

# 2012 Earth Observations Assessment Disasters Societal Benefit Area (SBA) Out-Brief

Briefing  
for the  
Sub-Committee  
for Disaster Reduction

David Helms, NOAA  
and  
Bill Leith, USGS

October 4, 2012

# Overview

- Earth Observations Task Force
  - National Earth Observations Strategy
- Earth Observations Assessment (EOA) Working Group
  - USG-wide Earth Observations Assessment
- OSTP
  - OMB Observing System Cost Data Call
  - 10-yr National Plan for Earth Observations
- Data Gathering Process
- Workshops
- Report Overview (embargo)

# Earth Observations Task Force

## Summary

Mandate - Established February 2011 by CENRS to advise OSTP, in response to congressional direction in NASA Authorization Act of November 2010.

Task Force Co-Chairs and Membership - Steve Fetter (OSTP); Waleed Abdalati (NASA); Marcia McNutt (USGS); Kathryn Sullivan (NOAA) - Thirteen agency principals from: USDA, NOAA, NIST, DOD, DOE, DOS, EPA, NASA, NSF, OFCM, SI, USAID, OSTP, OMB

Deliverable - A national Earth Observations Strategy providing a framework for assessment to advise the Director of OSTP in the completion of a National Plan for Earth Observations as a supplement to the FY 14 budget.

Results in advice to OSTP and OMB on the relative value of the Nation's observing system investments

*(Final draft of the NEO Strategy has cleared CENRS and LRM, in final review by OSTP)*

# Earth Observations Assessment Working Group

## Leadership and Membership

- Co-Chairs: John Crowe (USGS), Pat Jacobberger-Jellison (NASA), Pamela Taylor (NOAA), Peter Colohan (OSTP)
- Membership includes representatives of 11 agencies of the NEO Task Force, appointed by Task Force Principals
- Subject Matter Teams formed by CENRS subcommittees, sequence of workshops with each team to perform the assessment, facilitated by NOAA contract support

Deliverable - Organize, execute, and deliver the first National assessment Sep 2012 - Internal results to USG only

Organization - 12 Societal Benefit Areas (SBAs) + Reference Measurement; areas debated and finalized by CENRS, February 2012

# Earth Observations Assessment

## 12 Societal Benefit Areas + Ref. Measurements

SBA	Team Lead
Agriculture & Forestry	Ken Brewer (USDA FS), Dan Good (USDA NRCS)
Biodiversity	Jake Weltzin (USGS)
Climate	Mike Tanner (NOAA), Chris Weaver (USGCRP)
Disasters	David Helms (NOAA), Bill Leith (USGS)
Ecosystems	Roger Sayre (USGS)
Energy and Earth Resources	Gerald Geernaert (DOE), Larry Meinert (USGS)
Human Health	Lorrie Backer (CDC)
Oceans & Coastal Resources	Mike Ford (NOAA)
Space Weather	Mike Bonadonna (OFCM)
Transportation	Paul Pisano (DOT)
Water Resources	Bill Kustas (USDA ARS)
Weather	Margaret McCalla (OFCM)

# Earth Observations Assessment (EOA)

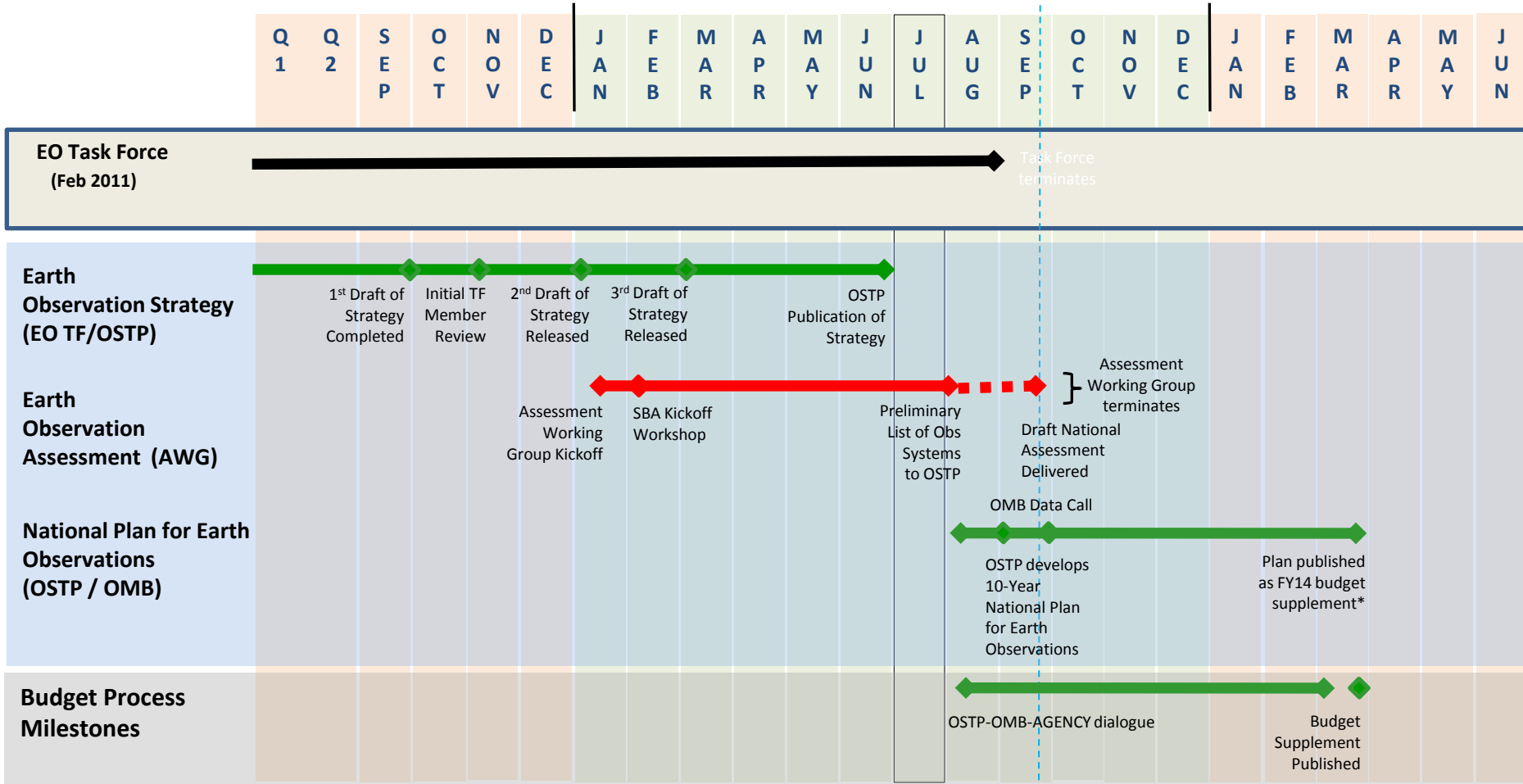
## Status

- ✓ Mar-July: 26 full workshops completed
- ✓ Early August: All data entered in PALMA model, provide full list of systems (355) for OMB Cost Data Call (*tentative: Aug 15-Sep 7*)
- ✓ Aug 6-24: SBA Teams verify model representation of their inputs
- ✓ Late Aug: Cross agency AWG conducts integrated analysis
- ✓ Early Sep: OMB Cost Data Call on Agency Observing Systems
- ✓ Sep 5-18: OSTP reviewed draft integrated analysis with EO TF Chairs: USGS (McNutt), NASA (Abdalti), NOAA (Sullivan) and OMB
- Oct 3: Initial comments from AWG
- Oct 30: Final report: Individual SBA and Integrated narratives
- Apr, 2013: National Plan for Earth Observations by OSTP, Supplement to FY14 PB

# National Plan for Earth Observations

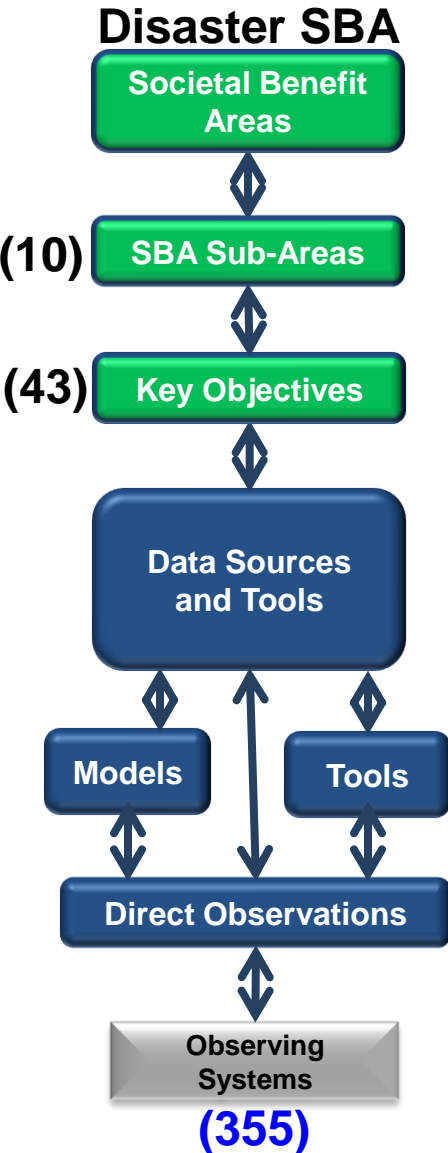
## Timeline of All Elements

Today's Date ▼



# Earth Observations Assessment

## Disaster SBA



- “Value Chain” Approach - Provides traceability of societal benefit needs through to observing systems, with research needs integrated within the value chain
- Impact Assessment Method- Applied at each level of the Value Chain
  - Evaluates both the current overall performance of an SBA objective and the relative criticality of each individual input
  - Standardized performance scale, based on swing weighting, results in standardized product from each team, facilitating integration
- 95 (of 330) Subject Matter Experts (SME) constituting 14 teams (phase I and II) from 17 USG groups (DHS/FEMA, DHS/USCG(ASA), DoD/DTRA, DoD/NGA, DoD/USACE, DoD/USAF, DOE, DOI/USGS, EPA, HHS/CDC+APRS, NASA, NOAA, NRC, NSF, USAID, USDA)
- SMEs contributed to evaluation of 10 SBA Sub-Areas with 43 Key Objectives



# Disaster SBA

## Boundary Conditions Established by SDR

- Societal benefits accrue from ability to monitor, predict, mitigate, respond to, assess the risk of, and provide early warning of events
- NSTC Subcommittee on Disaster Reduction (SDR) identified four key characteristics of disaster-resilient communities:
  - (1) relevant hazards are recognized and understood;
  - (2) communities at risk know when a hazard event is imminent;
  - (3) individuals at risk are safe from hazards in their homes and places of work; and
  - (4) communities experience minimum disruption to life and economy after a hazard event has passed

### Sub-Areas:

- Earthquakes
- Floods
- Landslides
- Tropical Cyclones
- Other Severe Weather (e.g., tornadoes, severe thunderstorms/hail, winter storms, heat waves)
- Volcanic Eruptions
- Wildfires
- Oil/Chemical Spills
- Space Weather

# Preliminary Disaster SBA

## Sub-Areas and Key Objectives

		Air		Land		Water	
Key Objective	Sub-Area	Severe Thunderstorm	Winter Storms	Wildfires	Volcano-Land	Floods-Fresh (3)	Techno-Water
		Volcano-Ash	Hurricanes	Landslides	Earthquakes	Coastal Inundation - Storm Surge	Erosion-Bathymetry Change (Nav) (4)
		Techno-Air	Heat Waves (1)	Techno-Land		Coastal Inundation-Tsunami	
			Solar/Magnetic Storms(2)				

**Phenomena not assessed by Disaster SBA:**

1. Heat Waves and Drought: Climate and Weather SBA
2. Solar Storms: Space Weather SBA
3. Riverine Flooding: Water Resources SBA
4. Bathy/Topo: Incorporated across Disaster sub-areas
5. Synoptic Weather: Weather SBA

# Final Disaster SBA

## Sub-Areas and Key Objectives

- (1) Emergency Management:**
  - (a) Response: Pre-Event
  - (b) Response: During Event
  - (c) Recovery: Post Event
  - (d) Prepare: Before and After
  - (e) Mitigate: Before and After
- (2) Solid Earth: Earthquakes**
  - (a) Monitor
  - (b) Predict/Assess Risk/Warn
  - (c) Mitigate/Recover/Post Event Assessment
- (3) Solid Earth: Volcanoes**
  - (a) Monitor-Domestic
  - (b) Monitor-Global
  - (c) Predict/Assess Risk/ Warn-Domestic
  - (d) Predict/Assess Risk/ Warn-Global
  - (e) Mitigate/ Recovery /Post Event Assessment-Domestic
  - (f) Understanding (Research)
- (4) Solid Earth: Landslides**
  - (a) Monitor
  - (b) Predict/Assess Risk/ Warn
  - (c) Mitigate/ Recovery /Post Event Assessment
  - (d) Understanding
- (5) Solid Earth: Tsunami**
  - (a) Strategic Monitoring and Detection
  - (b) Tsunami Modeling
  - (c) Tsunami Research
- (6) Severe Weather: Tornado, Flash Floods, Winter Storms, and Hurricanes/Tropical Cyclones:**
  - (a) Warnings
  - (b) Watches
  - (c) Outlooks
- (7) Wildfires:**
  - (a) Assess Potential/Intensity (e.g., fuels, weather, terrain)
  - (b) Detection and Strategic Monitoring
  - (c) Predict Active Wildfire Behavior
  - (d) Tactical Support to Firefighting Activities
  - (e) Post Fire Assessment (forest affected by abiotic agents)
- (8) Coastal Inundation:**
  - (a) River In-Flow Monitoring and Prediction
  - (b) Near-Shore Waves Monitoring and Prediction
  - (c) Tides Monitoring and Prediction
  - (d) Storm Surge Monitoring and Prediction
- (9) Atmospheric Dispersion: Limited to unclassified data sources**
  - (a) Chemical and Radiological Dispersion (Initial Scaling)
  - (b) Chemical Dispersion ( $\geq 60$  minutes)
  - (c) Radiological Dispersion ( $\geq 60$  minutes)
  - (d) Biological Dispersion
  - (e) Volcanic Ash Dispersion
  - (f) Smoke Dispersion
  - (g) Dust
  - (h) Urban (Chemical and Radiation)
- (10) Marine Dispersion: Assessment limited to navigable waters**
  - (a) Oil and Chemical
  - (b) USCG Search and Rescue

# Disaster SBA Workshops

## Phase I – Current Observing System Impact Assessment

**Eight workshops were conducted for the Disaster SBA.** Additionally, results from six workshops from the NOAA Observation Systems Integrated Analysis (NOSIA) Pilot Project were used for completing the Severe Weather portion of the Disaster SBA.

**Workshop Objective:** Determine which observing systems impact service delivery and to what magnitude (**note:** teams did not assess classified observing systems)

Sub-Area	Workshop Date
1. Emergency Response-Respond and Recovery	4-Jun-12
2. Emergency Response-Prepare and Mitigate	1-Jun-12
3. Solid Earth-Earth Quakes, Volcanic Eruptions, and Land Slides	24-Apr-12
4. Solid Earth-Tsunamis	15-Jun-12
5. Severe Weather-Tornadoes, Flash Floods, Winter Storms, Hurricanes	<u>NOSIA 2011:</u> - Boulder, CO - Norman, OK - Miami, FL
6. Severe Weather-Wildfires	11-May-12
7. Atmospheric Dispersion-Biological, Chemical, Nuclear, Smoke, Volcanic Ash	24-Apr-12
8. Coastal Inundation	25-Apr-12
9. Marine Dispersion and USCG Search and Rescue	23-Apr-12

# Disaster SBA Roll-up Sub-Areas

## Phase I - Current Observing System Capabilities and Impacts

### Emergency Management:

- Response and Recovery<sup>1</sup>
- Prepare and Mitigate<sup>2</sup>

### Coastal Disasters:

- Coastal Inundation<sup>8</sup>
- Hurricanes<sup>5</sup>
- Marine Dispersion<sup>9</sup>
- Search and Rescue<sup>9</sup>

### Severe Weather (Land):

- Tornadoes<sup>5</sup>
- Flash Floods<sup>5</sup>
- Winter Storms<sup>5</sup>
- Wildfires<sup>6</sup>

### Solid Earth:

- Earth Quakes<sup>3</sup>
- Volcanic Eruptions<sup>3</sup>
- Tsunamis<sup>4</sup>
- Landslides<sup>3</sup>

# Disaster SBA Workshops

## Phase II – 10 Year Planning Input

**Workshop Objective:** Respond to OSTP Questionnaire

a) Near-Term:

1. Savings in Near-Term (5 years)
2. Data Processing Efficiencies
3. Resource Priorities:
  - Satellite
  - Non-Satellite

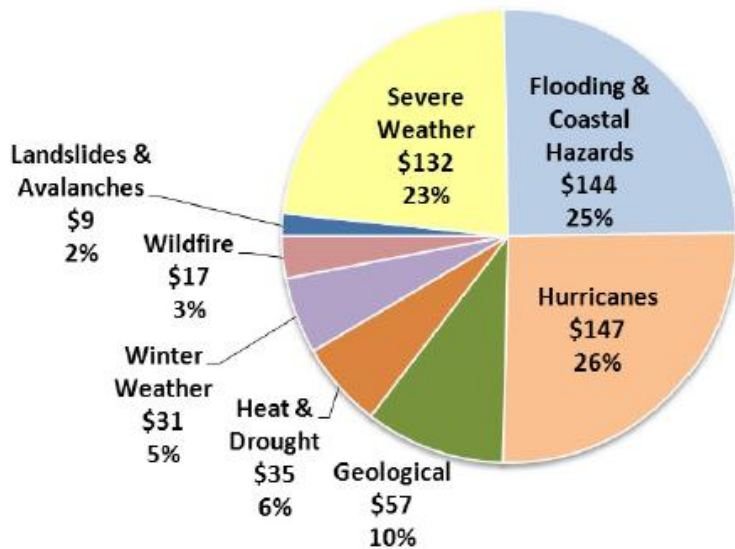
b) Long-Term Priorities (10 years)

Sub-Area	Workshop Date
Air and Marine Dispersion	22-Aug-12
Coastal Inundation	20-Aug-12
Severe Weather (hurricanes, tornados, severe thunderstorms, flash floods, hail, winter storms)	21-Aug-12
Solid Earth (earth quakes, tsunamis, land slides)	18-Aug-12
Wildfires	5-Sep-12
Emergency Management	24-Aug-12

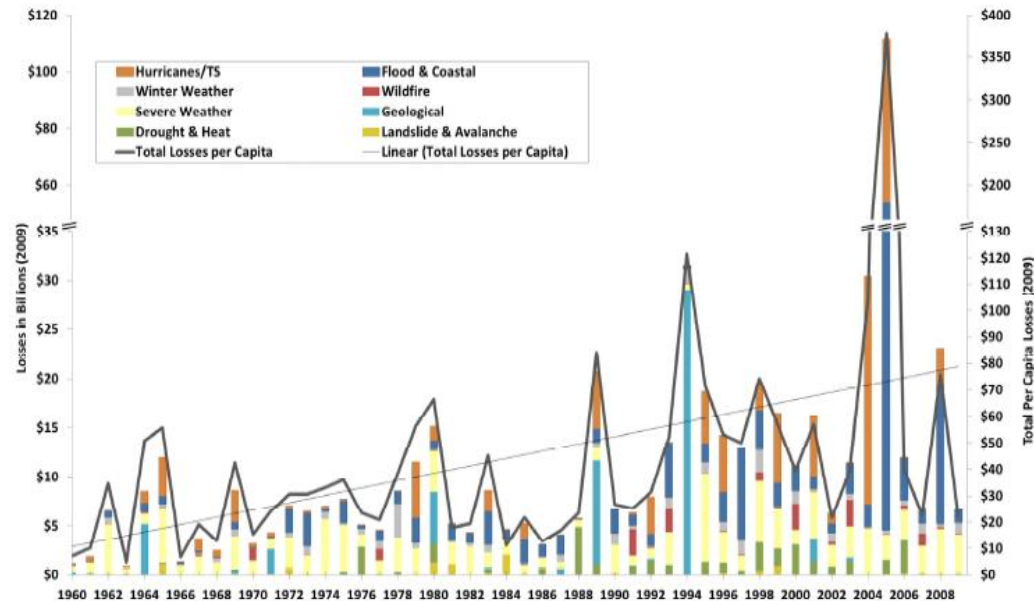
# Disaster SBA

## Economic Impact: 1960-2009

US per capita losses increased from \$25 in 1960s to \$80 in 2000s (\$2009)



Natural hazard losses, in \$2009 (billions and % of total (\$574B))



Source: Gall, et al, 2011 (from SHELDUS)

# Disaster SBA Report Structure

- Disaster SBA observing system impact results represent a broad cross-section of phenomena detection requirements and service applications needs
  - ✓ Observing systems with specific mission application were captured in sub-sections, Emergency Management, Coastal Disasters, Severe Weather (land), and Solid Earth
- Executive summary includes economic data from SHELDUS
- Disaster report summarized information from the following workshops:
  - Phase I: Baseline observing system impacts (14 workshops)
  - Phase II: Follow-on OSTP Questionnaire Responses (6 workshops)
- Report recommendations (phase II) were drawn from SME workshop input, Agency planning guidance and recently published relevant papers and reports. For example, suggested improvements to monitoring disaster economic impact was drawn from Gall (2011) and Holzman (2012)



# Disaster SBA Report Input

## High Level Observing System Impact Summary

- GOES and NEXRAD systems have rapid refresh rate (low latency) and high spatial resolution, but also provide a broad picture of the environment they are designed to monitor
- ANSS, GSN, and Earthscope provides the backbone of monitoring capability for the Solid Earth sub-SBA.
- NWS RAOB and Aircraft Observations provide a high resolution picture of atmospheric winds, temperature, and moisture which are not available through satellite-based sensors.
- Disaster Incident Reports Team input, and volunteer weather Spotters (Skywarn) are the eyes and ears for decision makers, providing situational awareness reports in rapidly evolving environments.
- LiDAR, Hi-Res Imagery, NAIP, and the Built Environment Database provide information on landforms and infrastructure, before and after an event, which inform decision makers to understand risk and coordinate recovery activities more efficiently and safely.
- Event History Databases and HAZUS MH provide decision makers with historical context of risk and the cost of similar events in the future.
- NWLON, ASOS and HF Radar data provide detailed information about conditions near the Earth's surface, while
- WC-130 Hurricane Hunters provide targeted information in the vicinity of hurricanes.
- Finally, GPS underpins the integrity of temporal and spatial data.

# Backup

# Disaster SBA – Report References

- Cummins, J. David, Michael Suher and George Zanjani (2007), “Federal Financial Exposure to Catastrophic Risk”, presented at the Conference on Measuring and Managing Federal Financial Risk, Zell Center for Risk Research, Kellogg School of Management, Northwestern University, United States, 8-9 February.
- Ewert, J., et al, 2006. [National Volcano Early Warning System \(NVEWS\)](#), U.S. Geological Survey.
- FEMA 2009. Risk Mapping, Assessment, and Planning (Risk MAP) Multi-Year Plan: Fiscal Years 2010-2014. Report to Congress.
- Gall, Melanie, Kevin A. Borden, Susan L. Cutter, 2009. When do losses count?. *Bull. Amer. Meteor. Soc.*, 90, 799–809.
- Gall, M., K.A. Borden, C.T. Emrich, and S.L. Cutter. 2011. The Unsustainable Trend of Natural Hazard Losses in the United States. *Sustainability* 3: 2157–2181.
- Goldberg, M., and Coauthors, 2011. The global space-based inter-calibration system (GSICS). *Bull. Amer. Meteor. Soc.*, 92, 467–475.
- Holzman, David C., 2012. Accounting for Nature’s Benefits: The Dollar Value of Ecosystem Services, *Environ Health Perspect.* 2012 April; 120(4): a152–a157.
- NRC 2009a. *Observing Weather and Climate from the Ground Up: A Nationwide Network of Networks*. Washington, DC: The National Academies Press.
- NRC 2009b. *Mapping the Zone: Improving Flood Map Accuracy*. Washington, DC: The National Academies Press.
- NRC 2010. *When Weather Matters: Science and Service to Meet Critical Societal Needs*. Washington, DC: The National Academies Press.
- NRC 2012a. *Weather Services for the Nation: Becoming Second to None*. Washington, DC: The National Academies Press, 2012.
- NRC 2012b. *Urban Meteorology: Forecasting, Monitoring, and Meeting Users’ Needs*. Washington, DC: National Academies Press.
- NWA 2007. National Weather Association (NWA) letter of support for an operational GPS Meteorological Network (GNSS-Met)
- NWS 2012a. *Weather-Ready Nation Roadmap*. Draft 1.0. Silver Spring, MD, National Oceanic and Atmospheric Administration, Department of Commerce.
- NWS 2012b: *Report to Congress on the Hyperspectral Environmental Sounder from Geosynchronous Orbit*. NOAA National Weather Service.
- Mass, Clifford, 2012. Nowcasting: the promise of new technologies of communication, modeling, and observation. *Bull. Amer. Meteor. Soc.*, 93, 797–809.
- NOC, 2012. Draft National Ocean Policy Implementation Plan. National Ocean Council.
- OMB 2010. Office of Management and Budget (OMB) Circular A-16 Supplemental Guidance, November 2010.
- Stensrud, David J., and Coauthors, 2009. Convective-scale warn-on-forecast (WoF) system. *Bull. Amer. Meteor. Soc.*, 90, 1487–1499.
- WMO 2012. Fifth WMO Workshop on the Impact of Various Observing Systems on NWP, Sedona, Arizona, USA, 22 - 25 May 2012 – Preliminary Report.

# Disaster SBA SMEs

## Air Dispersion

Sub-SBA	Agency	LO	Office/Division	Expertise	POC	Phase I	Phase II
AirDisp	DOE	LLNL	IMAAC	Program Manager	<a href="#">Sugiyama, Gayle</a>	X	X
AirDisp	NOAA	NOS	Office of Response and Restoration	Emergency Response Div	<a href="#">Payton, Debbie</a>		X
AirDisp	NOAA	OAR	Air Resources Lab	Deputy Director, Air Resou	<a href="#">Artz, Rick</a>		X
AirDisp	DoD	DTRA	Joint Science and Technology Office	HPAC	Meris, Roland	X	
AirDisp	DOE	LLNL	IMAAC	Dep Director, NARAC	<a href="#">Nasstrom, John</a>	X	
AirDisp	EPA	NERL	Multi-Agency Cooperative Modeling	Air Quality	<a href="#">Gary Foley</a>	X	
AirDisp	EPA		Center for Radiological Emergency Management, Radiation Protection Division, Office of Radiation and Indoor Air	RadNet radiation monitorin	<a href="#">Keating, Terry</a>	X	
AirDisp	EPA		Center for Radiological Emergency Management, Radiation Protection Division, Office of Radiation and Indoor Air	Director	<a href="#">Veal, Lee</a>	X	
AirDisp	EPA		Center for Radiological Emergency Management, Radiation Protection Division, Office of Radiation and Indoor Air	RadNet radiation monitorin	<a href="#">Keating, Terry</a>	X	
AirDisp	NOAA	NOS	ORR	CAMEO	<a href="#">Miller, Mark W.</a>	X	
AirDisp	NOAA	OAR	Air Resources Lab	Atmospheric Dispersion -	<a href="#">Rolph, Glenn</a>	X	
AirDisp	NOAA	NWS	NCEP/EMC	Remote Special Meteorolo	<a href="#">McQueen, Jeff</a>	X	
AirDisp	NOAA	NESDIS	OSDPD/SAB	Volcanic Ash Alert Center	Kibler, Jamie	X	
AirDisp	NRC		Office of nuclear security and incident response	RASCAL Model PI (reacto	<a href="#">Brandon, Lou (alt: George</a>	X	
AirDisp	USDA	USFS	Pacific Northwest Research Station	BlueSky Smoke Model PI	<a href="#">Larkin, Sim</a>	X	20

# Disaster SBA SMEs

## Emergency Management – Prepare and Mitigate

Sub-SBA	Agency	LO	Office/Division	Expertise	POC	Phase I	Phase II
EM-Prepare, Mitigate	DHS	FEMA	Digital Flood Insurance Rate Map Program (DFIRM)	RiskMap Program	<a href="#">Rooney, Paul</a>	X	X
EM-Prepare, Mitigate	DHS	---	S&T Directorate	Federal Coordination Office	<a href="#">Davis, Bruce</a>	X	
EM-Prepare, Mitigate	DHS	FEMA	Mitigation	HAZUS-MH Program Mana	<a href="#">Berman, Eric</a>	X	
EM-Prepare, Mitigate	DHS	FEMA	FEMA National Hurricane Program	Nat Hurricane/HURREVAC	<a href="#">Griffith, David</a>	X	
EM-Prepare, Mitigate	DoD	USACE	Civil/Military Emergency Preparedness	Director	<a href="#">Bruzewicz, Andy</a>	X	
EM-Prepare, Mitigate	DOI	USGS	Coastal and Marine Geology Program		<a href="#">Thatcher, Cindy</a>	X	
EM-Prepare, Mitigate	DOI	USGS		Emergency Management C	<a href="#">Crowe, John</a>	X	
EM-Prepare, Mitigate	NOAA	NOS	Office of Coastal Survey	Chief, Hydrographic Survey	<a href="#">Ferguson, Jeffrey</a>	X	
EM-Prepare, Mitigate	NOAA	NOS	National Geodetic Survey	Chief, Remote Sensing Div	Aslaksen, Michael	X	
EM-Prepare, Mitigate	NOAA	NOS	Coast Survey Development Laboratory	Marine Modeling And Analy	<a href="#">Feyen, Jesse</a>	X	
EM-Prepare, Mitigate	USDA	RMA	Office of Strategic Data Acquisition & Analysis	Crop Loss Remote Sensing	<a href="#">Hipple, James D.</a>	X	
EM-Prepare, Mitigate	USDA	FSA	National Agriculture Program	GIS Program Manager	<a href="#">Hall, Shirley</a>	X	
EM-Prepare, Mitigate	USDA		Foreign Agricultural Service	Remote Sensing Advisor	<a href="#">Bethel, Glenn</a>	X	

# Disaster SBA SMEs

## Emergency Management – Response and Recover

Sub-SBA	Agency	LO	Office/Division	Expertise	POC	Phase I	Phase II
EM-Respond, Recovery	NOAA	NWS	Office of Climate, Water, Weather Services	National Warning Coordination	Maier, Chris	X	X
EM-Respond, Recovery	DHS	---	S&T Directorate	Federal Coordination Office	Davis, Bruce	X	
EM-Respond, Recovery	DHS	USCG	Incident Command System Instructor	Incident Command System	McGrath, Gabrielle CMDR	X	
EM-Respond, Recovery	DHS		Former Intelligence Unit (GIU)/Joint Field Operations (JFO)	Geo-Spatial CONOPS (BA	Langhelm, Ron	X	
EM-Respond, Recovery	DoD	USACE	Civil/Military Emergency Preparedness	Civil/Military Emergency Pr	Bruzewicz, Andy	x	
EM-Respond, Recovery	DoD	NGA	IBE	NextView Commercial Imag	Lewis, Paul	x (email input)	
EM-Respond, Recovery	DOI	USGS	Hazards Data Distribution System (HDDS)	Program Manager, Nationa	Jones, Brenda	X	
EM-Respond, Recovery	DOI	USGS		Emergency Management C	Crowe, John	X	
EM-Respond, Recovery	DOI	USGS		HWM, Streamgauge Netwo	Mason, Robert	x	
EM-Respond, Recovery	EPA		ASPECT	Program Manager	Kudarauskas, Paul	x	
EM-Respond, Recovery	HHS	CDC	HHS/CDC/OSELS/OD/BMO	Emergency Preparedness	DeSantis, David	X	
EM-Respond, Recovery	HHS	CDC			Adams, Joe	X	
EM-Respond, Recovery	HHS	ASPR	Fusion Branch, MedMap Data Portal	Branch Chief	Olsen, Jennifer	X	
EM-Respond, Recovery	HHS	CDC	Division of Emergency Operations, OPHPR	Epidemiologist	Burkholder, Jacqueline	X	
EM-Respond, Recovery	HHS	CDC	Division of Emergency Operations, OPHPR		O'Connor, Ralph	X	
EM-Respond, Recovery	NOAA	NOS	Office of Coastal Survey	Navigation Response Bran	Haupt, Todd (CMDR)	X	
EM-Respond, Recovery	NOAA	NOS		DHS Ops Center (vice AI M	Walter, Regis J	X	
EM-Respond, Recovery	NOAA	NOS	National Geodetic Survey	Chief, Remote Sensing Div	Aslaksen, Michael	X	
EM-Respond, Recovery	NOAA	NWS	Office of Climate, Water, Weather Services	Environmental Services Le	Green, David	X	
EM-Respond, Recovery	USDA		Foreign Agricultural Service	Remote Sensing Advisor	Bethel, Glenn	x	

# Disaster SBA SMEs

## Inundation and Marine Dispersion

Sub-SBA	Agency	LO	Office/Division	Expertise	POC	Phase I	Phase II
Inundation	NOAA	NOS	Coast Survey Development Laboratory	Marine Modeling And Analy	<a href="#">Feyen, Jesse</a>	X	X
Inundation	NOAA	NGDC	Marine Geology and Geophysics Division	Digital Elevation Models	<a href="#">Mclean, Susan</a>		X
Inundation	DOI	USGS	NSIP	Supervisory Hydrologist	<a href="#">McCallum, Brian E.</a>	X	
Inundation	NOAA	NOS	Center for Operational Oceanographic Products & Services	Physical Scientist, Chief of	<a href="#">Tronvig, Kristen</a>	X	
Inundation	NOAA	NWS	Office of Science and Technology	Surge Lead	<a href="#">Kurkowski, Nicole</a>	X	
Inundation	NOAA	NWS	MDL Developer	P-Surge, PHISH	<a href="#">Taylor, Arthur</a>	X	
Inundation	NOAA	NWS	OHD	Fresh Water (River) Level A	<a href="#">Pavelle, Kenneth</a>	X	
Inundation	NOAA	NWS	NCEP/NHC	Surge Team Lead	<a href="#">Rhome, Jamie</a>	X	
Inundation	NOAA	NWS	WFO Wilmington, NC	Science and Operations Of	Hawkins, Reid	X	
Inundation	NOAA	NWS	NCEP/EMC	Near-shore Wave Predictio	<a href="#">Van der Westhuysen, And</a>	X	
MarineDisp	NOAA	NOS	OR&R Emergency Response	OR&R Emergency Respon	<a href="#">Payton, Debbie</a>		X
MarineDisp	ASA			CHEMMAP Modeler for BC	<a href="#">Spaulding, Malcolm</a>	X	
MarineDisp	DHS	USCG	Office of Search and Rescue	SAROPS Program Manage	<a href="#">Allen, Art</a>	X	
MarineDisp	NOAA	NOS	Office of Response and Restoration	Director, NOAA GOM Disa	<a href="#">Henry, Charles</a>	X	
MarineDisp	NOAA	NOS	Office of Response and Restoration	GNOME	<a href="#">Watabayashi, Glen</a>	X	

# Disaster SBA SMEs

## Solid Earth – Earthquake, Volcano, Landslide, Tsunami

Sub-SBA	Agency	LO	Office/Division	Expertise	POC	Phase I	Phase II
SE-Earthquake, Volcanoes, LS	DOE				Leslie Casey	X	X
SE-Earthquake, Volcanoes, LS	DOI	USGS			Francis Ashland	X	X
SE-Earthquake, Volcanoes, LS	DOI	USGS		Structural geology	Michael Blanpied	X	X
SE-Earthquake, Volcanoes, LS	DOI	USGS		Volcano hazards, plume ge	Charles Mandeville	X	X
SE-Earthquake, Volcanoes, LS	NOAA	NWS	OHD	landslides, debris flow	Pedro Restrepo	X	X
SE-Earthquake, Volcanoes, LS	USGS (USAID)			volcanoes, foreign disaster	Gari Mayberry	X	X
SE-Earthquake, Volcanoes, LS	DOI	USGS		Earthquakes	Lind Gee	X	
SE-Earthquake, Volcanoes, LS	DOI	USGS		Earthquakes	Bill Leith	X	
SE-Earthquake, Volcanoes, LS	NASA				John Labrecque	X	
SE-Earthquake, Volcanoes, LS	NASA				Craig Dobson	X	
SE-Earthquake, Volcanoes, LS	NOAA	NWS	OCWWS	Aviation, volcanic ash	Cecilia Miner	X	
SE-Earthquake, Volcanoes, LS	NSF				Greg Anderson	X	
SE-Earthquake, Volcanoes, LS	USAF			Volcanic ash, plume	Charles Holliday	X	
SE-Tsunami	DOI	USGS	Global Seismic Network	Research Geophysicist	Choy, George	X	X
SE-Tsunami	NOAA	NWS	OCWWS/Marine	Tsunami PM	Hollingsworth, Jane	X	
SE-Tsunami	NOAA	OAR	Pacific Marine Environmental Laboratory	Tsunami Modeler	Eble, Marie	X (SIFT Model)	



# Disaster SBA SMEs

## Severe Weather and Wildfire

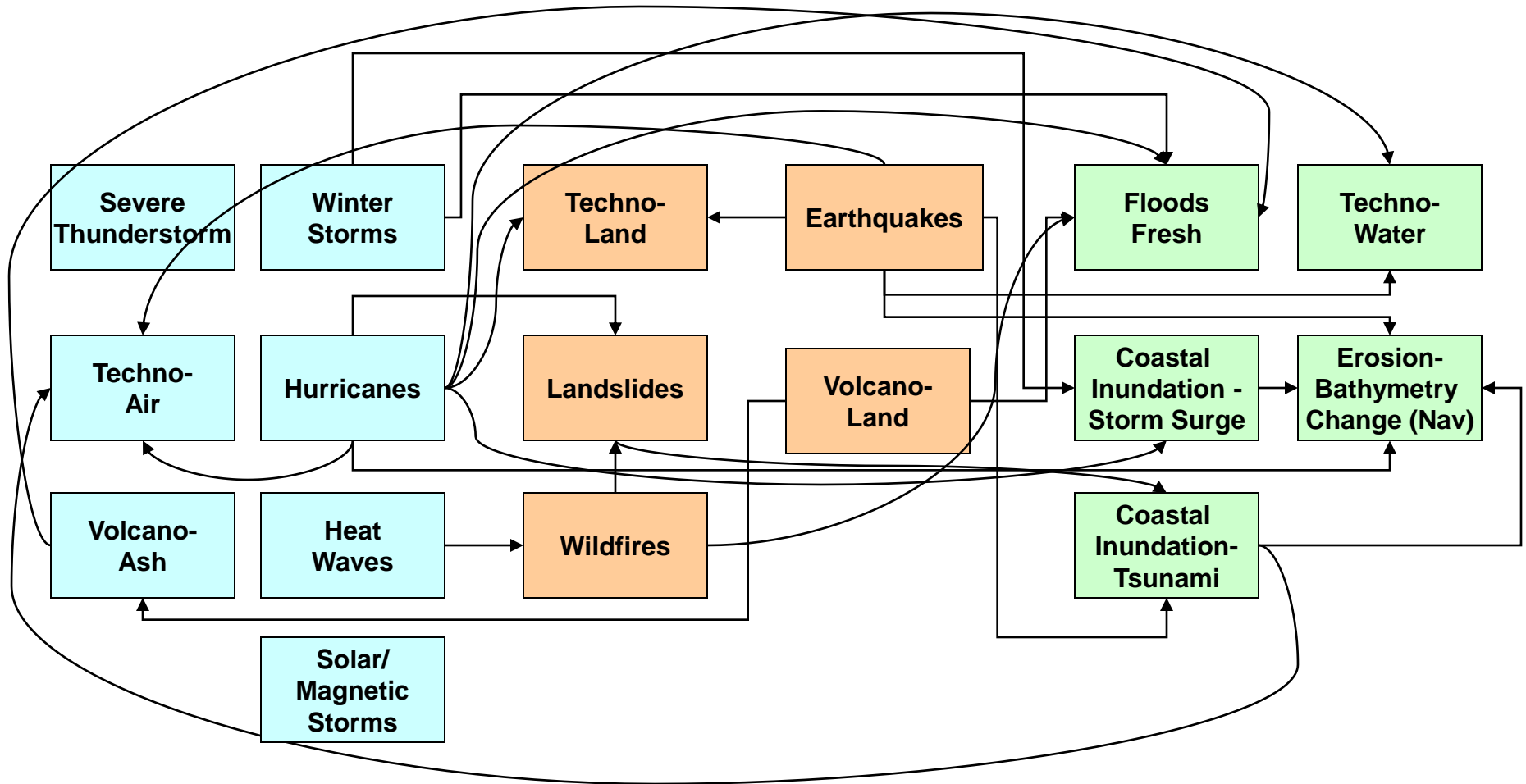
Sub-SBA	Agency	LO	Office/Division	Expertise	POC	Phase I	Phase II
SvrWx	NOAA	OAR	NSSL	Chief, Forecast Research and Development Division	Stensrud, Dave		X
SvrWx	NOAA	NWS	OHD	Hydro-Meteorological Testbed	Schneider, Tim		X
SvrWx	NOAA	NESDIS	STAR	Regional And Mesoscale Meteorology Branch	DeMaria, Mark		X
SvrWx	NOAA	OAR	AOML	Hurricane Forecast Improvement Program-Observing Team	Aberson, Sim		X
SvrWx	NOAA	NWS	NOHRSC	Hydrologic Remote	Olheiser, Carrie		X
SvrWx	NOAA	NWS	NCEP National Hurricane Center	Science and Operations Officer	Landsea, Chris	X	
SvrWx	NOAA	NWS	NCEP National Hurricane Center	Senior Hurricane Specialist	Brennan, Mike	X	
SvrWx	NOAA	NWS	WFO Miami	Meteorologist in Charge	Santos, Pablo	X	
SvrWx	NOAA	NWS	NCEP Hydroemeteotology Prediction Center	Science and Operations Officer	Novak, Dave	X	
SvrWx	NOAA	NWS	WFO Boulder	Science and Operations Officer	Thaler, Eric	X	
SvrWx	NOAA	NWS	WFO Norman	Science and Operations Officer	Andra, Dave	X	
SvrWx	NOAA	NWS	NCEP Storm Prediction Center	Science Support Branch	Bothwell, Phillip	X	
Wildfires	USDA	F&S		National Remote Sensing	Everett Hinkley	X	X
Wildfires	NWS				Pete Roohr	X	
Wildfires	NWS	NWS		NWS Fire Weather	Heath Hockenberry	X (NOSIA)	
Wildfires	USDA	FAS		National Remote Sensing	Glenn Bethel	X	

# Phase I – Sub-SBA/Key Objective Performance Scale

<b>Performance/Satisfaction Scale</b>		
<b>100</b>	<b>Ideal</b>	<b>Meets all requirements and exceeds some</b>
<b>90</b>	<b>Fully Satisfied</b>	<b>Meets all requirements</b>
<b>80</b>	<b>Good</b>	<b>Meets all major requirements with minor limitations</b>
<b>60</b>	<b>Fair</b>	<b>Meets most major requirements, with significant limitations</b>
<b>40</b>	<b>Poor</b>	<b>Fails to meet many major requirements, but provides some value</b>
<b>20</b>	<b>Very Poor</b>	<b>Fails to meet most major requirements, but provides minor value</b>
<b>1</b>	<b>No Capability</b>	<b>Provides no value</b>

# Disaster SBA

## Sub-Area Cause/Effect – A Case for Prioritization?



**Air**

**Land**

**Water**