




## The Value of Open Data and Big Data to the Weather, Water and Climate Enterprise

Panel Discussion

Moderated by *Dr. Edward J. Kearns*  
*National Oceanic and Atmospheric Administration (NOAA)*  
*National Centers for Environmental Information*

AMS Washington Forum  
 3:00 PM-4:30 PM: Wednesday, 13 April 2016

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## Our Distinguished Panelists

- **Laura Furgione**, NOAA/NWS
- **Mary Glackin**, The Weather Company, an IBM Business
- **Berrien Moore**, The University of Oklahoma
- **Barry Lee Myers**, AccuWeather Inc.

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## Framing Questions

- Are open data policies an opportunity, a threat, or both?
- Is data access or data utilization the biggest challenge today?
- How will Big Data advances change the information landscape?
- How is the expertise required to support Big Data applications best provided?
- Which has more overall value, access to data or services that are based on the data?

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## Panelist Comments and Discussion

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## National Weather Service

**Laura Furgione**  
 Deputy Director, National Weather Service

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## Open Data Policy and Big Data


- NOAA's environmental intelligence depends on reliable, timely access to **global** environmental measurements from satellites and other sources.
  - NOAA depends on and supports U.S. Government policies and directives that collectively establish U.S. open data principles.
  - NOAA depends on and supports international data sharing conventions such as those underpinned by World Meteorological Organization Resolutions 40, 25 and 60
- Rapid change in the commercial space services arena is yielding new technical and business approaches to acquiring data from commercial providers.
- NOAA's Commercial Space Policy represents an ongoing effort to promote private sector innovation while maintaining critical international data sharing regimes.
- **Big Data** is a distinct effort to more fully realize the benefits of open data policy by implementing technical solutions to make data more available, accessible and useful, including data from non-traditional and emerging sources .






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## NOAA Big Data Project

*Research through Data Alliances*

Collaborators established in April 2015 as nucleus around which data marketplaces (Data Alliances) can form


<https://data-alliance.noaa.gov/>

**Research Objective**

- Explore value proposition and self-sustainability of business model by mimicking full market ecosystem via Data Alliances

**What does success look like?**

- Demonstrated sustainable use cases of a market ecosystem in one or more Data Alliance

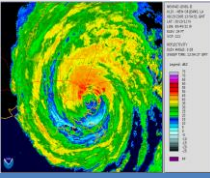
Researching self-sustainable business model mimicking market ecosystem

## NOAA Big Data Project

*Early Success*

**NEXRAD Level II Data**


- Archive and real-time data freely available to public on Amazon Web Services
- June 1991 - Present (270 TB compressed / 1 PB uncompressed)
- 60 percent decrease in anticipated data orders from NOAA/NCEI (Feb 2016)



**NEXRAD on AWS**

The Next Generation Weather Radar (NEXRAD) is a network of 160 high-resolution Doppler radar sites that detect precipitation and atmospheric movement and disseminates data in approximately 5 minute intervals from each site. NEXRAD enables severe storm prediction and is used by researchers and commercial enterprises to study and address the impact of weather across multiple sectors.

The real-time feed and full historical archive of original resolution (Level II) NEXRAD data, from June 1991 to present, is now freely available on Amazon S3 for anyone to use. This is the first time the full NEXRAD Level II archive has been accessible to the public on demand. Now anyone can use the data on-demand in the cloud without worrying about storage costs and download time.



Researching self-sustainable business model mimicking market ecosystem

## NOAA Big Data Project


*Current Activities*

**Tackling Big Challenges**

- MRMS**
  - Exploring the feasibility of delivering Multi-Radar Multi-Sensor data to the private sector through the Big Data Project
  - High Demand from private sector: e.g. Reinsurance industry seeks use for catastrophic flooding and severe storm damage prediction
  - Delivery requires coordination between NOAA, Oklahoma University (copyright holder), cloud providers and customers
- GOES-R**
  - GOES-R will produce very large volumes of data, so ftp delivery is not practical. We are exploring with collaborators how to provide GOES-R access on the cloud to the public on an equal access on equal terms basis. In doing so, NOAA hopes to address both technical and policy challenges.
  - NESDIS has already delivered 1.5TB of synthetic test data

## Evolving the NWS to Build a WRN

- Becoming a Weather-Ready Nation is about building community resiliency in the face of increasing vulnerability to extreme weather, water & climate events

**"Ready, Responsive, Resilient"** 

- REQUIRES NWS TO:
  - Fully integrate our field structure to produce:
    - Better forecasts and warnings
    - Consistent products and services
    - Actionable environmental intelligence
- Address the "last mile" that connects forecast to critical national, state and location decisions through IDSS

BIG DATA: used internally and generated for external usage

Involves entire US Weather, Water and Climate Enterprise using Big Data and WORKING TOGETHER



## Big Data and Evolving the NWS

Our ability to provide IDSS depends on Big Data, especially:

- Probabilistic Information
- Use of Ensembles
- Impact Data
- Predictive Analytics


Big Data will improve consistency and drive probabilistic predictive information critical to IDSS

- Examples: National Blend of Models and FACETS

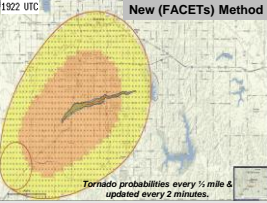
## Example Big Data Generation: FACETS Concept

1922 UTC



Current Method

1922 UTC



New (FACETS) Method

*Tornado probabilities every 1/2 mile & updated every 2 minutes.*

FACETS applied to the Moore, OK tornado on May 20<sup>th</sup>, 2013