

US Weather Prediction

An Alternative Model

Justin Sharp, Ph.D

With Contributions From:

John Zack – AWS Truepower/Meso

Mark Ahlstrom – WindLogics

Eric Grimmit – 3TIER

Klondike Wind Farm, Photo © Justin Sharp

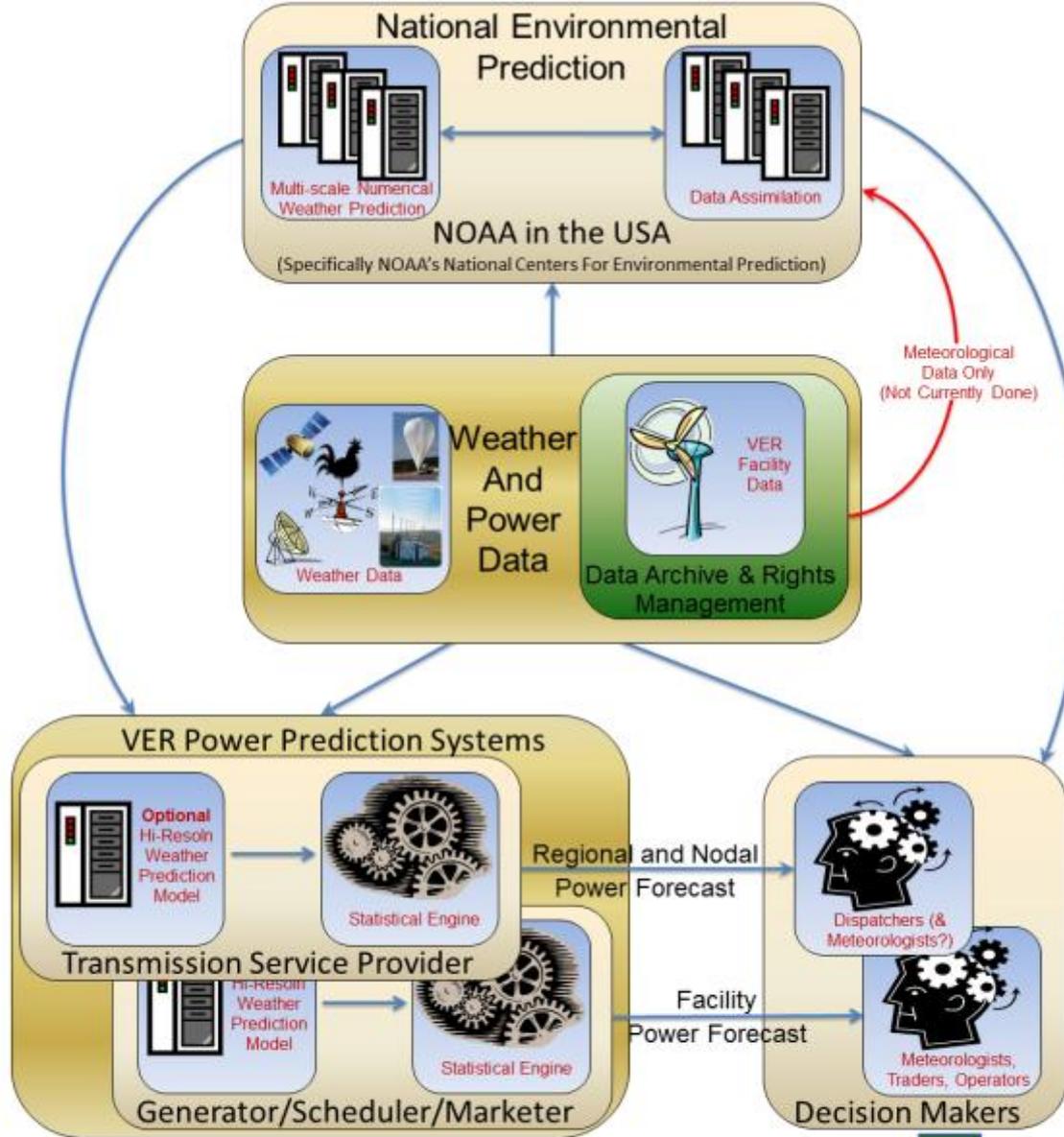


Clearer Vision for Renewables

3367 NE Oregon Street,
Portland, OR 97232

justin@sharply-focused.com

AMS Board on Enterprise Communications Meeting
November 29, 2012. Silver Spring, MD



Example Emphasizing the Importance of Foundational Forecasting



Courtesy of Dr. Justin Sharp
 Owner and Principal
 Sharply Focused LLC
justin@sharply-focused.com
 May be redistributed with
 this label intact.



Disclaimer

- **These are ideas for discussion purposes**
 - **They do not represent anyone's official position**
 - **Their value will increase with constructive analysis and criticism**
 - **They have evolved quickly in the last 4 weeks**
- **Critique of the status quo identifies areas of possible improvement. It is not intended to offend or demean any group or individual**



Motivation

- **Weather forecasts from the US operational centers are lower in skill than some counterparts around the world, most notably the ECMWF**
- **The weather sector is undervalued and underutilized**
 - **Probably not just in the USA**

Can We Fix This?



You Can't Please All The People All The Time

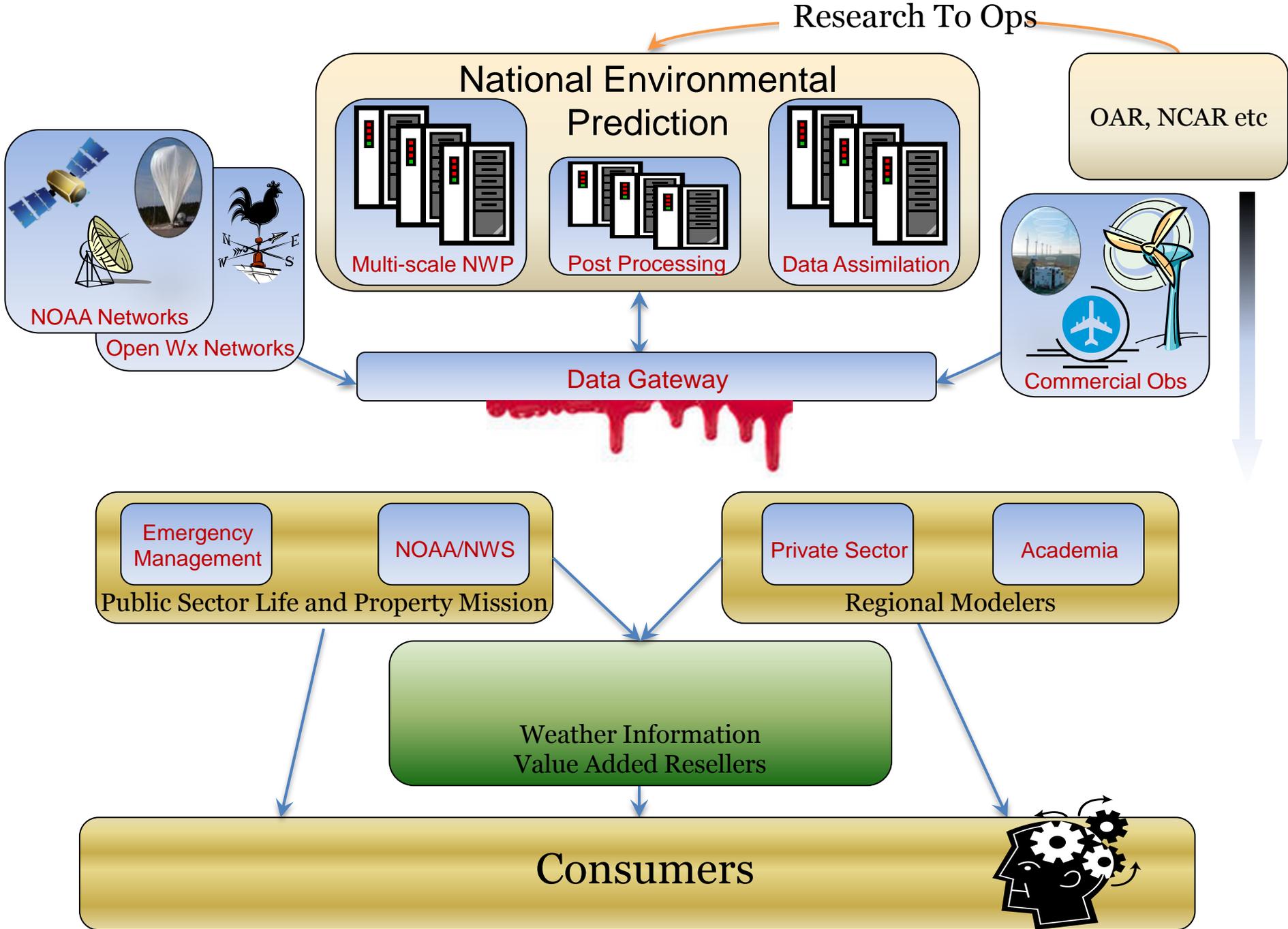
- **NOAA's resources are fundamentally limited**
- **All stakeholders will never be satisfied**
 - **Diverse and complex needs yield competing interests**
- **Politics chains NCEP to expensive suppliers**
- **Hard to connect the dots from cost to value**
- **NOAA/NWS is chronically underfunded**
- **Infrastructure limitations: bandwidth etc**



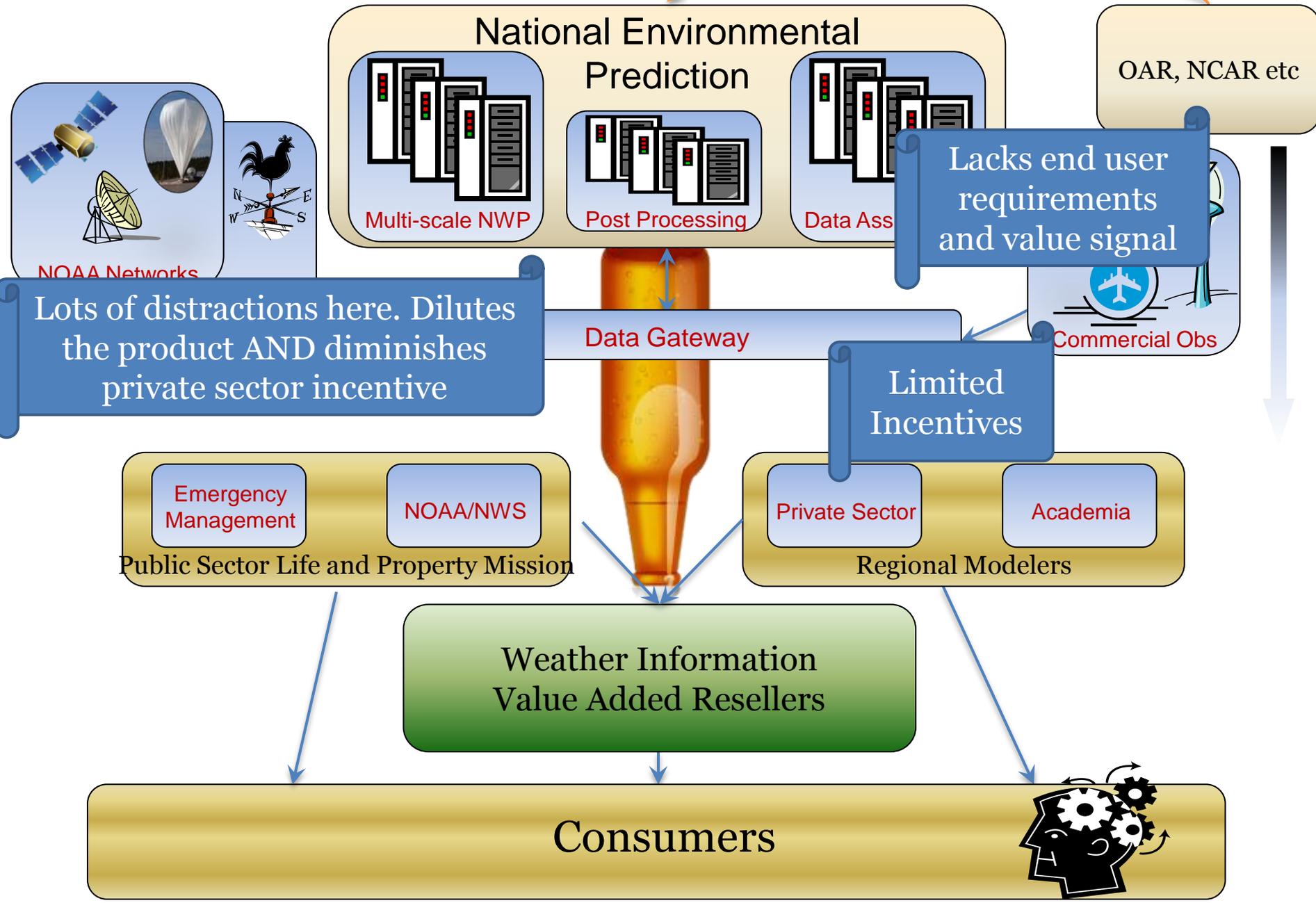
The Results Are In

- **NCEP HPC costs are extraordinarily high**
- **Bullet proof reliability requirements create unnecessary hurdles to progress**
- **World leading research yet transition to operations is painfully slow**
- **NOAA/NWS is chronically underfunded**
- **Legacy tasks performed because “we have to”**
 - **Performance is sometimes mediocre**
 - **But what is available stifles innovation**
- **NOAA products and data are not available and open to all**





Research To Ops



What Do We Need To Do?

- **FOCUS – Each sector does what it is best suited to do**
 - **Public: Assimilation, global forecasting, high reliability**
 - **Private: NWP solutions customized to client needs. Sometimes speed or price trumps reliability and accuracy!**
- **Remove the barriers to healthy robust private sector NWP**
 - **Provide the best possible foundational data to enable world leading private sector NWP**
 - **Remove artificial price signals to allow competition to develop**
 - **Encourage innovation and progress by providing open access research to ops**
- **Ensure that overall cost is in line with current cost or that improvements merit the expense**

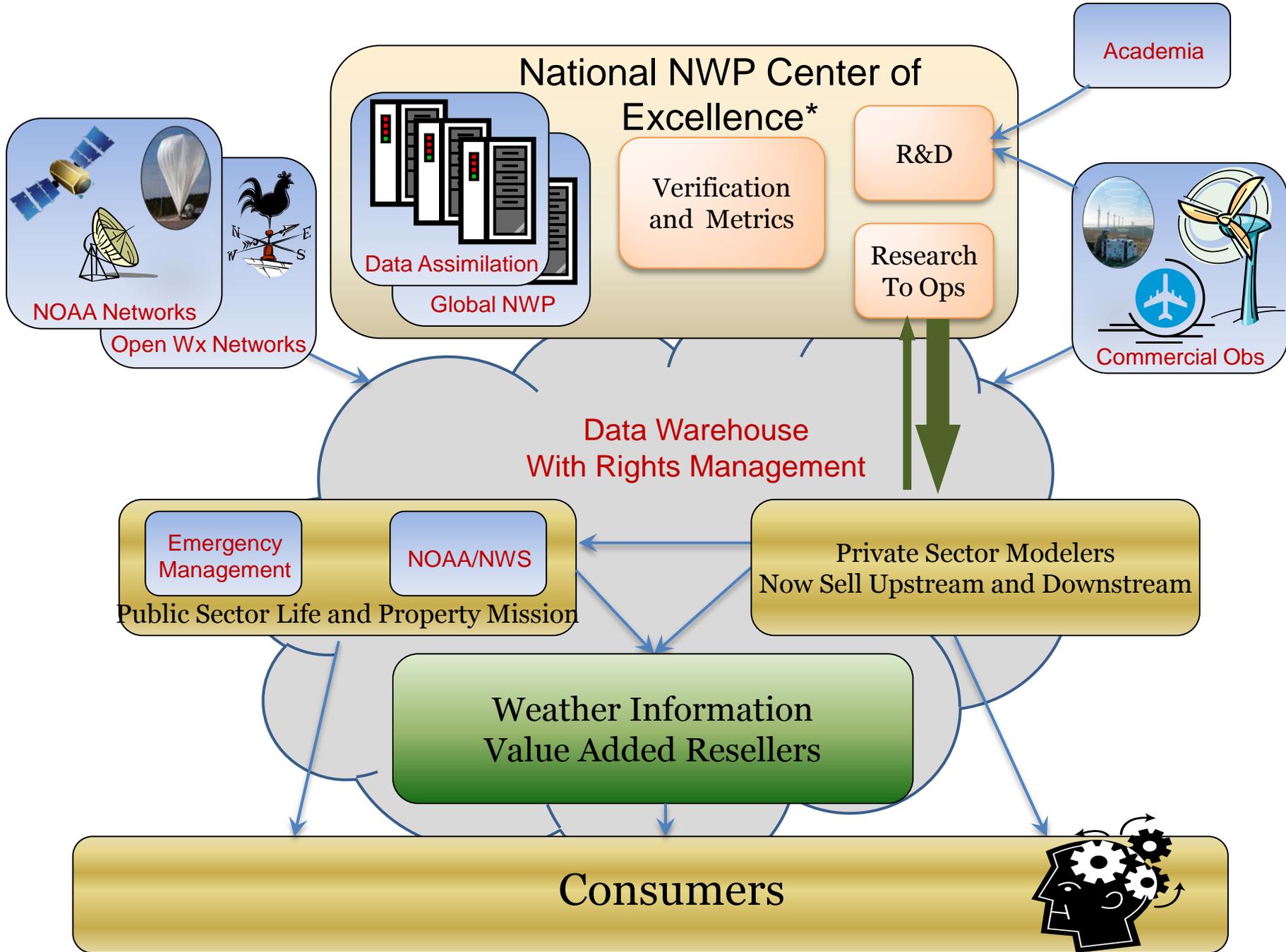
Think SpaceX



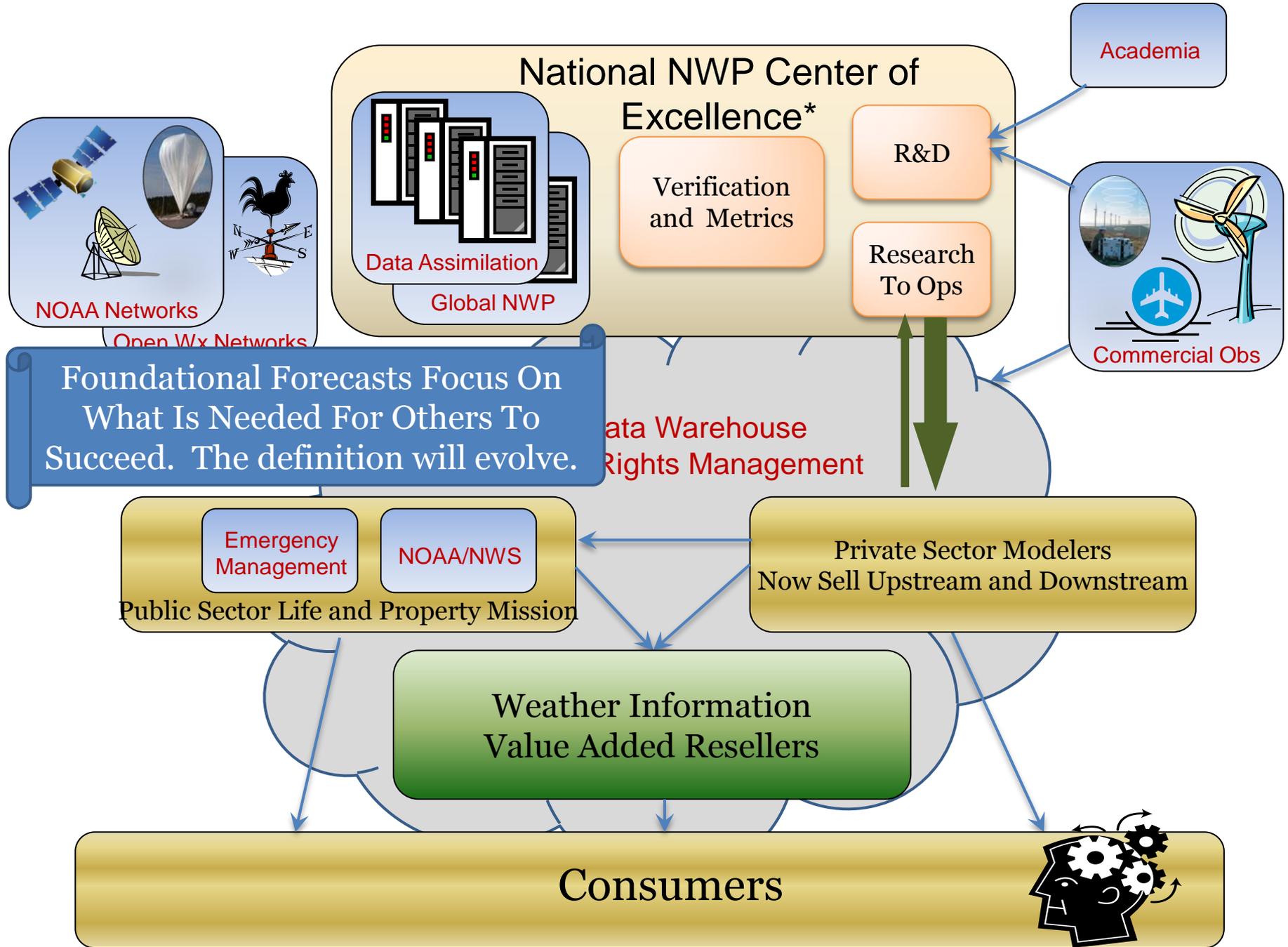
Just A Few Changes

- **Ensure that a group exists within NOAA that is a center of excellence for creating and rolling out NWP improvements to the community as well as NCEP. Open to all, at least in the US and is a two way street**
- **Allow NCEP to turn its focus on assimilation and global modeling**
 - Like the ECMWF does.
- **Begin to migrate other NWP to the private sector**
 - Create a market for NWP solutions tuned to different needs – some want it fast at the expense of detail, some crave reliability at any cost, others want it cheap
 - This already exists today but the existence of the NCEP solutions for free distort the market
 - If NOAA (or any other govt dept) needs regional area NWP they procure it from the private sector. This output is subject to negotiated disclosure arrangements and is unlikely to be open to all
- **Create an optional clearing house for NWP verification. An independent auditor who can validate forecast skill, timeliness and reliability against standard metrics.**
 - This is a complicated subject. Where does it belong? Public or private?
 - Perhaps the market will create it if it is needed?





* Center does not imply everything needs to be physically collocated, just organizationally aligned



* Center does not imply everything needs to be physically collocated, just organizationally aligned

Anticipated Consequences

- **The growth of a substantive private sector NWP enterprise with lots of competition**
- **More product diversity and redundancy adds to robustness**
- **Solutions are tailor to client needs instead of one size fits all**
- **Signals from the private sector to NOAA research about the most important R&D**
- **Price signals that value private data networks**
- **Rapid R2D adoption in the private sector as companies look to get a competitive advantage**
- **Less complexity within NCEP with less competing interests**
 - simpler R2D upgrade paths that are easier to justify and implement
- **Growing private sector may encourage better NOAA funding**
- **This paradigm shift could ultimately play out into global forecasting as well**



Potential Challenges

- **Demanding end users will likely pay more**
 - **This is really the way it should be**
 - **Overall societal burden likely reduced AND product is improved**
- **Cultural acceptance**

Bottom Line

- **NOAA has to do it all or pull back enough on certain aspects and allow the market to work**
 - **The former is probably not an option**
 - **Even if it was, is it justified?**



Discussion

“Cautious, careful people, always casting about to preserve their reputation and social standing, never can bring about a reform.”

- **Susan B. Anthony**

Hay Canyon Wind Farm. Photo © Justin Sharp



Clearer Vision for Renewables

3367 NE Oregon Street,
Portland, OR 97232

justin@sharply-focused.com

AMS Board on Enterprise Communications Meeting
Silver Spring, MD – November 29, 2012