Reducing geoscience data friction in the private sector: opportunities and barriers

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The increasing role of the private sector in the weather enterprise

"Today, the (weather) enterprise has grown considerably and now the NWS has many important partners."

"Private sector organizations provide value-added, end-user weather, water, and climate services to a broad set of customers encompassing both businesses and the public."

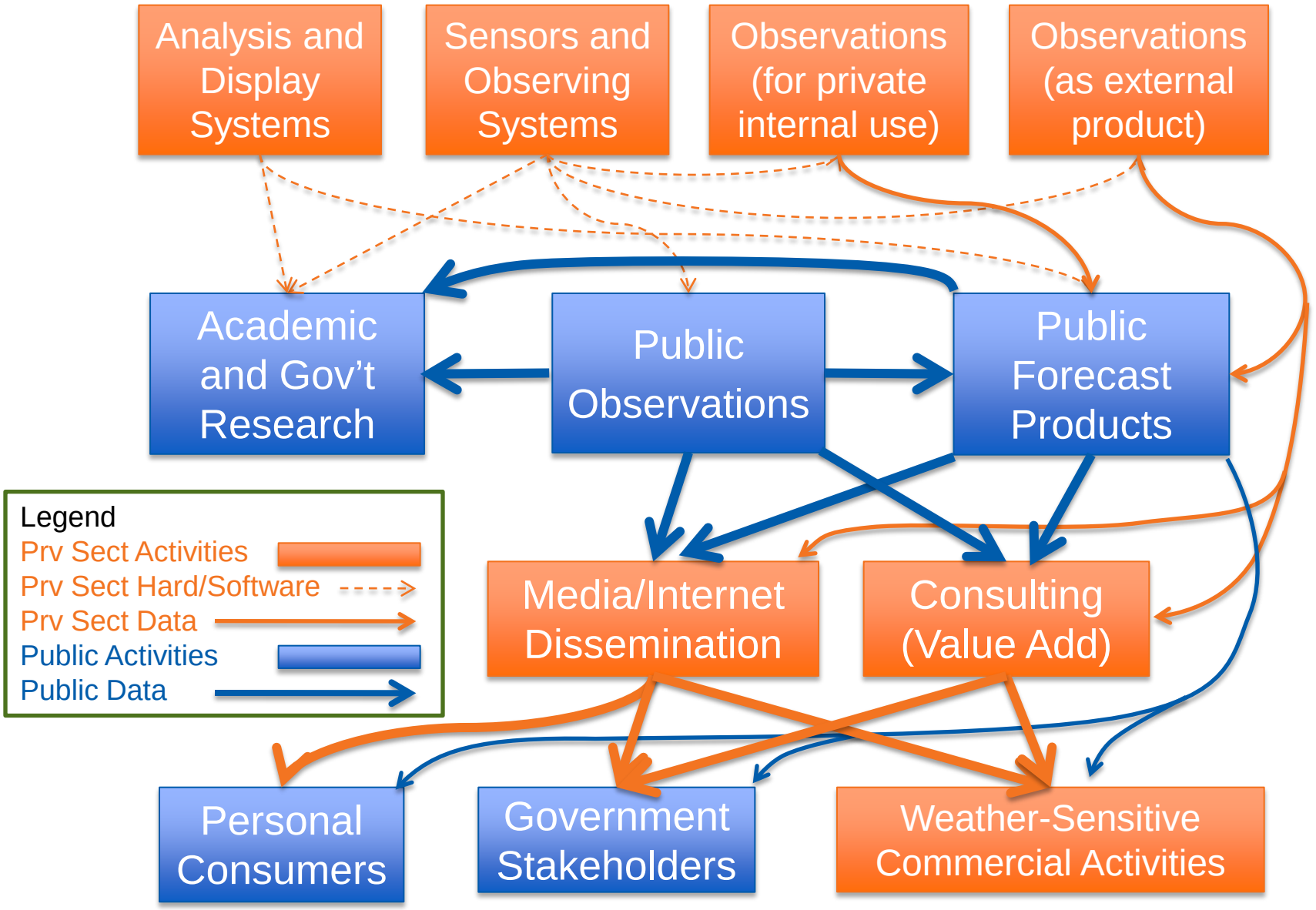
"All of these entities rely on core NWS infrastructure and capabilities to provide customized services."

"Together, this combination of the NWS and third parties serves the Nation better than the NWS could on its own."

- 2012 NRC Report "Weather Services for the Nation: Becoming Second to None"

The increasing role of the private sector in the weather enterprise

- Who is the private sector (PS), as it relates to the weather enterprise?
- How does the PS fit in to the “sea of data” within the weather enterprise?



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The increasing role of the private sector in the weather enterprise

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What is the economic value of the private sector in the weather enterprise?

- Revenue of “Weather Expert” subsector:
  “An estimate between $1.65 and $1.8 billion for the PS has high confidence, and the PS market may conceivably be as big as $2 billion.” (Spiegler 2007)

- Revenue of the remainder of the PS that is sensitive to weather:
  “42% of the $9 trillion U.S. economy was in some way sensitive to weather and climate.” (Pielke et al. 2003, NRC 1998).

Enigmatic behavior of the private sector

- Goal of the federally funded weather enterprise:

  “Make the best forecasts for the good of society.”

- Goal of the private sector of the weather enterprise:

  “Make money. Keep our jobs.”

- Private sector is very competitive by nature.

  e.g., our view of a “barrier to entry”: **bad** if it stops me, **good** if stops you.

Enigmatic behavior of the private sector

- Long-standing “cold war” between government funded and private sides of the weather enterprise (Pielke et al. 2003)
- The PS expects (indeed, depends on) a significant level of free data, products, and software from the public sector.
- However, ..
  - All data produced by the PS is considered a closely guarded asset, that either never sees the light of day or is sold to the highest bidder.
  - The PS has a keen sense of “turf” with regard to its functions vs. those of publically funded agencies.

Enigmatic behavior of the private sector

- PS is highly pragmatic about methods: “whatever works”; biggest gain for smallest effort (e.g., yes to ensembles and DA, but also statistical methods, analogs, etc.)
- PS does not speak with one voice…often different entities in the PS have completely opposing desires with regard to what the weather enterprise should be doing

Positive developments

- "NWS recognizes that cooperation, not competition, with private sector and academic and research entities best serves the public interest and best meets the varied needs of specific individuals, organizations, and economic entities. The essence of this partnership is an understanding of respective roles and responsibilities and how they complement each other. This includes government having a taxpayer-funded responsibility to provide basic information, while creating the conditions for private sector entities to maximize their ability to serve their constituencies."

  - The Weather-Ready Nation Roadmap, NWS, 2012

Positive developments

- “NWS can appropriately assume the role of an ‘honest broker’, receiving and protecting proprietary data from industry for use in improving the accuracy of foundational weather forecasts.”

  - The Weather-Ready Nation Roadmap, NWS, 2012

Positive developments

11/29/12 Weather data from nation's largest wind farms could improve U.S. models, forecasts

NOAA NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
UNITED STATES DEPARTMENT OF COMMERCE

Weather data from nation's largest wind farms could improve U.S. models, forecasts

Private companies share weather data with NOAA

November 14, 2012

Two of the nation's largest producers of wind-generated electric power will share privately-collected weather data with NOAA, providing agency scientists with additional observations from wind farms across the nation for research and operations.

NOAA now has data sharing agreements with Iberdrola Renewables of Portland, Ore., and NextEra Energy Resources of Juno Beach, Fla.—the country's two largest generators of wind-generated electric power, according to the American Wind Energy Association.

The companies will provide valuable weather observations from instrumented towers in their wind farms and wind speed data from instruments atop wind turbines. Since 2011, Xcel Energy of Minneapolis, Minn. has provided similar observations to NOAA.

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Private Sector Interest in EarthCube

- Even if EQ's goals are focused only on research and education (traditional NSF turf), the PS would benefit.
  - Education and training would enhance the talent pool.
  - EQ framework would (hopefully) provide easier access to data (common formats, virtual repository, documentation, open source tools), mitigating the "80/20" problem ("one offs")
  - PS could gain easier access to relevant out-of-discipline data (e.g. census data for AQ industry).
- If it is broader (focused not just on Res&Ed, but also on improving the entire weather enterprise), additional benefits to the PS could include:
  - Improved foundational data sets (observations, analyses, NWP forecasts) from NWS
  - Tech transfer from research to private enterprise

How can the private sector contribute?

- Many of the latest “whiz-bang” data sets are intertwined in the private sector (e.g., TAMDAR, pressureNET, Windpole™, Weatherbug™, instrumented cell towers, e.g. CASA radar, etc.). The PS should be engaged in populating the EarthCube.
- PS data is generally proprietary, and is either “for sale”, or hidden behind “nondisclosure” walls. However, mutually beneficial arrangements can be found (e.g., NOAA/Iberdrola/NextERA).
- The PS often interacts more closely with certain stakeholders than does the public sector, and can provide feedback on the products and metrics that really matter to those stakeholders.

Additional thoughts on EarthCube

- Agree with key statements from yesterday:
  - John H, Mohan R: EQ should be a framework and a process, not necessarily an outcome like a central repository.
  - Agree with Chris S, others: The **first focus** should be data: ease of access, common formats, solid documentation and metadata, and QC.
- A second step, perhaps contingent upon success with the first, would be to develop or incorporate software frameworks to enable broader access to ensembles, DA, and model/ensemble evaluation.

Additional thoughts on EarthCube

- Many current/planned efforts are very closely related to potential components of EQ:
  - Data archives: NOAA/NCEP/NOMADS, NESDIS/NCDC, NCAR/CISL/DSS
  - Formats: NetCDF/HDF, Climate and Forecast format, BUFR/PrepBUFR, GRIB/GRIB2
  - Virtual real-time data repository: NWS Data Cube
  - Data access: OpenDAP (Ferret, IDV, GrADS), Unidata LDM
  - DA-enabling frameworks: NCAR DART, NOAA OOPS (idea)
  - Evaluation: DTC MET
- Is there any risk of duplication? And are all the relevant developers in the conversation?