Successfully Transitioning Science Research to Space Weather Applications

James Spann, NASA/MSFC
Two examples
Commitment
Culture
Clarity
Cycle
Check
Conclusions
SERVIR—the Regional Visualization and Monitoring System—helps government officials, managers, scientists, researchers, students, and the general public make decisions by providing Earth observations and predictive models based on data from orbiting satellites. The SERVIR system helps nations in Mesoamerica, East Africa, and the Himalayan regions cope with: disasters, ecosystems, biodiversity, weather, water, climate, health, and agriculture.

Works hand-in-hand with the State Department USAID program


Dan Irwin - Head of SERVIR
Short-term Prediction Research and Transition (SPoRT) Center is a NASA project to transition unique observations and research capabilities to the operational weather community to improve short-term forecasts on a regional scale.

- Works hand-in-hand with NOAA National Weather Service

- [http://weather.msfc.nasa.gov/sport/](http://weather.msfc.nasa.gov/sport/)

- Dr. Gary Jedlovec - Head of SPoRT
Experimental VIIRS Blackout RGB Composite

R=8/31, G=8/31, B=11/1
November 1, 2012

Clear sky yellows: Likely power outages
Detection of outages in Lower Manhattan, Long Island, NJ

Hurricane Sandy “Frankenstorm”
Restoration to white color – some power returns.

Continued outages in New Jersey

Experimental VIIRS Blackout RGB Composite

R=8/31, G=8/31, B=11/3

November 3, 2012
Much of the major outages restored – remaining outages may be below the satellite resolution.

Experimental VIIRS Blackout RGB Composite

$R=8/31, G=8/31, B=11/6$

November 6, 2012
Commitment

- Nothing happens overnight
- There has to be a commitment on both sides:
  - research/operations
  - science/applications
  - provider/user
- Commitment must exist at all levels; from management down to implementer and user
- End-User engagement from the beginning is important
Culture

- The provider and user exist in very different cultures

  - Provider (researcher)
    - focuses on detail, perfection
    - how things work
    - scientific method
  
  - User
    - just want it to work
    - doesn’t care about some of the details

- The researcher must live in the user world long enough to understand it - not the other way around
Clarity

- Clearly identify the needs and requirements
- Reassess needs and requirements on a frequent and regular basis
- Identify conditions of satisfaction for the end user
- Involve the user in the entire process
- The user must have some investment in the product in order for them to eventually own it
SPoRT Cycle

- match forecast challenge to data or product
- develop solution / demonstrate in “test bed” environment
- integrate successful products into end user’s decision support tools
- create product training
- perform product assessment
- Maintain interactive partnership with end user throughout process
- Need local end user advocate for product
- Endorsement from all levels of end user organization
Reality Check

- Just because we (i.e. researchers) have provided a great product, the user will adjust to it - **NOT**

- Often user does not have the resources to receive and ingest the product

- In the cases of SERVIR and SPoRT, USAID and NWS provide capacity to the receiver to ingest the product

- Recognize and understand the difference between research, building tools, and transition process

- Must be intentional to successfully transition – not a weekend activity
Conclusion

- We have a lot to learn from our Earth Science colleagues
- They have been at this much longer than we have
- But we have a future
- This is an area of growth in the discipline because it brings a new dimension, an applied dimension
- Transitioning must be intentional and be able to stand on its own