial attempt to establish Agency-wide goals follows verbatim:

> Several targets have been identified as key components requiring completion in advance of the development of a successful Historic, Archaeological, and Cultural Resource Management Program. To meet the goals of this EMP, timelines for each of these targets will need to be established by the cross-functional committee (hereby referred to as the CRM Work Group). The establishment of timelines is an essential tool in measuring progress for the development of an Agency CRM program and a Site CRM plan for Center implementation.
>
> **Complete historic building and archaeological surveys of NASA Centers.** Existing cultural resource personnel, including contractor support are charged to complete the historic building and archaeological surveys. Six months to 1 year after obtaining contract support, CRM personnel and workload reporting will measure progress in conducting building and archaeological surveys. At this milestone, the Centers will be asked to report projected schedules for the completion of historic property surveys identified as needed. A 2- to 3-year timeframe is anticipated.
>
> **Design and populate a NASA automated cultural resources database.** The projected timeframe for the design of a national CRM database will be 1 year. This will entail outlining tracking fields assessing the ability to utilize existing databases (RPI, NETS, etc.) and implementing the scope of work for a contractor to develop the database. Linkage to existing data will help populate some fields. The CRM Work Group will be tasked with identifying the resources needed to populate

and maintain the database. The full implementation of the CRM database is beyond the scope of the EMP. The schedule for the CRM database project will depend on the projected cost and resources. To reach this goal, a 5-year timeframe is anticipated.

Develop NHPA training/competency requirements and offer initial training.
In order for the Centers to embrace a formal CRM Program, training will be needed to educate managers on historic preservation regulations and EO processes and reporting requirements. As with the first two tasks, the target of the CRM Work Group will be to identify the training options and CRM training needs, including the proper target audience, but not necessarily to conduct the actual training. One goal will be to develop a list of training resources, and another to develop an internal CRM course. This will require the first tasks to be underway so that the findings can be included and presented in the training. Pending funding, the ultimate target is to offer the initial training as part of this EMP. However, this goal could take several years to establish and fully implement.

Develop a process to review and document the historic significance of physical assets associated with completed missions and projects, as well as new missions.
The overall goal of establishing a CRM Program will include defining roles, responsibilities, and processes needed for a successful NASA CRM Program. Developing this process can be included within the EMP and should be completed within a year, pending contractor support. However, the application of a review process is a long-term objective that will extend beyond the scope of the EMP. Assessing the success of the review process may require the development of checklists or protocols that can be applied for completed missions and projects, as well as for new ones. NASA's wind tunnels are examples of historic resources for which a review protocol should be applied to assess proper consideration and documentation. It should be noted that funding for documenting the wind tunnels scheduled for demolition is beyond the scope of this EMP. Documentation of the SSP is also detailed in a separate EMP and does not have a time-sensitive connection to this EMP. This process of reviewing and documenting physical assets will assist NASA in assessing underutilized and/or unutilized space for historic preservation, redevelopment, or disposal consideration.

The CRM Program should also address NHPA compliance for new mission and project plans. Potential adverse effects to historic properties are often captured through implementation the National Environmental Policy Act (NEPA) guidelines for each specific project. NHPA compliance also needs to be evaluated when a Congressional earmark involves construction activities. Linking NEPA findings and the process of evaluating Congressional earmarks should be reviewed by the CRM Work Group with the target goal of incorporating them into the CRM Program nationally and CRM Plans at each Center. These targets have been tracked quarterly and are reported to senior management annually.

Through the process of its development, the CRM EMP has served to make the needs of the CRM program known within the Agency. CRM EMP has become the wellspring from which educational and outreach efforts have emerged.

CRM Project Highlight: NASA Environmental Quality Award (2007)

Integrating CRM into projects early in the mission planning process has yielded substantial time savings for project delivery. In 2007, the CITE Stand Historic Property Mitigation Team at KSC was honored with the NASA Environmental Quality Award. The CRM's review process helped ensure that the State of Florida funded $35 million for modifications to the O&C. The O&C is a NRHP-listed historic property and the CITE stands are considered contributing elements. Typically, the

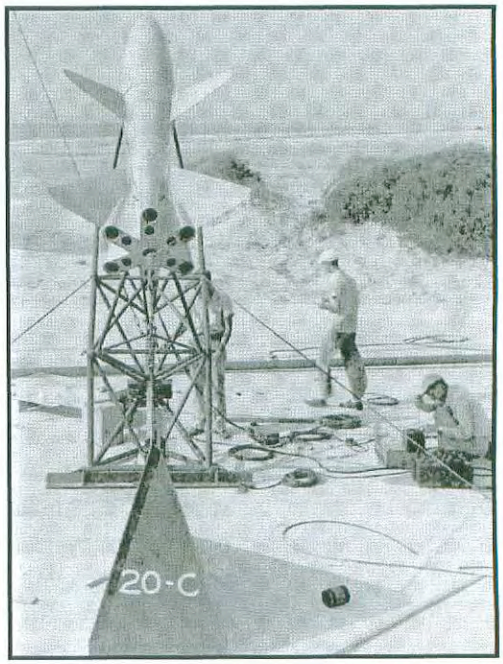
Section 106 review process for removal of the CITE stands would have taken 3 to 6 months to complete, resulting in mission delays and the potential loss of $35 million in funding from the State of Florida. The environmental team was able to negotiate an appropriate agreement document with the SHPO in less than 3 months. The agreement required NASA to document the CITE stands through photographs. This was the first time a NASA CRM project received the Agency's Blue Marble Award, in this case for expediting the regulatory review process.

Wallops Recognized for Aviation First in Virginia

In March 2008, the Virginia Aeronautical Historical Society recognized NASA's WFF for its contribution to aeronautical research using rocket-propelled vehicles. Together with the Virginia Department of Transportation and the Virginia Department of Historic Resources, the Virginia Aeronautical Historical Society (VAHS) recognizes aviation firsts in the Commonwealth. A roadside historical marker, which will soon be located on Virginia Rt. 175 adjacent to the facility's Visitor Center, recognizes WFF's first research rocket launch on July 4, 1945. A dedication ceremony is scheduled in late 2008.

Tiamat, the Army Air Forces' first air-to-air guided missile, was the first rocket tested at the NACA Langley Field Station at Wallops Island. Produced at Langley (now LaRC), ten of these missiles were launched from Wallops Island, VA, beginning on July 4, 1945. Originally, the purpose of the program was to develop a missile for combat use; however, with the close of war, the purpose changed to research on automatic control systems. The launch facilities were minimal at that time, consisting only of a concrete pad, marsden matting, and welded pipe for the first launch. The roadside marker recognizes these significant achievements in aviation history.

WFF is one of the oldest launch sites in the world and continues to support scientific research and orbital and suborbital payloads, placing WFF at the center of Space and Earth sciences research.



Wallops personnel prepare Tiamat for launch in July 1945

2.10.2 Advanced Risk Management

In many ways, the growing success of the CRM program within NASA may be attributed to an increased awareness of the federal requirements and the integration of the historic preservation regulatory processes into mission planning. The fact remains, however, that CRM is viewed by many NASA managers as a regulatory burden that negatively impacts their missions. Though the Agency prides itself in its historic accomplishments, the focus of managers, understandably, remains their immediate mission needs. NASA Headquarters works closely with the HPOs to highlight ways in which the CRM program supports mission. With the incorporation of historic preservation considerations into early planning, the risk of a schedule delay can be minimized. To track the relationship between regulatory requirements and mission requirements, advanced risk management, a system accessible to

mission managers to define and track any potential risks (safety, performance, cost, or schedule) to mission, presents CRM compliance as a risk. The relevant risks, Risk Numbers 1622 and 5329, are presented below:

Risk Number: 1622
Risk Title: Delayed Implementation of Cultural Resource Management (CRM) Regulatory Requirements Adversely Impacts Mission Schedules
Risk Statement: Given that NASA does not have a robust Cultural Resources Management (CRM) program and personnel are not aware of or do not understand CRM regulations, there is a possibility that cultural resources and associated issues will not be identified, NASA will not comply with applicable CRM regulations, and schedule and cost impacts will occur while implementing corrective actions and managing public and political involvement.
Context: NASA owns numerous facilities, sites, and properties that have historical, cultural, and archaeological significance to the national and international community. Before NASA can modify, abandon, or demolish real property, historic preservation statutes and regulations first must be satisfied. Neglecting to consider these resources during mission planning has caused program and project delays via external factors, such as regulatory requirements, public involvement/opinion, and political pressure. Time involved can be considerable, (1+ years to resolve citizen suits). Without a cultural resources management process in place, timely project delivery can be compromised and regulatory requirements may be unmet. The primary historic preservation regulatory requirements are: the National Historic Preservation Act (NHPA); EO 13287 – Preserve America; and EO 13227 – Federal Real Property Asset Management. Other external requirements also may apply.

Risk Number: 5329
Risk Title: Cultural Resources Management Impacts Scoped to Transition
Risk Statement: Given that NASA does not have a robust Cultural Resources Management (CRM) program, Transition is occurring while CRM processes and policy are being developed, and personnel do not understand CRM regulations; there is a possibility that Shuttle transition and retirement will experience schedule and cost impacts while NASA implements corrective actions and manages public and political involvement.
Context: NASA owns numerous Shuttle historic resources within local, State, Federal, and international communities. These resources have significant value to these communities. Before NASA can modify, abandon, or demolish real property, historic preservation statutes and regulations first must be satisfied. Neglecting to consider these resources has caused program and project delays via external factors, such as regulatory requirements, public involvement/opinion, and political pressure. Time involved can be considerable (1+ years to resolve citizen suits). The primary regulatory requirements are the National Historic Preservation Act (NHPA); EO 13287 – Preserve America; and EO 13227 – Federal Real Property Asset Management. Other external requirements also may apply. The risk priorities are very high based on the fact that this risk exists currently, and the risk is reintroduced each time a mission is planned without consideration of Federal cultural resource management regulations. The risk is present each time a modification is made to a known or potential historic resource (primarily real property), to include archaeological resources located on NASA property. These risks are the responsibility of the Environmental Management Division's (EMD) Director and tracked by the FPO.

2.10.3 External Website

2005 NASA Commitment: *NASA will make CRM documents readily accessible to CRM personnel, and will establish a Headquarters-sponsored website on which CRM documents will be posted.*

NASA Headquarters has successfully met this requirement, and the website's popularity has precipitated the development of additional CRM Web-based resources at NASA's Centers. These efforts have been successful through the support of Center HPOs, master planners, as well as NASA's IT and GIS experts.

The Environmental Management Division (EMD) upgraded its website in 2006 http://oim.hq.nasa.gov/oia/emd/ to meet the Agency's update requirements. The enhanced website provides a public summary of the support

services that EMD provides to the strategic focus areas. NEPA and CRM Programs are cited under Direct Mission Support.

NASA EMD Website

The second screenshot illustrates NASA's public CRM homepage. This site provides links to many resources, both internal and external. The site's tabs provide direct links to the Center CRM websites, many of which have been established within the past three years.

2.10.4 Internal Websites

NASA also has established an historic preservation website during the current reporting period: http://nets.grc.nasa.gov/histpreserve/home/index.cfm. The pages of this website are directly accessible to NASA employees via the EMD CRM Website.

EMD's CRM Website provides a link on the public page stating that the internal site is accessible only to NASA employees. These NASA-only Web pages are used to post documents related to NASA policies.

NASA CRM Website

2.11 COLLABORATION AND PARTNERSHIP WITH NATIVE AMERICAN TRIBES

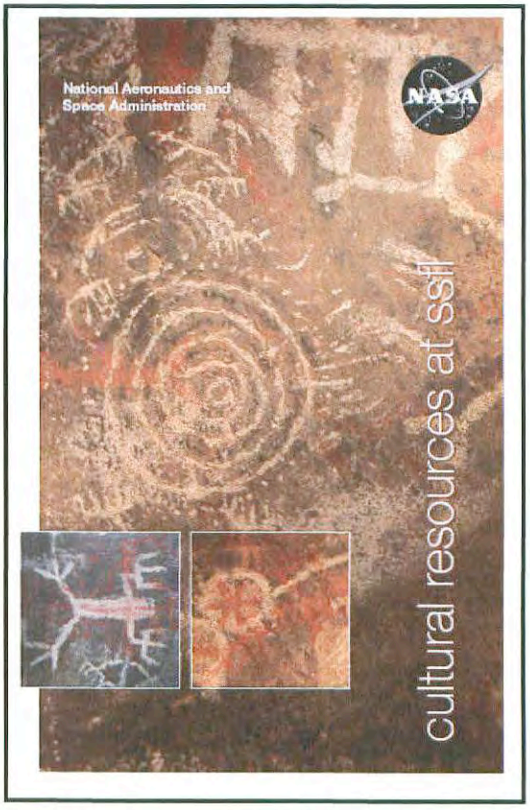
Generally, NASA des not have undertakings that affect Tribal lands. Even though NASA manages over 250 archaeological sites, the limited new construction NASA conducted during the reporting period has been within the NASA Center or component facilities. As a consequence, NASA has not held nation-to-nation consultation with Native Americans under NHPA, ARPA, or the Native American Graves Protection and Repatriation Act

(NAGPRA). However, NASA does partner with numerous tribes each year. Partnerships have been developed to apply NASA technology, such as satellite data, to solve Tribal issues or to promote economic growth. For example, in November 2007, the Central Council of the Tlingit and Haida Indian Tribes of Alaska conducted a GIS User Conference in Juneau, Alaska, that included a half-day workshop by NASA's GSFC on the fundamentals of remote sensing analysis using Landsat data.

Chief Little Bear of Fernandeno/Tataviam Tribe with Rocketdyne administrators at SSFL in the early 1970s

NASA's outreach programs, such as New Frontiers missions, Explorer schools, and space grants engage tribal leaders and students. NASA invests in the Indian nations' education programs to ensure the next generation of explorers is prepared for science's new frontiers. For example, in 2006 NASA, Exxon, and the Bernard Harris Foundation formed a partnership to send 85 minority middle school students to the Bernard Harris Summer Science Camp. The group included students from Oklahoma Native American tribal schools.

NASA ARC, through a partnership with the Navajo Nation and Artreach Studios, developed educational materials to encourage Navajos to study science in a culturally-relevant way. Also, in 2006, following two years of planning, the partnership developed an activity book and DVD integrating both Navajo and Western teachings on astronomy. The material presents Navajo stories about the stars, as well as Western scientific knowledge.



CRM brochure created for Painted Cave NRHP-listed site located at NASA's SSFL

Partnerships address common interests, such as meetings to discuss climate change issues viewed from both a Native American and a NASA perspective. NASA recognizes the value in learning from Native Americans. In September 2007, NASA invited a Native American, Scott Fraizer, a Santee/Crow Indian and executive director of Native Waters, to LaRC to speak on "Traditional Native Scientists." Native Waters is an outreach program that seeks to create contemporary,

scientifically-accurate, and culturally-sensitive water education resource programs and networking opportunities for tribal and non-tribal educators. The program supports what the tribes have done for generations—pass down scientific knowledge through the oral tradition.

In addition to NASA's educational initiatives, NASA's Science Mission Directorate recognizes the value of learning about Native science. A collaboration between the Native American Academy and the NASA Science Mission Directorate led to "One Earth, One Universe" workshops held in 2005. The workshops brought professional researchers and educators trained in Western science together with Native American scholars who were both traditionally and university trained. More information can be found on the website created for the workshops (http://www.oneearthoneuniverse.org/home.html).

The NASA Science, Engineering, Mathematics and Aerospace Academy (SEMAA) Project is one of NASA's investments focused on NASA's educational goal to attract and retain students in science, technology, engineering, and mathematics disciplines. In 2006, a grant was awarded to a NASA SEMAA site, Oglala Lakota College (Tribal College)—together with Arizona State University and a Historically Black University, Tennessee State University—to develop a unique, geosciences curriculum for historically underserved and underrepresented high school students, entitled the "GeoRobotic Analytical Sampling Project (GRASP): Increasing the Participation of African Americans and Native Americans in Geosciences."

This program meets a NASA mission goal of educating Native American students but also focuses on studying their heritage and reservation. As Stacy Phelps, Co-Chair, Math and Science Department, Oglala Lakota College, states in the 2006 SEMAA annual report,

> *The badlands are often viewed by our Native American students as an area that our people were forced onto a long time ago. The GeoRobotics Project provides our students with an opportunity to appreciate the uniqueness of their surroundings, as the badlands provide a perfect backdrop for a simulated robotics mission on Mars. By design, the project demonstrates to students that science and engineering can flourish anywhere, and that they have the right and the abilities to be a part of science and engineering everyday and literally in their own backyards.*

In 2008, NASA's SSC signed a tribal education agreement with members of the Mississippi Choctaw Tribal Council. The goal of the agreement is to enhance existing mathematics, science, and technology education programs and to create new vocational and technical training programs. "We all have an interest in space," said Roy Estess, SSC Director. "We try to capitalize on the human interest in space and leverage that for an increased emphasis in education." The agreement calls for NASA to establish a teacher enhancement center at the Choctaw reservation. The center will include teacher resource materials such as videotapes, slides, curricula, and publications.

NASA began a new era in education in 2005 with the opening of the first SEMAA Program housed at a Tribal College on a Native American Reservation. It provides Native American students located at the Pine Ridge Reservation in Kyle, South Dakota, with the opportunity to explore, discover, and understand space exploration through an Aerospace Education Laboratory, a state-of-the-art electronically-enhanced computerized classroom that places cutting edge technology at their fingertips. John Herrington, the first Native American to walk in space was a dignitary at the opening ceremony.

While several NASA Centers are directly engaged with Native American tribes, their focus is educational outreach work and does not directly involve Center HPOs. Some HPOs are not even informed of the NASA's partnerships with tribes. Likewise, NASA educational and outreach personnel may not be aware of NASA's CRM program or that NASA manages archaeological sites relevant to tribal history at NASA Centers. The NASA FPO has established a goal of increasing

awareness of NAGPRA, ARPA, and the NHPA among the NASA education and outreach community. Even if NASA managers are not working with tribes within the context of regulatory consultation, increasing their awareness about NASA's responsibility to Native Americans will benefit NASA overall and help to ensure NASA's cultural resources are incorporated into future outreach initiatives.

Predator B unmanned aircraft system

In March 2007 NASA's Dryden Flight Research Center (DFRC) acquired a Predator B unmanned aircraft system adapted for civilian missions. The aircraft has been named "Ikhana" (ee-kah-nah), a Native American word from the Choctaw Nation meaning "intelligent," "conscious," or "aware." "The name perfectly matches the goals we have for the aircraft," said Brent Cobleigh, NASA DFRC's project manager for Ikhana. "They include collecting data that allow scientists to better understand and model our environmental conditions and climate, increasing the intelligence of unmanned aircraft to perform advanced missions, and demonstrating technologies that enable new manned and unmanned aircraft capabilities."

Views of a maquette of a sculpture designed by Bob Lomadapki from the Hopi tribe

This maquette was produced by model makers at ARC and is currently on display in the Director's office. Bob Lomadapki developed this design at NASA's request after studying the history of ARC and incorporating aspects of Hopi culture into the possible design for a new building project at the Center.

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SECTION THREE IDENTIFICATION OF HISTORIC RESOURCES

3.1 2005 NASA COMMITMENTS RELATED TO IDENTIFICATION

> ***2005 NASA Commitment:*** *NASA will complete historic building and archaeological surveys of NASA Centers.*

Prior to the development of NASA's CRM Program at Headquarters, no policy or directive existed requiring Centers to complete comprehensive identification and evaluation of historic properties. Cultural resource surveys were and continue to be driven by facility-specific needs. Under the new CRM Program, NASA's HPOs are tasked to complete their Center's building and archaeological surveys. While Centers have been extremely responsive to this directive, some historic survey needs remain. At most Centers, cultural resource surveys for properties over 50 years of age have been completed and the HPOs have established a protocol to survey assets when they reach 45 or 50 years old. Table 4 provides a summary of NASA's current inventory of built and archaeological resources.

During the current reporting period, NASA Centers have initiated a series of gate-to-gate surveys for built resources. For example, LaRC and GRC recently completed surveys that evaluated numerous architectural resources. Each survey resulted in the identification of a potential historic district. A similar gate-to-gate survey of JSC was initiated in 2008. The results of that survey are expected in 2009. These surveys enhance NASA's management of cultural resources by proactively identifying historic properties and allowing for short- and long-term management.

In 2008, NASA prepared a training guide, entitled *Understanding NASA's Historic Districts*, for Headquarters staff, HPOs, and facility real property managers and master planners. The purpose of the training guide was to:

> *...provide NASA managers with an understanding of historic districts as they apply to all Federal agencies with real property holdings. It outlines how historic districts are defined and documented (including statement of significance, period of significance, boundary description, etc.) and summarizes National Register of Historic Places (NRHP or "National Register") historic districts where NASA has facilities.*

The 12 historic districts summarized in this training guide are:

- ARC – Shenandoah Plaza Historic District (U.S. Naval Air Station Sunnyvale, CA, Historic District)
- GRC – Lewis Field Historic District
- KSC – Launch Complex 39: Pad A Historic District
- KSC – Launch Complex 39: Pad B Historic District
- KSC – Shuttle Landing Facility (SLF) Area Historic District
- KSC – Orbiter Processing Historic District
- KSC – Solid Rocket Booster (SRB) Disassembly and Refurbishment Complex Historic District
- KSC – Hypergolic Maintenance and Checkout Area Historic District
- LaRC – NASA Langley Historic District
- SSFL – Alfa Test Area Historic District
- SSFL – Bravo Test Area Historic District
- SSFL – Coca Test Area Historic District

Numerous archaeological surveys have been conducted across NASA Centers, including several extensive surveys within the current reporting period. A total of 266 archaeological sites are currently recorded in the NETS CRM Module (Table 4). These sites include a diverse range of resource types, including a historic ranch at WSTF,

antebellum plantations at LaRC, a prehistoric rock shelter with rock art at SSFL, prehistoric middens and mound sites at KSC, and a historic courthouse at SSC. NASA's CRM NETS module relates data related to the type of archaeological resource, the cultural resource studies completed at each site, and the volume of records and collections recovered during excavations. The latter data can be used in the completion of accurate ARPA and NAGPRA reports. Table 5 lists the archaeological sites by type.

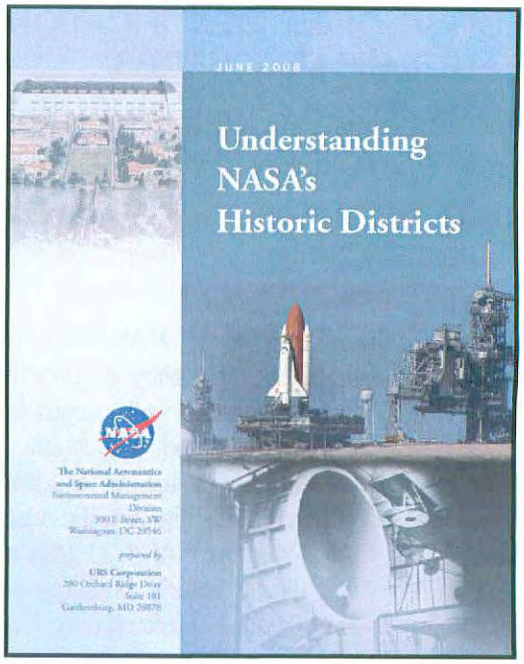


Table 4: Number of Identified Cultural Resources (Archaeological and Above-Ground)

Center	NRHP-Listed or Eligible Buildings*	Archaeological Sites	NHLs
ARC	33	10	1
DSFC	0	5	0
GRC	67	0	1
PBS	2	0	1
GSFC	0	1	1
WFF	1	8	0
JPL	0	0	2
GDSCC	0	**	1
JSC	0	0	2
WSTF	0	94	0
KSC	78	100	1
LaRC	3	21	5
MSFC	32	22	4
MAF	2	0	0
SSFL	0	1	0
SSC	2	2	1
Totals	220	(not including GDSCC) 266	20

* Does not include NHLs
** Sites present, information pending

Table 5: Archaeological Sites by Type

Center	Total Archaeological Sites	Historic	Pre-Historic	Multi-Component	Unknown
ARC	10	0	6	4	0
DFRC	5	4	1	0	0
GSFC	1	0	1	0	0
KSC	100	16	73	8	3
LaRC	21	7	1	13	0
MAF	2	2	0	0	0
MSFC	22	16	4	2	0
SSC	2	2	0	0	0
SSFL	1	0	1	0	0
WFF	8	6	1	1	0
WSTF	94	14	79	1	0
Totals	**266**	**67**	**167**	**29**	**3**

2005 NASA Commitment: *NASA will complete the survey of Space Shuttle-related resources by September 2008.*

The first NASA-owned properties to be recognized as historic were identified under the *Man in Space Theme Study* completed in 1984. This groundbreaking initiative resulted in approximately 24 NHL nominations, 20 of which are associated with the Apollo Program and were NASA-owned properties. In January 2004, President Bush's *New Vision for Space Exploration* announced the ending of the SSP by 2010. Responding to this new vision, NASA established a Transition Historic Preservation Work Group (HPWG) in February 2006.

The HPWG prepared a scope of work to perform NRHP eligibility surveys of assets that supported the SSP and developed shuttle-specific NRHP evaluation criteria that were approved by the NPS Officer of the National Register. In 2007, surveys were completed for 331 assets at 13 NASA locations with SSP functions. Center management reviewed and approved results, as summarized in Table 6, and final reports were submitted to the appropriate SHPOs. Among the assets found to be eligible due to their historically significant role in the SSP, 68 resources were recommended eligible that were not previously determined eligible under another context. Half of the resources had been determined eligible under the Apollo Mission or another past mission. The historic status of these assets has been updated in the new CRM NETS database, as well as in RPI.

Shuttle Approaching the Launch Pad

The following case study illustrates NASA's commitment to the identification of historic properties.

Case Study Title: NASA-Wide Survey and Evaluation of Historic Facilities in the Context of the SSP

Location: Nationwide

Date: 2006–2007

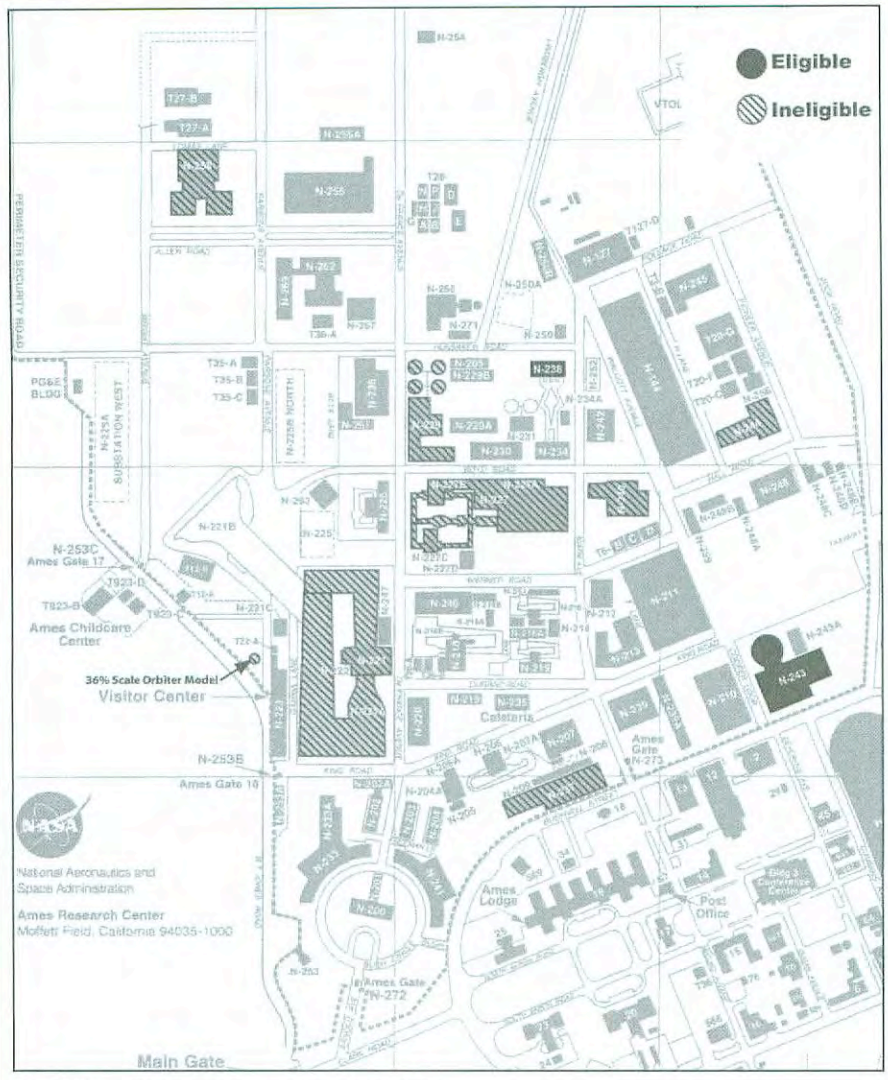
Case Study Description: In 2006, NASA kicked off a nationwide thematic cultural resource survey to identify NASA-owned and NASA-controlled historic properties associated with the SSP. Spearheaded by NASA Headquarters EMD, the SSP survey served two important purposes that advanced the Agency mission while ensuring efficient management of historic properties. First, the survey was intended to add to the Agency's inventory of historic properties through identification and evaluation consistent with its responsibilities under Section 110 of the NHPA. Second, the survey was undertaken to proactively identify historic properties that require consideration as required by Section 106 of the NHPA in advance of the transition from SSP to the CxP.

In the decision to adopt a thematic approach to the identification of historic properties, NASA took a cue from the earlier NPS *Man in Space Theme Study*, completed in 1984 and resulting in the designation of numerous NASA-owned NHLs significant for their association with the advances in aeronautics research and development that culminated in the Apollo Program. As the next generation of manned space travel, the SSP was a logical focus for NASA in undertaking their first Agency-initiated and Agency-executed thematic resource survey. The thematic approach was particularly appropriate as many of the resources associated with the SSP were likely to be reused by CxP, and their identification and evaluation through the SSP survey allows for advance planning with respect to anticipated Section 106 undertakings.

Because the SSP survey was executed at the Center level, EMD took steps to ensure a consistent approach. EMD worked with the Facilities Engineering and Real Property Division (FERPD) to identify NASA properties associated with the SSP, and with NPS to develop uniform criteria for evaluating eligibility of cultural resources for listing in the NRHP. NASA HPOs at each of the Centers then took the lead in retaining qualified consultants to carry out the identification and evaluation and to prepare summary reports. Survey was completed at all participating NASA Centers by the summer of 2007, and a roll-up report that summarized the Agency-wide results was finalized by Archaeological Consultants, Inc. (ACI) in July 2008.

In total, the SSP thematic survey evaluated over 330 individual resources, including buildings, structures, and objects, and both real and personal property, at thirteen NASA Centers and component facilities for their eligibility for listing in the NRHP for their association with the SSP under Criteria A, B, and C (Table 6). Most of these resources were less than 50 years of age at the time of the survey and were, therefore, also evaluated under Criterion Consideration G. Additionally, several SSP-related historic districts were identified.

The SSP thematic survey was a large-scale, nationwide effort that required active coordination between agencies and NASA Centers, and is a major success for NASA's CRM Program. The survey highlights the Agency's ongoing commitment to the identification of historic properties as envisioned in the NHPA. The outstanding contribution of the SSP survey was recently recognized by the California SHPO, which announced that it will present ARC with a 2008 Preservation Design award in the category of Cultural Resource Studies and Reports for their "Evaluation of Historic Resources Associated with the Space Shuttle Program at Ames Research Center," prepared by Page and Turnbull of San Francisco.



Map 2. Space Shuttle Program Eligibility Map
(Source: NASA Ames Research Center; altered by Page & Turnbull)

In their recognition of ARC's SSP survey report, the California SHPO praised Page and Turnbull's skillful application of the NRHP Criteria to NASA's highly-specialized, technical resources, observing that in the evaluation of the resources:

The aspects of integrity deemed to be most instructive were workmanship and association. Workmanship, in this case, is physical evidence of the technology of a period in history. Examples of workmanship include the presence of specialized infrastructure, such as vacuum spheres and wind tunnels. In many cases, the buildings housing these resources are treated as shells, adapted specifically to the equipment. Similarly, integrity of association is not defined by aesthetic attributes, but rather as the direct link between an important historic event and a historic property.

Shuttles Waiting on Launch Pads 39A and 39B

Table 6: Properties Determined NRHP-Eligible in the SSP Survey

NASA Center	Facility No.	Facility Name	Applicable Property Type*											
			1	2	3	4	5	6	7	8	9	10	11	12
ARC	N238	Arc Jet Laboratory							X					
ARC	N243	Flight & Guidance Sim Lab/VMS										X		
CANOGA PARK	N/A	Pacific Scientific Furnace									X			
DFRC	4860	Mate-Demate Device (MDD)	X										X	
GRC	85-94, 113-114	Abe Silverstein 10 by 10 SWT							X					
GRC	39, 46, 53-57, 59, 61, 138	8 by 6 SWT							X					
JSC	5	Jake Garn Mission Simulator and Training Facility										X		
JSC	7	Crew Systems Laboratory							X			X		
JSC	9	Systems Integration Facility										X		
JSC	16	Avionics Systems Laboratory							X					
JSC	30	Mission Control Center			X	X		X				X		
JSC	44	Communications and Tracking Development Lab						X	X					
JSC	222	Atmospheric Reentry Materials and Structures Evaluation Facility							X					
JSC	OV-103	*Discovery*								X				
JSC	OV-104	*Atlantis*								X				
JSC	OV-105	*Endeavour*								X				
KSC	K6-848	Vehicle Assembly Building		X										
KSC	K6-900	Launch Control Center			X			X						
KSC	N/A	Crawler Transporter (#1)	X		X									
KSC	N/A	Crawler Transporter (#2)	X		X									

NASA Center	Facility No.	Facility Name	Applicable Property Type*										
			1	2	3	4	5	6	7	8	9	10	11	12
KSC	N/A	Crawlerway	X		X									
KSC	N/A	Press Site: Clock and Flag Pole					X							
KSC	J8-1708	LC 39: Pad A			X									
KSC	J7-0337	LC 39: Pad B			X									
KSC		Shuttle Landing Facility (Runway)	X										X	
KSC	J6-2313	Landing Aids Control Building	X										X	
KSC	J6-2262	Mate-Demate Device (MDD)	X										X	
KSC	K6-894	Orbiter Processing Facility		X										
KSC	K6-696	Orbiter Processing Facility High Bay 3		X							X			
KSC	K6-794	Thermal Protection System Facility									X			
KSC	K6-494	Rotation/Processing Building		X										
KSC	L6-247	SRB ARF Manufacturing Building		X							X			
KSC	M7-961	Hypergol Module Processing (North)		X										
KSC	M7-657	Parachute Refurbishment Facility									X			
KSC	M7-777	Canister Rotation Facility		X										X
KSC	N/A	Payload Canister (#1)	X											X
KSC	N/A	Payload Canister (#2)	X											X
KSC	N/A	Retrieval Ship *Liberty Star*	X										X	
KSC	N/A	Retrieval Ship *Freedom Star*	X										X	
KSC	N/A	Mobile Launcher Platform (#1)	X		X									
KSC	N/A	MLP (#2)	X		X									
KSC	N/A	MLP (#3)	X		X									

NASA Center	Facility No.	Facility Name	Applicable Property Type*											
			1	2	3	4	5	6	7	8	9	10	11	12
LaRC	1257, 1257N/S, 1258, 1258A, 1261, 1262	Aircraft Landing Dynamics Facility							X					
MSFC	4436	SSME – HSL Block II Facility							X					
MSFC	4540	Acoustic Model Engine Test Facility 116 (TF 116)							X					
MSFC	4550	Structural Dynamic Test Facility							X					
MSFC	4583	Test and Data Recording Facility							X					
MSFC	4612	Materials and Processes Laboratory							X					
MSFC	4619	Structures, Dynamics and Thermal Vacuum Lab							X					
MSFC	4663	HOSC/NDC						X						
MSFC	4670	Advanced Engine Test Facility							X					
MSFC	4674	Control Facility							X					
MSFC	4705	Multi-Purpose High Bay Facility and NBS							X			X		
MSFC	4707	National Center for Advanced Manufacturing							X					
MSFC	4732	Office and Wind Tunnel Facility (14-foot Trisonic Wind Tunnel only)							X					
MSFC	N/A	NASA Barge *Poseidon*	X											
MAF	110	Vertical Assembly Building		X										
MAF	114	High Bay Addition		X										
MAF	451	Pneumatic Test Facility		X										
MAF	452	Control Building (for 451)		X										
PALM-DALE	150	Shuttle Orbiter Final Assembly Building		X					X		X			
PALM-DALE	N/A	Orbiter Lifting Frame	X											
SSFL	218	Coca Control Center (for 733)							X					

NASA Center	Facility No.	Facility Name	Applicable Property Type*											
			1	2	3	4	5	6	7	8	9	10	11	12
SSFL	733	Coca I Test Stand (A-3)							X					
SSC	4120	Propulsion Test Stand A-1							X					
SSC	4122	Propulsion Test Stand A-2							X					
SSC	4210	Propulsion Test Stand B-1							X					
SSC	4220	Propulsion Test Stand B-2							X					
WSSH	N/A	Shuttle Landing Facility Runways 17/35, 23/05, and 22/02	X									X	X	
Totals			**17**	**12**	**10**	**1**	**1**	**4**	**26**	**3**	**6**	**7**	**7**	**3**

*** Property Types:**

1 Resources Associated with Transportation
2 Vehicle Processing Facilities
3 Launch Operation Facilities
4 Mission Control Facilities
5 News Broadcast Facilities
6 Communications Facilities
7 Engineering and Administrative Facilities
8 Space Flight Vehicle (Space Shuttle)
9 Manufacturing and Assembly Facilities
10 Resources Associated with the Training of Astronauts
11 Resources Associated with Space Flight Recovery
12 Resources Associated with Processing Payloads

3.2 ADVISORY GUIDELINES QUESTIONS 1–6: RESOURCE IDENTIFICATION

Following the ACHP 2007 Advisory Guidelines, responses to the six questions addressing the status of NASA's identification of historic properties are provided in this section. This information was provided by NASA's HPOs in response to a data call from NASA Headquarters in March 2008. Relevant responses from the HPOs have been provided below with minimal editing, in order to illustrate the involvement of NASA's "on-the-ground" cultural resource managers.

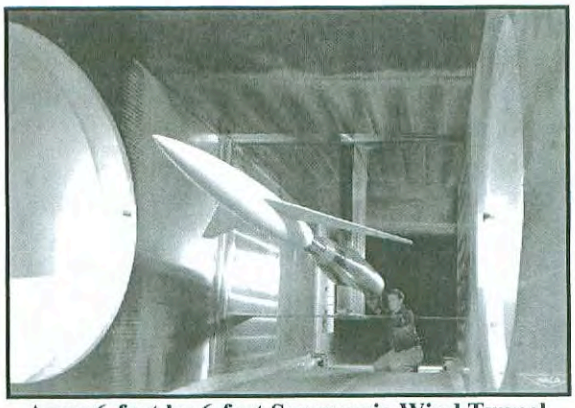
Data Call Question 1

Building upon NASA's 2004 and 2005 Section 3 reports, please explain how many historic properties have been identified and evaluated at your Center/component facility during the past 3 years (October 2005 through September 2008)? Has this inventory improved?

Under NASA's new CRM program, HPOs are tasked to complete surveys to identify and evaluate historic properties with the goal of complying with Section 110 and improving the Agency's overall historic property inventory. During the past 3 years, numerous NRHP eligibility surveys have been performed throughout the Agency including those performed for SSP-related resources. The following provides a brief description of historic property surveys performed at 11 Centers/component facilities.

Ames Research Center

During the reporting period, five historic properties were identified and evaluated at ARC. Two of these are historic resources associated with the SSP including Building N238 (Arc Jet Laboratory) and Building N243 (Flight and Guidance Simulation Laboratory).



Ames 6-foot by 6-foot Supersonic Wind Tunnel (Considered NRHP-eligible)

Three additional buildings at ARC were evaluated and determined by NASA to be eligible for listing in the NRHP: N200 (Administration Building), N221 (40-foot by 80-foot Wind Tunnel), and Building N226 (6-foot by 6-foot Supersonic Wind Tunnel). In 2008, the California SHPO concurred with ARC's eligibility determination.

Dryden Flight Research Center

The SSP NRHP eligibility survey performed at DFRC evaluated five properties. One property, the Mate-Demate Device (MDD), was identified as eligible for listing in the NRHP within the context of the SSP.

Space Shuttle Discovery in post-flight processing in the NRHP-eligible MDD

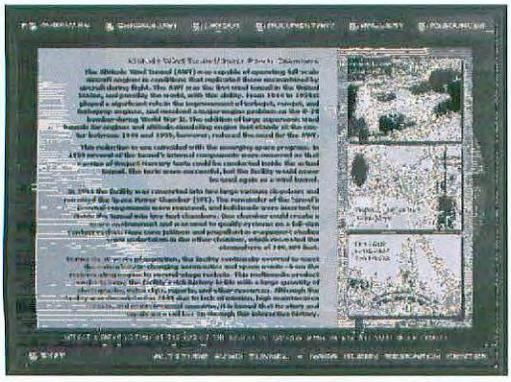
Wallops Flight Facility

Four properties were surveyed for historic eligibility at WFF. None of the properties were found to be eligible for listing in the NRHP.

Altitude Wind Tunnel Interactive History, GRC (http://awt.grc.nasa.gov/Interactive/awt.html)

Glenn Research Center

As part of the SSP historic eligibility survey, two facilities at GRC, the 8-footy by 6-foot Supersonic Wind Tunnel and the Abe Silverstein (10-foot by 10-foot) Supersonic Wind Tunnel, were determined to be eligible for listing in the NRHP. Additionally, during the reporting period, the Altitude Wind Tunnel and the Propulsion Systems Laboratory, Cells No. 1 and No. 2 were determined to be eligible for listing in the NRHP with concurrence from the Ohio SHPO.

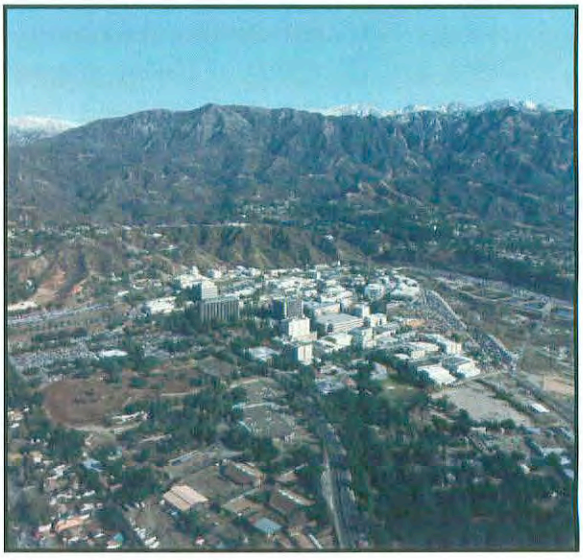


Altitude Wind Tunnel Interactive History, GRC (http://awt.grc.nasa.gov/Interactive/awt.html)

Shuttle models being tested in the NRHP-eligible 8-foot by 6-foot Supersonic Wind Tunnel

Jet Propulsion Laboratory

During the reporting period, a review of a historic eligibility survey performed at JPL in 2004 identified deficiencies in the survey. As such, a re-survey of the facility is planned in the near future for structures that are 45 years of age or older.



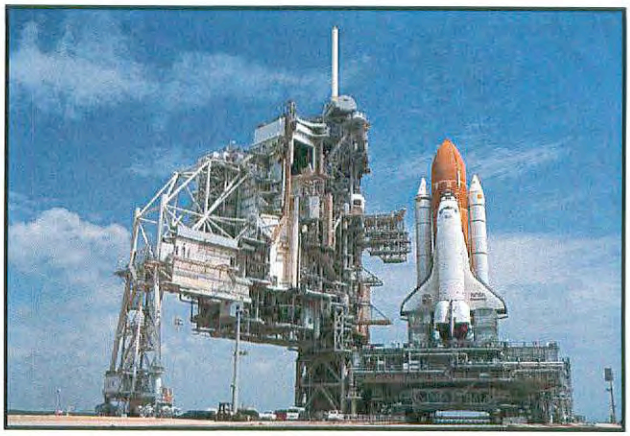
Aerial View of JPL

Johnson Space Center
The SSP historic eligibility survey evaluated 112 assets at JSC. Twenty-six assets were determined eligible for listing in the NRHP within the context of the SSP.

Runway at WSSH

White Sands Test Facility
Two new sites were identified at WSTF, including the Quartzite Mountain Agave Roasting Pit. Additionally, as part of site evaluations for possible renewable energy projects, surveys were performed at the Quartzite Mountain locations, resulting in an expansion of WSTF's historic property inventory of historic properties. The inventory also grew with the SSP historic eligibility survey of the White Sands Space Harbor (WSSH) runway location, which was identified as eligible for listing in the NRHP within the context of the SSP. The survey also identified a eligible historic district based on preliminary consultation with the New Mexico SHPO.

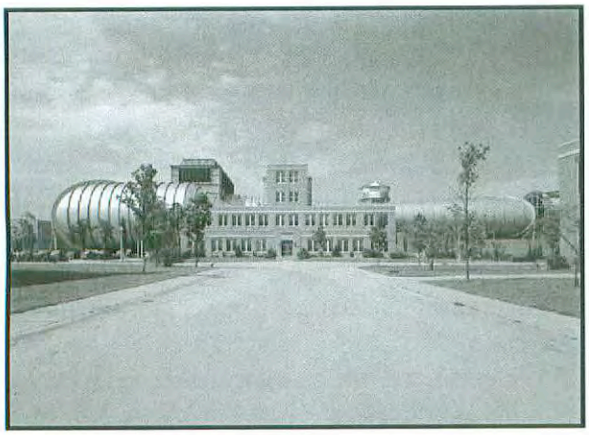
Kennedy Space Center
In 2006, 189 assets were evaluated as SSP-related facilities at KSC. Of these, 112 assets were identified as eligible for listing in the NRHP within the context of the SSP evaluation. With the addition of 40 new historic properties to the KSC inventory, the historic resources inventory for KSC has been greatly expanded. The Center utilized the services of the contractor who had completed the earlier SSP survey, thus augmenting studies previously undertaken. The support contractor has worked extensively with KSC's historic resources, and the inventory has benefited from this accumulated base of knowledge and experience.



Space Shuttle, KSC

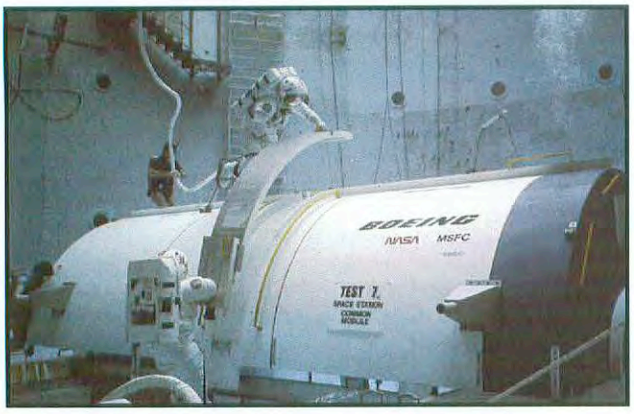
Langley Research Center
LaRC's historic property inventory was greatly improved during the reporting period with the completion of a comprehensive architectural survey of 165 architectural resources that were 45 years old or older. The survey identified 69 properties as eligible for listing in the NRHP. Additionally, the survey work identified a historic district at LaRC that is comprised of four non-contiguous parts.

As part of the SSP historic eligibility survey, 14 properties were evaluated within the Landing Loads Test Track Facility and were determined eligible for listing in the NRHP within the context of the SSP.



NRHP-eligible 16-foot Transonic Wind Tunnel Building (Building 1146) at LaRC

Marshall Space Flight Center
Forty-one properties were surveyed in 2007 at MSFC. Among those, 13 were identified as eligible for listing in the NRHP.



NRHP-eligible Space Station Mock-up in Neutral Buoyancy Simulator (an NHL) at MSFC

Michoud Assembly Facility
During the reporting period, five buildings at MAF were surveyed and found eligible for listing in the NRHP. Additionally, the SSP historic eligibility survey evaluated eight properties at MAF. Three buildings and one structure were identified as eligible for listing in the NRHP within the context of the SSP.

Data Call Question 2
Describe the policies of your Center/component facility that promote and/or influence the identification and evaluation of historic properties. Discuss the extent to which your Center/component facility has incorporated historic properties into strategic and master planning efforts. Identify the policies in place that address the stewardship and treatment of historic properties.

Although NASA Headquarters has the lead in developing Agency-wide policies for identification and evaluation of NASA's historic properties, Center/component facilities also have facility-specific policies and practices in place to identify, evaluate, and incorporate historic properties into strategic and master planning efforts and to address the stewardship and treatment of historic properties. The following provides a brief description of such policies and practices.

Ames Research Center
ARC has a policy to survey its resources for NRHP eligibility when a facility reaches 45 years of age. This policy is included in ARC's Cultural Resources Management Plan (CRMP).

Dryden Flight Research Center
Periodic cultural resource surveys are used to identify and evaluate historic properties. The DFRC CRMP includes policies for identification, evaluation, stewardship, and treatment of historic properties.

Wallops Flight Facility
The WFF Master Plan, which is targeted for completion by the end of 2008, includes an adaptive reuse plan for historic properties that is integrated with the facility's recapitalization plan.

Jet Propulsion Laboratory
JPL follows policies that address the stewardship and treatment of historic properties. All JPL planning activities within the facility take into consideration the potential effects to historic properties. The Protocol for the

Inadvertent Discovery of Cultural Artifacts describes the specific process that will be executed as a result of any activity that leads to the discovery of cultural artifacts.

Johnson Space Center

JSC has been pro-active in establishing and implementing policies to preserve the historic properties associated with the Nation's space program. JSC has instituted internal operating policies, including Johnson Policy Directive (JPD) 4310.B for preserving and displaying historic resources and JPD 8800.1I, Policy for Real Property Management.

Love Ranch at WSTF, White Sands Website

White Sands Test Facility

The WSTF CRM program is relatively new. A HPO was only recently assigned to the facility. At this time, identification and evaluation of historic resources is guided by few policies and procedures. However, with an assigned HPO and the facility approaching 50 years of age, the introduction of historic resource policies and programs is under development. Current policies and procedures require GIS mapping for all archaeological sites and approval by the HPO, or a designee, prior to any fieldwork being initiated within the White Sands' industrial area. Written policy also requires staff to immediately stop work if any new archaeological findings are discovered. Finally, site policy restricts access to the Gardner Springs Camp Site and the Love Ranch Facility.

Kennedy Space Center

The following KSC policy documents reference historic properties:

- KDP-KSC-S-1863, *The Center Planning Guidance for KSC for 2007–2009 and the scorecard*
- KSC-PLN-1911, *Environmental Resources Document*
- KDP-B-1036 (Revision J) *John F. Kennedy Space Center Business Objectives and Agreements for the Center Operations Directorate*
- KNPD 8500.1, *KSC Environmental Management*
- KDP-P-1733, *Historic and Archaeological Site Flow Chart*
- KCA-4088, *Launch Complex 34 Engineering Support Building Memorandum of Agreement*
- KDP-P-2569, *Lease or Exchange of Historic Properties*
- *Draft Cultural Resources Management Plan*
- *KSC Checklist Process*

The KSC HPO evaluates all undertakings to determine if they have the potential to affect historic properties. The HPO, along with a qualified CRM firm, identifies and evaluates historic properties eligible for listing in the NRHP. The KSC Real Property Officer

manages the list of facilities at KSC. Discussions and meetings are held with Master Planning and Program/Project Managers for strategic planning purposes, and to assess the potential to affect historic properties. Program/Project examples include the Shuttle Transition and Constellation activities. The Center Director reviews all new historic resource studies and evaluations prior to submission to the SHPO for concurrence.

Langley Research Center
Langley Policy Directive, LAPD 7000.2, *Review Program for Langley Research Center Facility Projects*, Part III, Design Requirements/Constraints – Historic Preservation, requires all project and construction managers to identify potential issues relating to cultural resources and historic preservation. The Center Master Planner also fills the role of HPO, which ensure that historic preservation concerns are incorporated into overall planning efforts. Additionally, LaRC's CRMP is incorporated into the Center's GIS-based master plan, which includes mapping of historic properties for use by project planners.

Marshall Space Flight Center
MSFC's policy for promoting identification and evaluation of historic properties requires the HPO to follow the requirements of the NHPA with support from NASA Headquarters. The Center Master Planner fills the role of the Center HPO, which ensures that historic preservation concerns are incorporated into overall planning efforts. The Center also has a Programmatic Agreement (PA) with the Alabama SHPO that streamlines the requirements of the NHPA.

Michoud Assembly Facility
The Lockheed Martin MAF CRMP is documented in Environmental Guideline number 53. This guideline describes the NRHP evaluation process for determining eligibility. The October 2006 Environmental Resources Document (ERD), Chapter 13 describes the cultural resources present at MAF. That ERD was bundled as Volume 3 of the three-volume MAF 2006 15-year Master Plan. Every month Lockheed Martin reviews Requests for Facilities, Operational Directives, and Facilities Plans for potential effects to cultural resources in accordance with Environmental Guideline number 57, "NEPA Monthly Reporting Plan."

Stennis Space Center
The SSC policy for determining the need to conduct identification surveys includes utilizing GIS. The SSC developed and regularly updates a "cultural resource sensitivity map" that is distributed to all facility personnel involved in construction, maintenance, and excavation. Various levels of pre-construction surveying and testing are mandated for each sensitivity zone. The map is updated after each parcel is surveyed, and the predictive model for site location is refined and updated. The procedure associated with all dig permits was modified to require review by the SSC HPO prior to excavations in sensitive areas per the Site Sensitivity Map.

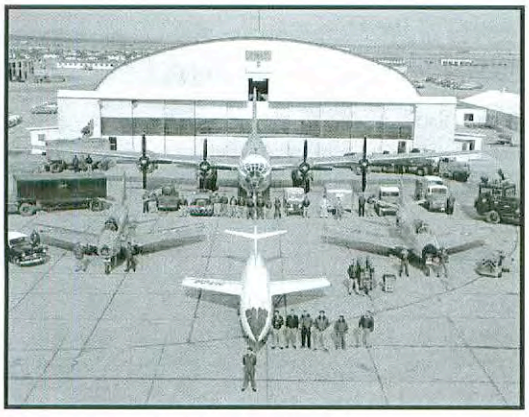
Data Call Question 3
How has your Center/component facility established goals for the identification and evaluation of historic properties, including whether they have been met?

The 2005 Section 3 Report outlined many of the goals and objectives NASA Headquarters had established in the development of the Agency's CRM program. With the continuing development of the Agency's overall program, Headquarters is encouraging Center/component facilities to have the responsibility for developing their own facility-specific goals for the identification and evaluation of historic properties. The following provides examples of the goals that have been established at Center/component facilities.

Ames Research Center
ARC's goals for the identification and evaluation of historic properties follow the guidelines established by the NHPA. These

goals include surveys of all resources for NRHP eligibility as they approach 50 years of age and for properties under 50 years of age that may have exceptional significance as defined by Criterion Consideration G.

Dryden Flight Research Center
DFRC has a goal to review the status of its inventory of historic properties every five years. The Center has also established an informal goal of nominating Building 4802 to the NRHP.



DFRC Building 4802

Glenn Research Center
GRC has a goal to conduct surveys and evaluations to identify its historic properties, including all of its major research facilities.

Jet Propulsion Laboratory
Through its Facilities Department and Environmental Affairs Program Office, the JPL has a goal to annually monitor the age of each JPL resource and evaluate those found to be 45 years or older for NRHP eligibility. Another goal is to document any significant changes proposed for resources, to include major modification, change in use or purpose, and demolition of historic properties.

White Sands Test Facility
At present, there are no specific identification and evaluation goals at the WSTF. However, as the facility approaches 50 years of age, the HPO will develop cultural resources procedures, policies, goals, and objectives. These goals and objectives will also be evaluated as the SSP phases out and facilities are evaluated for future use. For example, the WSSH runway systems are not identified for any future use by the CxP at this time, so goals for the identification and evaluation of the runways will need to be established prior to the 2010 program phase-out.

Kennedy Space Center
The EMS tracks cultural resources aspects, objectives, and targets for the KSC.

Langley Research Center
The goals for the identification and evaluation of LaRC's historic properties are included in the CRMP. Currently, no formal procedure or process is in place to determine whether the goals have been met.

Michoud Assembly Facility
A NASA SSP/Constellation transition team has established goals for the identification and evaluation of associated buildings that may be eligible for listing in the NRHP at MAF.

Stennis Space Center
Goals at SSC are set forth in the Historic Preservation Plan. With the completion of the post-Hurricane Katrina mitigation survey, one of SSC's informal goals is to update the Site Sensitivity Map as necessary.

Data Call Question 4
Describe any internal reporting requirements your Center/component facility may have for the identification and evaluation of historic properties, including collections (museum and archaeological).

In developing the Agency's overall CRM program, and as described in Section 2.8, NASA Headquarters has developed an Agency-wide database to provide for reporting and documenting of the Agency's historic properties. Development of the CRM NETS module has enabled NASA Headquarters to issue data calls to HPOs to track

historic property inventories, condition assessments, and activities associated with complying with NHPA. On a Center/component facility level, additional internal reporting requirements exist.

Dryden Flight Research Center
Reporting requirements at DFRC include a provision that facilities report any proposed major maintenance projects to appropriate managers in sufficient time to conduct Section 106 reporting and/or NEPA documentation. No reporting requirements exist for curated items because these items are Air Force property. The Air Force may have their own reporting responsibilities.

Wallops Flight Facility
Reporting requirements for identification and evaluation of historic properties at WFF are included as part of the facility's environmental impact checklist process.

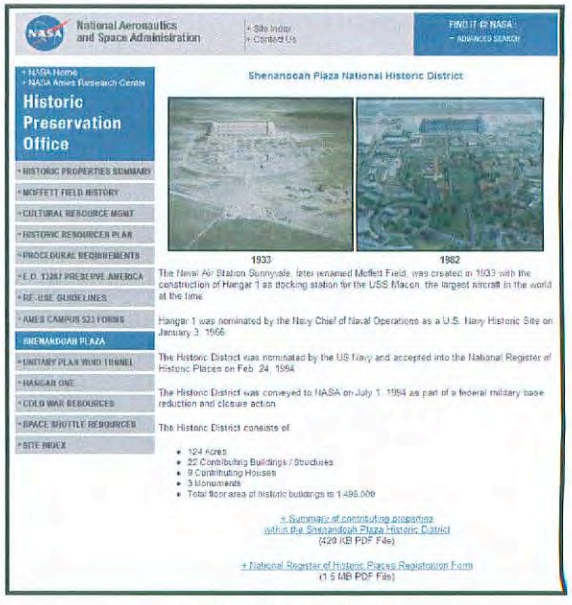
White Sands Test Facility
WSTF's internal reporting requirements involve a dig permit process, which requires a GIS evaluation and HPO approval prior to any field work that could affect archaeological siteses. All cultural resources collected at the WSTF are currently curated with the Laboratory of Anthropology at the Museum of New Mexico in Albuquerque. All materials submitted to the laboratory have been cataloged by the contractor. One collection is currently on loan and on display, at the White Sands Complex Second TDRSS Ground Terminal.

Kennedy Space Center
An EMS serves as the reporting and tracking system for cultural resources at KSC.

Langley Research Center
Internal reporting requirements at LaRC for the identification and evaluation of historic properties were developed and included in a draft PA for the management of facilities, structures, and sites. The PA is currently under review by the SHPO and the ACHP. Collections management at LaRC is performed in accordance with the guidelines established by the Virginia Department of Historic Resources, *Guidelines for Conducting Cultural Resource Survey in Virginia*, Rev. Jan. 2004 (Additional guidance includes *Archaeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines* [48 FR 44716, September 29, 1983]).

Data Call Question 5
Explain how your Center/component facility has employed the use of partnerships to assist in the identification and evaluation of historic properties. Examples may include the survey of NASA historic resources at the Center by the SHPO, an academic institution, or private interest group.

As described in Section 2.6, NASA formed the CRM Panel primarily to meet the outstanding needs of NASA's EMS in accordance with EO 13287. Formation of the panel, and the annual panel meetings, has provided a forum for interaction among the Agency's HPO's and CRM stakeholders. This interaction has allowed for the exchange of information and ideas regarding successful CRM partnerships at Center/component facilities, well as other CRM initiatives.



ARC CRM Website

Ames Research Center

ARC maintains a partnership with the Moffett Historical Society, a private group interested in the preservation of the Shenandoah Plaza National Historic District and, in particular, Hangar One, an important contributing structure sited within the historic district. The Moffett Historical Society has been helpful by providing access to its files, which include Historic American Buildings Survey (HABS) documents of Hangar One; identification of important persons associated with the historic district; and support in developing the ARC historic preservation and cultural resources website.

Dryden Flight Research Center

DFRC partnered with KSC to conduct the SSP historic eligibility survey. In addition, DFRC is currently partnering with the JSC to have historic eligibility surveys conducted by the NPS.

Wallops Flight Facility

WFF partnered with the James River Institute for Archaeology through the County of Accomack to conduct an archaeological survey of the Wallops Research Park area.

Goldstone Deep Space Communications Complex

GDSCC and JPL are currently working with partnerships to relocate the Pioneer Antenna from the Goldstone facility to the City of Barstow, CA. This project provides a unique opportunity to establish partnerships with a variety of groups and institutions, as well as to promote heritage tourism in the area.

Kennedy Space Center

NPS (Tallahassee, Florida) has been contracted to complete KSC's archaeological collection/ cataloging process through a loan agreement with the Canaveral National Seashore in Titusville, Florida.

Langley Research Center

The LaRC GIS team has had a successful partnership with the Virginia Space Grants Consortium to provide college interns to assist the GIS team in developing a Web-based CRM application to document LaRC's historic properties.

Marshall Space Flight Center

MSFC has worked with the Historic American Engineering Record on four different occasions to document the Center's NHLs.

Stennis Space Center

The SSC HPO continues to provide support to Hancock County by providing presentations to community groups. This includes teacher and student workshops and historic tours, which are conducted upon request.

Data Call Question 6

Provide specific examples of major challenges, successes, and or opportunities your Center/component facility has experienced in identifying historic properties over the past 3 years.

With the sunsetting of the SSP, a major Agency-wide challenge and success story has been the identification and evaluation of resources that supported SSP. A total of 331 facilities at 13 NASA Center/component facilities were identified and evaluated as part of this study. As a result of the survey, 121 historic properties were identified and determined eligible for listing in the NRHP within the context of the SSP; of these, 68 assets had not been previously determined eligible for NRHP listing. The surveys performed at the various Centers were rolled up in to a single final report that will be a useful resource as NASA transitions to the CxP. Some of the major challenges, successes, and opportunities that were experienced by Center/component facilities are described below.

Wallops Flight Facility

Successes at WFF include the Development of the Wallops Research Park and associated World War II-era temporary buildings, development of the Superdarn array with

associated archaeological survey; and the identification of landscape and dock features overlooked in the initial survey associated with the Life Saving Station on Wallops Island.

Jet Propulsion Laboratory
During the past three years, JPL has identified many departments and individuals involved with the documentation and tracking of historic properties and information at JPL including, but not limited to, Facilities Department, Environmental Affairs Program Office, Real Property, and the JPL Historian. Coordination between all of these departments and resources allows for a thorough understanding of JPL's historic properties and the manner in which they can be identified and protected.

White Sands Test Facility
The evaluation of potential NRHP-eligible sites in relation to the SSP has helped WSTF gather valuable information with respect to its cultural resources program. As the facility approaches 50 years of age, the inventory of SSP assets will assist with gate-to-gate evaluations under Section 106. Additionally, as the SSP phases out, challenges will include the evaluation of the WSSH due to the current expectation that the facility will not be utilized for the CxP and due to land use agreements between the U.S. Army and NASA that state the WSSH facility must be returned to the U.S. Army in its original natural state. An additional challenge relates to future resources and funding as the CRM program is accelerated. As WSTF is a relatively small facility with limited civil servants and minimal contractor funding for CRM work, identifying resources that can devote more than 5 percent of their time will be a challenge.

Kennedy Space Center
With regard to successes, KSC led the way in assisting the Agency in the identification and evaluation process for the SSP historic surveys conducted in 2006–2007. KSC was able to obtain funds from the Constellation Project Office to perform future mitigation activities in support of the new exploration program. Working with the other Centers during the Agency-wide SSP Survey is regarded as a significant opportunity for KSC.

Shuttle and 747 above JSC

Langley Research Center
A major challenge for LaRC has been delays in the consultation process with the Virginia SHPO to receive concurrence on historic property identification initiatives. Two major successes are the completion of a survey of 164 architectural resources at LaRC and completion of the revision and update of LaRC's CRMP. Both of these documents provide an excellent historic baseline and structure for identifying LaRC's historic properties.

SECTION FOUR PROTECTION OF HISTORIC RESOURCES

4.1 2005 NASA COMMITMENTS

2005 NASA Commitment: *NASA will develop processes to review and document the historic significance of physical assets associated with completed missions/ projects and new missions/projects.*

NASA has undertaken review and documentation of the historic significance of physical assets, though not through a formal process. The planned publication of the CRM NPR provides an opportunity to develop a formal process. Even without a formal process in place, the Transition HPWG has been successful in proactively supporting mission. Multiple meetings have been held and the process remains ongoing. Because of this continuing dialogue, Constellation and Shuttle managers and facility managers are becoming increasingly aware of the NHPA. For example, the Constellation Asset Management Plan has incorporated the NHPA as part of its due diligence. This is an important milestone for cultural resources awareness, and it sets NASA on a path for expanding the protection of and reuse of historic resources.

2005 NASA Commitment: *NASA will ensure a CRMP is in place for all Centers.*

NASA is proud to report this goal has nearly been met. Table 7 illustrates the progress made in this regard. CRMPs are scheduled to be updated every 5 years with the exception of the ARC CRMP, which is updated annually.

Table 7: Cultural Resource Management Plans: Center Status

Center/Facility	CRMP	Date Issued/Updated	Center PA	Section 106 MOAs*** Executed 06-08
ARC	Yes	Nov-04	Yes *	0
DSFC	Yes	Update Ongoing	No	0
GRC	Yes	Feb-08	No*	2
PBS	Yes	Feb-08	No	0
GSFC	No	Not planned	No*	0
WFF	Yes	Jul-05	Yes	1
JPL	No	In Progress	No*	2
GDSCC	No	In Progress	No*	0
JSC	No	In Progress	No*	2
WSTF	Yes**	Jun-05	No	0
KSC	Yes	Update Ongoing	Center-wide PA under development*	2
LaRC	Yes	Mar-08	Center-wide PA under development*	6
MSFC	Yes	Aug-07	Center-wide PA under development*	1
MAF	Yes	Jun-07	No	0
SSFL	No	In Progress	No	1
SSC	Yes	Jun-05	No*	0

* Center is also under Agency-wide PA

** Falls under White Sands Missile Range Integrated CRMP as tenant

*** MOA – Memorandum of Agreement

2005 NASA Commitment: *NASA will update CRMPs for two Centers with the goal of entering into PAs at those Centers.*

NASA has exceeded this goal with three Centers updating their CRMPs and developing Center-wide PAs. While MSFC, KSC, and LaRC are in the process of finalizing their PAs, NASA Headquarters is also in the process of finalizing a Center-specific PA template. The template has been reviewed by the ACHP and their comments have been incorporated. The PA template will be used by JSC and made available to all HPOs for their use and consideration. Additional guidance from Headquarters on the use of the PAs to manage historic districts is needed. This topic was addressed in a guidance document prepared under Headquarters directive in 2008. Headquarters is also developing a training module on this topic.

4.2 DATA CALL QUESTIONS 7–10

Following the ACHP 2007 Advisory Guidelines, responses to the four questions addressing the status of NASA's protection of historic resources are provided below. Responses incorporate information provided by NASA's HPOs.

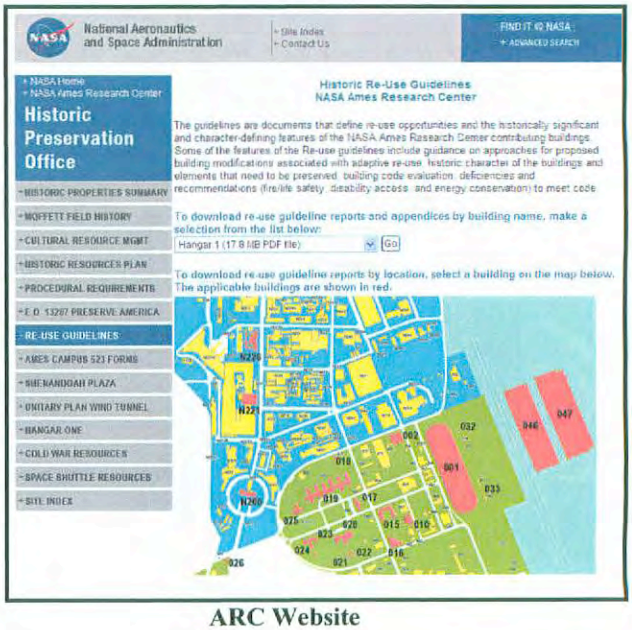
Data Call Question 7

Explain how historic properties have been protected at your Center/component facility. Provide specific examples. Include examples of historic properties that have been rehabilitated. Have vacant historic properties been maintained, stabilized, and monitored?

NASA's overall CRM program promotes protection and rehabilitation of historic properties whenever it is feasible and consistent with the Agency's mission. While NASA takes great pride in its technological and scientific accomplishments, its mission-driven focus has not always favored the physical preservation of all of its historic properties. The following provides examples of successful preservation and rehabilitation initiatives that have been carried out at NASA's Center/component facilities.

Ames Research Center

ARC has been active in protecting its historic properties and promoting their reuse. Examples of this include the long-term lease and partnership with Carnegie Mellon University for a $5 million renovation of Building 23. This building was the original hospital building at Moffett Field. ARC commissioned Building 23 Reuse Guidelines prior to the adaptive reuse and renovation planning by Carnegie Mellon University. These guidelines were critical in aiding the renovation work. The building's character-defining features were indentified in the reuse guidelines. These historic features were retained and protected during the renovation planning and subsequent rehabilitation construction. During the past 3 years, building reuse guidelines have been prepared for all of the contributing buildings within the Shenandoah Plaza Historic District. These guidelines are also now available in electronic format, and they serve as initial guidance when renovations or alterations to historic properties are proposed.



ARC Website

Wallops Flight Facility
The Wallops Beach Lifesaving Station has received stabilization and monitoring, as well as HABS Level II Photographic and Graphic Documentation. WFF is seeking an entity to purchase and remove the station from its current position, because NASA faces challenges to maintain it.

Jet Propulsion Laboratory
JPL actively protects two NHLs for NASA, a mission control room within Building 230 (Space Flight Operations Facility) and a space chamber housed within Building 150 (25-Foot Space Simulator). The two NHL's at JPL are closely monitored for any modifications that may be proposed. Modifications are initially proposed by the JPL Facilities Group, which then presents its proposal to the Environmental Affairs Program Office (EAPO). The EAPO reviews the proposal and determines whether an impact to the NHL will occur. Only after EAPO approval (which may first require SHPO concurrence) can a project at an NHL proceed. No historic properties at JPL require rehabilitation, and no vacant properties are located at JPL.

Goldstone Deep Space Communications Complex
The Pioneer Deep Space Station, retired in 1981, is an NHL located at GDSCC. It is comprised of a 26-meter dish supported on an 80-foot tower. The antenna is technologically obsolete, and its equipment has been removed from the support buildings. The antenna is unable to support future missions, and the City of Barstow has expressed interest in incorporating the antenna into a proposed technology center at a local community college. The project will not only protect and maintain the NHL but will also promote Heritage Tourism.

Johnson Space Center
The two NHLs and the Saturn V rocket located at JSC have been very well maintained and preserved and are accessible to the public through visitor and educational programs. In fact, the restoration of the Saturn V rocket was a commitment made in NASA's 2005 EO 13287 Section 3 Report. The restoration was supported by a *Preserve America* grant awarded to the Smithsonian Institution. A grant condition required that the rocket be nominated for listing on the NRHP. JSC provided funding for the restoration, to include the construction of a permanent structure over the entire rocket. Before the execution of this initiative, the rocket stood unprotected and in need of restoration. The rocket remains on JSC property but title has been transferred to the National Air and Space Museum, Smithsonian Institution.

White Sands Test Facility
WSTF is not open to the public. Access to archaeological sites and historic properties is restricted due to safety requirements and security restrictions. Additionally, the Environmental Program has identified all archaeological resources throughout the facility using the Environmental Department's GIS. The GIS information has been significant in protecting archaeological sites when facility infrastructure work is undertaken. For example, all dig permits and fieldwork must be preceded by GIS map checks to ensure that blading, road work, digging, trenching, and other associated activities do not disturb the numerous archaeological sites located throughout the facility. For sites such as the Love Ranch facility, the Gardner Springs Camp, and the Quartzite Mountain locations, access restrictions are in effect. For the Love Ranch facility, a controlled gate, interpretive sign, and visitor sign-in logbook have been established to minimize unauthorized access and any potential disturbance. Access to Love Ranch must also be coordinated through Security and the HPO.

Kennedy Space Center
The Mission Control Center on the Cape Canaveral Air Force side is the only vacant

historic property at KSC. This facility is part of an NHL and has been used for storage only. The historic Control Room consoles were removed and relocated to the KSC Visitor Complex/Early Space Exploration Exhibit. At this time, tours are no longer available. The facility is in need of major modifications and upgrades.

Langley Research Center
The Gantry or Lunar Lander Facility (Building 1297) is a major example of a historic property rehabilitated at LaRC. This NHL has been modified for use for tests associated with the Constellation Project, specifically the Orion capsule tests. In accordance with the Agency-wide NHL PA, LaRC notified the SHPO, the NPS, and the ACHP of the proposed modifications related to the rehabilitation of the facility with a determination of no adverse affect. LaRC received concurrence from the SHPO and the ACHP.

The Gantry (NHL), LaRC

Michoud Assembly Facility
Rehabilitation initiatives at MAF have included roof repairs performed on NRHP-eligible Buildings 110 and 420 in the aftermath of Hurricane Katrina. The large external sliding doors on the west side of Building 420 were repainted. The green translucent paneling near the top of Building 110, also damaged during Hurricane Katrina, was replaced with a blue paneling material.

Data Call Question 8
Describe Center/component facility policies that promote and/or influence the protection of historic properties. Include a discussion of asset management plans and management contracts.

NASA recognizes three groups of stakeholders in stewarding cultural resources and seeks to customize communications with each according to their interests and/or responsibilities:

- Program and Agency leadership, which sets the Agency's overall agenda, promotes common organizational values, and allocates resources in accordance with mission commitments and those values
- Institutional stewards, including environmental, facilities, logistics, and finance professionals
- The broader community of those interested in NASA's programs for diverse reasons

In the case of Facilities, coordination with the EMD on issues relating to cultural resources has been on the rise for several years. This coordination includes both interactions among institutional program managers within Headquarters, and interactions between Headquarters and the Centers within communities of practice. Each of these interactions provided an opportunity for improved communication and produced significant new strides.

For institutional program managers within Headquarters, sharing relevant knowledge and perspective seamlessly and in real time is ideal. Moving in this direction, FERPD has worked closely with EMD to ensure prompt and coordinated access to shared information. This has included tying historic preservation information to real property record systems, and progress has been made towards ensuring such coordination between databases and adapting NASA's Real Property Inventory in response. Individual program

managers spend more time ensuring coordination in many aspects of NASA interactions, and though there is opportunity to improve, important steps are being taken to bridge the gaps between organizations that view the work very differently. For instance, individual NASA programs invite one another to participate in relevant training and workshop activities for real property and master planning, and involve one another when issues of mutual interest arise. In particular, policy documents have been the subject of closer coordination in recent years.

To improve interactions between Headquarters and the Centers, FERPD coordinates closely with EMD in designing resource management training within real property and master planning communities. For instance, CRM awareness has been routinely incorporated into the agendas of workshops to strengthen and standardize the performance of program responsibilities in the past year. Recognizing the power of leadership by example, facilities managers who also have cultural resource preservation responsibilities have been enlisted to lead training of their peers. Their perspective on the importance of close coordination in facilities and CRM has prompted energetic, thoughtful discussion among these communities of practice.

Ames Research Center
At ARC, Historic properties are reported and documented in the NASA Real Property report as heritage assets.

Dryden Flight Research Center
DFRC maintains an agreement with Facilities to provide notification of planned modifications to NRHP-eligible resources. The Draft CRMP has procedures for maintaining historic resources, which will become policy when finalized.

Wallops Flight Facility
WFF's CRMP includes policies that promote the protection of historic resources.

Goldstone Deep Space Communications Complex
GDSCC is in the process of developing a CRMP that will contain policies for protecting historic properties at the Complex.

Johnson Space Center
JSC has instituted internal procedures, Johnson Policy Directive (JPD) 4310.B for preserving and displaying the historic properties and JPD 8800.1I, Policy for Real Property Management. Additionally, JSC is in the process of developing a CRMP that will contain policies for protecting historic properties.

White Sands Test Facility
The only policy currently in-place at WSTF is the GIS evaluation of field work locations through the dig permit procedure to ensure that archaeological resources are not affected. Access restrictions are also in place due to safety requirements and security restrictions at a hazardous testing facility. No asset management plans or management contracts exist at this time.

Kennedy Space Center
The KSC Checklist Process has been put in place to assist the Center in determining if an historic property may be affected by a proposed undertaking. The HPO evaluates the undertaking to assess the extent of the effects of the project on the historic property. KSC has no asset management plans or management contracts in place.

Stennis Space Center
The SSC NEPA process guidance established in the Historic Preservation Plan, SPR 8500.2, and the SSC ERD, SCWI-8500-0026, serves to protect historic resources.

Data Call Question 9
Explain how your Center/component facility has employed the use of partnerships, such as public-private partnerships, to assist in the protection of historic properties. Address any security or legal

considerations that may limit opportunities for partnerships.

In developing the Agency's CRM program, NASA Headquarters encourages Center/component facilities to employ partnerships to assist in the protection of historic properties. The following provides a brief description of the successes and challenges that several facilities have had in employing partnerships over the past 3 years.

Ames Research Center

ARC maintains an active leasing partnership program for tenants who rent historic properties in the Shenandoah Plaza National Historic District. The leasing agreements include provisions for protection of historic properties. Building 19, a 151,000-square-foot building that originally served as a naval barracks, is currently fully occupied by approximately 32 separate corporate tenants who pay rent for use of office space. Building 23, a 28,000-square-foot building, has been adaptively reused by Carnegie Mellon University as the nucleus of the CMU west coast campus for graduate level education in software technology and management. Rent revenues have been used to renovate Buildings 17 and 20 for occupancy. Building 17 will be the home of the NASA Lunar Science Institute.

ARC Building 17

NASA Lunar Science Institute

Dryden Flight Research Center

DFRC maintains a strategic partnership with the Aerospace, Education, Research and Operations Institute located in the Palmdale Civic Center. The partnership not only allows DFRC to display historic artifacts at the Institute, but provides an innovative educational initiative to cultivate, incubate, and stimulate advances in engineering and science through education and research in a joint setting with industry.

Goldstone Deep Space Communications Complex

GDSCC is proposing a partnership with the City of Barstow to relocate the Pioneer Antenna from the GDSCC facility to the Barstow Community College. The Pioneer Antenna is currently located within an area that is difficult to access. The project will provide an opportunity to establish partnerships with various groups and institutions, as well as promote heritage tourism.

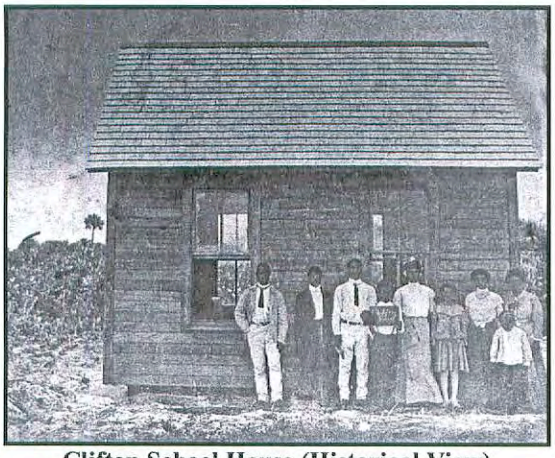
White Sands Test Facility

No partnerships are currently in place at WSTF. This type of opportunity is limited due to the WSTF mission, which involves hazardous testing programs. Site access is severely restricted due to hazardous testing operations, large-scale inventories of hypergolic propellants, and the associated security and safety concerns. Some historic properties, such as Love Ranch and the Gardner Springs Camp site, are located in potential wind corridors identified during hazardous test operations. Test operations could result in unintentional toxic chemical releases in the general area that could follow wind corridors to the specific historic property locations.

Kennedy Space Center

The Clifton School House project in 2006 involved a partnership between NASA and Brevard County, Florida. The Clifton School House structure was in poor condition and was no longer eligible for listing on the NRHP.

However, KSC recognized that the structure still retained some historic value, both in the remnants of the structure and in the setting. Therefore, KSC entered into a partnership with Brevard County to salvage remnants of the structure for reconstruction of the school house on a new location within the County. The County plans to use salvaged materials, recycled lumber, and new materials to restore the structure to its 1890s appearance. Some materials will be solicited from local businesses, and salvaged historic building materials are available from other demolished structures. Descendents of the Campbell family and the North Brevard Heritage Foundation, Inc. have volunteered to provide carpenter and in-kind services for the reconstruction.



Clifton School House (Historical View)

Brevard County, FL

When completed, the restored school house will become part of the Heritage Park Complex at the Chain of Lakes Project in Titusville, Florida. It will serve as an African American living school museum, providing historical background pertaining to the African American education system and teachers of Brevard County. The site will convey the important role education played during the early 20th century. Once restored, the building will be operated and maintained by the Brevard County Parks and Recreation Department. North Brevard Heritage Foundation has plans to sponsor special events, and develop storytelling programs and other educational programs. In addition, the County will, through the Brevard Historical Commission, provide NASA with a roadside marker (erected by the Canaveral National Seashore) opposite the original site of the school house. A Non-Reimbursable Space Act Agreement was signed to transfer the materials (e.g., the remains of the school house) from NASA-KSC to Brevard County. This was a permanent transfer and NASA relinquished all rights and ownership of the remnants to the County. A public ceremony highlighted the cooperative efforts with the County and provided NASA with some positive press coverage.

Langley Research Center

For the past eleven years, LaRC has had a very successful partnership with Old Dominion University Research Foundation (ODURF) for the operation of the LaRC's 30-foot by 60-foot Full Scale Tunnel. The Memorandum of Understanding between LaRC and ODURF includes provisions for maintenance and protection of the facility. It also permits operation of the facility until August 2009, after which, the agreement will not be renewed. Because the facility is physically located on U.S. Air Force Base property, security challenges exist for developing future partnerships to continue operation of the wind tunnel.

Data Call Question 10:

Provide specific examples of major challenges, successes, and/or opportunities your agency has encountered in protecting historic properties over the past 3 years.

One of the biggest challenges HPOs face is limited funds to maintain unused structures. This creates an incentive to keep them active or modify them to support current and future needs. If adaptive reuse is

not an alternative, properties are placed on a demolition list.

Dryden Flight Research Center
Challenges at DFRC related to the protection of historic property have involved issues associated with acquiring and preserving items for historical exhibits and displays. In the past, no process or policy was in place to ensure the material history of the Center was preserved; however, this situation has recently improved.

Jet Propulsion Laboratory
JPL has continued to maintain a consistent and successful process of protecting its NHLs. The NHLs continue to operate in the same and improved manner that qualified them for landmark designation.

White Sands Test Facility
A major success in promoting the protection of historic properties at the WSTF has been to raise awareness and knowledge among facility personnel of the importance of historic properties. This is especially true with reference to senior management and test operations personnel who manage and use the facilities. They are concerned with any constraints that relate to historic properties and the ability to make modifications to such properties. The increased awareness has been accomplished through assignment of a facility HPO and through various educational presentation opportunities. Another example of successfully promoting the protection and preservation of an historic property at WSTF involved a scheduled visit of the Love Ranch descendants to the site and the completion of an oral history tape documenting this experience.

Langley Research Center
A major challenge that LaRC has encountered in protecting historic properties is limited funding to preserve and maintain the Center's aging infrastructure. While funds for maintenance and upkeep of facilities are provided by the organizations and operations performing work or research within the facilities, many of LaRC's historic properties are closed or abandoned and are no longer operational or utilized for research. An example of LaRC's successfully protecting a historic property is the adaptive reuse of the Gantry. The facility will be used to perform vehicle drop testing of Orion in support of NASA's CxP.

Marshall Space Flight Center
The MSFC HPO is supported by an ARM who manages compliance activities associated with archaeological resources. MSFC manages NASA's SSFL located in Ventura County, California. The MSFC CRM is therefore responsible for the archaeological resources on the site, including the Burro Flats Painted Cave. Listed on the NRHP since 1973, the site contains pictographs that are a remarkable example of prehistoric Native American art. To support the management of this important site, visitation protocols were developed along with an educational brochure (cover shown on page 25). Additionally, a gate-to-gate archaeological survey was completed and a CRMP was developed to protect onsite historic resources, which include the archaeological resources, as well as three static rocket test stand complexes.

SECTION FIVE UTILIZATION OF HISTORIC RESOURCES

NASA's inventory of historic properties includes numerous highly technical facilities that are built for long term service. These specialized facilities are often engineered to be expanded and support facility reuse. There has been a surge of adaptive reuse of the Agency's historic resources during the reporting period to support Transition to the CxP. While the SSP remains focused meeting the remaining fly-out schedule safely, it has already inventoried facilities to determine last need dates. Concurrently, the CxP has determined the first need dates of facilities to be utilized. Many facilities have supported adaptive re-use during the reporting period.

Examples include numerous reuse decisions made or finalized during the reporting period, including the Test Stand A-1 and A-2 at SSC, Mississippi, Operations & Control (O&C) High Bay and offices and Launch Complex 39 A&B at KSC, Florida, and the Space Power Facility at Plum Brook at GRC. In November 2006, the first Transition ceremony was held, officially transferring the Test Stand A-1 at SSC from SSP to the CxP. The Mississippi SHPO attended the ceremony. The O&C is an historic property originally used to process space vehicles during the Apollo era. Florida officials attended a ceremony in January 2007 commemorating the partnership that will enable the O&C Building to serve as the final assembly facility for the Orion crew exploration vehicle. The reuse of the O&C High Bay required the immediate removal of the cargo integration test equipment (CITE) from the facility. This required prompt consultation and mitigation that was completed with the Florida SHPO within 45-days.

Many support facilities serve to provide a specific service, such as the wind tunnels, space chambers and arc jet facilities. These traditionally support a wide range of customers, such that facility modifications are not needed to support new programs or customers. For example, during the reporting period, ARC entered into an agreement with the US Air Force to support testing needs of the Arnold Engineering Center, TN, utilizing the 40- by 80-foot wind tunnel known as the National Full-Scale Aeronautic Complex (NFAC). Though still building upon the original intent of the NFAC, modifications allow the expanded capability to support rotocraft and fix-wing aircraft testing needs of the US Air Force.

Adaptive reuse of the facilities is often supported by economic analyses, as less capital is typically required to modify existing infrastructure than to build new capability. Facility reutilization also avoids addressing the increasing challenges of limited land space and Center encroachment. The economic analysis of system upgrades is the focus of internal facility reuse considerations by mission managers. For example, modifications are needed to enable a space simulation chamber, an NHL, at JSC to support the James Webb Telescope Project. The cost to make needed modifications was accepted by the project. There are, however, cases in which technology has become so obsolete that use of a historic resource is impractical. NASA works to locate external users, such as other government agencies, universities, etc. Fortunately, the majority of NASA's historic inventory is currently in use with extensive adaptive reuse planned for Constellation and other mission needs.

In essence, utilization of NASA's inventory of historic resources is contingent upon their technological capability to support evolving mission demands. The focus on building

utilization is and will continue to be mission driven. To this end, however, Agency policy has been adopted to be appropriate stewards of historic properties. Specifically, policies and procedures for implementing NHPA in accordance with its mission, organization structure, policies, and procedures are in place. While these policies were in place prior to this reporting period, the expansion of the stewardship has been through internal education and awareness. We have incorporated education about NHPA and EO stewardship into relevant facilities training programs. This includes awareness of Section 111 authority in the management of historic properties. The EO prompted the Agency to evaluate the reason why the Agency has not utilized this authority more. Though there are no impediments per se, this authority is not used frequently for several reasons:

- Many of the historic properties are still in active NASA use and thus not available for outlease
- Many are within secured perimeters, limiting access and thus the utility of the properties to others
- Some may have environmental or safety issues that constrain the economic viability of a lease
- NASA's Enhanced Use Leasing program provides overlapping authority and has at times been used instead

Once building use decisions were made by mission managers, the Center HPO is notified to initiate consultation. Through training conducted in 2008, a growing number of managers understand that consultation provides a means to ensure that unique engineering and architectural features of historic resources are documented before they are altered or removed. While HPOs do not have a role in trade studies and other technical factors used in facility reuse determinations, they do play an important role in general Center planning. Nearly half of the HPOs work within Facilities. Two serve as the Center Master Planner and a third as a Facility Utilization Officer. These HPOs have the ability and responsibility to actively promote adaptive reuse decisions involving the Agency historic assets both internally and externally.

5.1 DATA CALL QUESTIONS 11–16

NASA's 2005 report included no explicit commitments that could be related to the theme of utilization of resources.

Following the ACHP 2007 Advisory Guidelines, responses to the six questions addressing the status of NASA's utilization of historic resources are provided below. Responses incorporate information provided by NASA's HPOs.

Data Call Question 11:
Explain how your Center/component facility has used historic properties. Address how historic properties have been used to promote heritage tourism and local economic development.

In addition to using historic properties to promote heritage tourism and local economic development, NASA's CRM program encourages managers at Center/component facilities to consider NASA historic preservation processes as a tool to provide redevelopment opportunities that may generate revenue. This opportunity will continue to grow under the ongoing expansion of the enhanced use lease authority (EULA). There are several options for leasing historic properties under NHPA and EULA. NASA's Office of General Counsel has reviewed several opportunities for leveraging NASA's real property and facilities using existing legal authorities. This analysis illustrates the potential value of EULA within the context of historic properties. The entire analysis is posted on NASA's CRM Website at http://oim.hq.nasa.gov/oia/emd/crm.html.

The following briefly describes how several Center/component facilities have used historic properties either through EULA or to promote heritage tourism and economic development.

Ames Research Center
The Moffett Historical Society, a partner organization with the ARC, operates a visitor center, museum, and gift shop located within ARC's historic district. This facility attracts many visiting tourists and former veterans who served part of their military tours at Moffett Field. One of the main draws for this heritage tourism site had been the opportunity to tour the inside of the 8-acre Hangar One. Built in 1932, Moffett Field's Hangar One was the original hangar, constructed to house the U.S. Macon, a large Navy dirigible. Subsequently, a hangar was used by the U.S. Army aviation program in the 1930s and the 1940s. Later, the Navy redeployed the hangar for use by jet aircraft. Tours within the hangar have been suspended pending the resolution of PCB contamination of the hangar skin and hangar components. NASA assumed stewardship of Hangar One in 1994 when the Navy vacated Moffett Field.

In addition, ARC maintains a partnership with the NASA Exchange Council that has resulted in the operation of a hotel in the west wing of Building 19. The convenience and economy offered by this lodge for short term stays offers the potential for enhancing heritage tourism at Moffett Field.

Dryden Flight Research Center
Currently, both NRHP-eligible properties at the DFRC are in active use by the Center and are supporting their originally intended purposes. In addition, approximately 338 tours of the Center, including the historic properties, are given yearly.

Goddard Space Flight Center
Currently, GSFC has one building designated as an NHL. This building is periodically used as a Magnetic Test Facility in service to NASA's mission responsibilities, a role that is expected to continue for the foreseeable future. Thus, the NHL is appropriately utilized. Because public access to Goddard's sole NHL is inconsistent with its current/periodic active support to NASA's mission, no opportunities for heritage tourism and local economic development exist at this time. Should mission usage be completed, GSFC would explore further opportunities for heritage tourism.

Wallops Flight Facility
Artifacts at the visitor's center are used as a vehicle for interpretation. There are no other heritage tourism initiatives.

Glenn Research Center
GRC holds open houses to promote NASA, and provides periodic tours of the campus, including areas within the GRC historic district.

Michoud Assembly Facility
All NRHP-eligible buildings at MAF are in active manufacturing use. There are no opportunities at MAF to use historic properties to promote heritage tourism.

Jet Propulsion Laboratory
JPL's two NHL properties, Building 230 (Space Flight Operations Facility) and Building 150 (25-foot Space Simulator) are currently being used in the same manner in which they were designated as NHLs. During JPL's annual open house, the Space Flight Operations Facility is opened for viewing by the public.

Goldstone Deep Space Communications Complex
The Pioneer Antenna NHL at GDSCC was decommissioned in 1981. It is currently located in an area that is difficult to access due to a lack of road maintenance and U.S. Army presence. NASA is considering the relocation of the Pioneer Antenna from the Complex facility to the City of Barstow Community College. This project would invite opportunities to extend partnerships with various groups and institutions, as well as to promote heritage tourism.

Johnson Space Center
Visitors to the Space Center Houston are provided tours of the Apollo Mission Control Center and the Space Environment Simulation Laboratory, Chambers A and B.

Mission Control, JSC

White Sands Test Facility
Heritage tourism opportunities at WSTF are not feasible because historic resources are still in use, including runways for astronaut training and testing programs. In addition, the NRHP-eligible Love Ranch is not used. The remaining historic properties are archaeological resources.

Kennedy Space Center
Almost all historic properties at the KSC are in operational use for Agency programs. Due to operational constraints and active use, these properties are not available for use in heritage tourism. However, the KSC Visitor Complex conducts drive-by and walk-through tours throughout the Center to promote manned and unmanned space activities for past, present, and future programs. Some of the historic properties at the Center, such as the Launch Complexes and the Launch Control Center, are included in drive-by and walk-through tours.

Langley Research Center
The Virginia Air and Space Center in Hampton, Virginia serves as LaRC's official visitor's center. This venue is the primary vehicle by which heritage tourism activities are promoted. Additionally, LaRC maintains a publicly accessible website that provides historical documentation and educational information on LaRC's historic properties, both architectural and archaeological. The website includes a virtual tour of facilities, history, photos, old film clips, interviews with researchers, and old research documents. This very popular site attracts 850 unique visitors per month.

Stennis Space Center
Tours are conducted upon request at SSC. Additionally, a permanent exhibit is maintained at the SSC Visitor's Center (Building 1200).

Data Call Question 12
Explain the overall condition of historic properties at the Center/component facility. How is condition assessed? How is the condition of historic properties monitored, maintained, and improved? How does the condition of historic properties impact their active, programmatic use?

Throughout the Agency, NASA facilities managers utilize a standardized condition assessment rating system known as the Facilities Condition Index (FCI). This system evaluates the condition of a facility in terms of structural integrity, life-span, and efficiency of major operating systems (electrical, water, HVAC, etc.), and safety and health issues for facility personnel. While the FCI rates the overall "health" of a facility in terms of operational functionality and projected useful life span, the FCI does not address specific issues related to the integrity and condition of historic properties, such as character-defining features. The condition of historic properties at Center/component facilities is generally assessed by the facility HPO and the evaluations are consistent with the monitoring condition report information submitted bi-annually to the NPS for NHL properties.

Ames Research Center
The overall condition of the historic properties at ARC is good to very good. Buildings 23 and

24 have been completely renovated. The long-term lease with Carnegie Mellon University ensures lease payments that represent in-kind funding for building improvements to the historic buildings at ARC. Building 19 has been upgraded with new life-safety features (seismic retrofit and sprinklers), new lighting, a new elevator, and new internet connectivity. Building 18 has been renovated for adaptive reuse. Building 20 is currently being renovated for potential future tenants. Building 25 has not been renovated. ARC is seeking a partnership with a tenant for Building 25 that would include cost sharing of a building renovation. The historic landscapes, street lighting, and roads are maintained by ARC, which is reimbursed, in part, by the tenants in the district as part of the institutional support services. Building 17 has received minor rehabilitation work and is currently being adaptively re-used.

Space Shuttle in the NRHP-eligible MDD (being loaded onto SCA-747)

Dryden Flight Research Center

Both historic properties are in use and continually evaluated and maintained by DFRC Facilities to ensure they support the mission. Currently, the roof at Building 4802 is being modified to prevent leaks. The building houses expensive aircraft, so the hangar's condition needs to be improved. In addition, the MDD underwent lead paint and asbestos abatement in advance of repainting in 2006. The previous condition was considered a health hazard.

Glenn Research Center

As one of the original NACA laboratories, GRC takes pride in the legacy and on-going use of its historic properties. Maintaining Center inventory is key to Agency decisions to reuse historic resources to support future missions. For example, the CxP is currently considering using the Spacecraft Propulsion Research Facility, known as the B-2 Facility, managed by GRC at Plum Brook Station.

Visitors at GRC's B-2 Facility, an NHL

The B-2 Facility uniquely combines space thermal-vacuum simulation with the ability to "hot-fire" a rocket engine. This combination yields a highly desired capability to qualify and certify upper stage engine system ignition and restart under space conditions. Its unique role in testing was recognized when it was designated an NHL when the facility was only 16-years old. Originally constructed to support the development of the Centaur rocket, the B-2 Facility has been maintained and upgraded to support subsequent programs. GRC is hopeful Constellation will use the B-2 Facility to provide verification of start-at-altitude testing

for launch vehicles supporting the new lunar program, Ares V.

Studies are underway to see if the chamber can support the advanced engine systems that will deliver the next generation of vehicles beyond earth's orbit. The GRC HPO has already notified the Ohio State Historic Preservation Officer (SHPO) and National Park Service that if selected by Constellation, modifications to the facility will be required. However, the HPO has no role in the on-going trade study and formal consultation will not be initiated until a mission decision is made.

Jet Propulsion Laboratory

JPL's two NHLs, the Space Flight Operations Facility and the 25-foot Space Simulator remain in active use for the same purpose by which they were designated as NHLs. The condition of the properties is monitored, maintained, and improved through routine notifications and the annual report for modifications performed on NHL's. Modifications requested and proposed for the NHLs are generally promoted by the users and occupants and are typically targeted to the maintenance and improvement of the facility. Proposals and requests are submitted to the JPL Facilities Department and subsequently forwarded to the JPL Environmental Affairs Office for approval. The NHLs must be consistently maintained in excellent condition as they are fully utilized for JPL programs.

Goldstone Deep Space Communications Complex

At GDSCC, the Pioneer Antenna NHL was decommissioned in 1981. Currently, no specific process exists to monitor, maintain, or improve the NHL. JPL programs are no longer in need of antennas of the Pioneer type. Therefore, the antenna's current idle condition does not directly impact its active, programmatic use.

Johnson Space Center

JSC historic properties are in very good condition. The Facility Managers of the Apollo Mission Control Center (Building 30) and the Space Environment Simulation Laboratory, Chambers A and B (Building 32) are responsible for maintaining the facilities.

White Sands Test Facility

The WSTF runways remain in operational use and are continually monitored and maintained to ensure safe operations for astronaut training and as the alternative landing site for the Space Shuttle. While the Space Shuttle remains operational, the runways are maintained for Space Shuttle landing. The condition of Love Ranch is deteriorating and has received no improvements during this reporting period. Some future structural stabilization may occur, but such a goal was not recommended by the SHPO. The SHPO has recommended archival photographic documentation every 2 to 3 years to capture changes at the ranch. Additionally, the Love Ranch facility is monitored for potential risk of rangeland fires, and any dry brush and grass present near the structures is removed as needed. Archaeological sites are left undisturbed, in their natural environment. As such, the condition of historic properties is static, with slow but progressing deterioration at the Love Ranch location.

Kennedy Space Center

The historic properties at the KSC are in good condition. All but one are occupied with tenants and used for administrative and/or operational support. The Mission Control Center remains vacant. When any type of routine maintenance is required for these facilities, a Support Request is submitted for the work needed. The projected timeframe for work to be completed is scheduled as appropriate. If a project requires major modifications, such as replacing a roof, the project is reviewed and approved by a Facilities Board. Building conditions are assessed by the facility managers and the overall engineering community. A building's

condition is evaluated primarily by its ability to support the mission rather than for its historic significance or value. However, as long as buildings are maintained to support the mission, their historic integrity is maintained. General maintenance and minor modifications to historic properties can be performed under the 1989 PA. KSC is currently developing another PA for all of the Center's future activities that could affect historic properties.

Langley Research Center
The overall condition of historic properties at LaRC varies greatly. The Gantry is the recipient of a multi-million dollar rehabilitation and modification and is in very good condition. The Full Scale Tunnel is minimally maintained by Old Dominion University for research operations until April 2009. Portions of the roof of the Full Scale Tunnel are in poor condition, and the paint on the transite siding is beginning to deteriorate and flake off. The Rendezvous Docking Simulator is stabilized inside the Hangar (Building 1244). The Variable Density Tunnel, which is in good condition, has been relocated and incorporated into a permanent exterior exhibit. The two 8-foot concrete wind tunnels are in a state of complete disrepair. Most of LaRC's other historic properties are in very good or fair condition.

Marshall Space Flight Center
The overall condition of historic properties at MSFC ranges from excellent to poor. An FCI includes evaluations for general operating condition of facilities. The condition of facilities at MSFC is mainly based on the use of the facility.

Michoud Assembly Facility
All NRHP-eligible buildings at MAF are in good condition. They are assessed by functional use criteria, such as lighting, HVAC, utilities, and roof/rain-proofing. These conditions are evaluated during regular preventive and corrective maintenance programs.

Stennis Space Center
Based on the 2006 NHL report, the facilities at SSC were assessed as satisfactory, Priority 3. The test stands are maintained, monitored, and improved through the Construction of Facilities (CoF) process. SSC has been designated NASA's program manager for rocket propulsion testing. Therefore, these facilities must be maintained in operational condition.

Data Call Question 13
Describe Center/component facility policies that promote and/or influence the use of historic properties. Is the use of historic properties fostered by the strategic or master planning processes? How does the Center/component facility engage public stakeholders in the use of historic properties?

Ames Research Center
ARC's 2002 Development Plan resulted in preparation of an Environmental Impact Statement that included evaluating the development planning in and around the historic district. Alternatives included possible infill construction. The reuse and development plans for the entire Center were updated in the 2007 Center Master Plan. As part of the Environmental Impact Statement, an Historic Resources Protection Plan was developed. This document was approved by ARC, the California SHPO, and the ACHP and resulted in a 10-year Programatic Agreement (PA). The plan defines a historic preservation program for the Shenandoah Plaza Historic District. Elements of this plan include guidelines for new construction in the historic district, categories of historic resources within the historic district and the treatment plan for these resources, procedures for the inadvertent discovery of cultural resources, coordination with other plans, actions not requiring further consultation with the SHPO, and management goals policies for the Shenandoah Plaza Historic District.

Dryden Flight Research Center
At DFRC, both historic properties are in active use and are components of the master planning process. Currently, all historic properties are fully utilized and no immediate opportunities exist to engage public stakeholders in their use.

Glenn Research Center
The proposed historic district is part of the Master Plan for GRC. GRC generally does not engage public stakeholders in the use of historic properties, mostly due to the highly technical nature of the facilities.

Jet Propulsion Laboratory
Currently, no specific policy promotes and/or influences the use of JPL's historic properties. However, the need for space at JPL is a significant issue. Therefore, the full utilization of all JPL facilities, historic and non-historic, is encouraged and necessary. JPL does not engage public stakeholders in the use of the historic properties.

White Sands Test Facility
Use of historic properties at WSTF is either not feasible (archaeological sites and the inaccessible Love Ranch) or active (runways for example). The use of historic properties is not currently fostered by any strategic or master planning processes. However, descendants and former occupants (stakeholders) of Love Ranch have visited the old homestead over the last 5 years. In both instances, an oral history was recorded to capture some of the family legacy of growing up on the ranch. These stakeholders have provided valuable historic information on the facility structures and living conditions of remote area ranches on the White Sands property.

Kennedy Space Center
KDP-KSC-S-1863 is the Center's strategic plan. Use lease agreements have been executed for public stakeholders to occupy some of KSC's historic properties, such as the O&C High Bay Facility. Lockheed Martin is using this facility to process the upcoming Orion vehicle for the CxP. Public involvement was conducted during the MCC and LC-34/ESB projects at KSC through the Section 106 consultation process.

Langley Research Center
LaRC has a Center Master Plan that is integrated with the Center's long- and short-term strategic goals to ensure the Center continues to actively support the Agency's mission. The use of the Gantry was fostered by this strategic planning approach.

Michoud Assembly Facility
Public stakeholders do not use the NRHP-eligible buildings at the MAF and no policies to promote or influence their use by public stakeholders are in place.

Stennis Space Center
Historic properties are a part of Facility Master Planning at SSC. The HPO and the Office of External Affairs and Education respond to public inquiries related to historic properties.

Data Call Question 14
Explain how your agency has used Section 111 of NHPA in the protection of historic properties. [Section 111 permits the lease or exchange of Federal historic properties and use of the proceeds to defray maintenance costs, and allows agencies to enter into management contracts for historic properties.]

Traditionally, NASA has not invoked Section 111 (16 U.S.C. §470h-3) authorities as many of the Agency's properties remain in active use. Additionally, many resources are sited within secured perimeters that limit access and thus the utility of the property to others. Some properties may have environmental or safety issues that constrain the economic viability of a lease. NASA's EULA program provides overlapping authority and has at times been used instead.

Ames Research Center
ARC has used the NHPA leasing authority to lease Building 23 to Carnegie Mellon University. The lease spans a 30-year term with

a provision for possible extensions. Proceeds from this lease arrangement represent in-kind payments that offset the cost of totally renovating the building. ARC has used the NHPA lease authority. However, NASA's EULA program has on several occasions been more flexible and beneficial to the Agency. When disposing or transferring properties, NASA adheres to the NHPA.

Stennis Space Center

At SSC a special lease agreement is in place for B-1 by Pratt-Whitney/Rocketdyne pursuant to engine testing activities. This agreement works to defray some of the maintenance costs for NASA.

Data Call Question 15

Explain how your agency has employed the use of partnerships to assist in the use of historic properties.

There are several options for leasing historic properties under NHPA and EULA. NASA's Office of General Counsel has reviewed several opportunities for leveraging NASA's real property and facilities using existing legal authorities.[1] This analysis illustrates the potential value of enhanced use lease authority within the context of historic properties. The entire analysis is posted on NASA's CRM Website at http://oim.hq.nasa.gov/oia/emd/crm.html. The analysis highlights the following:

Proceeds from NHPA adaptive use leases may be used to defray the costs of administration, maintenance, repair, and related expenses. Like EULA, the NHPA is an exception to the general rule that proceeds retained by the Government cannot be kept by an agency but rather must be deposited in the U.S. Treasury. Also, as with EULA, funds remain available beyond the usual 1-fiscal-year period in which appropriated funds must be spent. Finally, as with EULA, there are no limits on the total amount of proceeds a Center may receive under an NHPA adaptive use lease. The NHPA is not limited to any number of NASA Centers but rather is available now and can be used Agency-wide.

Similar to EULA, NHPA provides tremendous flexibility for strategic development with associated potential to expand NASA's business base, distribute costs, and create human capital advantages. Under the concept of adaptive use, NASA may lease qualifying property and retain proceeds for 2 years.

Ames Research Center

ARC's partnership with the NASA Exchange Council has been successful for operation of a small hotel in the west wing of Building 19. This directly benefits users who have a NASA or military affiliation and seek convenient and economical lodging. The hotel also promotes heritage tourism at Moffett Field.

Dryden Flight Research Center

As part of the Edwards Air Force Base Alliance, DFRC is on the public tour route established by the Base. Citizens park outside the west gate, and the Base provides a bus ride to various points of interest. Tour operations are coordinated with the DFRC Public Affairs Office, which provides a 1.5-hour walking tour of the Center.

School Group Touring DFRC

[1] David S. Schuman (Office of General Counsel, NASA Headquarters) *Leveraging the Value of NASA's Real Property and Facilities Using Existing Legal Authorities.* May 2005.

The tours feature the NRHP-eligible MDD and Hangar 4802, In addition, visitors observe the historical artifacts displayed in the DFRC Visitor Center at the end of each tour. Approximately 6,000 people participate in these tours annually.

DFRC maintains a partnership with the City of Palmdale to operate the Exploration Gallery, part of a larger complex in the City that houses some of the education offices and business outreach efforts. Presently, the gallery is closed, but when open, the gallery features displays of both irreplaceable objects and elements that may be touched. Ejection seats and the full scale mockup of the X-43 were arranged such that visitors may touch them. Irreplaceable and fragile items are displayed behind glass.

Kennedy Space Center
KSC has partnered with the State of Florida to modify the O&C High Bay to support the upcoming CxP. Lockheed Martin will be processing the Orion in this facility. KSC has also partnered with its onsite contractor for use of some of the Center's historic facilities to perform day-to-day operations.

Langley Research Center
LaRC has successfully partnered with ODURF for use of LaRC's 30-foot by 60-foot Full Scale Tunnel. ODURF has operated the tunnel for the last 11 years for graduate student research.

Data Call Question 16
Provide specific examples of major challenges, successes, and/or opportunities your agency has encountered in using historic properties over the past 3 years.

Ames Research Center
ARC has a challenge in meeting current fire code and life-safety regulations for the 75-year-old buildings at Moffett Field. Modification to the buildings is often required to accommodate code egress requirements, fire safety, Americans with Disabilities Act (ADA) access, and seismic stability. These actions must be accomplished without adversely affecting the historic integrity of the historic buildings. Implementing these upgrades is an expensive challenge. ARC has commissioned building reuse guidelines, in the form of small historic structures reports, for all of the historic buildings within the historic district. These guidelines have proven to be very helpful in defining and ranking the historic character-defining features of a building so that a renovation plan can be developed in harmony with the historic preservation program for the historic district. A successful accomplishment during the last 3 years is the provision of public access to these guidelines on the ARC historic properties website under "Reuse Guidelines."

White Sands Test Facility
At WSTF there have been no major challenges to using historic properties over the last 3 years simply because the facility has very few potentially eligible historic properties and a large portion of those properties are not used at all. WSTF and WSSH structures have not reached the 50-year threshold or have not yet been phased out with the SSP changes. As a result, resources have not been fully evaluated at this time.

The various archaeological sites, along with Love Ranch, Gardner Springs, and Quartzite Mountain locations, which are potentially eligible for listing in the NRHP are not utilized at this time. These sites are left undisturbed in their natural environment. The WSSH facility was recently recommended as a potentially eligible site and is currently in operation. It is actively managed and maintained for astronaut training, as well as for an alternate landing location for the Space Shuttle. The remaining small-scale challenge relates to access for sites such as Love Ranch, now restricted due to Federal facility security and safety requirements. Allowing former residents to visit the remote Love Ranch location was especially difficult. Families requested access for young children along with elderly family members,

and obtaining approval for site access to this remote area proved to be quite difficult.

Kennedy Space Center
KSC challenges include the need to undertake major modifications to facilities required to support programmatic activities. Some activities have a potential to affect the historic integrity of a property. In these cases, the Section 106 process is initiated and appropriate mitigation activities are implemented. The implementation of the CxP is an opportunity that will result in many changes to facilities over the next several years. The Program has budgeted for mitigation activities to fund these changes and, as a result, the Center has developed an overall mitigation strategy, rather than pursuing mitigation as a piecemeal approach.

Langley Research Center
As previously mentioned, the use of the Gantry to support the CxP is a major success in using historic properties.

Marshall Space Flight Center
A successful use of an historic property at MSFC includes modifications to the Dynamic Test Stand, an NHL, for new testing. This does result in the modification of the structure, but the stand was designed for reuse. The resulting reuse will only add to the historic significance of the structure.

Dynamic Test Stand at MSFC

Stennis Space Center
An example of a successful use of historic properties at SSC includes the transition from the Shuttle Main Engine to the CxP without damaging the integrity of the NHLs under the Center's stewardship.

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SECTION SIX CELEBRATING NASA'S HISTORY

6.1 GENERAL OUTREACH

NASA's foundation is its history. This history is presented to the public through a wide range of methods, from websites to anniversary galas. Likewise, there has been an increase in awareness of historic preservation within the Agency. Building upon the synergy of pride in NASA's rich history, the new CRM Program is putting a spotlight on the physical assets that have enabled the Agency's historic accomplishments. This awareness spans the four mission directorates and extends from the 90th Anniversary of the founding of NACA, NASA's predecessor agency, to the honor of celebration of NASA's 50th Anniversary during the Smithsonian's Folklife Festival on the National Mall in 2008.

As Steve Dick, NASA Chief Historian, states, the signing of the National Aeronautics and Space Act on 29 July, 1958, created NASA and allowed all the potential energy to unfold as kinetic energy. In October 2007, NASA celebrated the 50th Anniversary of the start of the Space Age by hosting a conference, "Remembering the Space Age." While there have been disappointments and tragedies, Dr. Dick notes, "one could hardly have imagined the triumphs that did in fact occur, both on the human and robotic side and in aeronautics."

And history continues to be made. NASA has enjoyed seven successful launches of the Space Shuttle during the reporting period, culminating in the rare event of having two orbiters readied for launch at Launch Pad 39A and 39B simultaneously in September 2008. We've made major additions to the International Space Station with the European Columbus and Japanese Kibo modules, launched the Gamma-ray Large Area Space Telescope (GLAST) observatory, and landed Phoenix on Mars, joining the still rolling Spirit and Opportunity.

This section provides an overview of how NASA's history has been celebrated during this three year report period. Section 6.1 addresses general outreach and educational initiatives that includes a sample of presentations that show the scope of activities and application to CRM. Section 6.2 provides a list of the Agency and Center events held during the reporting period celebrating history with the summary of these events included in Appendix A and B. The report ends with a summary (Section 6.3) of the successes and a look at forward actions needed to continue to grow NASA's CRM Program.

Outreach Activities

NASA is dedicated to public outreach and student education. Curricula include historic milestones and students have an opportunity to visit historic assets both on-site and through virtual tours. The following list gives a sample of outreach activities that focus on NASA's historic properties.

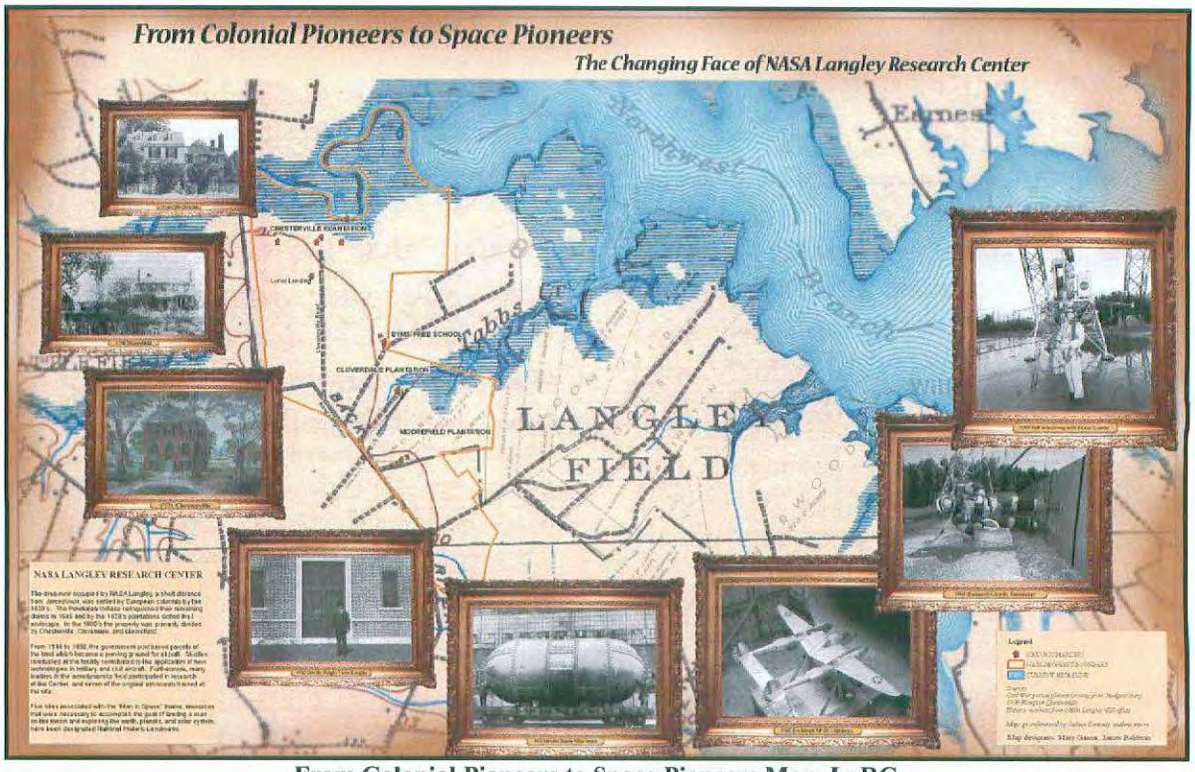
James Baldwin, Mary Gainer, Joshua Kennedy: map *Colonial Pioneers to Space Pioneers* accepted for exhibit at Federal GIS Users Conference, Washington D.C. and at the ESRI International Users Conference, San Diego, CA.

Mary Gainer: map *NACA Wind Tunnels: Sequence of Wind Tunnel Construction 1920–1958* accepted for exhibit at ESRI International Users Conference, San Diego, CA.

James Baldwin: presentation *Using Geographic Information System to Develop Virtual Tours by the Use of Photography,* Federal GIS Users Conference, Washington, D.C.

Mary Gainer: presentation *Presenting History Through GIS,* Federal GIS Users Conference, Washington, D.C.

Mary Gainer: presentation *Using GIS to Preserve America,* 2008 Virginia GIS Conference, Roanoke, VA.



From Colonial Pioneers to Space Pioneers Map, LaRC

Joshua Kennedy: presentation *Wetland Loss in the Back River Area of Hampton and Poquoson, VA.*, senior project Old Dominion University.

NASA History Publications

- Chertok, Boris. *Rockets and People, Volume 1.* (NASA SP-2005-4110). Also available on-line
- Laufer, Alexander; Post, Todd; and Hoffman, Edward. *Shared Voyage: Learning and Unlearning from Remarkable Projects.* (NASA SP-2005-4111)
- Dawson, Virginia P. and Bowles, Mark D. *Realizing the Dream of Flight: Biographical Essays in Honor of the Centennial of Flight, 1903–2003.* (NASA SP-2005-4112)
- McCurdy, Howard E. *Low Cost Innovation in Spaceflight: The History of the Near Earth Asteroid Rendezvous (NEAR) Mission.* Monograph in Aerospace History, No. 36, 2005. (NASA SP-2005-4536).
- Seamans, Robert C. Jr. *Project Apollo: The Tough Decisions.* Monograph in Aerospace History, No. 37, 2005. (NASA SP-2005-4537)
- Lambright, W. Henry. *NASA and the Environment: The Case of Ozone Depletion.* Monograph in Aerospace History, No. 38, 2005. (NASA SP-2005-4538)
- Chambers, Joseph R. *Innovation in Flight: Research of the NASA Langley Research Center on Revolutionary Advanced Concepts for Aeronautics.* Monograph in Aerospace History, No. 39, 2005. (NASA SP-2005-4539). Only available on-line
- Phillips, W. Hewitt. *Journey Into Space Research: Continuation of a Career at NASA Langley Research Center.* Monograph in

Aerospace History, No. 40, 2005. (NASA SP-2005-4540). Only available on-line

- *Of Ashes and Atoms: A Documentary on the NASA Plum Brook Reactor Facility.* (NASA SP-2005-4605). Electronic Media
- *Fueling Space Exploration: The History of NASA's Rocket Engine Test Facility.* (NASA SP-2005-4607). Electronic Media
- *Aeronautics and Space Report of the President, Fiscal Year 2004 Activities*
- Chertok, Boris. *Rockets and People: Creating a Rocket Industry, Volume II.* (NASA SP-2006-4110)
- Bowles, Mark D. *Science in Flux: NASA's Nuclear Program at Plum Brook Station, 1955–2005.* (NASA SP-2006-4317)
- Matranga, Gene J.; Ottinger, C. Wayne; Jarvis, Calvin R.; and Gelzer, D. Christian. *Unconventional, Contrary, and Ugly: The Lunar Landing Research Vehicle.* Monograph in Aerospace History, No. 35, 2006. (NASA SP-2006-4535)
- Dick, Steven J. and Launius, Roger D. *Critical Issues in the History of Spaceflight.* (NASA SP-2006-4702)
- Mudgway, Douglas J. *William H. Pickering: America's Deep Space Pioneer.* (NASA SP-2007-4113)
- Meltzer, Michael. *Mission to Jupiter: A History of the Galileo Project.* (NASA SP-2007-4231)
- Heppenheimer, T.A. *Facing the Heat Barrier: A History of Hypersonics.* (NASA SP-2007-4232). Parts 1, 2, and 3
- Tsiao, Sunny. *"Read You Loud and Clear!" The Story of NASA's Spaceflight Tracking and Data Network.* (NASA SP-2007-4233)
- Wallace, Lane E. *Flights of Discovery: An Illustrated History of the Dryden Flight Research Center.* (NASA SP-2007-4318)
- Hogan, Thor. *Mars Wars: The Rise and Fall of the Space Exploration Initiative.* (NASA SP-2007-4410)
- Hansen, James R., ed. *The Wind and Beyond: Journey into the History of Aerodynamics in America, Volume 2, Reinventing the Airplane.* (NASA SP-2007-4409)
- Rumerman, Judy A., comp. *U.S. Human Spaceflight: A Record of Achievement, 1961-2006.* Monograph in Aerospace History, No. 41, 2007. (NASA SP-2007-4541). This is an updating by Chris Gamble and Gabriel Okolski of the similarly titled article in Monograph in Aerospace History, No. 9, published in 1998
- *Aeronautics and Space Report of the President, Fiscal Year 2005 Activities*
- Seamans, Robert C. Jr. *Project Apollo: The Tough Decisions.* Monograph in Aerospace History, No. 37, (2005) 2008 Reprint. (NASA SP-2005-4537)
- Dick, Steven J. and Launius, Roger D., ed. *Societal Impact of Spaceflight.* (NASA SP-2007-4801)
- Tsiao, Sunny. *"Read You Loud and Clear!" The Story of NASA's Spaceflight Tracking and Data Network.* (NASA SP-2007-4233)
- Butrica, Andrew J. *Single Stage to Orbit: Politics, Space Technology, and the Quest for Reusable Rocketry.* Baltimore: Johns Hopkins University Press, 2005
- Conway, Erik M. *High-Speed Dreams: NASA and the Technopolitics of Supersonic Transportation, 1945–1999.* Baltimore: Johns Hopkins University Press, 2005
- Kay, Woody. *Defining NASA: The Historical Debate over the Agency's Mission* (University of New York Press, 2005)
- Dick, Steven, editor, et. al. *America In Space: NASA's First Fifty Years.* New York: Abrams, 2007

- Launius, Roger D. and Howard E. McCurdy. *Robots in Space: Technology, Evolution, and Interplanetary Travel.* Baltimore: Johns Hopkins University Press, 2008

NASA History Publications

History Office Quarterly Newsletter

In addition to the many books that NASA's History Office has published during the reporting period, the NASA FPO began contributing to the quarterly newsletter, News & Notes, with a series on NASA's NHLs. Five articles have been published during the reporting period, each featuring one of NASA's 20 NHLs. The series has increased awareness of NASA's historic properties both internally and for the general public. The series begins with the following statement:

> *While NASA's historic accomplishments in aeronautical research, science, and space exploration are well documented, less is known about the buildings and structures that supported and enabled these accomplishments. This series provides a brief review of the real property assets that NASA owns and operates across the country. Of the many assets that are listed or eligible for listing on the National Register of Historic Places, 20 are National Historic Landmarks (NHLs).*

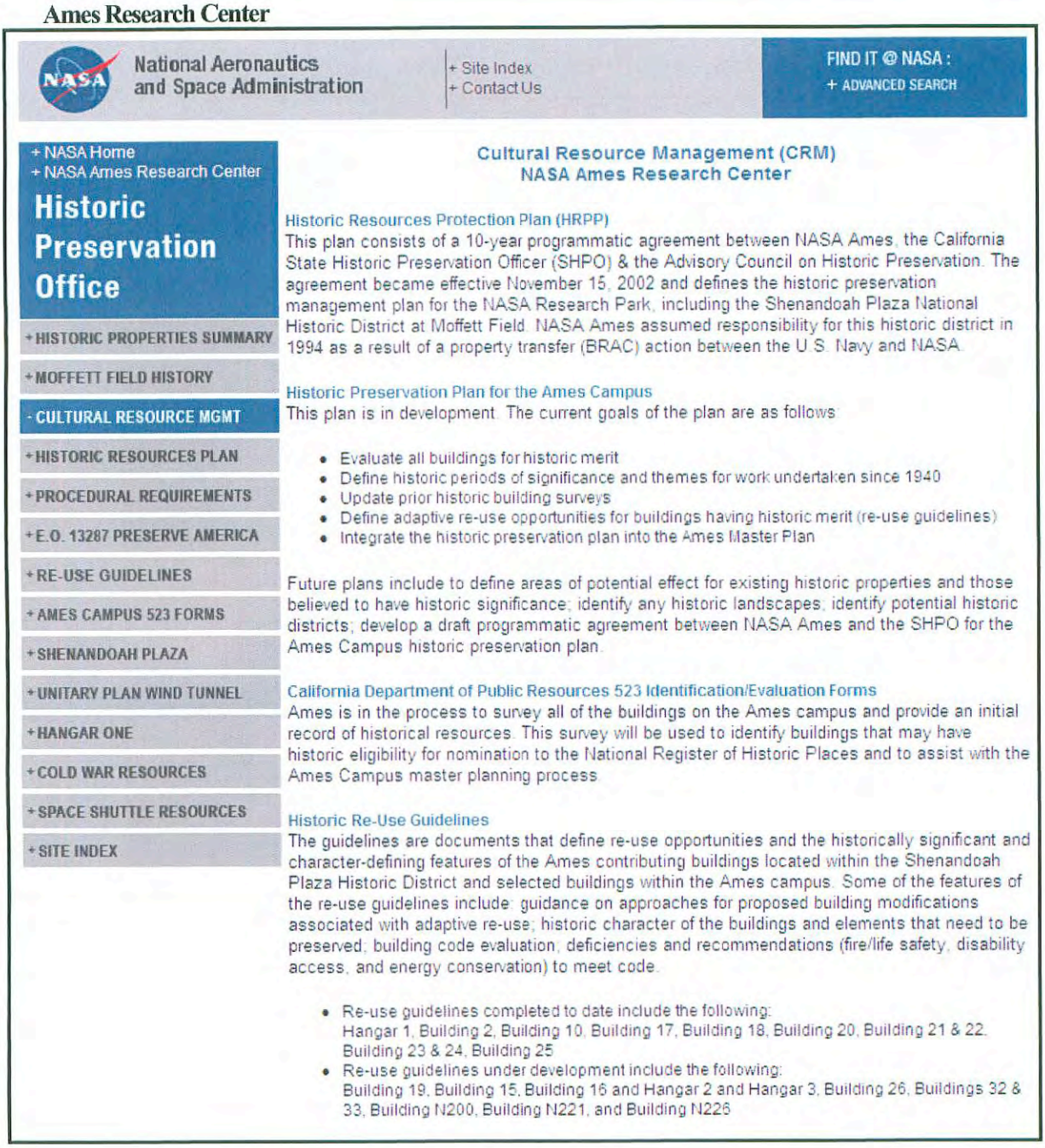
- *Test Complex A and B, Stennis Space Center, Mississippi: An Evolution of Space Exploration Support*, by Tina Norwood and Dr. Marco Giardino, quarterly newsletter, News & Notes, NASA History Division, Office of External Relations (Vol. 24, No. 3) May 2007, page 13
- *NASA Space Environmental Simulation Laboratory Johnson Space Center, Houston, Texas,* By Abdul Hanif, quarterly newsletter, News & Notes, NASA History Division, Office of External Relations (Vol. 24, No. 4) November 2008, page 17
- *NASA Dynamic Test Stand, Marshall Space Flight Center, Alabama,* by Ralph Allen, quarterly newsletter, News & Notes, NASA History Division, Office of External Relations (Vol. 25, No. 1) February 2008, page 17
- *From New Deal to New Discoveries: 8-Foot High-Speed Tunnel, Langley Research Center, Hampton, Virginia,* by Tina Norwood and Caroline Diehl, quarterly newsletter, News & Notes, NASA History Division, Office of External Relations (Vol. 25, No. 2) May 2008, page 24
- *From Lunar Probe Tracking to Deep Space Communications: Pioneer Antenna, Goldstone Deep Space Communications Complex , California*, by Tina Norwood, quarterly newsletter, News & Notes, NASA History Division, Office of External Relations (Vol. 25, No. 3) August 2008, page 24

Newsletters are available at the NASA History Office Website: http://history.nasa.gov/nltrc.pdf

NASA Center Websites

The following are screenshots of the NASA Center Web sites featuring cultural and historic resource content:

Ames Research Center

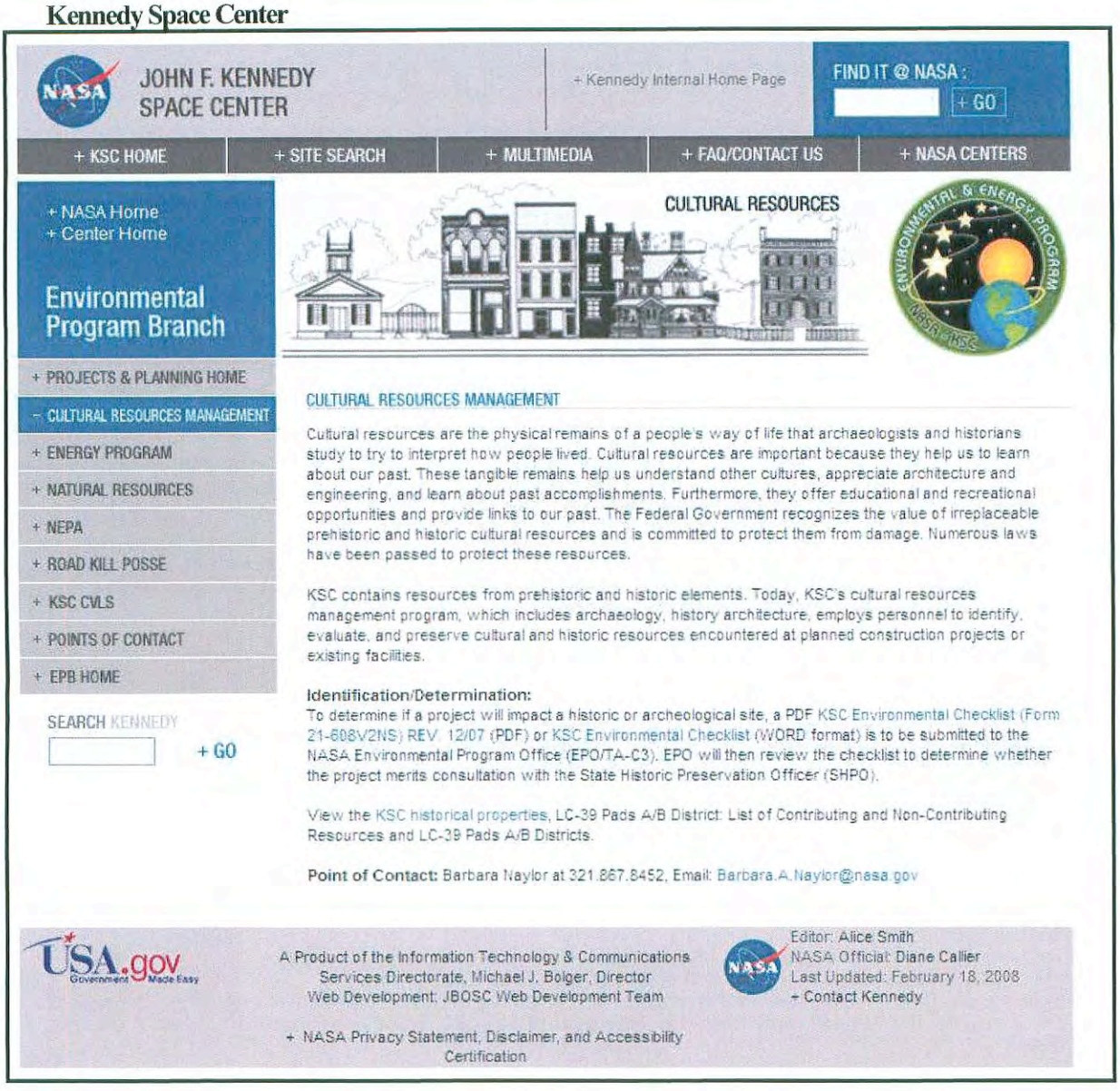


ARC CRM Website

Stennis Space Center

SSC Website featuring SSC Test Stands

Kennedy Space Center



KSC CRM Website

Marshall Space Flight Center

MSFC History Office

Marshall Space Flight Center
Huntsville, Alabama

Other History Links | MSFC Home | MSFC Art Collection | NASA Home | NASA Privacy Statement | Contact Us

Home > MSFC Landmarks & Facilities > Five Marshall Sites Designated as National Historic Landmarks

Five Marshall Sites Designated as National Historic Landmarks

(The information below was compiled from articles published in the Marshall Star on January 22, 1986, and on July 15, 1987)

The NASA Marshall Space Flight Center announced on January 22, 1986, that the U. S. Department of the Interior's National Park Service had designated four Marshall Center facilities as National Historic Landmarks. On July 15, 1987, a fifth designation was announced.

The first four facilities are the Redstone Test Stand, Propulsion and Structural Test Facility, Saturn V Dynamic Test Stand, and Neutral Buoyancy Simulator. The Saturn V on display at the United States Space and Rocket Center represents the fifth designation.

Historic Redstone Test Stand

The Redstone Test Stand was used during the 1950s in early development of Redstone missile propulsion system. This was the test stand where the modified Redstone missile that launched the first American into space, Alan Shepard, was static tested as the last step before the flight occurred.

Propulsion and Structural Test Facility

The Propulsion and Structural Test Facility, developed in support of Jupiter missile development, was modified and used for testing during the first clustered engine stage in the American space program- the S-IB stage of the Saturn I launch vehicle period. It was also used as the primary test stand for the development of the F- 1 engine, the largest liquid Rocket engine ever developed. The F-1 generated 1.5 million pounds of thrust.

MSFC Website featuring properties designated as NHLs

6.2 SPECIAL EVENTS

NASA Centers and NASA as an Agency have participated in numerous special events during the past 3 years. Many of these events related to the celebration of NASA's 50th anniversary. These events are described in Appendices A and B. An index of these events follows.

NASA-Wide Events

NASA
Smithsonian Folk Life Festival
National Mall, Washington, D.C.

Stennis Space Center
NASA 50th Anniversary Picnic Celebration

Ames Research Center
NASA's 50th Anniversary

Kennedy Space Center
NASA's 50th Anniversary, Air Show Highlighting the Thunderbirds at the Space Expo

Kennedy Space Center
NASA Astronaut at Daytona Speedway Event for 50th Milestone

Center Events

Ames Research Center
ARC Anniversary Celebration

Building 19, NASA Research Park, Moffett Field

Dryden Flight Research Center
Historical Artifacts Display
The Space Race

Jet Propulsion Laboratory
50th Anniversary of the launch of JPL's Explorer 1 Satellite

NASA Beams Beatles' *Across the Universe* into Space

5th Anniversary of Mars Odyssey

Viking 30th Anniversary Celebration

5th Anniversary of the Genesis Sample Return Mission Launch

5th Anniversary of the Launch of the Jason 1 Spacecraft

5th Anniversary of the Launch of the Gravity Recovery and Climate Experiment (GRACE) Spacecraft

5th Anniversary of the Launch of Atmospheric Infrared Sounder (AIRS)

Goldstone Deep Space Communications Complex
40th Anniversary of Mars Deep Space Station-14

Barstow Space Days

Goldstone Apple Valley Radio Telescope (GAVRT) 10th anniversary

White Sands Test Facility
Love Ranch Tour and Oral History from Family Descendants

Kennedy Space Center
Removal of the CITE Stands and Apollo Test Mount (ATM) in the O&C High Bay

Langley Research Center
NACA Reunion XII

LaRC's 90th Anniversary Open House

NASA – Jamestown Partnership

Stennis Space Center
American Institute of Aeronautics and Astronautics (AIAA) designation of SSC Test Complex as an Historic Aerospace Site

6.3 SUMMARY OF SUCCESS

NASA has always enjoyed celebrating its history. Many Agency managers proclaim that NASA is in the business of making history. This triennial period has provided NASA the opportunity to celebrate the 90th anniversary of the founding of the NACA (1917) and the 50th anniversary of the founding of NASA. Section 6 provides an outline of how these

events were celebrated both nationally and through Center events.

The public's awareness of NASA's history continues to grow through the internet. The NASA History Division's Website (http://history.nasa.gov) had 77,574,617 hits in 2007 and *Great Images in NASA* (GRIN), the historic images Website, had 7,966,850 hits. A wealth of information on the 50th Anniversary events is publically available (http://www.nasa.gov/50th/home/index.html).
NASA websites will continue to be expanded in 2009 as NASA prepares to celebrate the 40th Anniversary of the Apollo 11 First Manned Landing on the Moon.

On-site events and topical websites bring into focus the many historic properties that have contributed to the Agency's historic success. As noted in the Executive Summary, NASA's history is considered the foundation upon which future mission success is built; while celebrating its history, NASA utilizes its historic accomplishments as building blocks for current mission support and future mission planning.

Artist's Interpretation of the New Horizons Spacecraft

Ever forward-looking, NASA is focused on the next 50 years. New achievements and successful missions will be celebrated as they occur. One of NASA's most significant current missions, New Horizons, is a robotic spacecraft mission launched on January 19, 2006. New Horizon's cameras provided never before seen images as it passed by Jupiter in February 2007 and Saturn in June 2008. It is expected to be the first spacecraft to fly by and study the dwarf planet Pluto and its moons in 2015 and will then continue into the Kuiper Belt Objects.

In 1984, the National Park Service conducted the Man-in-Space NHL Thematic Study, resulting in the NHL-designation of 20 buildings and structures managed by NASA (though less than 50 years old). Many of these resources were found to have significance to America's space exploration program. During the current reporting period, NASA has proactively stepped forward to survey over 300 assets associated with the SSP. Many of these assets were found to be eligible for listing in the National Register of Historic Places, despite their relative youth. NASA's survey and evaluation program recognizes the need to consider the contribution of the Agency's unique and highly specialized assets to the national Space Program. This study illustrates NASA's heightened efforts to meet the EO call to inventory, protect and utilize its inventory of historic resources.

The Path Forward

NASA has made great strides during this report period, Fiscal Years 2006 to 2008, in establishing the Agency CRM Program. Over these past three years, the CRM Program has focused on the development of CRM policy and procedures, as well as creating and populating a CRM database. The database provides an Agency inventory of over 200 historic buildings and structures, as well as over 250 archeological resources. While this report celebrates the many accomplishments, continued development of the CRM Program is needed and planned. As the CRM Program matures, so will the protection and utilization of the Agency's growing inventory of historic resources. In addition, continued training and awareness of CRM responsibilities within NASA is planned.

NASA recognizes three groups of stakeholders in stewarding cultural resources, and seeks to customize communications with each according to their interests and/or responsibilities:

- Program and Agency leadership, which sets the Agency's overall agenda, promotes common organizational values, and allocates resources in accordance with mission commitments and those values
- Institutional stewards, which include Environmental, FERPD, Logistics, and Finance professionals
- The broader community of those interested in NASA's programs for diverse reasons

In the case of FERPD, coordination with the EMD on issues relating to cultural resources has been on the rise for several years. This coordination includes both interactions among institutional program managers within Headquarters, and interactions between Headquarters and the Centers within communities of practice. Each of these interactions has been identified as an opportunity for improvement, and each has made significant new strides.

For institutional program managers within Headquarters, the ideal is to share relevant knowledge and perspective seamlessly and in real time. Moving in this direction, FERPD has worked closely with EMD to ensure prompt and coordinated access to shared information. This has included tying historic preservation information to real property record systems, ensuring coordination between databases, and adapting NASA's Real Property Inventory in response.

Further, individual program managers from each organization spend time ensuring coordination in various aspects of NASA's interactions; though there is much more opportunity to improve, we are taking important steps to bridge past divides between organizations. For instance, we invite one another to participate in relevant training and workshop activities for Real Property and Master Planning, and involve one another when issues of mutual interest arise. In addition, policy documents have been the subject of closer coordination in recent years.

To improve interactions between Headquarters and the Centers, FERPD coordinates closely with EMD in designing training for real property managers and master planners. In 2008, both of these communities of practice held workshops to strengthen and standardize understandings of program responsibilities; CRM awareness was incorporated into both agenda. The Agency also has asked facilities managers who also have CRM responsibilities to lead training among their peers. Their perspective on the importance of close coordination in facilities and cultural resources management has prompted energetic, thoughtful discussion.

Additionally, EMD recognizes the need for continued and expanded interaction with other key stakeholders. The success of the ongoing coordination with the Space Shuttle and CxP is credited to the team work and communications provided in the Transition Historic Preservation Work Group (HPWG) formed in 2006. It is absolutely essential that this internal network and cooperation continue during the sunsetting of the SSP. EMD will continue to track potential affects on historic properties through quarterly review and updates of the measures and targets in the risk management systems utilized by mission managers.

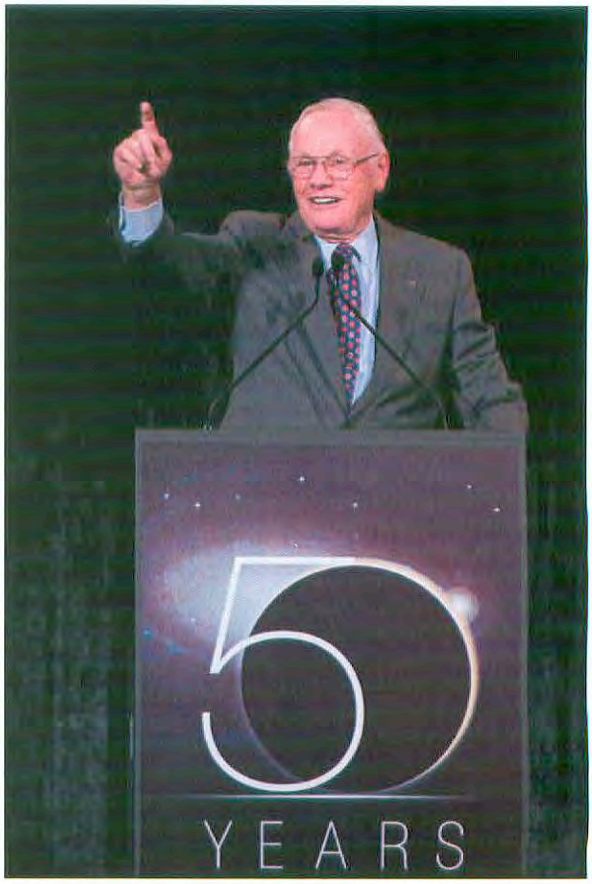
The HPWG will continue to report to the Transition Control Board the cost and schedule of CRM activities. Recently, digital management tools were developed to support Transition Managers. Continued funding support will be need to ensure these tools are utilized and CRM contractors engaged to expedite NHPA compliance activities within mission. To this end, the HPWG and particularly NASA HPOs also will need to continue working closely with SHPOs, initiating consultation early and proactively develop mitigation plans. To support Transition, the HPOs will have a growing dependence on internal resources to support mitigation and recordation activities. These include

offices that maintain historic records, such as Public Relations, Center Historians, Center Archivists, etc. HPO attendance at mission and facility planning meetings is increasing and will need to continue. In addition to working with program and project managers, educational and outreach personnel have been identified as new internal stakeholders.

While many, if not all, NASA Centers are directly engaged with Native American tribes, the focus is educational outreach work that does not directly involve Center HPOs. Some HPOs are not even informed of the NASA's partnerships with tribes. Likewise, NASA educational and outreach personnel may not be aware of NASA's CRM program and that NASA manages archaeological sites containing Native American resources on NASA Centers. NASA's FPO has established a goal of increasing awareness of NAGPRA, ARPA, and the NHPA. Even if NASA managers are not working with tribes within the context of formal consultation, they would benefit from knowing the Agency's responsibility to Native Americans (as defined in the ACHP's November 2008 *Consultation with Indian Tribes in the Section 106 Review Process: a Handbook*) and might consider incorporating NASA's cultural resources into new outreach initiatives.

EMD appreciates the support provided by the ACHP and the NPS in the development of the CRM Program and Transition-specific activities during the past three years. EMD will continue to work with the NPS in addressing the ongoing issue of applying NASA digital photography to recordation activities. EMD will also play an active role in promoting GIS application to CRM, as well as responding to recommendations that the NASA Archeological Work Group may put forward in 2009. EMD will continue to chair the NASA CRM Panel and seek stakeholder input in determining Agency CRM priorities.

EMD looks forward to continuing to work closely with the ACHP to ensure their awareness of and input in the numerous undertakings anticipated during the new triennial period. The initial 2004 Section 3 report revealed NASA's CRM program was driven by undertakings that triggered Section 106 consultation. The 2005 progress report identified program needs to comply with Section 110 guidelines. This report provides the status of efforts to meet the program needs cited in the 2005 progress report. All commitments from the 2005 report have been initiated, and many have been completed. NASA looks forward to reporting the progress in the continued development of the CRM Program including the integration of stewardship responsibilities in mission planning.



Neil Armstrong, Astronaut, Professor, and first man on the moon, at NASA's 50th Anniversary Gala

Ames Research Center

Event title: ARC Anniversary Celebration

Location: Parade grounds of the Shenandoah Plaza National Historic District, ARC

Date: Annual anniversary celebration

Event Description: The ARC birthday celebration honored the Center's notable past, while looking towards the future. Annually, employees gather on the Shenandoah plaza for an historic photograph to commemorate the Center's celebration of excellence. The photo was a re-enactment of the event conducted years past on the ARC flight line. Programs featuring ARC history were described in the *Ames Astrogram.*

The parade grounds, a contributing feature of the Shenandoah Plaza National Historic District, offers a prime location for the NASA 50th event, as is the case for the ARC's annual birthday celebration events. The Naval Air Station Sunnyvale, later renamed Moffett Field, was created in 1933 with the construction of Hangar One as the docking station for the USS Macon, one of the largest airship in the world at the time. The Historic District was nominated by the U.S. Navy for listing on the NRHP. The Historic District was conveyed to NASA on July 1, 1994 as part of a Federal military base reduction and closure action.

ARC recognizes its birthday every year, generally with an article in the center newsletter, the *Ames Astrogram.* On major milestone birthdays, as with the 60th, Center-wide events are often planned. During the planning process for this anniversary, managed by the ARC Public Affairs Office, an opportunity to partner with the San Jose Symphony arose. Through this partnership, NASA created a visual show of NASA space imagery to accompany the symphony's live performance of Gustav Holt's, *The Planets.* The symphony performed one show for NASA employees on the Shenandoah Plaza's Parade Grounds. The biggest challenge for any large event is funding for the outdoor venue, for renting the theater, and paying staff for the public event. NASA's 50th anniversary celebration at ARC is another significant Center event. Employees and guests all enjoy the annual birthday festivities, and many positive comments have been received and reported in the *Ames Astrogram.*

ARC 60th Anniversary Celebration

Ames Research Center

Event title: Building 19, NASA Research Park, Moffett Field

Location: Shenandoah Plaza National Historic District, Moffett Field, CA

Date: April 2008

Event Description: Building 19, a former Navy and Marine barracks building, was constructed in 1932 as part of what became the Naval Air Station Moffett Field. It was constructed at a cost of $5 million, and the dedication of the station followed on April 12, 1933. Building 19 has been rehabilitated and adaptively reused over the course of 3 years to provide corporate office space. The 151,000-square-foot building also boasts a 40 room hotel-type lodge that also has been designed for use by government and military guests.

Shenandoah Plaza National Historic District is historically significant due to the presence of Hangar One, a facility built as a hangar for the 785-foot long USS Macon dirigible. The USS Macon and USS Akron airships were commissioned in the early 1930s to advance the United States in the area of lighter-than-air technology and to be used for aerial surveillance and reconnaissance for the Navy. The USS Macon was planned for west coast aerial surveillance responsibility while the USS Akron was to cover the east coast of the United States. The complex of support buildings at the naval air station are sited in an elegant formal arrangement around the original parade grounds that became known as Shenandoah Plaza. Today, the buildings and grounds stand remarkably intact, proudly displaying their original 1932 period of construction. Most of the buildings were designed in the Spanish Colonial Revival style, while the hangar design is a unique and impressive example of Streamlined Modern architecture. Moffett Field was named in honor of Rear Admiral William A. Moffett, the first director of naval aeronautics after he perished in the crash of the USS Akron in 1933.

Building 19 represents a series of cumulative renovations that have adapted a building designed to house Navy and Marine personnel to an attractive office complex that is fully occupied by NASA contractors, NASA Research Park partner tenants, and a small number of NASA civil servants. In addition, a 40-room hotel occupies the west wing of the building. Improvements made in the last 3 years include:

- Seismic upgrade of several of the long wings of the building. Walls were reinforced with steel rebar, and shot-crete concrete was applied to a thickness of four inches
- A new elevator was installed in the center of the building
- Restrooms were upgraded from the original military style latrines
- New lighting was installed in the foyer hallway of the building
- Sprinkler fire suppression systems were installed throughout the building and the front porch to meet current fire code requirements
- Interiors were redecorated to provide an office atmosphere
- New staircases and handrail systems were installed to meet current code requirements
- Air conditioners were installed with special care to not diminish the historic integrity of the buildings exterior

The adaptive reuse of Building 19 has received positive feedback from the stakeholders now occupying the building. The rents obtained from the building tenants are helping in defraying the maintenance and repair costs of the historic district.

ARC Building 19

Dryden Flight Research Center

Event title: Historical Artifacts Display

Location: Visitor Center, DFRC, CA

Date: Ongoing

Event Description: DFRC offers a display of artifacts relating to the history of the Center. Collection items include graphing tools, Friden calculators, film readers, and examples of work done by the NACA women who produced data in the late 1940s and early 1950s at DFRC. These historical items provide an interesting counterpoint to today's use of computer technology. The walls of the visitors center provide a backdrop for four flight suits representing the different eras of flight research at the center, from the earliest full pressure suits, to the X-15 pressure suits, to those worn by ER-2 pilots, as well as today's F-18 pilots. The first two pressure suits have long been out of production, displaced by those worn by SR-71 and ER-2 pilots. The display of suits marks a progression in the development of technology necessary for conducting aspects of research at DFRC.

DFRC has received many compliments on the display from the public and NASA visitors.

Dryden Flight Research Center

Event title: The Space Race

Location: DFRC Visitors Center and Research Library

Date: May through December 2008

Event Description: DFRC is offering a unique display of models, books, articles, and artifacts connected to the space race between the Soviet Union and the United States. The display includes early texts on rocketry, documents from early American discussions, plans for voyages into space, and artifacts from both sides stemming from the contest itself, all secured behind lockable glass doors in cabinets.

The 50th anniversary display is the product of two individuals at the center with large personal collections of space-related memorabilia, documents, and first edition texts. DFRC received a positive response from attendees.

Jet Propulsion Laboratory

Event title: 50th Anniversary of the launch of JPL's Explorer 1 Satellite

Location: JPL

Date: May through December 2008

Event Description: In honor of the 50th anniversary of the launch of the JPL's Explorer 1 satellite, JPL is celebrating by offering a series of lectures, film screenings, and other events for employees. The commemoration began with the distribution of the booklet, Explorer 1, presenting a detailed history of the satellite campaign, and continued with an Explorer 1-themed float in the Rose Parade. In addition, JPL has launched a website devoted to the history of Explorer 1 (http://www.jpl.nasa.gov/explorer), and banners are flying at JPL and around the City of Pasadena saluting the historic mission. JPL also offers a variety of history-related presentations, such as talks, films, radio programs, lunchtime events, and educator's workshops. Examples include:

- JPL's historian, Erik Conway, presented a noontime talk on the history of space science
- Explorer 1: The Beginning of the Space Age, a 55-minute film, produced by Blaine Baggett, JPL's executive manager for communications and education, highlights the story of America's first satellite
- A talk, *Explorer I - Really 80 Days???* was to be presented by retiree Dr. Henry Richter, who served as manager of JPL's Explorer Design and Development Group, and later as chief of Section 27 Space Instruments
- JPL Library presented a special display on Explorer 1
- JPL hosted a 2-day educators' workshop on Explorer 1 and the history of space flight

Jet Propulsion Laboratory

Event title: NASA Beams Beatles' *Across the Universe* into Space

Location: JPL, Space Flight Operations Facility (NHL)

Date: February 4, 2008

Event Description: For the first time ever, NASA beamed The Beatles' song, *Across the Universe,* directly into deep space at 7 p.m. EST on February 4, 2008. The transmission over NASA's Deep Space Network commemorated the 40th anniversary of the day The Beatles recorded the song, as well as the 50th anniversary of NASA's founding and the group's beginnings. Two other anniversaries were also honored: The launch of the first U.S. satellite, Explorer 1, which occurred 50 years ago and the founding 45 years ago of the Deep Space

Network, an international network of antennas that supports missions to explore the universe. The transmission was aimed at the North Star, Polaris, which is located 431 light years away from Earth. The song will travel across the universe at a speed of 186,000 miles per second. February 4 was declared "Across The Universe Day" by Beatles fans to commemorate the anniversaries. As part of the celebration, the public was invited to participate in the event by playing the song at the same time it was transmitted by NASA.

According to the article, Sir Paul McCartney of The Beatles, Yoko Ono, and Dr. Barry Geldzahler (NASA Deep Space Network Program Executive at NASA Headquarters) all praised the beaming of the song.

Website: http://www.nasa.gov/topics/universe/features/across_universe.html

The Beatles' *Across the Universe* beamed into deep space

Jet Propulsion Laboratory

Event title: 5th Anniversary of Mars Odyssey

Location: JPL

Date: April 7, 2006

Event Description: On April 7, 2001, the 2001 Mars Odyssey spacecraft began its journey to Mars with a flawless launch. Five years later, the spacecraft and science teams were still going strong, returning unique information about the composition, geology, and environment of Mars. On Friday, April 7, 2006, JPL celebrated the 5th anniversary of its Mars Odyssey spacecraft launch and its remarkable successes over the previous 5 years in advancing knowledge of Mars and its environment.

Jet Propulsion Laboratory

Event title: Viking 30th Anniversary Celebration

Location: JPL

Date: July 17, 2006

Event Description: JPL's Public Services Office hosted a Viking 30th Anniversary Celebration on Monday, July 17, 2006, in the Center's von Karman Auditorium. Speaker Conway Snyder shared his personal experiences.

Jet Propulsion Laboratory

Event title: 5th Anniversary of the Genesis Sample Return Mission Launch

Location: JPL

Date: August 10, 2006

Event Description: JPL's Public Services Office hosted a special lecture in honor of the 5th anniversary of the Genesis Sample Return Mission launch. The event was held in the Center's von Karman Auditorium. The lecture was entitled *Genesis*: *Behind the Science* and was presented by Don Sweetnam, Genesis Project Manager. Nearly 2 years after Genesis' return to Earth, JPL's science team is now beginning to reveal the mysteries of the Sun's composition and the origins of the Solar System. Participants at the lecture learned more about the project, with highlights from recovery in the Utah desert to the clean room at JSC.

Jet Propulsion Laboratory

Event title: 5th Anniversary of the Launch of the Jason 1 Spacecraft

Location: JPL

Date: December 7, 2006

Event Description: JPL's Public Services Office hosted a special celebration to commemorate the 5th anniversary of the launch of the Jason 1 spacecraft. The celebration was held at the Center's von Karman Auditorium. Jason 1's measurements of ocean surface topography have greatly contributed to the understanding of the changing dynamics of the oceans and how these changes affect Earth's weather.

Jet Propulsion Laboratory

Event title: 5th Anniversary of the Launch of the GRACE Spacecraft

Location: JPL

Date: March 15, 2007

Event Description: JPL's Public Services Office hosted a special celebration to commemorate the 5th anniversary of the launch of the GRACE spacecraft. The twin satellite GRACE mission has been making detailed measurements of Earth's gravity field which will lead to discoveries about Earth's gravity and natural systems.

Jet Propulsion Laboratory

Event title: 5th Anniversary of the Launch of AIRS

Location: JPL

Date: May 18, 2007

Event Description: JPL's Public Services Office hosted a special celebration to commemorate the 5th anniversary of the launch of AIRS. The celebration took place at the Center's von Kármán Auditorium. AIRS has moved climate research and weather prediction into the 21st century. AIRS is one of six instruments on board the Aqua satellite, part of NASA's Earth Observing System. AIRS, along with its partner microwave instrument, Advanced Microwave Sounding Unit, represents the most advanced atmospheric sounding system ever deployed in space. Together, these instruments observe the global water and energy cycles, climate variation and trends, and the response of the climate system to increased greenhouse gases. AIRS uses cutting-edge infrared technology to create three-dimensional maps of air and surface temperature, water vapor, and cloud properties. With 2,378 spectral channels, AIRS has a spectral resolution more than 100 times greater than previous infrared sounders and provides more accurate information on the vertical profiles of atmospheric temperature and moisture. AIRS can also measure trace greenhouse gases such as ozone, carbon monoxide, and methane.

Additional information was obtained from JPL's Website:

http://science.jpl.nasa.gov/projects/AIRS/

Goldstone Deep Space Communications Complex

Event title: 40th Anniversary of Mars Deep Space Station-14

Location: GDSCC, Fort Irwin, CA

Date: March 30, 2006

Event Description: The event was held to honor of 40 years of tracking with the Mars Deep Space Station-14 antenna. The event centered on the antenna, which was used as the backdrop for the speaker's dais. The speakers spoke about the history of the antenna and the missions that had been supported by the Mars-14 antenna. More than 200 visitors attended the ceremony. A new plaque was dedicated in honor of 40 years of service. Escorts and ushers ensured the protection of the antenna, allowing the visitors to view the antenna and to approach the alidade, cable wrap, and hydrostatic bearing sites without causing harm to the antenna.

40th Anniversary Commemoration

Mars Deep Space Station-14 antenna

GDSCC, Fort Irwin, CA

Mars Deep Space Station-14 is a 70-meter, 24-story, 16-million-pound deep space tracking station located on GDSCC in Fort Irwin, CA. This antenna has been used to track spacecraft from the Mariner 4 mission to Mars (which gave the antenna its name) to the Viking, Apollo, Voyager, Cassini, Galileo, and Mars Exploration Rovers missions. In its first 40 years of use, these and many other spacecraft missions have been tracked by the Deep Space 14.

JPL Deep Space Network Outreach worked with ITT/Goldstone management and Outreach for approximately 6 months in advance of the 40th anniversary event. The employees of Goldstone worked many hours in preparation of the event, preparing the antenna and the area for its visitors: maintenance, cleaning, and painting were priorities to prepare the antenna for its anniversary event. Arranging for the 200 visitors to be processed through the Fort Irwin Visitors center and guard gate in a timely, efficient manner, and transporting them to the Mars site an additional 15 miles away were also challenges that were overcome in a very professional and manner.

Goldstone Deep Space Communications Complex

Event title: Barstow Space Days

Location: Barstow Community College, Barstow College, CA

Date: May 4, 2007

Event Description: This event was a celebration of National Space Day. Displays and exhibits showcased the history of the Deep Space Network with pictures and artifacts. The event also featured displays of current deep space missions, as well as antenna components such as low noise amplifiers and transmitters.

A Microwave Amplification by Stimulated Emission of Radiation (MASER) display with a Block 1 and a Block 3 MASER was the main historical association. The MASER is an early type of the low noise amplifier used by the Deep Space Network. Included with the MASER display were S-Band and X-Bank Feed Horns, MASER Rubies, and a S-Band HEMT. Also on display were photographs from the 48 years of deep space tracking. The history of the deep space network includes many significant events from the first track of a deep space probe, the Pioneer 3 on December 6, 1958, along with the Mariner, Viking, Apollo, Magellan, Voyager, Cassini, Galileo, Mars Rovers, Mars Odyssey, and many others. These historic elements tracked the launches, sent commands to deep space, and brought photos and other important data from the deep space spacecraft back to earth.

JPL, ITT/Goldstone, and Barstow College personnel planned and organized the events, including the installation of the displays. The greatest challenge was transporting personnel and displays to the college in advance of the event. Positive feedback was received from JPL Deep Space Network Outreach, ITT/Goldstone Management, and the Barstow College President.

Goldstone Deep Space Communications Complex

Event title: GAVRT 10th anniversary

Location: GDSCC, Fort Irwin, CA

Date: October 17, 2006

Event Description: The GAVRT program celebrated its 10th anniversary with speakers and a catered lunch for approximately 200 people. The event was held on site next to the DSS-12 Echo antenna. The antenna was renamed in honor of Dr. Mike Klein, as evidenced by a commemorative plaque. The speakers spoke from a platform centered in front of the antenna so that the antenna was the main focus. The antenna was protected by a perimeter fence.

Deep Space Station 12 was built in 1962. It is an hour-angle declination antenna that was originally built as a 26-meter antenna and in 1978 was expanded to 34 meters. This antenna was named Echo in honor of the Echo Balloon experiments in satellite communications. The antenna stands approximately 120 feet tall and weighs 850,000 pounds. The Echo antenna was also used to track other spacecraft missions before being decommissioned in 1996. In that year, NASA granted the use of the antenna/radio telescope to the Lewis Center for Educational Research for its students to study space. JPL's Dr. Mike Klein was instrumental in designing a program for students from all over the world now used in conjunction with Deep Space Station 12.

GAVRT, JPL, and ITT/Goldstone personnel organized and arranged the event, which included outfitting the remote site with tents, sound system, tables/chairs, caterers, and displays. Processing the 200 visitors through the Fort Irwin guard gate in a timely manner was one of the challenges met.

White Sands Test Facility

Event title: Love Ranch Tour and Oral History from Family Descendants

Location: Love Ranch

Date: December 28, 2006

Event Description: Dale Owen and his family visited Love Ranch and provided an oral history describing his childhood years growing up on the ranch. The oral history illuminated some of the day-to-day activities of ranch

life. Mr. Owen also described some of the uses of the buildings that were previously not well documented. Mr. Owen's history was recorded, with his permission, for future use.

Love Ranch is a locally significant ranch. It is recognized as one of the first remote homesteads in the area with electric service. Love Ranch, dating to the 1940s, survives as one of a handful of working ranches on the White Sands Missile Range. Also surviving at the ranch are significant historical murals that depict various cattle brands of the era.

Mr. Owen first expressed his interest in visiting the ranch to a contractor. He wished to show his family one of the homes from his childhood years. The contractor conveyed Mr. Owen's request to the Center's HPO, and as a result the Center arranged a special tour. Normally, access to the site is restricted due to hazardous testing operations at the WSTF.

Very positive feedback was provided by the stakeholders, including family members. Mr. Owen and his family were grateful for the opportunity. The visit provided Mr. Owen a chance to visit his childhood home, reminisce about the hardships and day-to-day life at the ranch, and to show the Love Ranch area to successive generations of his family, including children and grandchildren. In gratitude for the opportunity to revisit the historical family homestead, Mr. Owen agreed to record his memories on tape. NASA retained the taped oral history. This is the second recorded oral history of the ranch provided by Mr. Owen.

Kennedy Space Center

Event/Case Study title: Removal of the CITE Stands and ATM in the O&C High Bay

Location: KSC, O&C

Date: August 2006

Event Description: O&C is listed on the NRHP. The State of Florida allocated $35 million in funding to NASA for the purpose of modifying the High Bay for the next generation program. Historical components were found in the High Bay CITE and the ATM Clean Room, both of which required Section 106 compliance studies prior to actions being undertaken. KSC was able to streamline the Section 106 process prior to the removal and disposal of these components for the new high bay configuration. Photo documentation was undertaken for these elements.

O&C, 8BR1693, is listed on the NRHP for the Apollo period under the historic association with Space Exploration, Engineering, and Architecture. The period of significance is 1964–1975, and the significant date is 1964. O&C, also known as the Manned Spacecraft Operations Building, was completed in 1964. The 5-story facility, incorporating low and high bay areas, is sited east of the Headquarters Building. Historically, the O&C was used for assembly and checkout of the Apollo spacecraft modules, and it also accommodated preflight preparations and crew training. After testing, the mated spacecraft components—the command module, the lunar module, and the service module—were moved from the integrated test area to the Vehicle Assembly Building for stacking on top of the launch vehicle. O&C is still in active use and has been reconfigured to accommodate the needs of the SSP and the upcoming CxP. The experiment flight hardware for the Spacelab missions was integrated into the modules at O&C. The astronaut quarters are also located in this significant building.

KSC was able to expedite the Section 106 process for the modifications planned for the O&C High Bay to support the CxP. In 2007, KSC received the Blue Marble Award from NASA Headquarters for this project.

Langley Research Center

Event title: NACA Reunion XII

Location: LaRC, Hampton, VA

Date: May 2–4, 2008

Event Description: Employees of NACA, NASA's predecessor, held their 12th and possibly final reunion in Virginia. As part of this historic event, the JSC History Office conducted interviews with 10 to 12 attendees from the Ames, Lewis, and Langley Laboratories. NACA Reunion XII was co-sponsored by the NASA LaRC and the Langley Alumni Association. There were 360 attendees from over 30 States and all seemed to have a great time celebrating their past.

NASA Administrator Michael Griffin gave a powerful speech recognizing the important contributions of the NACA at the opening ceremony in the H.J.E. Reid Center at LaRC. Guests also heard impressive presentations from NASA LaRC Director Lesa Roe, and Air Force Vice Commander Jeffrey Prichard of the First Fighter Wing. Reunion Chairman Duncan McIver presented the NASA Administrator with a plaque from NACA congratulating NASA on their 50th Anniversary on October 1, 2008. The Administrator said he would hang the plaque in a prominent place in NASA Headquarters.

Jo Dibella, who participated in this event, organized the first Reunion, attended by 611 people, and held in 1976. Jo ended her career as the secretary to Dr. Hugh Dryden, the last NACA Director and the first Deputy Administrator of NASA.

The NACA alumni present represented staff who worked at the NACA Ames (today NASA's ARC, CA) and Lewis (today NASA's GRC, OH) laboratories. NACA operated from 1917 till the formation of NASA in 1958.

Langley Research Center

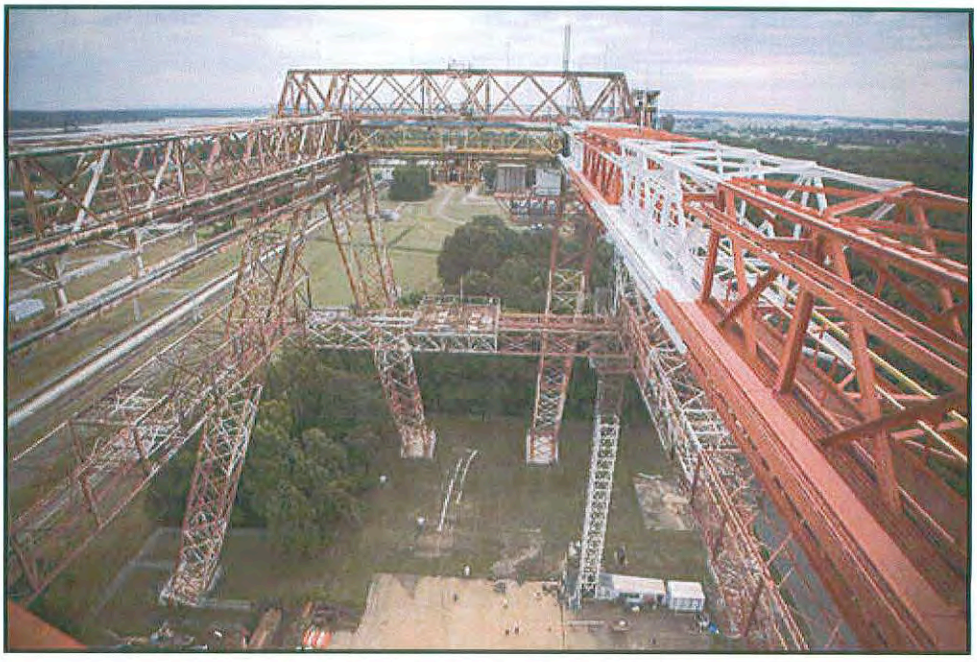
Event title: LaRC's 90th Anniversary Open House

Location: LaRC, Hampton, VA

Date: October 27, 2007

Event Description: Visitors to NASA LaRC's Open House examined the dome-like lunar habitat to learn what Hampton researchers are doing to send humans back to the moon, Mars, and beyond. On October 27, 2007, LaRC opened its gates for the first time in 6 years. Since that time, the Center has embarked on some exciting new projects. In celebration of NASA LaRC's 90th anniversary, NASA shared some of its local research with the Hampton Roads community. "As the country's first civil aeronautics laboratory, Langley was charged by Congress with solving the problems of flight," said NASA LaRC Director Lesa Roe. "Now we're helping develop the next generation of air and space vehicles, while helping make today's airplanes and air transportation system safer and more efficient and doing ground-breaking science research in important subjects like climate change." LaRC opened 17 facilities to the public. Among them was the Gantry, an NHL, where Neil Armstrong and other astronauts learned to land on the moon and the site of the world's fastest water-powered sled. Visitors also saw a half-dozen research aircraft in the NASA LaRC hangar. Visitors were permitted to navigate a flight simulator, examine a noise laboratory, and walk through a wind tunnel. Those visitors more interested in science were listened to NASA LaRC researchers share their thoughts about global warming, life on Mars, and astral photography. Those visitors curious to learn how astronauts will be rocketing back to the moon observed space capsule mock-ups under construction. Some of the NASA LaRC Open House displays were geared for children.

Hands-on activities allowed youth to help construct NASA's next rocket, experience life on Mars and the moon, or build and fly airplanes and spacecraft.



The Gantry, LaRC, under renovation

The open house was the culmination of a weekend of events that began with TeXpo on Friday, October 26, 2007. TeXpo was an effort to promote NASA LaRC for those who may consider conducting business with the Center. On October 26, Hampton Mayor Ross Kearney read a proclamation lauding the center's 90th anniversary to more than 250 people at a gala at the VASC. Participants also listened to author James Schultz and former director Jerry Creedon speak on the topic of LaRC's history in a program narrated by Lesa Roe. Creedon cited the NACA creed as the purpose for NASA LaRC, then and now: "Study the problems of life with a view toward a practical solution."

Langley Research Center

Event title: NASA – Jamestown Partnership

Location: Jamestown and Hampton, VA

Date: 2005–2007

Event Description: In anticipation of commemorating the 400th Anniversary of settling Jamestown in 1607 and to promote public interest and participation in the history of exploration, adventure, and discovery, the LaRC entered into a partnership with the Jamestown 2007 Commemoration Committee in November of 2005. Jamestown 2007, a sub-organization of the Jamestown–Yorktown Foundation, established partnerships to provide vital educational, marketing, and outreach benefits regarding the commemoration of America's 400th Anniversary.

The primary goal of NASA's partnership with Jamestown 2007 was to preserve and promote the spirit of exploration that led to the formation of our nation and continued with NASA's discoveries in aeronautics, as well as the original space flights and moon landings. In addition to describing the challenges faced by the Jamestown settlers and comparing them with the challenges faced by NASA's early space program, the partnership also looks to the future by including NASA's new *Vision for Space Exploration.*

The partnership has resulted in the development of a wide array of educational materials and the planning of numerous special events, with the commemoration culminating on the 400th Anniversary Weekend. The following provides an overview of events and activities associated with the NASA/Jamestown partnership:

- The 2006 Godspeed Sail: A replica of one of the ships that landed in Jamestown in 1607 visited six major East Coast ports from May through July 2006. Accompanied by a unique Landing Party Festival of educational exhibits, interactive displays, and entertaining performances, LaRC presented exhibits and speakers at each port
- *Jamestown Live!* consisted of a 1-hour, nationwide Web cast made available to more than 50 million K–12 students in over 90,000 schools across the country. Educational projects focusing on Jamestown were presented online by celebrities, educational leaders, and recognized experts, including NASA engineers and scientists
- America's 400th Anniversary Weekend (May 11–13, 2007) was attended by approximately 66,000 people, including distinguished guests Queen Elizabeth II and President Bush. This was the culminating event for the Jamestown 2007 initiative. An interactive NASA exhibit called "Jamestown and NASA: Exploring the Past, Discovering the Future, Understanding the Journey" was featured. NASA personnel, including NASA's FPO, were on hand to help visitors compare 17th-century exploration to NASA's past, present, and future space exploration initiatives. Additionally, the International Space Station Expedition 15 crew members sent a special message via live Web-cam during the Jamestown celebration
- Educational Module: The LaRC Public Affairs and Education Office developed a 200-page Exploration: *Then and Now – NASA and Jamestown Education Module* and interactive website. The module is made up of four lessons related to exploration: Transportation, Settlement, Follow the Water, and Human Needs. Lessons address the parallel challenges in exploration efforts faced by the Jamestown settlers and NASA. Links to the interactive lessons are available on NASA's Education portal and the Jamestown Journey home page
- As part of *Jamestown Artifact Flies on the Space Shuttle*, a 400-year old cargo tag reading "Yamestowne" was flown aboard the Space Shuttle Atlantis to the International Space Station and was then returned to the Jamestown settlement in September 2007 after traveling across the ocean and then 6 million miles circling the earth. The tag has been placed on display in the Archaearium at Jamestown

Although the 400th Anniversary celebration has passed, LaRC plans to continue to promote public outreach and education regarding the history of exploration and the NASA/Jamestown partnership. In addition to maintaining the educational module, information about the partnership is available to the public at the VASC, located in Hampton, VA, which serves as the LaRC Visitor's Center.

Langley Research Center

Event title: Various

Location: VASC, Hampton, VA (LaRC Official Visitor's Center)

Dates: 2005–2008

Event Descriptions:

- NASA Explorer Van Event – 150 people attended – VASC Main Gallery
  Viking 30th Reunion – 180 people attended – VASC Main Gallery
- NASA Space Shuttle Council Meeting – 40 people attended – VASC Library
- NASA Administrator Dinner – 40 people attended – VASC Library
- NASA Return to Flight Celebration – 300 people attended – VASC Main Gallery
- NASA Inventors Award Ceremony – 250 people attended – VASC Main Gallery
- Presentation to Hampton Roads Partnership of Flag Flown on STS-117 – 40 people attended – VASC Space Quest Gallery
- NASA – LaRC 90th Anniversary Gala – Main Gallery
- NASA Art Awards (LaRC Center Director Lesa Roe presented awards to local school children) – 120 people attended – VASC Space Quest Gallery
- NACA Reunion 300 people attended – VASC Main Gallery NASA Inventors Award Ceremony – 210 people attended – VASC Main Gallery

Stennis Space Center

Event description: AIAA designation of the SSC Test Complex as an Historic Aerospace Site

Location: SSC, MS

Date: April 10, 2008

Event Description: The Test Complex, whose test stands are already designated as an NHL, was nominated as an AIAA Historic Site, which increases its historic value, enhances its significance, and increases the need for preservation and conservation.

The historic properties include the A-1, A-2, B-1, and B-2 Test Stands. These structures are designated as NHLs because they were instrumental in the flight validation and testing of the Apollo Program's Saturn Rocket Engines. All engines that flew men to the Moon during the Apollo Program were tested at SSC.

The AIAA followed its process for designating historic districts through a nomination request submitted by the SSC's Senior Management. The SSC testing complex joins the Tranquility Base on the Moon and Kitty Hawk, NC as AIAA Historic Sites. the designation provides more visibility to the general public and increases the total number of AIAA/NASA designated sites to four.

The Sea Coast Echo, the Biloxi D'Iberville Press, and the Journal of South Mississippi Business, all members of the local media, printed releases featuring the AIAA/NASA designation. The internet-based news outlet, Areo-News.net, also featured the designation. The Office of External Affairs and Education provided local and regional media with news releases highlighting the event.

Saturn V S-II Hoisted onto Test Stand

Stennis Space Center

Event title: NASA 50th Anniversary Picnic Celebration

Location: SSC, MS

Date: April 10, 2008

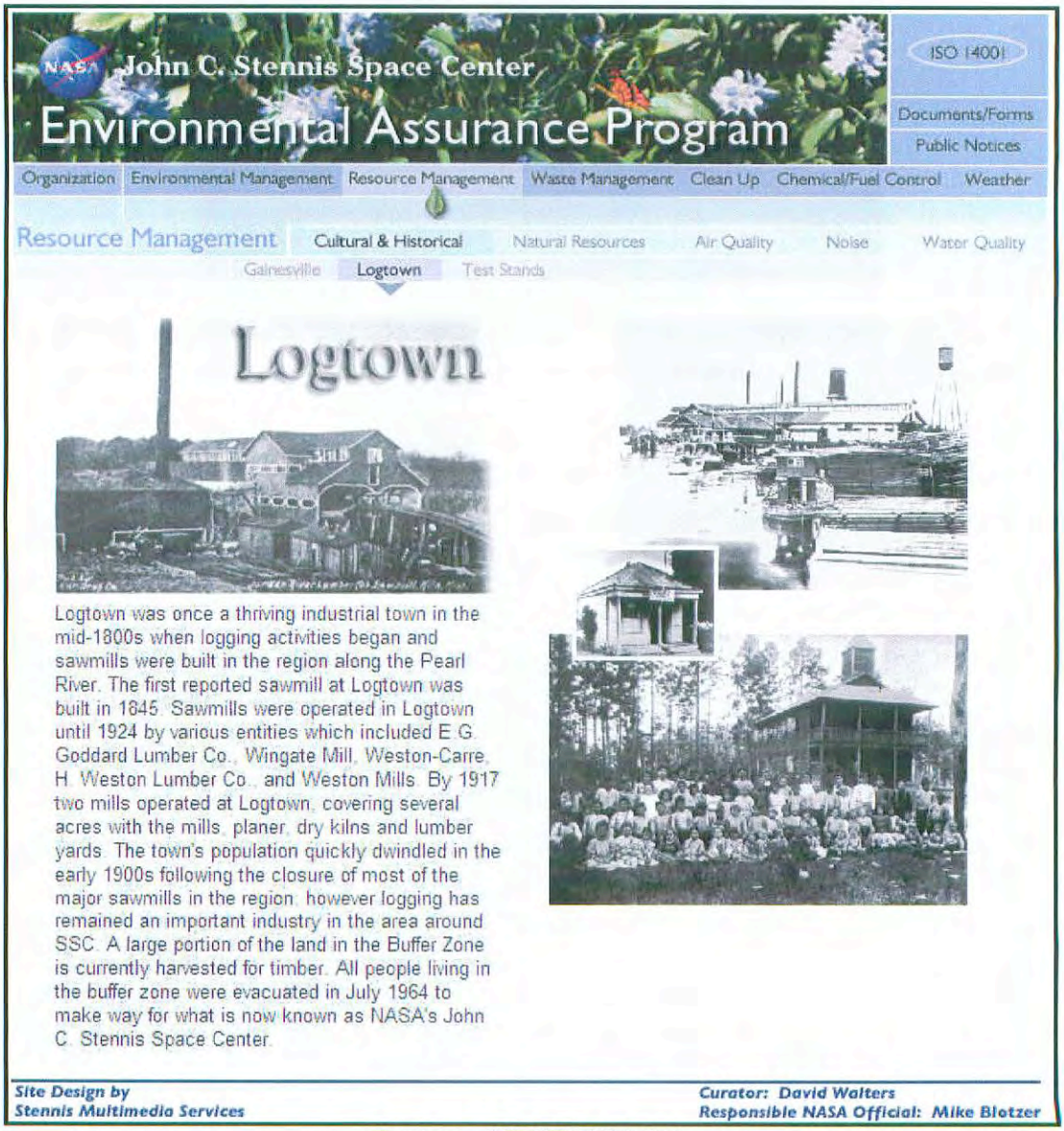
Event Description: The NASA 50th anniversary picnic was an event sponsored by the SSC exchange for NASA and its contractors to celebrate NASA's 50 years as a Federal agency, its accomplishments, and SSC's successful contributions to the Agency. The celebration was organized in conjunction with the AIAA Historic Site designation ceremony for SSC. NASA SSC's History Office provided video footage highlighting the early days of the center, as well as an historical fact sheet documenting the SSC's unique history.

SSC received a recent designation as an AIAA Historical Site. The video footage shown at the event also highlighted the historical towns of Gainesville and Logtown.

Historical fact sheets were produced and distributed by the NASA Office of External Affairs and Education in conjunction with the SSC History Office. These fact sheets contained a timeline of SSC's missions from acquiring the facility to future directives within the CxP. The AIAA produced a historical site program containing in-depth information of SSC and its mission. Each participant, including community leaders and employees, received a copy of the history fact sheet and AIAA historical site program.

In conjunction with NASA's 50th anniversary celebrations, the SSC's Office of External Affairs and Education followed its event management processes recorded within the Office of External Affairs and Education's internal operations manual.

The SSC's Office of External Affairs and Education received recognitions from numerous civil servant and contractor employees concerning the event's success. Employees appreciated the opportunity to engage in a work-related celebration honoring the Agency and showcasing their commitment to NASA and its mission. In the spirit of unity and teamwork, the SSC workforce formed a "50" formation to commemorate the 50th Anniversary. A photograph of the formation was featured on the Agency's 50th anniversary website, which has been viewed by thousands. The photograph was the most viewed image from among over 100 images displayed on the site.



Logtown, MS (SSC Website)

Agency-wide Events for NASA's 50th Anniversary

Event title: Smithsonian Folklife Festival

Location: National Mall, Washington, D.C.

Date: June 25–29 and July 2–6, 2008

Event Description: The Folklife Festival is an international exposition of living cultural heritage and was established in 1967. In 2008, the Smithsonian celebrated NASA's rich 50 year history and in conjunction with the event, the JSC History Office conducted oral history interviews.

During the summer of 2008, NASA was honored to be one of three featured programs in the 42nd Annual Smithsonian Folklife Festival on the National Mall in Washington, D.C. *NASA: Fifty Years and Beyond* showcased the role that the men and women of NASA have played in broadening the horizons of American science and culture, as well as the role that they will continue to play in helping to shape the future. The Smithsonian's Website (http://www.folklife.si.edu/festival/2008/NASA/index.html) lists the events and includes images from the festival. *NASA: Fifty Years and Beyond* showcased the role that the men and women of NASA have played in broadening the horizons of American science and culture, as well as the role that they will continue to play in helping to shape the future by stirring the public imagination.

NASA featured at the 42nd Annual Smithsonian Folklife Festival

The NASA program at the Festival included living presentations, hands-on educational activities, demonstrations of skills, techniques, and knowledge, narrative "oral history" sessions, and exhibits that explored the spirit of innovation, discovery, and service embodied by the Agency and its personnel. The Festival program encouraged

visitors to participate actively, to ask questions of astronomers, astronauts, astrophysicists, educators, engineers, and other experts: a cross-section of NASA's 18,000 employees and 40,000 contractors and grantees.

Folklore and folklife festivals are not usually associated with the people who work for NASA. After all, NASA generally perceives itself as a paragon of progressive science, exploration, and technology, continually breaking new ground rather than conserving its culture. However, on the occasion of NASA's 50th anniversary in 2008, its scientists, engineers, and technicians found themselves on the National Mall amidst Bhutanese archers and Texas musicians. Specific areas at the Festival were devoted to NASA's work in eight major fields: Space Science, Earth Science, Human Spaceflight, Aeronautics, Future Initiatives, Space Art, Space Foods, and Education.

Center-Wide Events for NASA's 50th Anniversary

Ames Research Center

Event title: NASA's 50th Anniversary

Location: Shenandoah Plaza National Historic District, Moffett Field, CA

Date: 2008

Event Description: The ARC Exchange and Public Affairs Office held a summer picnic and family day on the parade grounds of the Historic District to honor the 50th celebration of NASA.

The parade grounds, a contributing feature of the Shenandoah Plaza National Historic District, will be the prime location for the NASA 50th event, as was the case for the ARC 60th celebration event. The Naval Air Station Sunnyvale, later renamed Moffett Field, was created in 1933 with the construction of Hangar One as the docking station for the USS Macon, one of the largest airship in the world at the time. The Historic District was nominated by the U.S. Navy for historic designation and was and accepted into the NRHP on February 24, 1994. The Historic District was conveyed to NASA on July 1, 1994, as part of a Federal military base reduction and closure action.

Kennedy Space Center

Event title: NASA's 50th Anniversary, Air Show Highlighting the Thunderbirds at the Space Expo

Location: KSC Shuttle Runway Facility (SLF)

Date: November 1–4, 2007

Event Description: The squadron, including for the first time two female pilots, was joined at the SLF by the most advanced fighter aircraft in the American inventory, the Air Force F-22 Raptor and the Navy's F/A-18 Super Hornet. A pair of F-15 Eagles, the Army's precision parachute team known as the Golden Knights, and a World War II-era P-51 Mustang took part in a weekend of air shows over KSC in Florida. An HH-60 Blackhawk helicopter lowered a pair of rescue swimmers into the Banana River during a rescue demonstration by the 920th Rescue Wing. The demonstration simulated the capability of the helicopter team to retrieve an astronaut from the waters of the Banana River. Two helicopters then joined with an HC-130 transport aircraft for an aerial refueling demonstration. A soaring pair of fighter planes also demonstrated how aerospace technology has progressed. Crowds numbered approximately 7,000 both Saturday and Sunday at the NASA Causeway that links KSC and CCAFS. Former astronauts John Glenn, Scott Carpenter, and Al Worden watched the

demonstrations within miles of the launch pads where they began their historic flights into space—and in Worden's case, to the moon. The air show was one of the highlights of the weekend that celebrated the 50th Anniversary of space age. Hosted by Delaware North's KSC Visitor Complex, the Expo showcased various panels, presentations, and educational programs commemorating humanity's first 50 years in space, while looking forward to returning people to the moon and exploring beyond. Expo highlights included the 45th Anniversary of the Mercury Program.

In preparation for the other celebration of NASA's 50th Anniversary, KSC featured 50th themes in the NASA pavilion at the World Expo. Displays at the KSC Visitor Complex and throughout all building lobbies of the main facilities included 50th Anniversary logo flags, posters, and banners. The VAB history was featured on a large, three-sided poster board in the Headquarters' lobby. KSC also participated in the Folklife Festival in Washington, D.C., with a new KSC exhibit featuring ELV and STS Panels, launching the future for 50 years in theme. Finally, KSC Exhibits and Education staff participated in Future Forum panel sessions with Shana Dale in Miami, FL.

Kennedy Space Center

Event title: NASA Astronaut at Daytona Speedway Event for 50th Milestone

Location: Daytona Beach Speedway

Date: January 8, 2008

Event Description: Astronaut Andrew Feustel participated in NASCAR's Preseason Thunder Fan Fest in celebration of NASA's 50th Anniversary and Daytona International Speedway's 40th running of the Daytona 500. Feustel rode around the track in an official track vehicle and participated media interviews behind Pit Road wall. A televised segment in the afternoon featured Feustel and the Sprint Fan Zone. Over the years, technology developed for the Space Program has helped NASCAR drivers increase both performance and safety. Drivers wear cooling suits similar to what astronauts wear during a spacewalk. Foam that NASA developed for aircraft seats protects racecar drivers' necks in the event of crashes. NASA flew three Daytona 500 flags aboard a space shuttle flight in which the Speedway officials waved one of the flags to begin the 2009 installment of the Daytona 500. Another flag was presented to the winning driver. The third flag will be kept by NASA.

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NASA Langley Research Center
August 21-23, 2007

Cultural Resource Management (CRM) Annual Workshop

For NASA Historic Preservation Officers (HPOs) and Stakeholders

- Meet NASA CRM managers and stakeholders
- Hear from invited Federal CRM regulators
- Hear from NASA Mission Representatives
- Find out about the 2008 EO 13287 reporting requirements effecting every NASA installation
- Review NASA's CRM NPR (currently being drafted)
- Learn about NASA's CRM case studies, success stories (KSC's 2007 Blue Marble Award Project), and how best to support mission
- Have input into NASA's CRM database under development
- Tour NASA's birthplace and Langley's cultural resources

The Meeting & Hotel Registration and Agenda will be sent to all HPOs and posted on NASA's EMD and CRM websites:

http://www.hq.nasa.gov/office/oim/oia/emd/

http://netsdata-tt.grc.nasa.gov/histpreserve/home/index.cfm

For NASA Historic Preservation Officers (HPOs) and Stakeholders

Have input into the development of NASA's Cultural Resource Management Policies and Procedures

Who are NASA's CRM Stakeholders?

HPOs, Historians, Program and Project Manager who depend on historic resources for future mission success

Managers supporting Shuttle Transition who need to know the difference between Historic Artifacts and Historic Resources

Any manager dependant on NASA historic assets for mission success

Hear about successful mitigation measures applied to historic resources that no longer support NASA's mission

Have input into the development of the CRM database and repository providing an agency-wide resource to help you know the requirements and manage your resources without an adverse impact to mission

Hosted by Environmental Management Division, Infrastructure & Administration, NASA HQ

Supported by URS Corporation (www.urscorp.com)

http://www.visitwilliamsburg.com/

http://www.newport-news.org/

http://www.hamptoncvb.com/go/visitors

For more information contact

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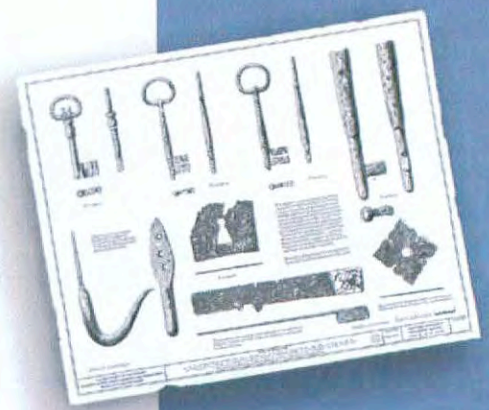

Jamestown VIRGINIA 1607-2007

See how NASA is Supporting 400th Anniversary Events Linking Past and Future Explorations www.larc.nasa.gov/

NASA Cultural Resources Management Panel Workshop

August 21-23, 2007
Hampton, Virginia

AGENDA

Monday, August 20

6:00 – 8:00 p.m.	**Pre-workshop Reception and Registration**

Tuesday, August 21

7:00 – 8:00 a.m.	**Breakfast & Registration**
8:00 – 8:15 a.m.	**Welcome** Lesa Roe, Director Langely Research Center
8:15 – 8:45 a.m.	**CRM Panel Chair Opening Remarks & KSC's 2007 Blue Marble Award** James Leatherwood, NASA's CRM Senior Policy Official (SPO) and Director, Environmental Management Division Office of Infrastructure and Administration, NASA Headquarters
8:45 – 9:15 a.m.	**Welcome to Virginia: Interagency Successes in Virginia** Kathleen Kilpatrick, Virginia State Historic Preservation Officer (SHPO) Department of Historic Resources, Richmond, Virginia
9:15 – 10:00 a.m.	**E.O. 13287, Preserve America, 2008 Section 3 Reporting** John Fowler, Executive Director Advisory Council on Historic Preservation (ACHP), Washington, D.C.
10:00 – 10:15 a.m.	**Morning Break**
10:15 – 11:00 a.m.	**Overview of DoD's CRM Priorities & New Program Alternatives** Maureen Sullivan, Department of Defense Federal Preservation Officer (FPO) Pentagon, Washington DC
11:00 – 11:45 a.m.	**National Historic Landmarks: Monitoring & 106 Consultation** National Park Service Jody Cook, Manager, NHL Program Southeast Region, Atlanta, GA Bill Bolger, Manager, NHL Program Northeast Region, Philadelphia, PA
11:45 a.m. – 1:00 p.m.	**Lunch Cyprus Grille - Hotel Restaurant**
1:15 – 2:30 p.m.	**HABS/HAER Overview** Tom Behrens, Architect, Historic American Engineering Record
2:30 – 4:30 p.m.	**Tour of Langley** Tour Guide: Rodney Harris, HPO (or designee) Transportation: Provided by Langley Public Affairs

Optional Evening Activity: **Dinner at the Trellis in Williamsburg**
Meet in lobby at 6:00 p.m. Dinner at 7:00 p.m.

August 7, 2007

NASA Cultural Resources Management Panel Workshop

August 21-23, 2007
Hampton, Virginia

Wednesday, August 22

7:00 – 8:00 a.m.	**Breakfast**
8:00 – 8:15 a.m.	**Administrative Announcements** Facilitator
8:15 – 9:00 a.m.	**Completion & Roll-up of SSP Surveys** Joan Deming, Archaeological Consultants, Inc
9:00 – 10:00 a.m.	**Center Updates**
10:00 – 10:15 a.m.	**Morning Break**
10:15 – 11:00 a.m.	**Center Updates**
11:00 – 11:45 a.m.	**Personal Property and the NHPA** Fred Holycross, URS Corp
11:45 a.m. – 1:00 p.m.	**Lunch Cyprus Grille - Hotel Restaurant**
1:00 – 2:00 p.m.	**NASA's CRM Database and Panel Discussion** **Overview of New CRM NETS Module** Chris Polglase, NASA CRM Team Lead Joe Homan, NETS Manager
2:00 – 2:15 p.m.	**Afternoon Break**
2:15 – 3:45 p.m.	**NASA's CRM NASA Procedural Requirements (NPR) and Panel Discussion** Chris Polglase, NASA CRM Team Lead
3:45 - 4:15 p.m.	**ARPA, NAGPRA, and Other Federal CRM Guidance** Chris Polglase
4:15 – 4:30 p.m.	**Workshop Wrap Up** Facilitator

Optional Evening Activity: Dinner at the Colonial Williamsburg Kings Arms
Meet in the lobby at 6:00. Dinner at 7:00 p.m.

Thursday, August 23

7:00 – 8:00 a.m.	**Breakfast**
8:00 a.m.	**Bus leaves for Jamestown** Meet in lobby at 7:45 a.m.
9:00 a.m.	**Tour of Jamestown Fort** Tour Guide: APVA representative Transportation: Provided by Langley Public Affairs Lunch at the Carrot Tree
2:00 pm	**Return to Hotel**

August 7, 2007

National Aeronautics and Space Administration (NASA)
Executive Order 13287 Section 3 Triennial Report (2008)