

Department of Homeland Security Science & Technology

Science and Technology in Disasters— Opportunities Revealed by Sandy

**CCICADA/DIMACS Workshop on
S&T Innovations in Hurricane Sandy Research**

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Science & Technology Directorate**

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**Homeland
Security**



The Lens of Hurricane Sandy

- One of the most devastating storms in US history--\$60B and counting
- Sandy hit an area not frequently impacted by hurricanes.
- Future: more more-violent weather?
- Many lessons learned (re-learned?)
 - Update building codes, laws and other issues that do not involve S&T
 - S&T can contribute to a more resilient society.
- Sandy is a lens to focus attention on capability gaps.
- USA is implementing
 - The National Preparedness Goal (PPD-8): a strategic change to “whole community”
 - PPD 21: “Critical Infrastructure Security and Resilience”



PPD-8 The National Preparedness Goal

- To have a secure and resilient Nation with the capabilities required across the **whole community** to prevent, protect against, mitigate, respond to, and recover from the threats and hazards that pose the greatest risk.

30 Mar2011

<http://www.dhs.gov/presidential-policy-directive-8-national-preparedness>

<http://www.whitehouse.gov/blog/2011/10/07/ppd-8-announcing-national-preparedness-goal>

- **FEMA Implementation:**
 - A National Preparedness System Description;
 - A series of National Frameworks and Federal Interagency Operational Plans;
 - A National Preparedness Report; and
 - A Campaign to Build and Sustain Preparedness
- **Sandy Observations:**
 - Innovative volunteer efforts
 - Social media extensively used
 - Many elderly died of hypothermia over several days
 - Where can we save lives? Money? Heart ache? Jobs/Economy?

PPD-21 Critical Infrastructure Security and Resilience

It is the policy of the United States to strengthen the security and resilience of its critical infrastructure against both physical and cyber threats. The Federal Government shall work with critical infrastructure owners and operators and SLTT entities to take proactive steps to manage risk **and strengthen the security and resilience** of the Nation's critical infrastructure, considering **all hazards** that could have a debilitating impact on national security, economic stability, public health and safety, or any combination thereof. These efforts shall seek to reduce vulnerabilities, minimize consequences, identify and disrupt threats, and hasten response and recovery efforts related to critical infrastructure.

12 Feb 13

<http://www.whitehouse.gov/the-press-office/2013/02/12/presidential-policy-directive-critical-infrastructure-security-and-resil>

PPD-21 Critical Infrastructure Security and Resilience-2

- **FEMA Implementation:**

- **Develop a situational awareness capability that addresses both physical and cyber aspects of how infrastructure is functioning in near-real time**
- **Understand the cascading consequences of infrastructure failures**
- **Evaluate and mature the public-private partnership**
- **Update the National Infrastructure Protection Plan**
- **Develop comprehensive research and development plan**

<http://www.dhs.gov/sites/default/files/publications/EO-PPD%20Fact%20Sheet%2012March13.pdf>

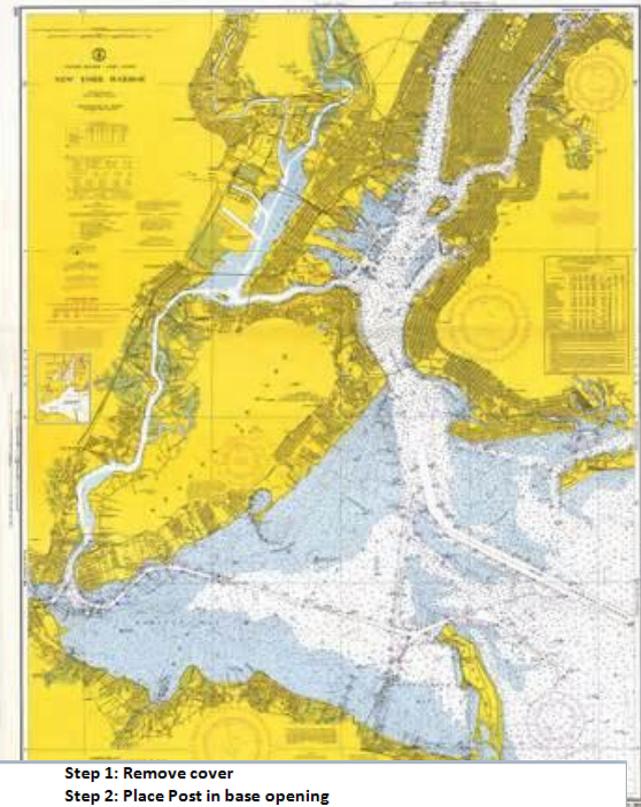
- **Sandy Observations:**

- **Situational awareness could have been better**
- **Cascading consequences ... no electricity, no fuel**
- **Public-private partnerships maturing**
- **R&D Plan...Today!**



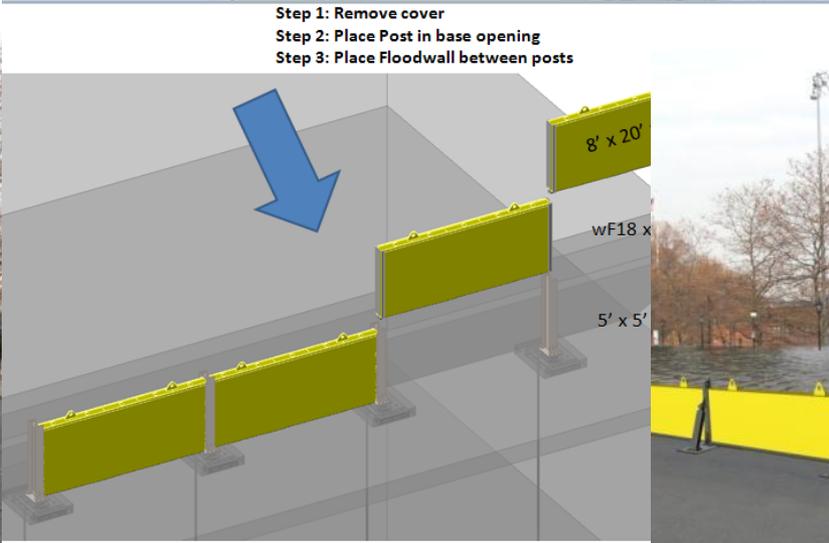


ONE MONTH LATER: Fires still smolder in the South Manoloking section of Brick Twp. Aerials of the Ocean County shore. Brick Twp, NJ 10/31/12 (Andrew Mills/The Star-Ledger)



Lake Borgne Surge Barrier

Hoboken, NJ

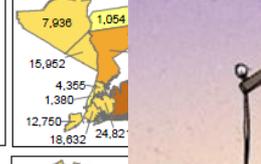
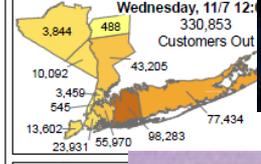
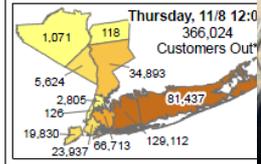
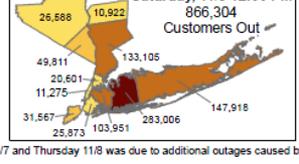
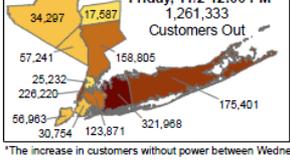
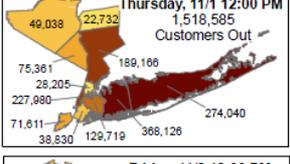
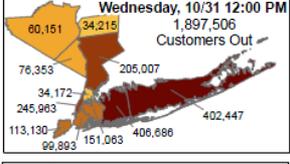
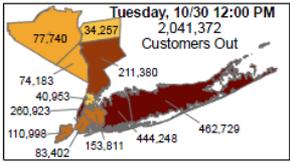
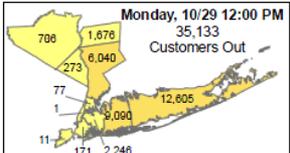
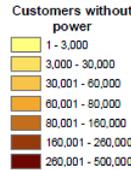
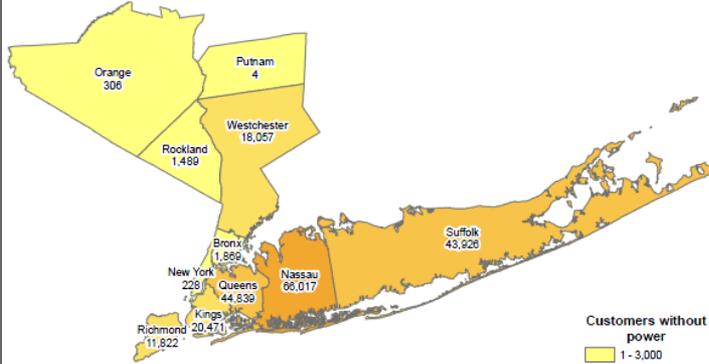


3 Step Installation





Friday, 11/9 12:00 PM Total Customers without Power: 209,028



*The increase in customers without power between Wednesday 11/7 and Thursday 11/8 was due to additional outages caused by the Nor'easter storm that hit the region.



ConEd Substation @14th St & FDR

TRANSCOM Report 3 Nov 2012

National Park Service Gateway National Recreation Area

*Sandy Hook: Weather related on National Park Service Gateway National Recreation Area at Sandy Hook (Monmouth) remains c
notice*

South Jersey Transp. Auth.

Atlantic City Expressway

*South Jersey Transp. Auth.: Heavy traffic on Atlantic City Expressway approaching Exit 5 - US 9 (Pleasantville) the Expressway c
Interchange 5. Brigantine residents will be allowed to pass through. The allowable route to Brigantine will be via Exit 1, the Atlant
Connector (tunnel). Expressway crews are currently deploying traffic cones at all Connector exits to prevent Brigantine-bound mo
in Atlantic City. **Brigantine residents will be asked for proof of residency** at the Expressway checkpoint. Emergency/essential en
allowed to pass through the checkpoint. Expect delays at exit 5 due to volume.*

*South Jersey Transp. Auth.: Weather related on Atlantic City Expressway eastbound between Exit 5 - US 9 (Pleasantville) and Atlant
Center/Eastern Terminus (Atlantic City) closed to traffic ALL VEHICLES "MUST" EXIT EB AT EXIT 5*

NEW YORK

NYC DOT

New York City

*NYC DOT: Parking related on New York City (New York) Alternate Side Parking (street cleaning) rules are suspended, all other park
including parking meters remain effect citywide today , Friday November 2 because of weather conditions.*

NYSDOT - Region 10

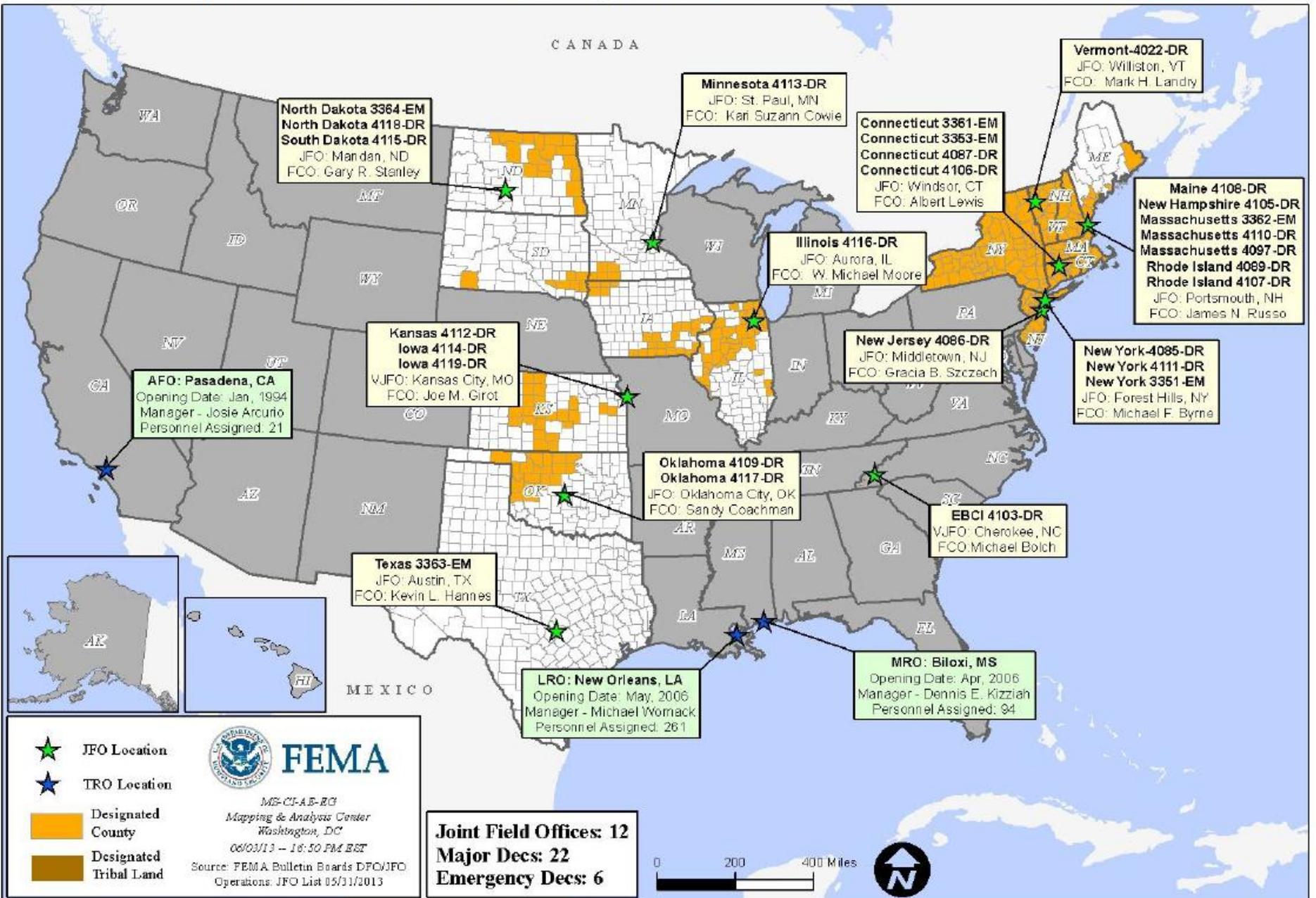
Meadowbrook State Parkway

*NYSDOT - Region 10: Weather related on Meadowbrook State Parkway both directions between Exit M9E - Merrick Road (Hemp
ROUTE Meadowbrook State Parkway **at Ocean Parkway (Hempstead) all lanes closed until further notice***

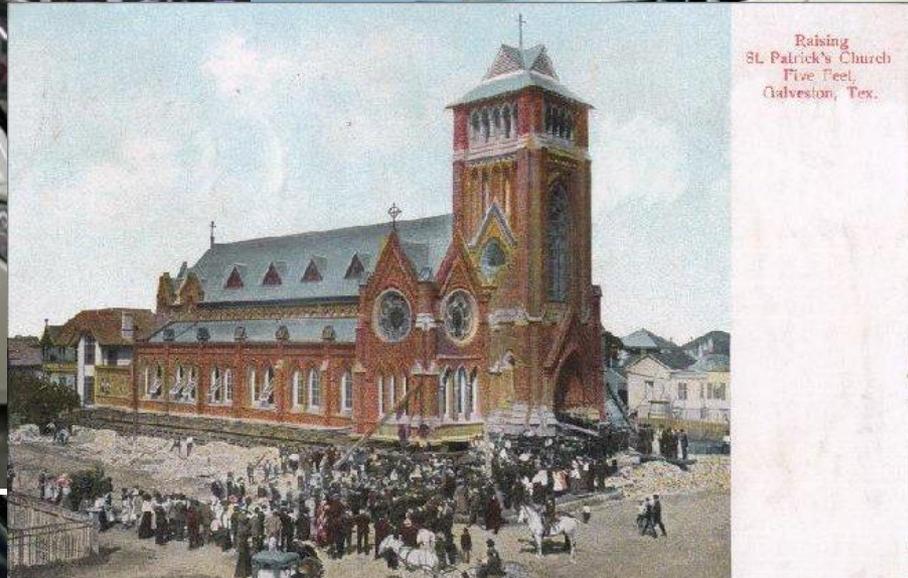
NY 101

NYSDOT - Region 10: Downed pole and Downed wires on NY 101 both directions between Oak Tree Lane (North Hempstead) and

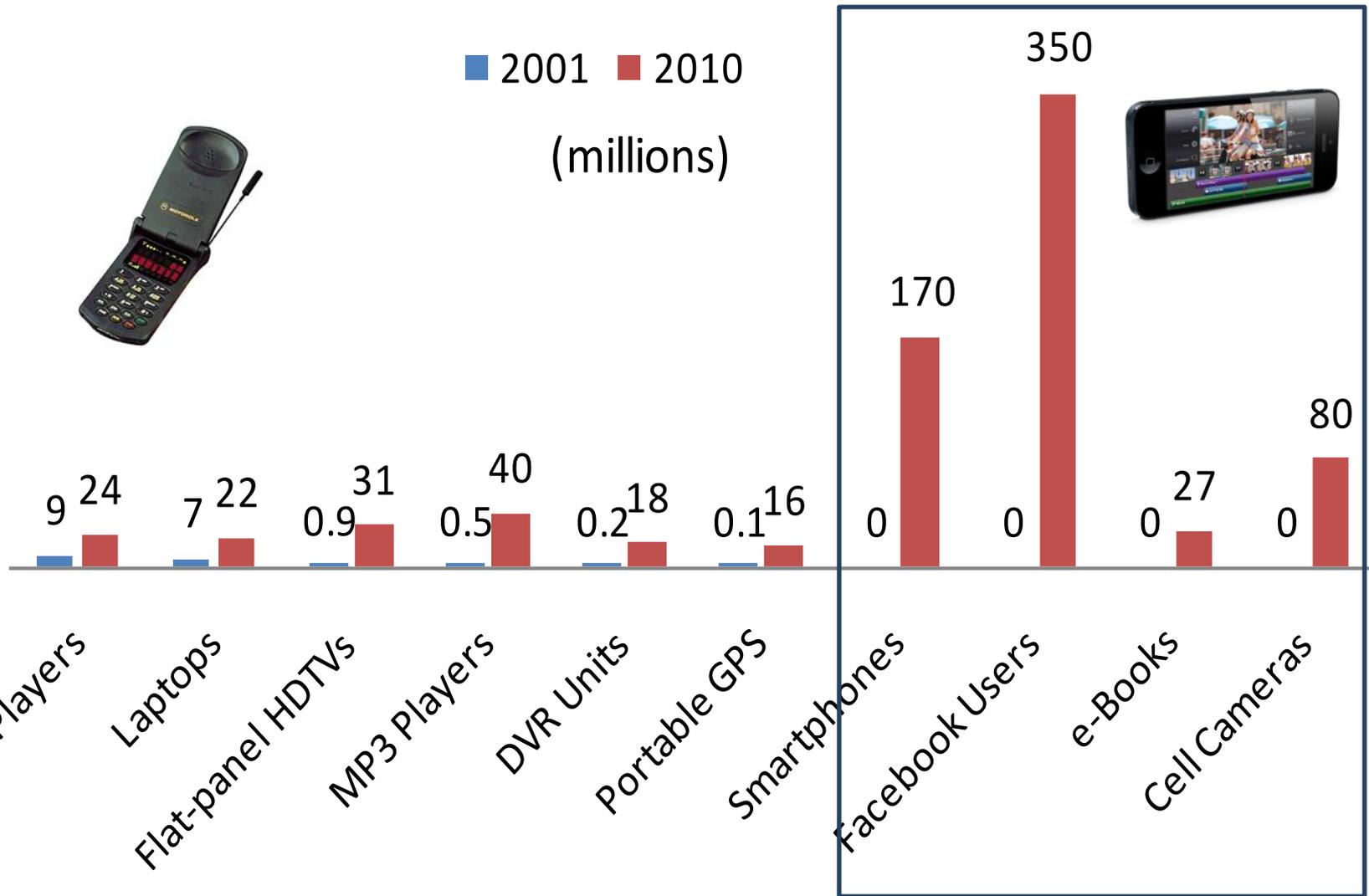
Open Field Offices & Designated Counties as of June 4, 2013



Masdar



Consumer Electronics



Capability Gap Categories

Infrastructure hardening
Models and assessment tools
Water Control
Electric Power
Other Lifeline Infrastructure Resilience
Training and Exercises
Analysis
Communications
Big Data
Other

OSTP Sandy Task Force

- **Federal Review & Permitting**
- **Infrastructure**
- **Housing**
- **Insurance**
- **Small Business**
- **Capacity Building**
- **Data Sharing**

Challenges for Disasters

- **Water management**
- **Make a compelling case for resilient infrastructure**
- **Work with, not against, Mother Nature**
- **Monitoring and diagnostics of infrastructure health**
- **Communications in challenged environments**
- **Informing the community**
- **Risk models that include direct and indirect costs (quality of life...)**
- **The data deluge**

Grand Challenges for Disasters

- **Cut the cost of disaster management in half**



- **How do we want our community to look in 50 years?**





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Science and Technology



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