

# Mobile Satellite Communications For Disaster Management

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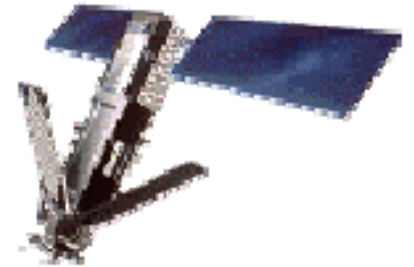
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**United Nations Workshop On  
Disaster Management  
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# Satellite Network Overview

IRIDIUM

- Satellite constellation
  - Full constellation life to mid-2014
  - Extendable to 2020 via replenishment plan
- Gateways
  - Provide terrestrial interconnection and back office
  - Commercial gateway in Tempe, Arizona
  - Backup facilities in Chandler, Arizona
  - Dedicated DOD facility in Hawaii
- Satellite Network Operations Center
  - Main facility in Leesburg, VA
  - Back-up facility in Chandler, AZ



# Iridium Network Capabilities

IRIDIUM

- Requires only one gateway.
- Pole-to-pole coverage.
- No reliance on infrastructure/ground routing.
- Security ensured through digital voice.
- Satellite diversity = very high access probability.
- Minimal set-up time, low latency, no echo.

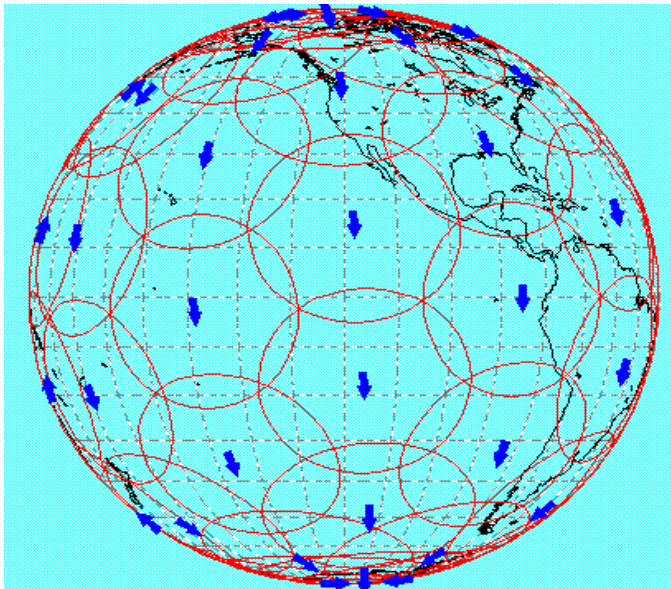
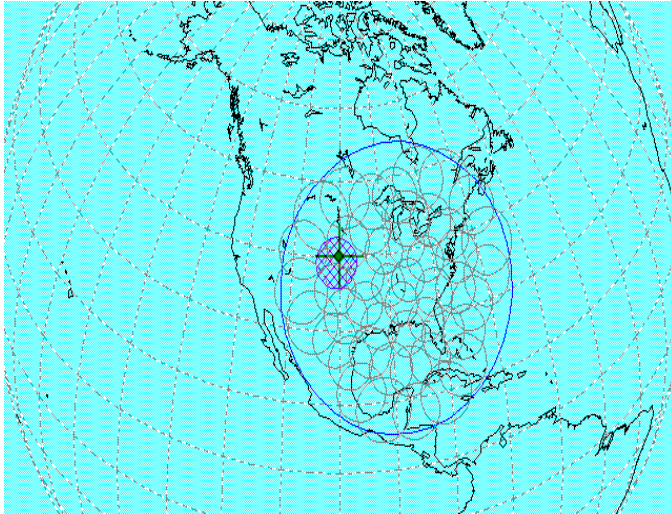


## Iridium Fact

- *Each satellite circles the earth every 90 minutes...*

# Iridium Satellite Details

IRIDIUM



- Constellation of 66 satellites in a Near Polar Low Earth (475NM) Orbit (LEO).
- On-orbit spares.
- Each footprint approximately 2800 NM in diameter. All satellite footprints overlap.
- Each satellite has 48 spot beams -- approximately 250 NM in diameter -- all overlap.

# Iridium Company Status



- Significant growth
  - 142,000+ subscribers
  - 2-3,000 new subscribers per month
- US DOD uses Iridium as system of choice
- Boeing manages the Iridium constellation



# Iridium Call Routing for Disaster Recovery

IRIDIUM



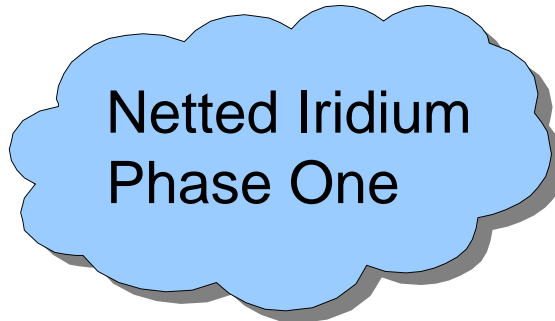
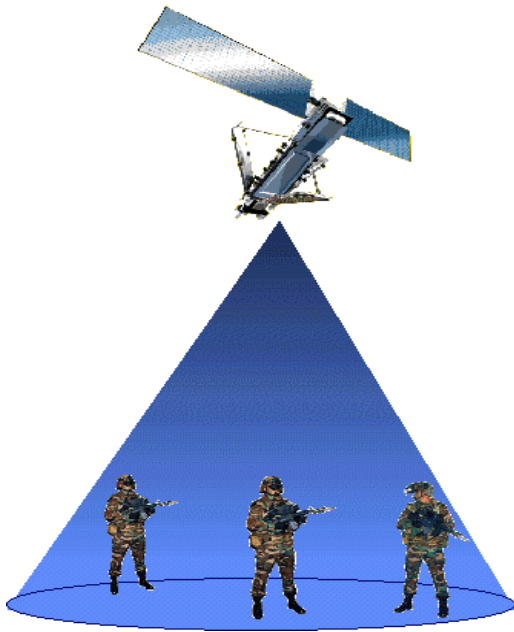
Tamil Nadu, India - Post Tsunami

Iridium 9505 Handset

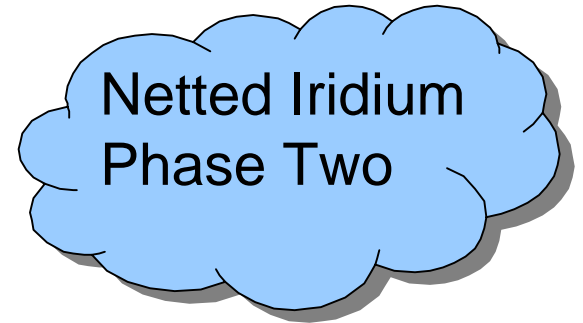
Iridium Gateway Tempe, Arizona

# Netted Iridium

IRIDIUM



**2004 - 2007**



**2007 +**

- Allows one user to talk/transmit data to many users simultaneously.
- Allows for integrating/relaying terrestrial radios and tying into terrestrial trunked radio systems.
- Ideal for crises -- rapid deployment, reliability, security.

# Equipment Configurations

IRIDIUM



Multi-Channel  
Fixed Service



Handheld



Vehicular Mount and  
Docking Stations



Solar Chargers



A variety of fixed  
antenna options



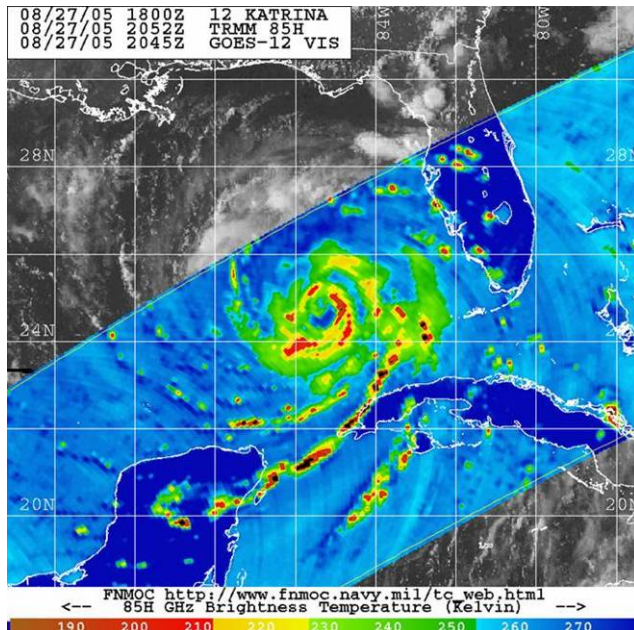
# The Time Line



# Iridium Usage -- 2005 Atlantic Hurricane Season

IRIDIUM

- 2005 Atlantic hurricane season one of the fiercest on record
- 21 named storms; 12 hurricanes



- Hurricane Katrina eliminated entire telecoms network for a broad swath of the Southern U.S.
  - Telecom switching stations submerged
  - Cell towers torn from moorings
  - Wires down
  - Network servers flooded

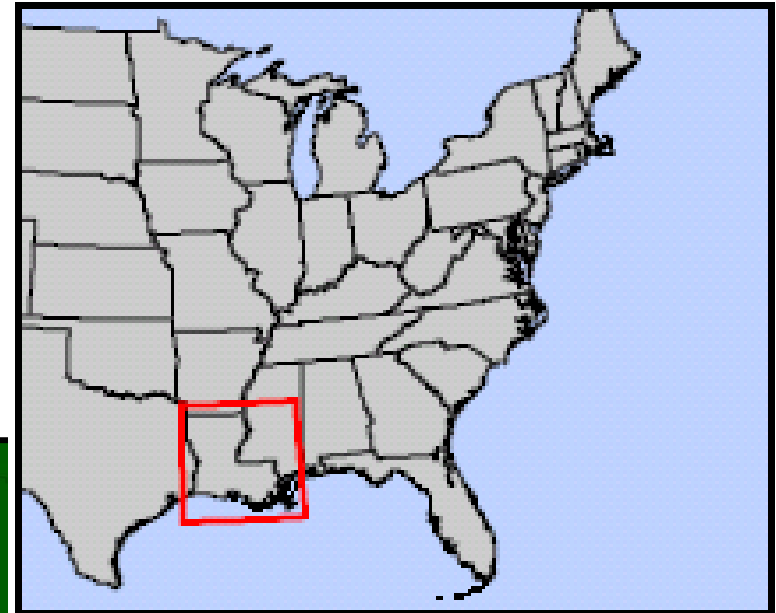
# Iridium Voice and Data Traffic in the Gulf Region

August 19, 2005

IRIDIUM

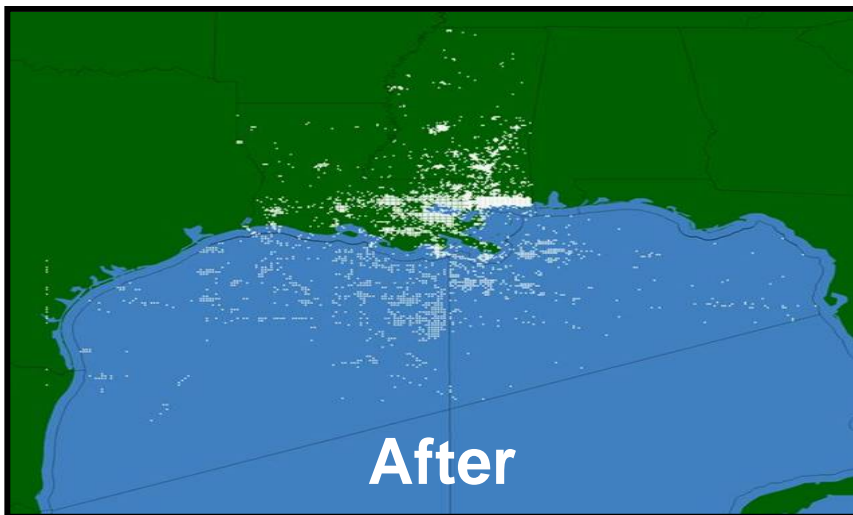
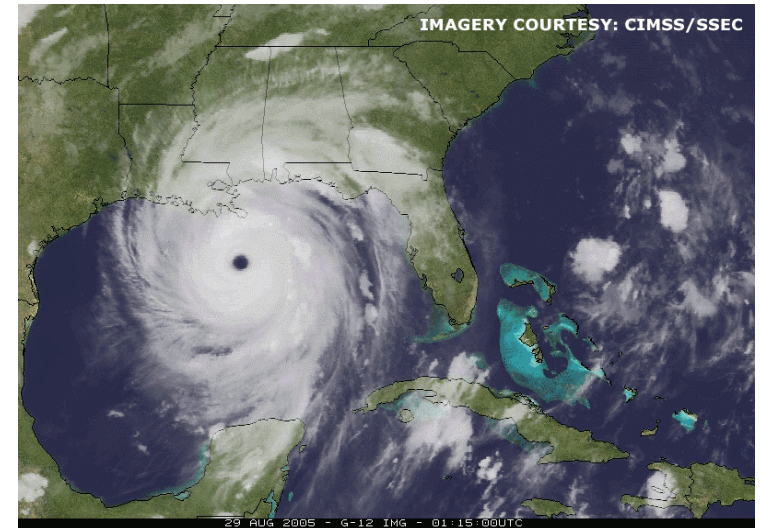


- Late August -- Iridium used along Gulf coast by commercial vessels; oil & gas installations.



- Each white dot represents voice or data call on system.

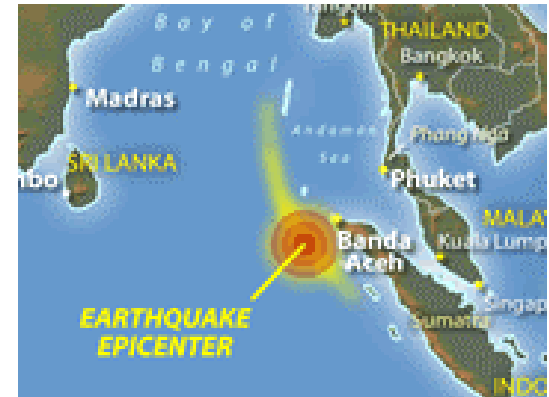
# Iridium Usage 2005 Atlantic Hurricane Season



# Historical usage of Iridium for Disaster Recovery

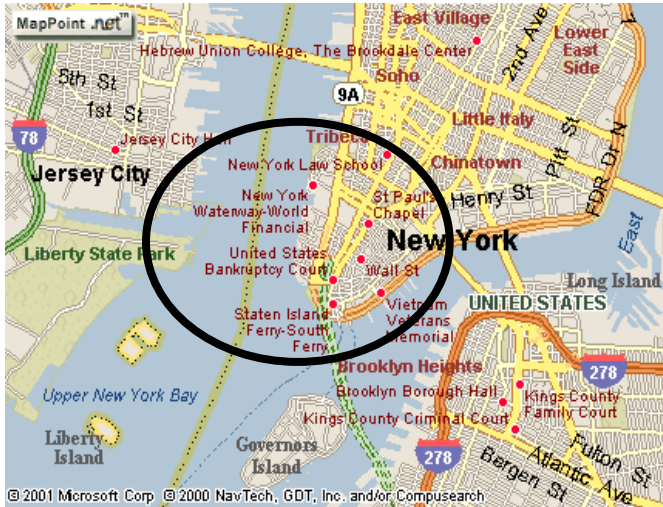
IRIDIUM

- **Taiwan Earthquake (1999)**
- **South Pole rescue (2001)**
- **September 11 (2001)**
- **Asian Tsunami (2004)**
  - Reopened Northern Sri Lanka communications to assist relief efforts
  - Temporary Authority to operate in Pakistan in support of the crisis
  - Hurricane Season in US and Caribbean (2005)
- **Pakistani Earthquake (2005)**



# September 11, 2001 Testimonial

IRIDIUM



“Shortly after the World Trade Towers were struck, Verizon lost all service from their West Street Central switching office. My cell phone was essentially useless, as was our landline home line. I walked out to a clear area on our street and turned on my Iridium handset.

It quickly responded with "Registered" and the signal came up. It meant more than I can say to have that call go through at that moment. I carry my Iridium handset regardless of how short a trip may be. Your service is an indispensable communications tool.”

*Gerald Anzano  
ING Asset Management*

- Licensing Obstacles
  - Have had to decline service to country hit by hurricane due to regulatory barriers
  - After earthquake, aid was delayed 5 days in a country while emergency authorization was obtained
  - Authorizations should be part of preparedness well in advance of an emergency
- Solutions
  - Tampere Convention
    - Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations
    - Disaster victims disasters now able to benefit from faster, more effective rescue operations
    - 30 countries ratified the convention
    - Translate commitments into preparedness phase
    - Invocation requirement requires time before emergency response
    - Convention commitments demonstrate need to eliminate regulatory barriers

# Iridium Initiatives

- Supporting governments' allocation of funding in advance of emergency events
- Educating authorities on the proper selection and use of systems and solutions
- Establishing authorizations wherever possible in advance of a disaster as part of preparedness
- Building relationships with NGOs
- Participating in panels and on working groups to raise awareness





# Needed Improvements

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- User education – solution choices
  - Multiple systems available
  - Specific capabilities
  - Varied requirements (over time, between tasks)
- Equipment pre-positioning / Rapid deployment
  - Network operators, service providers, users
- User training
  - e.g. Dialing, “line-of-sight
- Application adoption
  - e.g. Tracking, monitoring
- Interoperability
  - Wide variety of systems employed
- Global licensing exemptions

# Conclusions

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- Disasters can occur at any time and anywhere
- Only system capable of providing service anywhere in the world
- Instantly available when relief workers first arrive on-site
- Throughout recovery period, Iridium service is available on both a mobile and fixed basis
- No advance contractual arrangements/reservations necessary
- Iridium equipment readily available -- rental and purchase
- Complements longer term, less mobile solutions