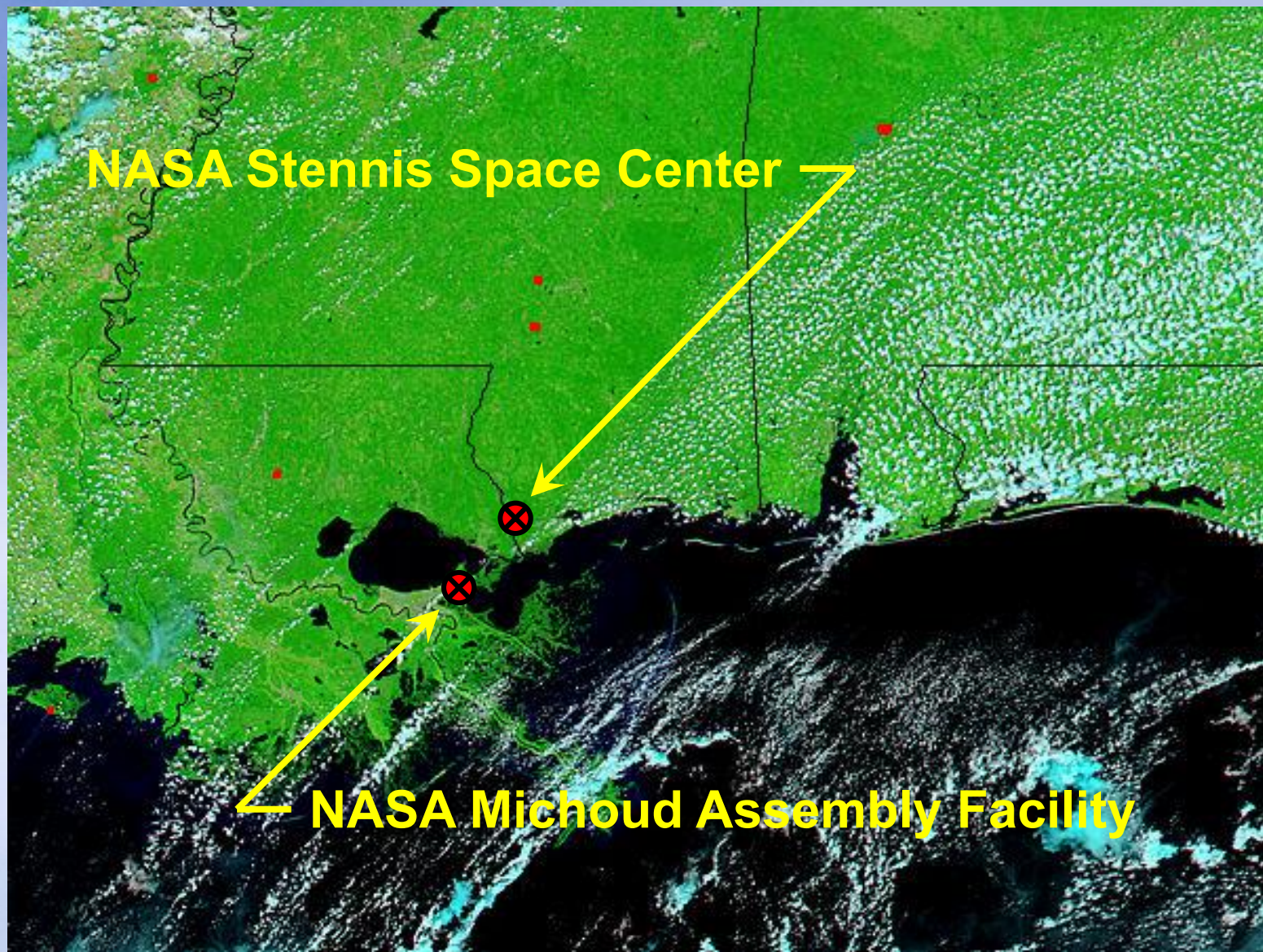


A satellite image of Hurricane Katrina, showing a well-defined eye and a dense, swirling cloud structure over the Gulf of Mexico. The coastline of the United States is visible, with the Gulf of Mexico to the south and the Atlantic Ocean to the east. The hurricane's eye is a bright white circle in the center of the storm, surrounded by a thick ring of white clouds. The surrounding clouds are a mix of white and grey, indicating varying cloud heights and densities. The landmasses are shown in shades of green and brown, with the Gulf of Mexico in a light blue color.

In the Eye of the Storm

Hurricane Katrina

The NASA Experience



NASA John C. Stennis Space Center History

1963 -- Established as *Mississippi Test Facility (of MSFC)*

Testing of 1st and 2nd Stages of Saturn V Rocket

Construction Began -- May 1963

1st Saturn V S-II Stage Test -- April 1966

1st Saturn V S-I Stage Test -- March 1967

1971 -- Assigned Role as Space Shuttle Main Engine Test Center

1st SSME Test -- June 1975

1974 -- Renamed *National Space Technologies Laboratories*

1988 -- Renamed *John C. Stennis Space Center*

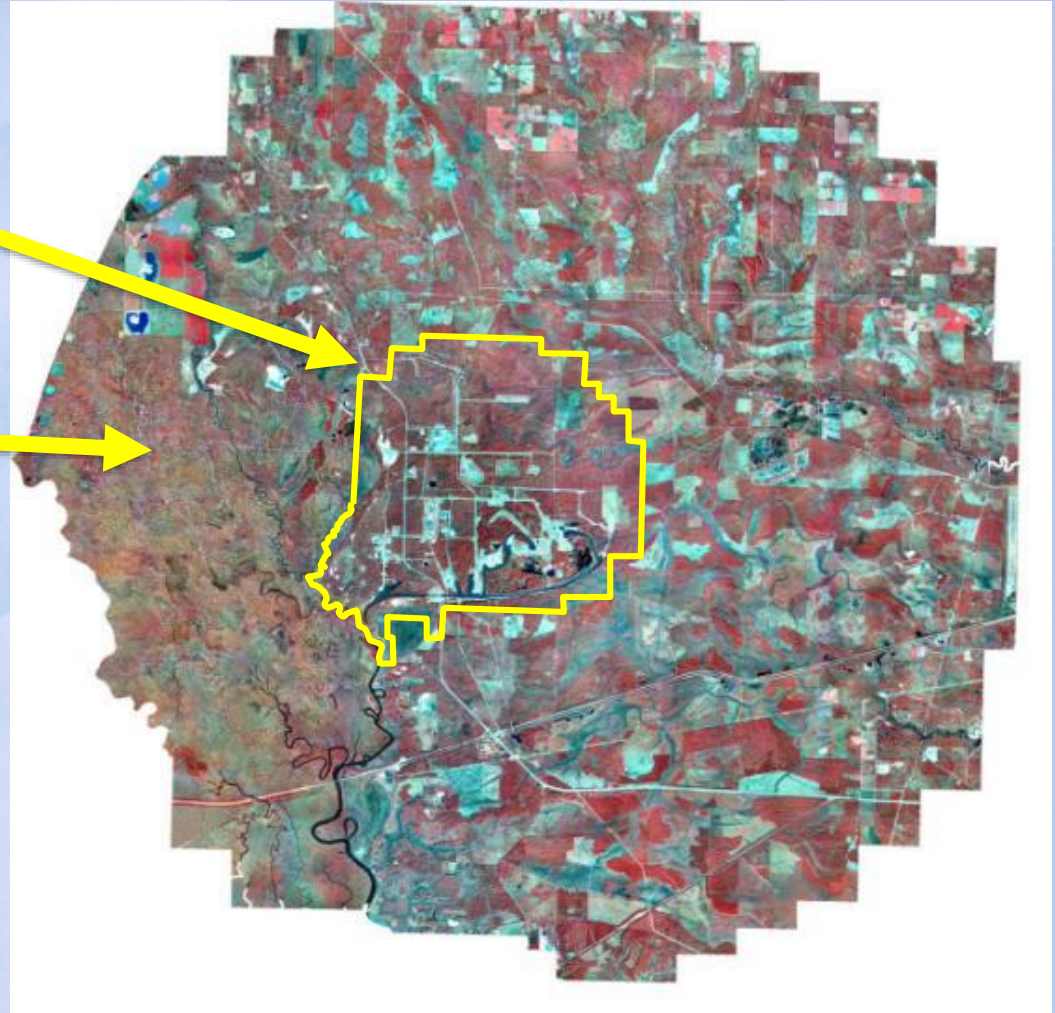


NASA Stennis Space Center Geography

**“Fee Area”
(13,800 Acres)**

**Buffer Zone
(125,000 Acres)**

**7½ - Mile Canal System
Links Test Facilities with
the Pearl River and the
Gulf of Mexico**

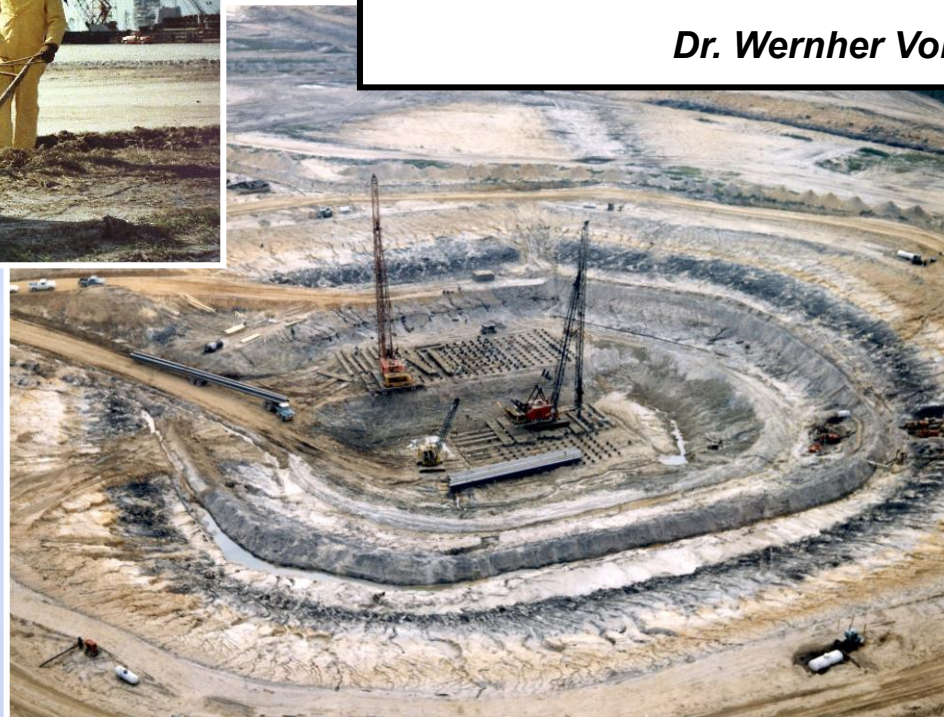


MSFC Mississippi Test Facility

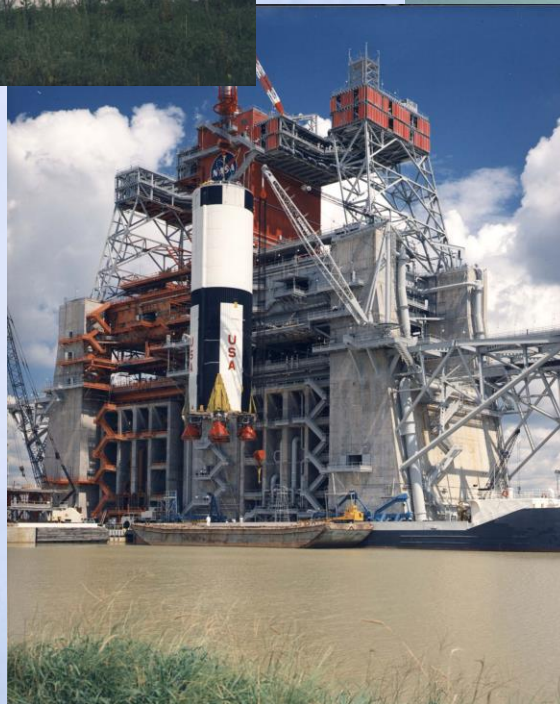
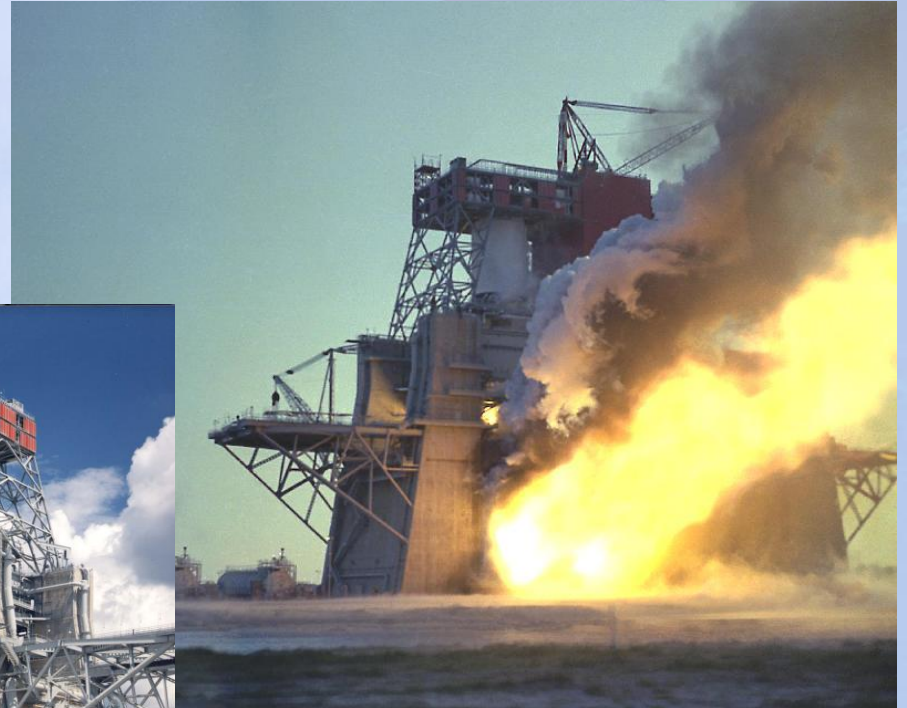


“I don’t know yet what method we will use to get to the moon, but I do know that we have to go through Mississippi to get there!”

Dr. Wernher Von Braun



MSFC Mississippi Test Facility



S-1-C Stage Testing

NASA Stennis Space Center

A Unique “Federal and Commercial City”

Department of the Navy

- Naval Meteorology and Oceanography Command
- Naval Oceanographic Office
- Naval Research Laboratory
- Naval Small Craft Instruction and Technical Training School
- Navy Special Boat Team 22
- Navy Human Resources Service Center Southeast

National Oceanic and Atmospheric Administration

- **National Data Buoy Center**
- National Marine Fisheries Service
- National Coastal Data Development Center

Environmental Protection Agency

- Environmental Chemistry Laboratory
- Gulf of Mexico Program

Department of Interior

- U.S. Geological Survey, Hydrologic Instrumentation Facility

Department of Energy

- **Strategic Petroleum Reserve**

Commercial Companies

- Pratt and Whitney
- Rocketdyne
- Lockheed Martin
- Rolls Royce North America



NASA Stennis Space Center Propulsion Test Facilities



NASA Stennis Space Center

Rocket Propulsion -- Component and Engine Testing



***Integrated Powerhead
Demonstrator Turbopump***



***Space Shuttle Main Engine
375,000 lbs. Thrust***



***RS-68
660,000 lbs. Thrust***

NASA Michoud Assembly Facility History

1827 -- Sugar Cane Plantation and Refinery

Antoine Michoud, Napoleon's "Administrator of Domains"

Died in 1863. Plantation Operated by Heirs into 20th Century

1942 -- Higgins Shipbuilding Company

World War II - Construction of Liberty Ships

1951 -- Chrysler Corporation

Korean War - Manufacture of Engines for Tanks

1961 -- Facility Acquired by NASA

1960s - Production of 1st Stage of Saturn I and Saturn V

1970s - Production of Shuttle External Tanks



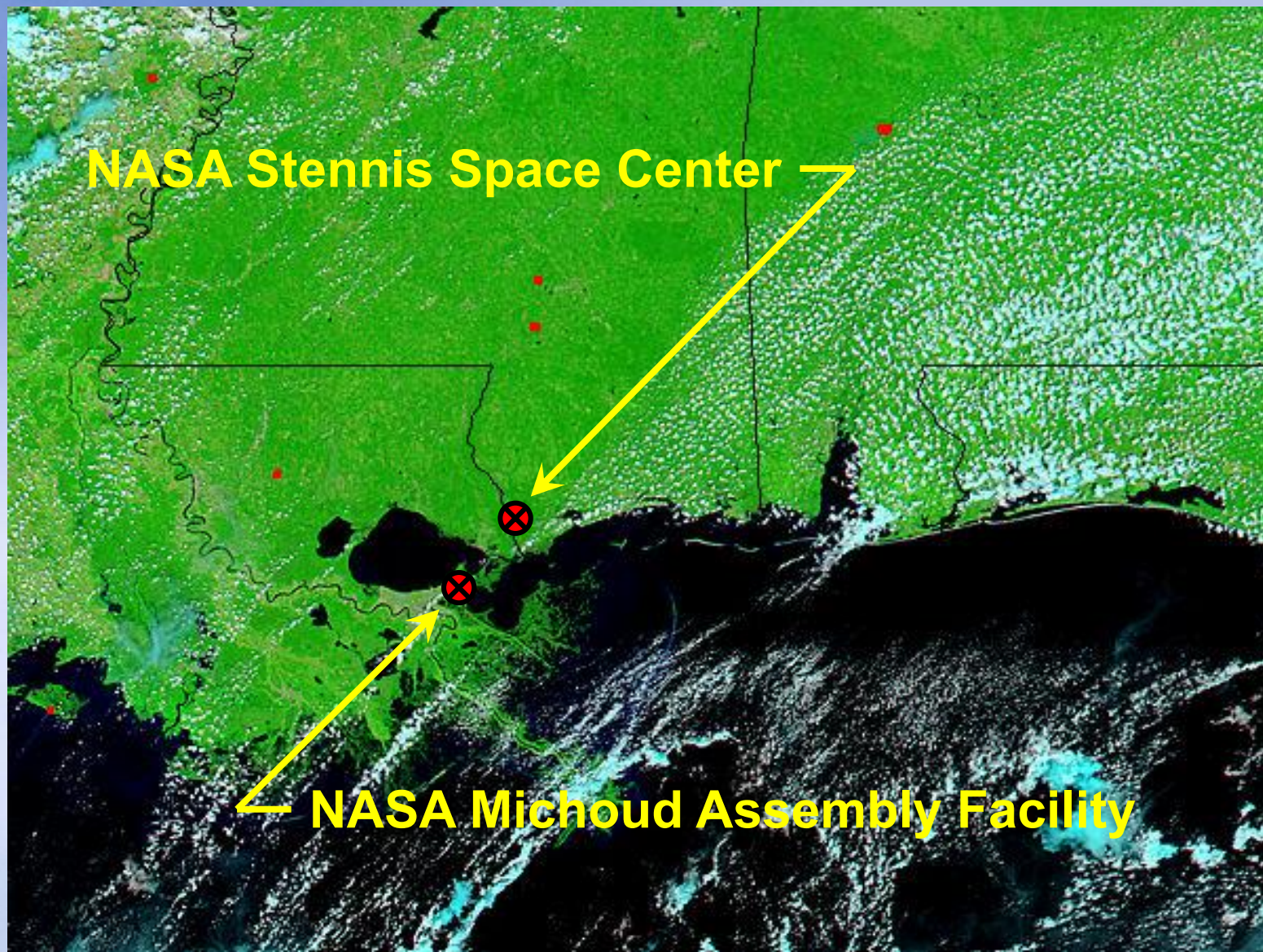
NASA Michoud Assembly Facility

Shuttle External Tank Fabrication



832 Acres





Pre-Storm Prep

At Michoud

Batten down the hatches !

Ensure pumping stations and electrical generators “at the ready”

Provide members of “Ride-Out” crew with appropriate equipment -- radios, flashlights, etc.

At Stennis

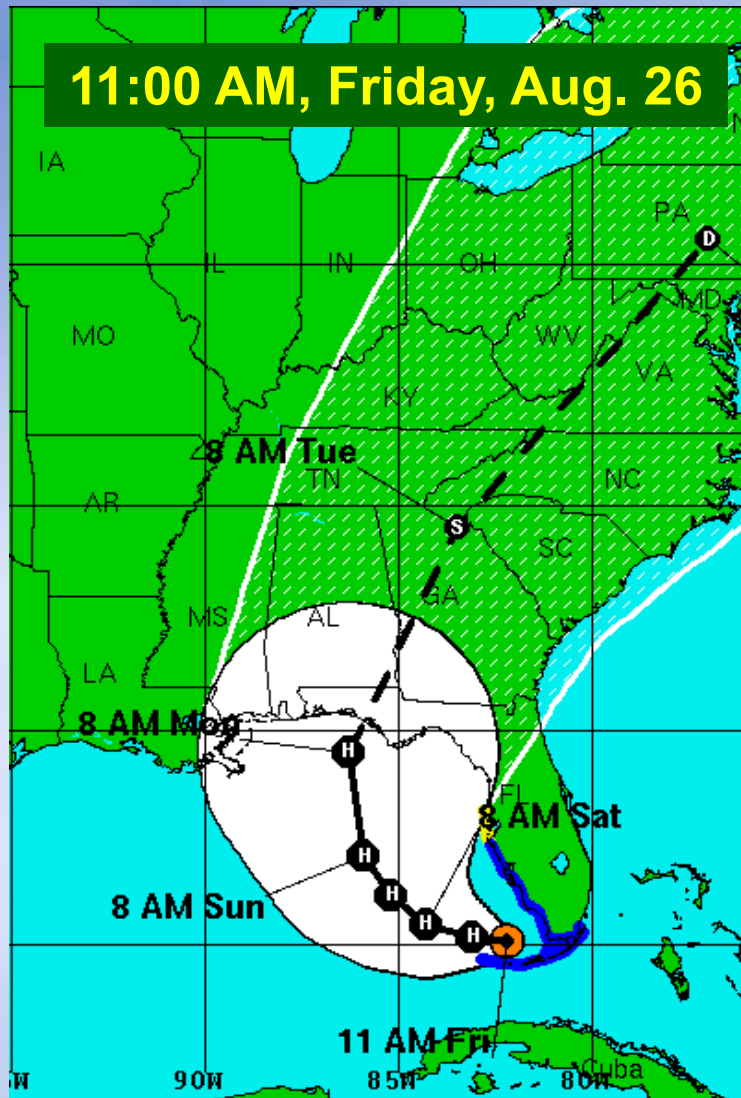
Batten down the hatches !

Deploy mobile electrical generators to multiple buildings

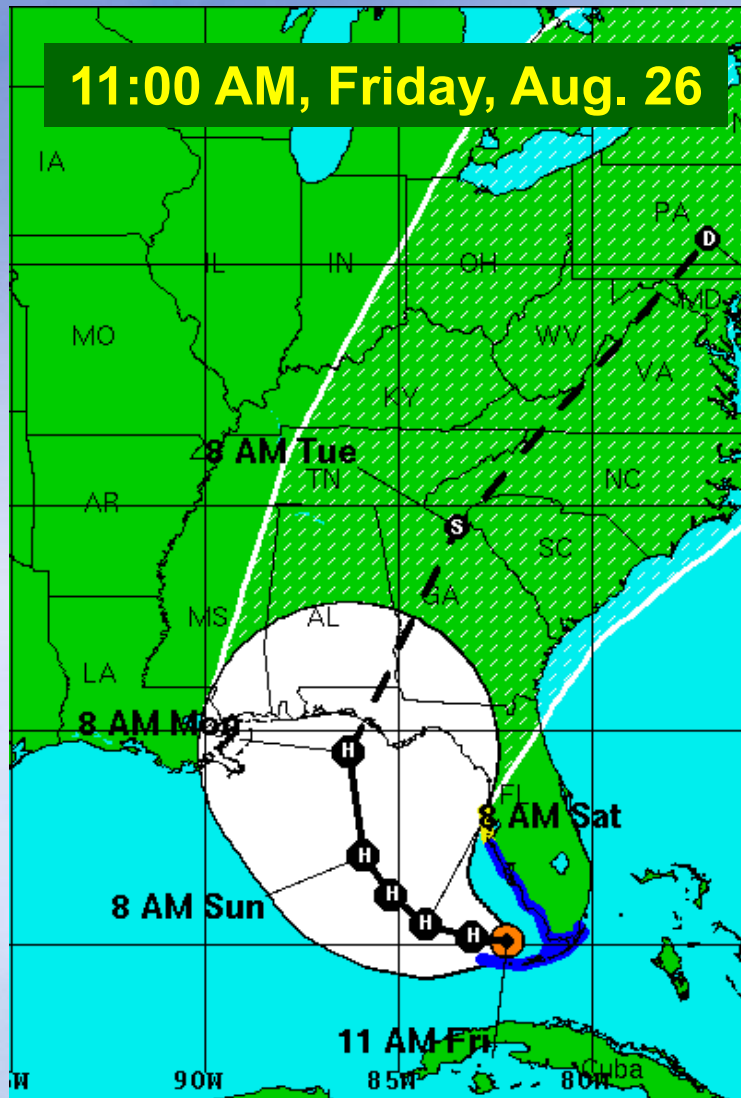
Provide members of “Ride-Out” crew with appropriate equipment -- radios, flashlights, etc.

Prepare for “Check-in” and location assignment of “Guests”

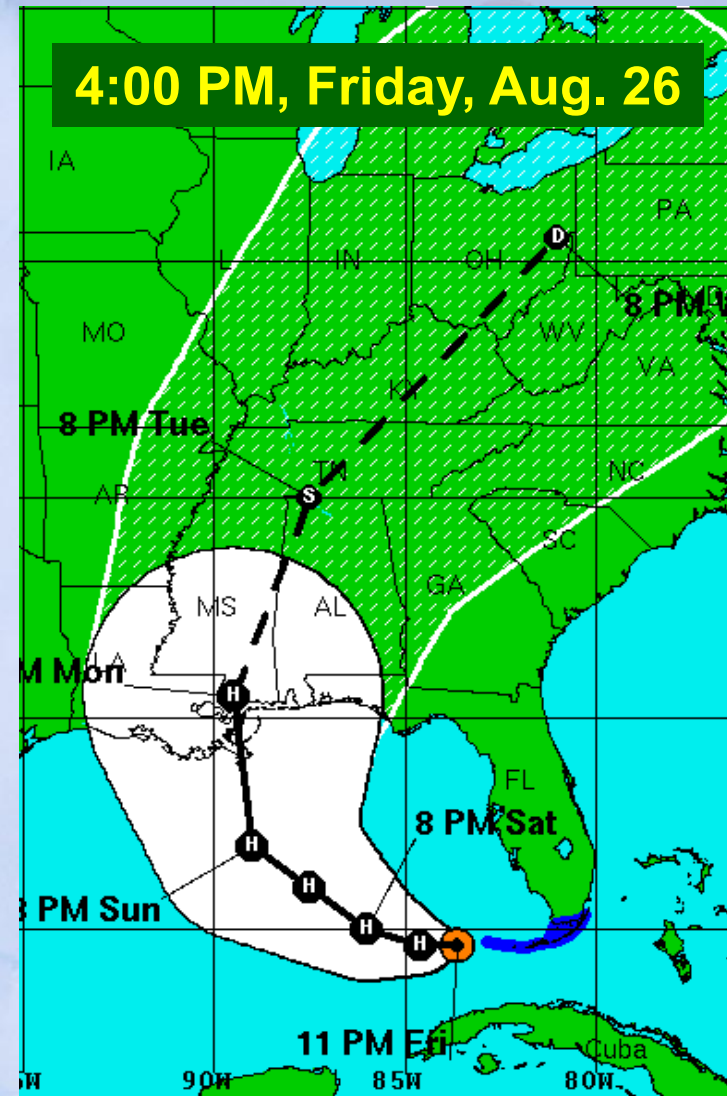
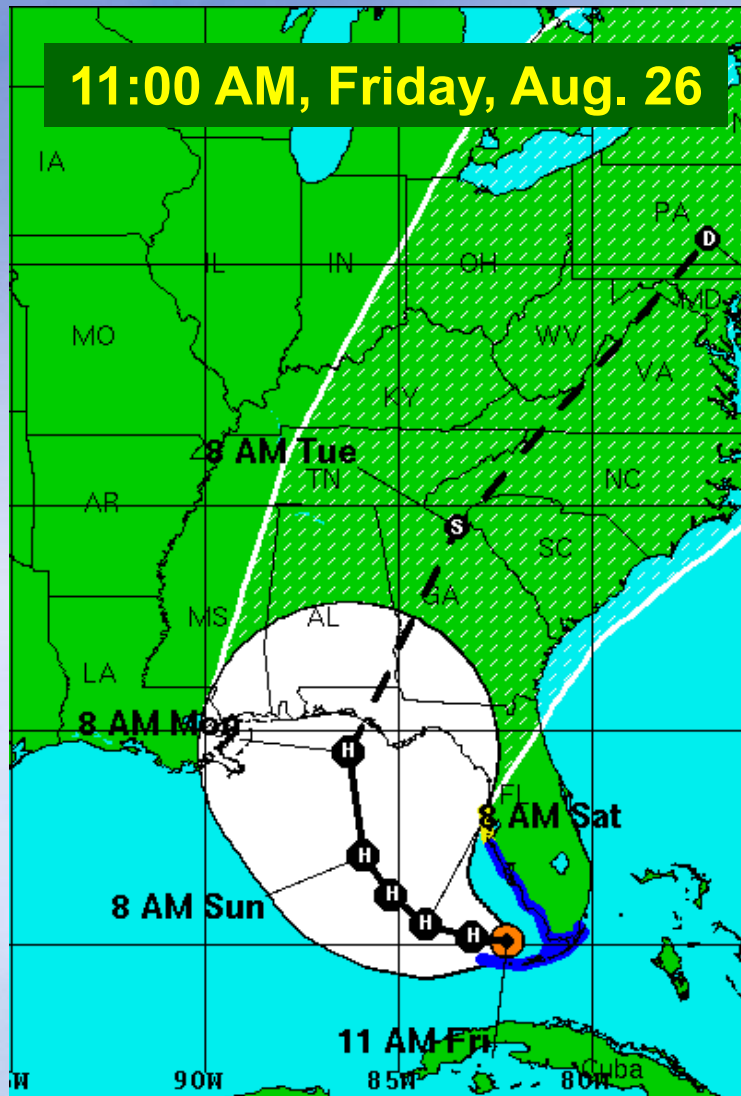
Projected Path of Hurricane Katrina

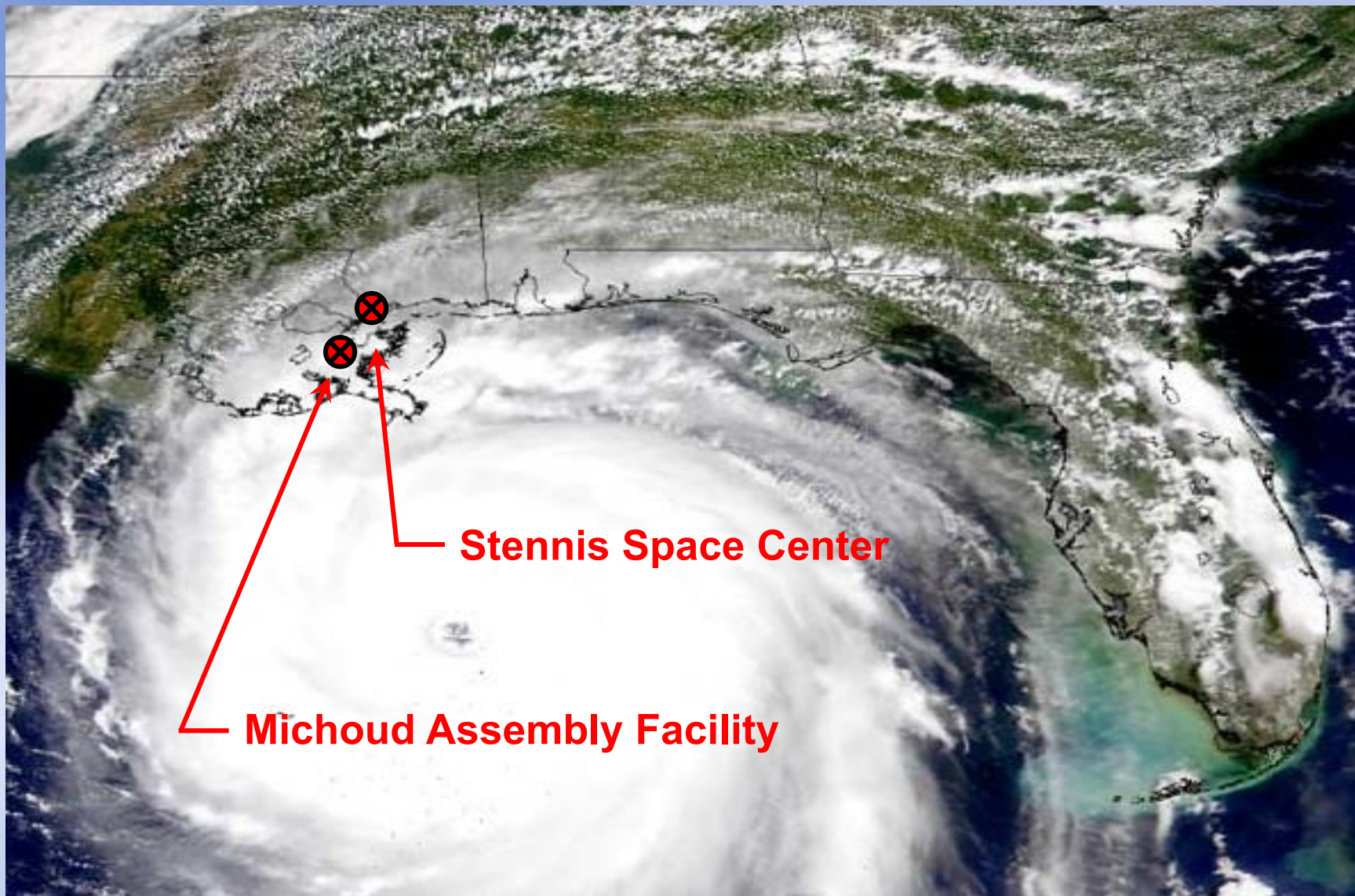


Projected Path of Hurricane Katrina



Projected Path of Hurricane Katrina





Storm Surge-Affected Coast Line



The Aftermath



NASA Stennis Space Center



NASA Michoud Assembly Facility



August 30 - Day 2



NASA Michoud Assembly Facility



Air Products - New Orleans

September 7 - Day 10



New Orleans, LA

**Bellaire Levee Breach
September 3 - Day 6**



I-10 Bridge from New Orleans to Slidell, LA



The Road to Waveland and Bay St. Louis, MS

September 9 - Day 12

August 31 - Day 3



Waveland, MS



Bay St. Louis, MS



Diamondhead, MS



Diamondhead, MS



Long Beach, MS

August 31 - Day 3



Long Beach, MS



Long Beach, MS

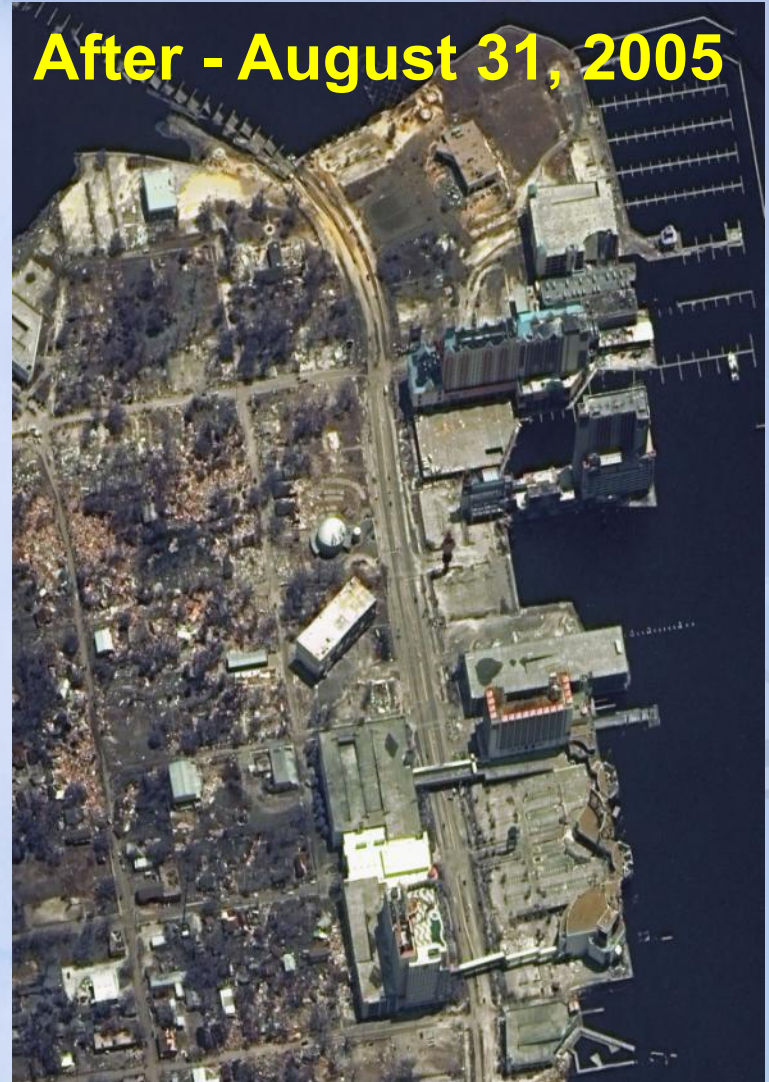


Biloxi, MS

Before - April 2005



After - August 31, 2005



The Initial Recovery Effort

NASA Michoud Assembly Facility



Emergency Operations Center

NASA Michoud Assembly Facility



**No Land Access for
10 Days after Storm**



NASA Michoud Assembly Facility



Water Purification Unit

Stennis International Airport



Stennis International Airport

**105 Fixed Wing and
86 Helicopter Sorties**



**Receive and Distribute
Water, Ice, and MREs
Medical Evacuation**



NASA Stennis Space Center

**Trucks Carrying Hurricane
Relief Supplies Await
Distribution Instructions**



NASA Stennis Space Center



Relief Supplies Distributed from Stennis

> 7.6 Million Gallons of Water



> 41 Million Pounds of Ice



> 3.5 Million MREs



NASA Stennis Space Center



**3000 Meals Served
3 Times a Day**

NASA Stennis Space Center

Life as an Evacuee



NASA Stennis Space Center

Employee Call Center



Stennis Relief Workers



Stennis Day Camp



A Return to Normalcy (?)

ET-119 Returned to Michoud for Modification

October 3, 2005



Engine Testing at Stennis

RS-68



October 12, 2005

SSME



October 25, 2005

Lessons Learned

Be Prepared ! Look out for your people !! Have a Plan !!!

Stennis Emergency Operations Plan – Post-Storm

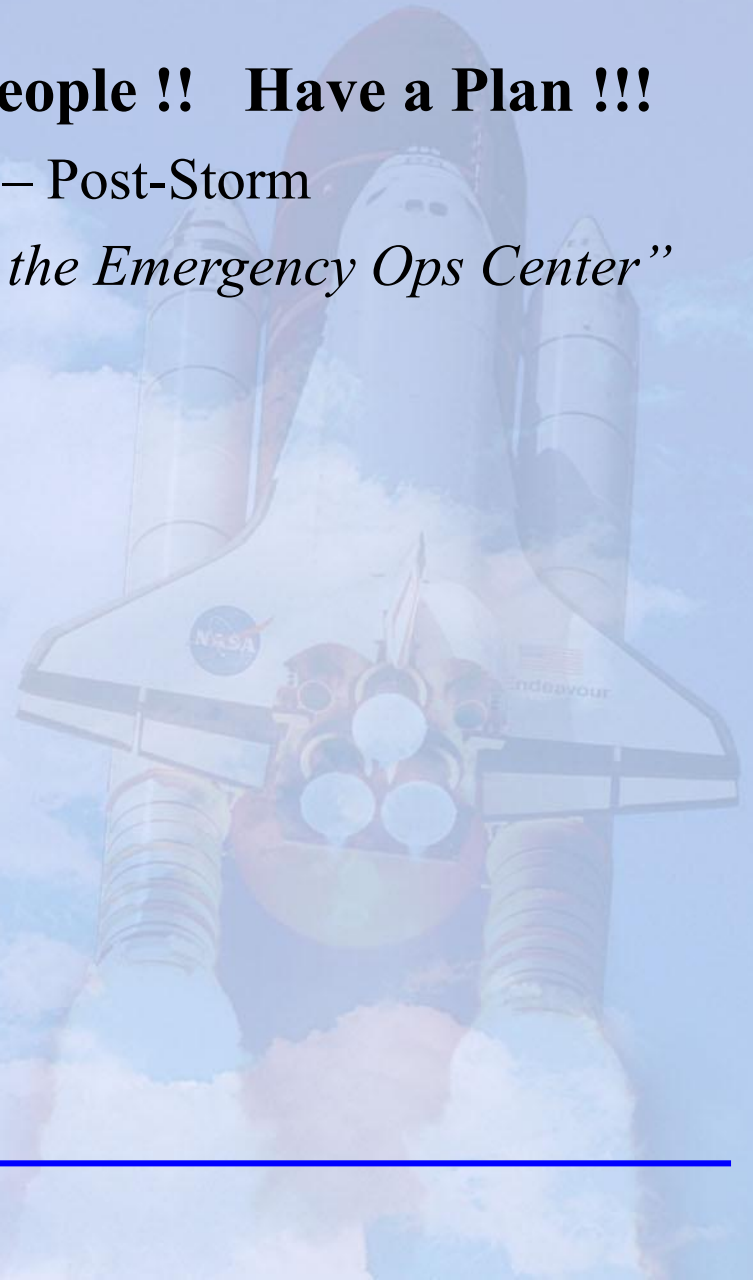


Lessons Learned

Be Prepared ! Look out for your people !! Have a Plan !!!

Stennis Emergency Operations Plan – Post-Storm

“Return radios and flashlights to the Emergency Ops Center”



Lessons Learned

Be Prepared ! Look out for your people !! Have a Plan !!!

Stennis Emergency Operations Plan – Post-Storm

“Return radios and flashlights to the Emergency Ops Center”

NASA Policy Actions Post-Katrina

Stennis no longer allowed to serve as a refuge for citizens seeking shelter from storms

ALL NASA Centers required to put Concept of Operations Plan in place to ensure ability to maintain management operations thru and in wake of any weather event

For Stennis, this meant moving Center Management Team and appropriate support team members to Hattiesburg, MS (~75 miles North) in advance of future storm threat



Additional Damage Photos

NASA Stennis Space Center



Slidell, LA



Waveland, MS



Waveland, MS



Waveland, MS

