

# KATRINA

The 2005 hurricane season will long be remembered both for the record-breaking number of early storms and the emergence of a powerful Category 5 hurricane in the central Gulf of Mexico—Hurricane Katrina.



Image was acquired by Terra's Advanced Very-High-Resolution Radiometer (AVHRR) Radiometer on April 29, 2005.



Image was acquired by Terra's Advanced Very-High-Resolution Radiometer (AVHRR) Radiometer on September 11, 2005.

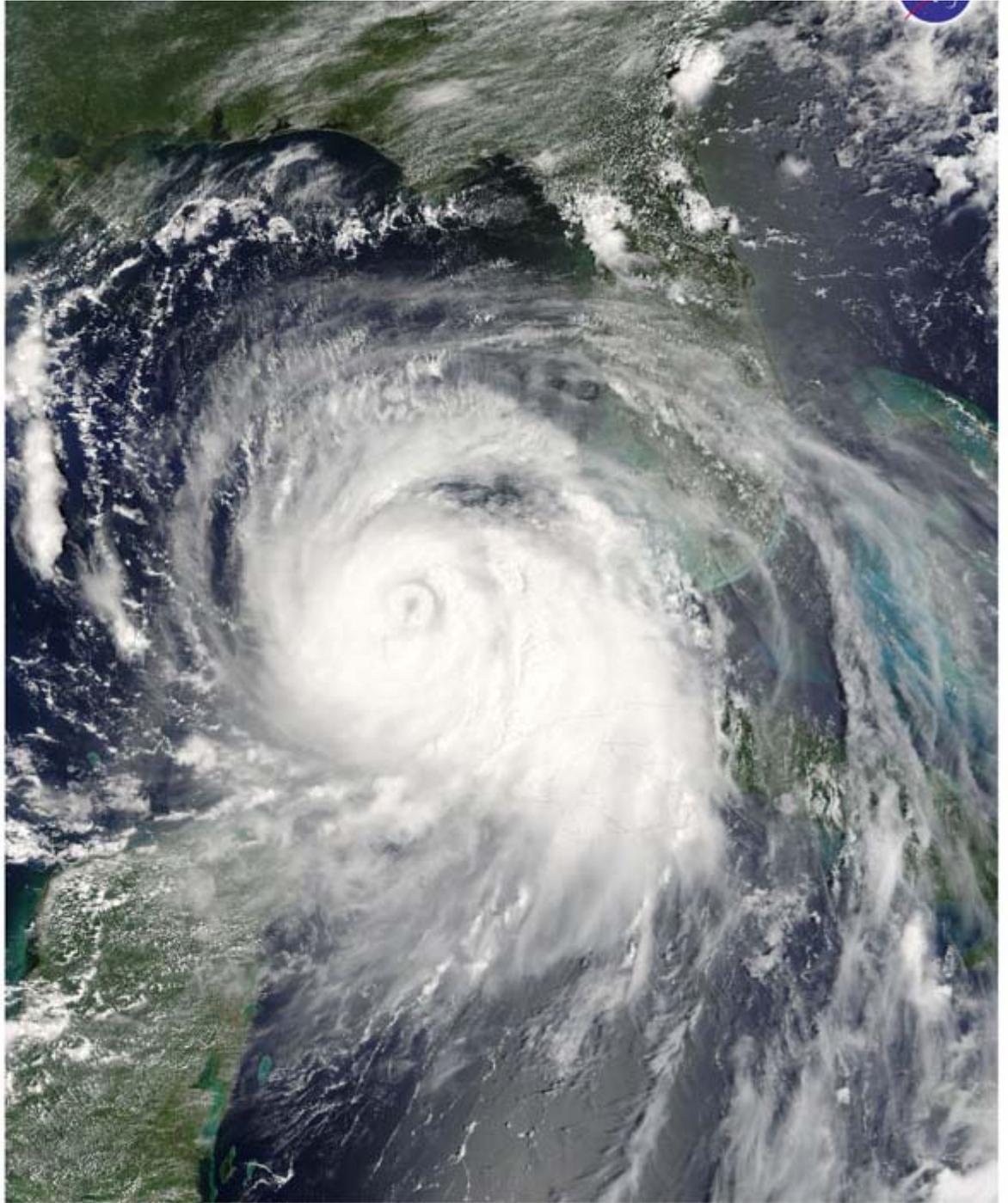


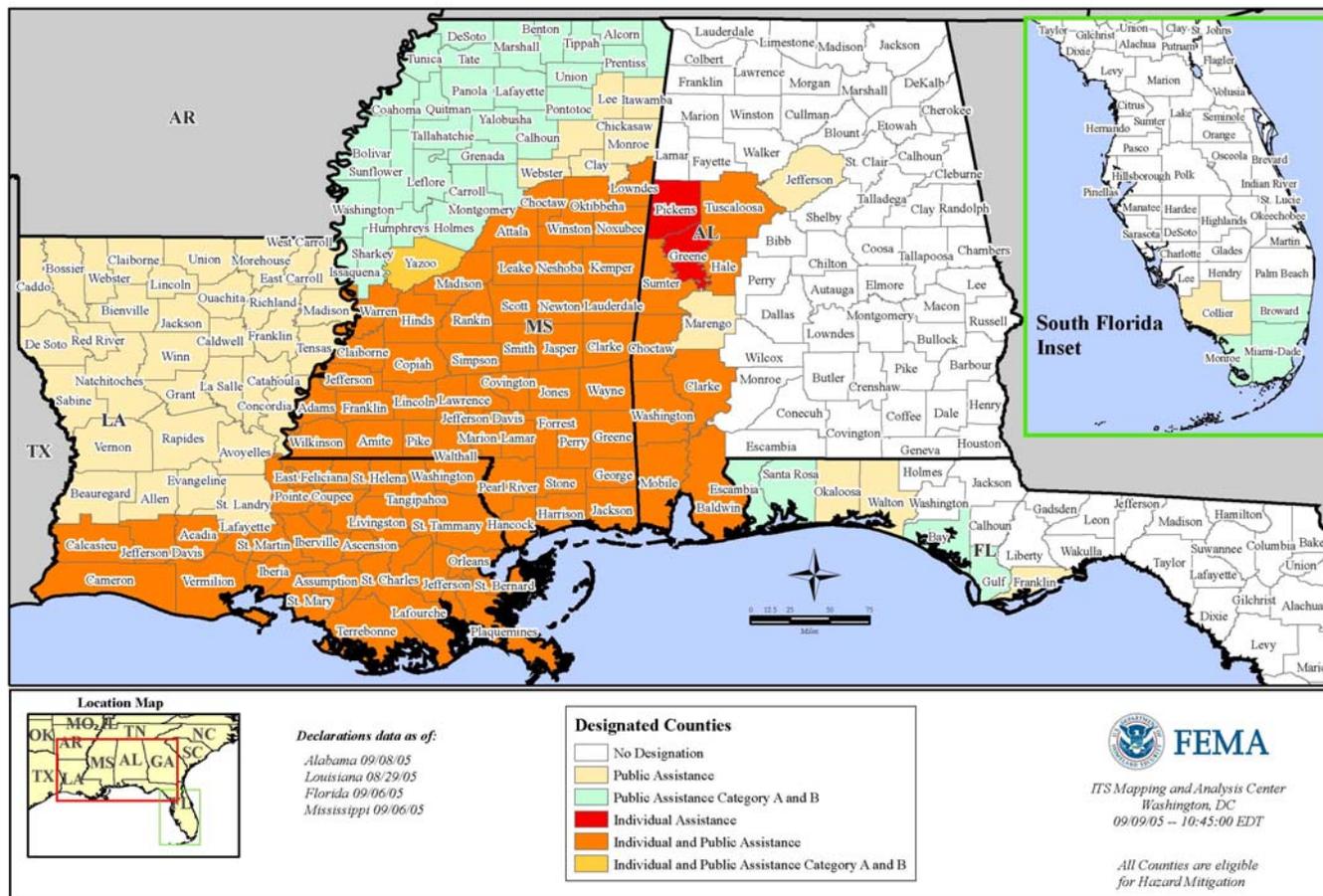
Image was acquired by Terra's Moderate Resolution Imaging Spectroradiometer (MODIS) sensor on August 18, 2005.



# Declared States/Counties

## Hurricane Katrina Combined Disaster Declarations

FEMA-1602-DR, Florida; FEMA-1603-DR, Louisiana; FEMA-1604-DR, Mississippi; FEMA-1605-DR, Alabama





# Hurricane Katrina Overview



Hurricane Katrina and Hurricane Rita together were truly the worst *natural* disaster in the history of the United States, here is a quick impact summary:

- 350,000 Homes destroyed
- 450,000 People sheltered (ARC)
- 1,100 Shelters in 27 states & the District of Columbia
- 1,890,985 FEMA assistance applications (1 application/family)
- 1.2 M ARC Cases (approx. 4 M people)
- 30 M meals and 28 M snacks served by ARC & SB



# Joint Housing Area Command



- New concept first used following the 2004 hurricanes
- Responsible for interim housing programs in all affected states
- Based on premise that using national Individual Assistance Technical Assistance Contractors (IA-TAC's) will help speed the creation of housing:
  - Bechtel
  - Fluor
  - Shaw
- JHAC created housing and arranged for basic site support (e.g. feeding and security), the Human Services Branch and states are responsible for screening and placement



# JHAC Major Agencies



- Lead by FEMA
- Army Corp of Engineers
- IA-TAC's
- EPA
- DOD
- JHSC run by Assistant Director, HUD
  - FEMA Private Sector Office
  - Non-profit agencies



# My Role



I was assigned on August 30 as the ARC/ESF-6 liaison to the “Housing Solutions Unit” within the JHAC. My role included:

- Providing technical input to housing strategy development
- Connecting housing planning to the larger non-profit community (through NVOAD)
- Assisting with resource identification and development
- Supporting implementation of housing solutions



# Housing Goals



- Initial goal of having people out of shelters and into temporary housing by October 30, 2005 (by October 31<sup>st</sup> there were about 37,500 units ready for occupancy)
- Once the extent of damage became apparent (165,000 housing units are required in LA alone) the goal was pushed to December, 2005
- Temporary housing demand continues to exceed supply today, with tens of thousands of people still living in motels spread around the country



# Site Development Process



- Potential location identified
- Site assessment strike team deployed within 48 hours
- Site assessment report submitted to selection evaluation team (Included EPA review for hazardous material and endangered species habitat)
- Decision made to proceed on site development or not
- If yes, consultation with State & local government
- Once approved, funding committed and engineering design started
- Once engineering plans approved, construction started
- Final inspection of units before request for occupancy (RFA) submitted to Human Services staff for placement



# Site Construction



**Electrical Systems**



**Drainage Control & Streets**



**Sewage Treatment**



**Trailer Pads, Fencing & Plumbing**



# Sample Housing Sites



- Active and demobilized military bases
- School play grounds and sports fields
- State and local parks (especially ones with existing RV pads)
- Existing trailer parks
- Available commercial land
  - Farms
  - Large empty buildings
  - Land next to airports & oil refineries
- College and university property
- Rehabilitated apartment buildings and hotels
- Existing Federal housing through (HUD and VA)



# Site Problems Encountered



- **Hazardous materials** (e.g. unexploded ordinance on demobilized military bases)
- **Environmental concerns** (e.g. wetland restrictions or critical habitat)
- **Too far from employment or services** (e.g. cruise ships)
- **State or community opposition to site**
- **Excessive cost for land or infrastructure development**



# Temporary Housing Strategies



**Ships (Cruise & other)**



**Modular Homes**



**Travel Trailers**

**Tents**





# Housing by Type

(11/28/05)

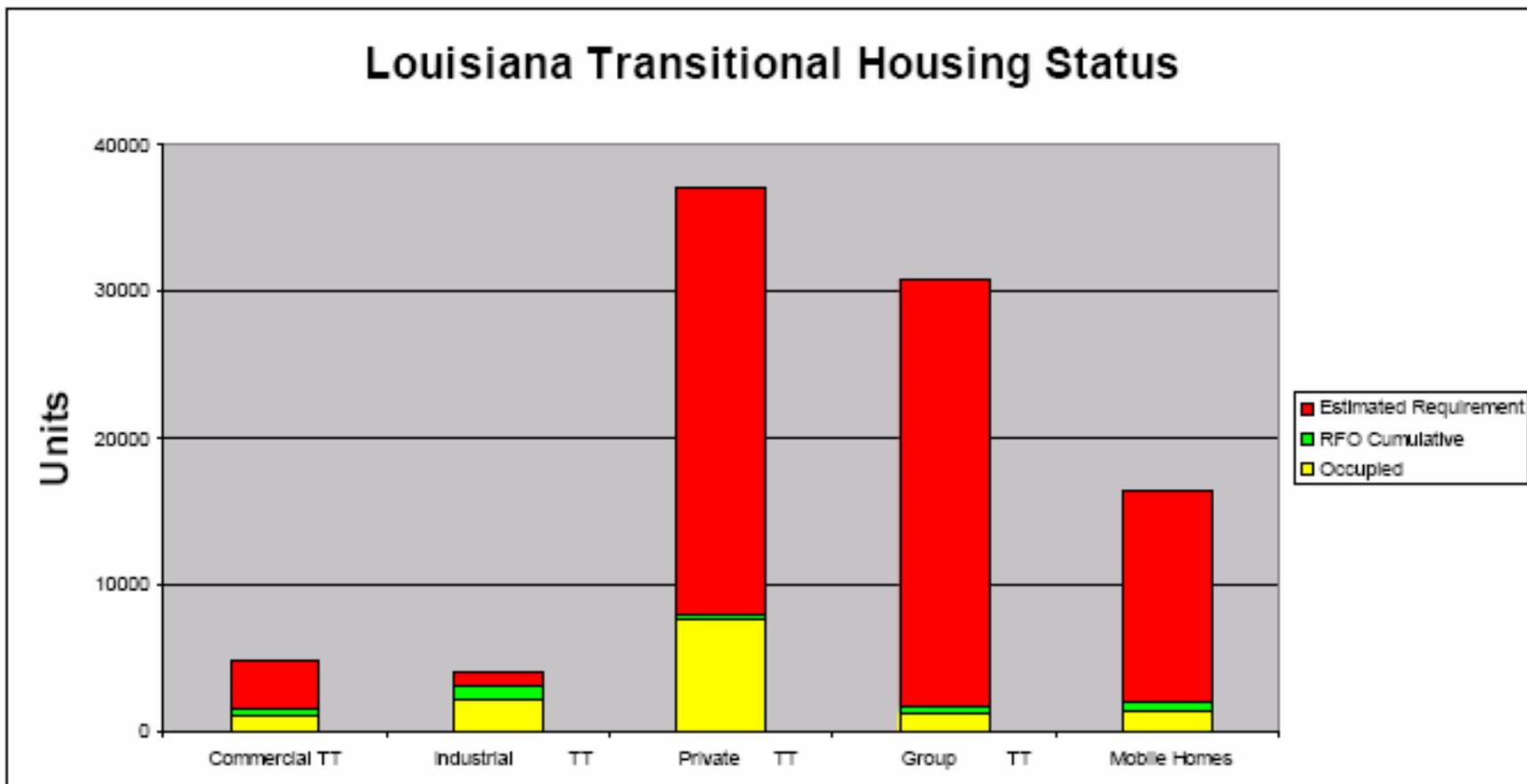


Cumulative	Louisiana		Mississippi		Alabama		Total	
	READY	OCCUPIED	READY	OCCUPIED	READY	OCCUPIED	READY	OCCUPIED
Cruise Ships	2,369	2,312	726	538	0	0	3,095	2,850
Travel Trailers	13,209	11,135	22,608	21,518	1,108	845	36,925	33,498
Mobile Homes	1,351	667	322	160	0	0	1,673	827
Existing Structures	1,000	925	0	0	819	184	1,819	1,109
Federal Housing	2,820	2,820	944	944	570	570	4,334	4,334
<b>TOTAL Units</b>	<b>20,749</b>	<b>17,859</b>	<b>24,600</b>	<b>23,160</b>	<b>2,497</b>	<b>1,599</b>	<b>47,846</b>	<b>42,618</b>



# LA Demand Vs Supply

(11/28/05)





# LA Housing Breakout

(11/28/05)



IV. Louisiana Transitional Housing Status			
	Estimated Requirement	RFO Cumulative	Occupied
Commercial Travel Trailers	4,000	1,120	680
Industrial Travel Trailers	4,000	3,155	2,129
Private Travel Trailers	30,000	7,673	7,494
Group/EGS Travel Trailers	37,000	1,261	832
<b>TOTAL Travel Trailers</b>	<b>75,000</b>	<b>13,209</b>	<b>11,135</b>
Mobile Homes	15,000	1,351	667



# Worker Housing



Replacement housing was also needed for recovery workers. Communities could not restore services or recover without their workforce.





# Lessons Learned



- The trade off for speed in building temporary housing is often quality of life and lost employment opportunities for displaced workers
- Ships work better as worker housing than housing for displaced families
- Federal disaster recovery laws need to be reevaluated regarding temporary and permanent housing
- Construction takes less time than reaching political consensus regarding the form and location of housing
- Lack of capacity nationally to build trailers fast enough to meet requirements



## Lessons Learned – Cont.



- A better national system for client tracking is needed to support recovery assistance. Current FEMA & ARC systems do not allow local government easy access to information
- The Human Services Branch needs a better defined and more robust system for quickly screening and placing people into available housing
- States with catastrophic disaster potential need to establish a pre-disaster housing recovery plan
- Contractors know how to build housing, but not communities



# Housing Vs Communities



Existing FEMA Mobile Home Group Site Schematic



Character of Place Sketch



Proposed Streetscape



Proposed FEMA Transitional Community Schematic



Future Mixed-Use / Mixed Housing Schematic



Character of Place Sketch



Character of Place Sketch