Product Training and Assessment

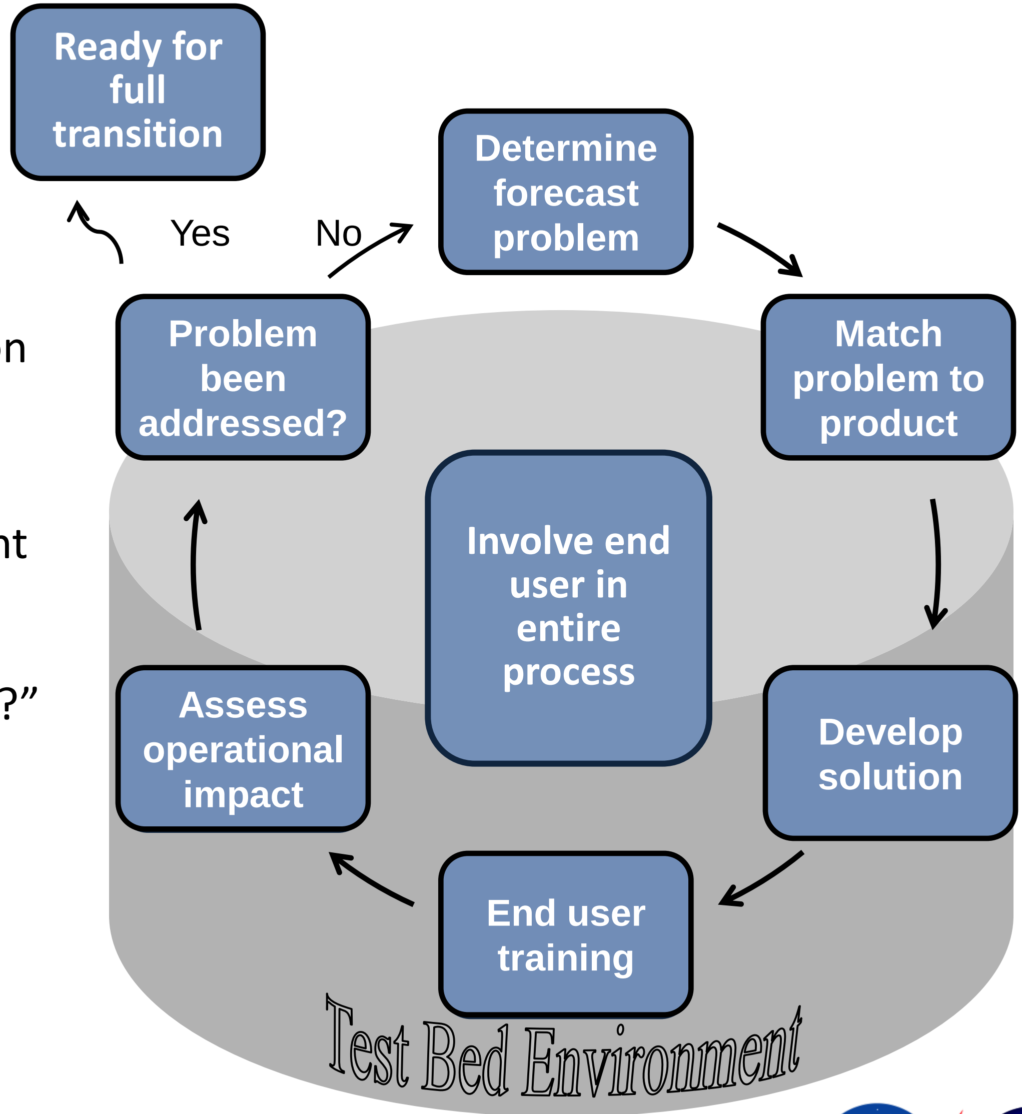
Science Advisory Committee Meeting

26 – 28 August, 2014

National Space Science and Technology Center, Huntsville, AL

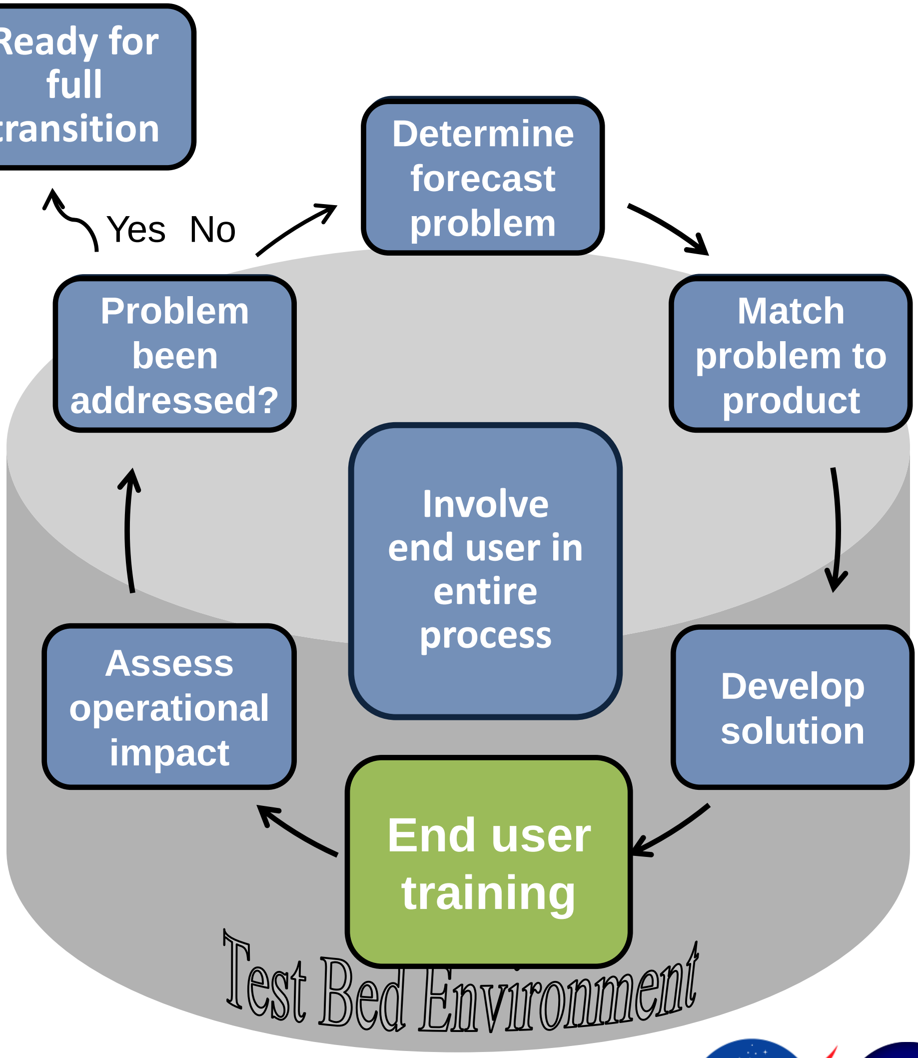
Transitioning to Operations

- SPoRT Paradigm:
  - Interactive partnership
  - Integrate end user's decision support tools
  - Create product training
  - Perform product assessment
- Why do this?
  - Bridge the "Valley of Death?"



Types of Training

- Site Visits
- Module (~15-30min) / LMS
- Micro-lesson (<15 min)
- Tele-training
- Quick Guides
- Blog posts/examples
- Advocate (peer-to-peer)
- Testbed – leading to assessment



Site Visits

As a group, we <u>initially</u> brought up "site visits" as most successful

- 1-on-1 time with staff allows relationship building as well as Q&A
- Have done this prior to intensive eval. periods to help ensure training
- Have sent SPoRT SME to SPC and AWC to provide total lightning training
- Have coordinated with EUMETSAT to have remote sensing expert train on RGB imagery at NHC
- However, this method is more challenging and occurs less frequently.

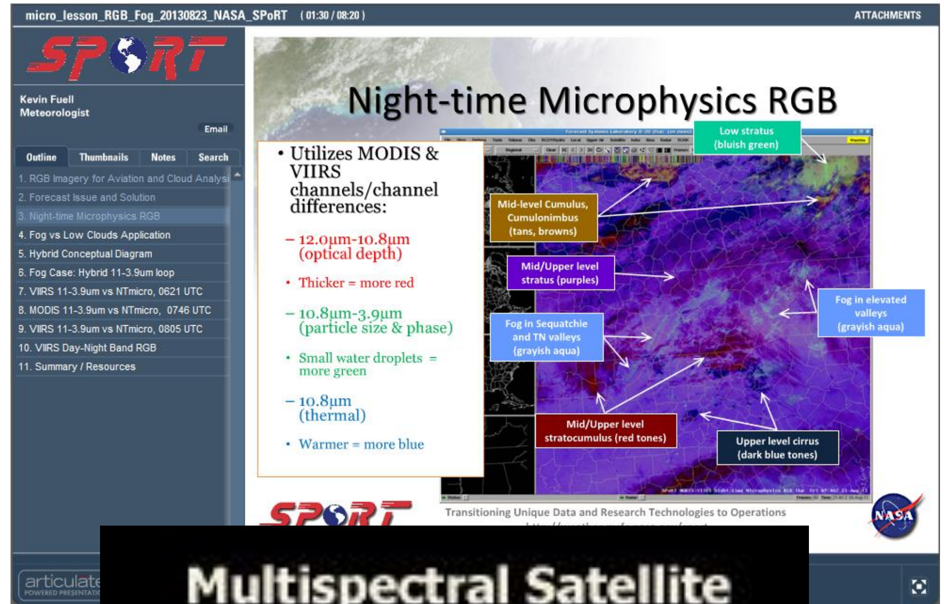
While considered a successful method, there are <u>limitations</u>.

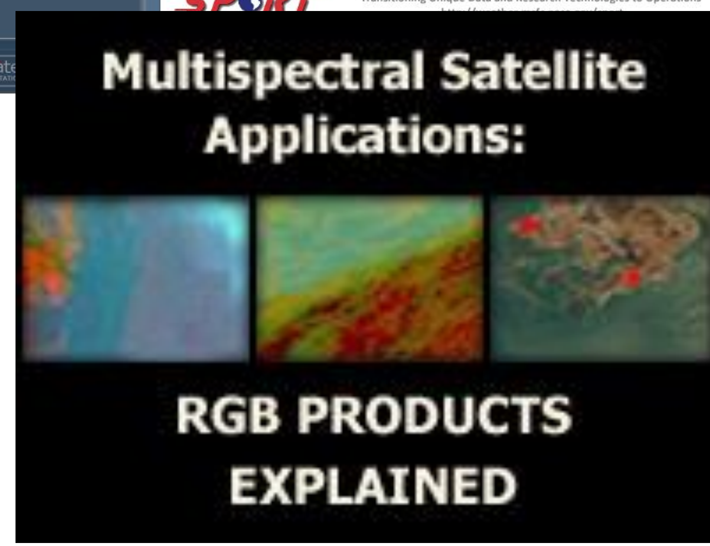
1. Lack of trainer time means that visits do not occur everywhere
2. Lack of trainee time means that not every gets to attend training during onsite visits
3. If time were available, likely to have lack of funds for travel or required staffing to fill void.
4. Tend to consider the training task "done" after the visit, but additional contact and engagement is typically needed

So…….. Several other methods employed

User-based, Operational Modules

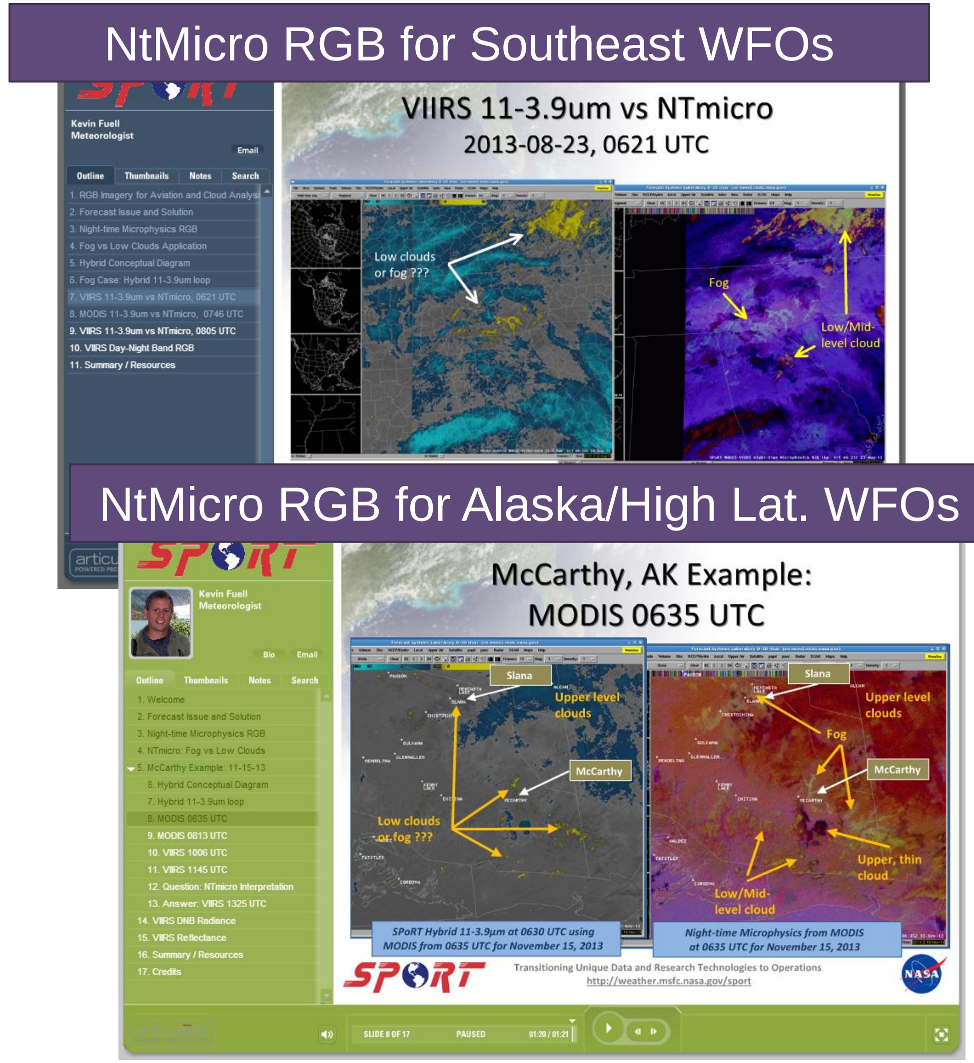
- General methodology is to enter a "testbed" mode with select users to determine product impact
- Examples from users are captured for training module to wider audience (peer-to-peer)
- Focused, short
- Rely on other group's foundational training





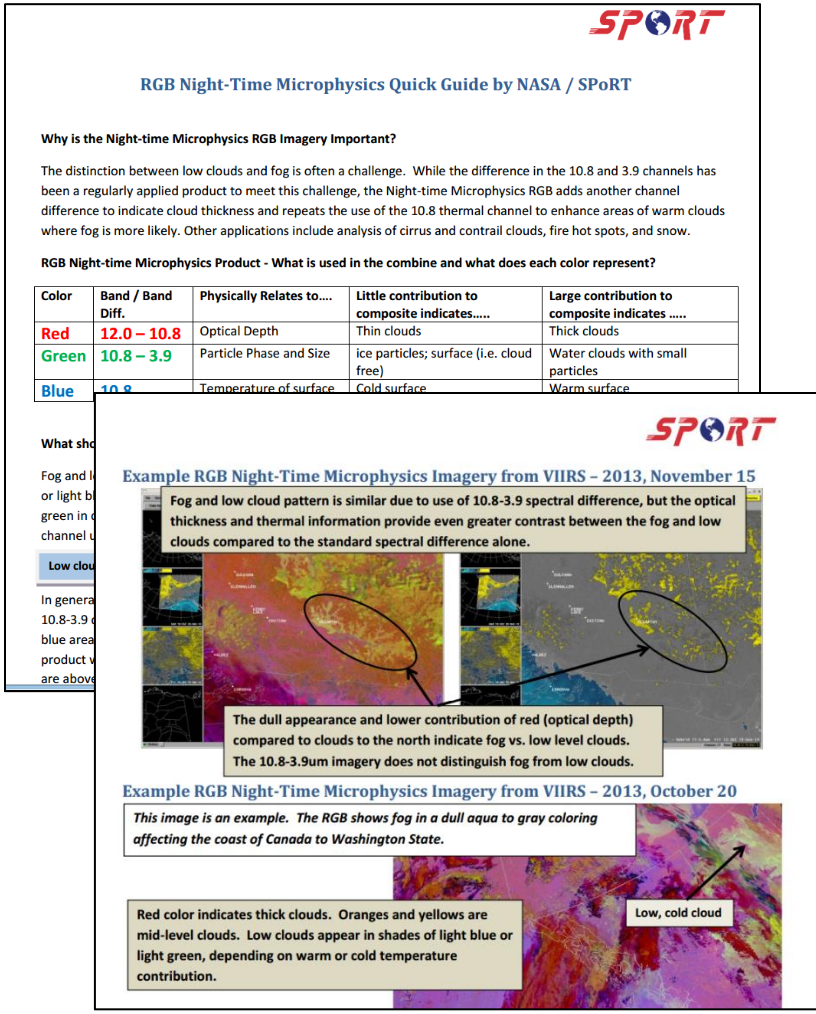
Micro-lesson vs. Module

- Micro-lesson: Ideally less than 8 minutes, goal of less than 15 minutes
- Assumes users have background knowledge
- Easy to digest in short timeframe
- Fast to create vs module
- Easy to reference in operations b/c not large amounts of info. to have to look through
- Regionally focused
  - Made separate S. CONUS vs Alaska training



Quick Guides in Operations Area

- 2-sided, single sheet hardcopy for reference in operations area
- Gained momentum in 2012 with transition of RGB imagery
  - Many other groups copied the idea, although name may have changed
- #1 training reference used by forecasters during SPoRT assessment
- Meant to complement other, more robust training; not necessarily stand on its own
- DANGER: It's like fast food
  - Easy & quick to create, Too much is unhealthy



SPoRT

RGB Night-Time Microphysics Quick Guide by NASA / SPoRT

Why is the Night-time Microphysics RGB Imagery Important?

The distinction between low clouds and fog is often a challenge. While the difference in the 10.8 and 3.9 channels has been a regularly applied product to meet this challenge, the Night-time Microphysics RGB adds another channel difference to indicate cloud thickness and repeats the use of the 10.8 thermal channel to enhance areas of warm clouds where fog is more likely. Other applications include analysis of cirrus and contrail clouds, fire hot spots, and snow.

RGB Night-time Microphysics Product - What is used in the combine and what does each color represent?

Color	Band / Band Diff.	Physically Relates to....	Little contribution to composite indicates.....	Large contribution to composite indicates .....
Red	12.0 – 10.8	Optical Depth	Thin clouds	Thick clouds
Green	10.8 – 3.9	Particle Phase and Size	ice particles; surface (i.e. cloud free)	Water clouds with small particles
Blue	10.8	Temperature of surface	Cold surface	Warm surface

SPoRT

Example RGB Night-Time Microphysics Imagery from VIIRS – 2013, November 15

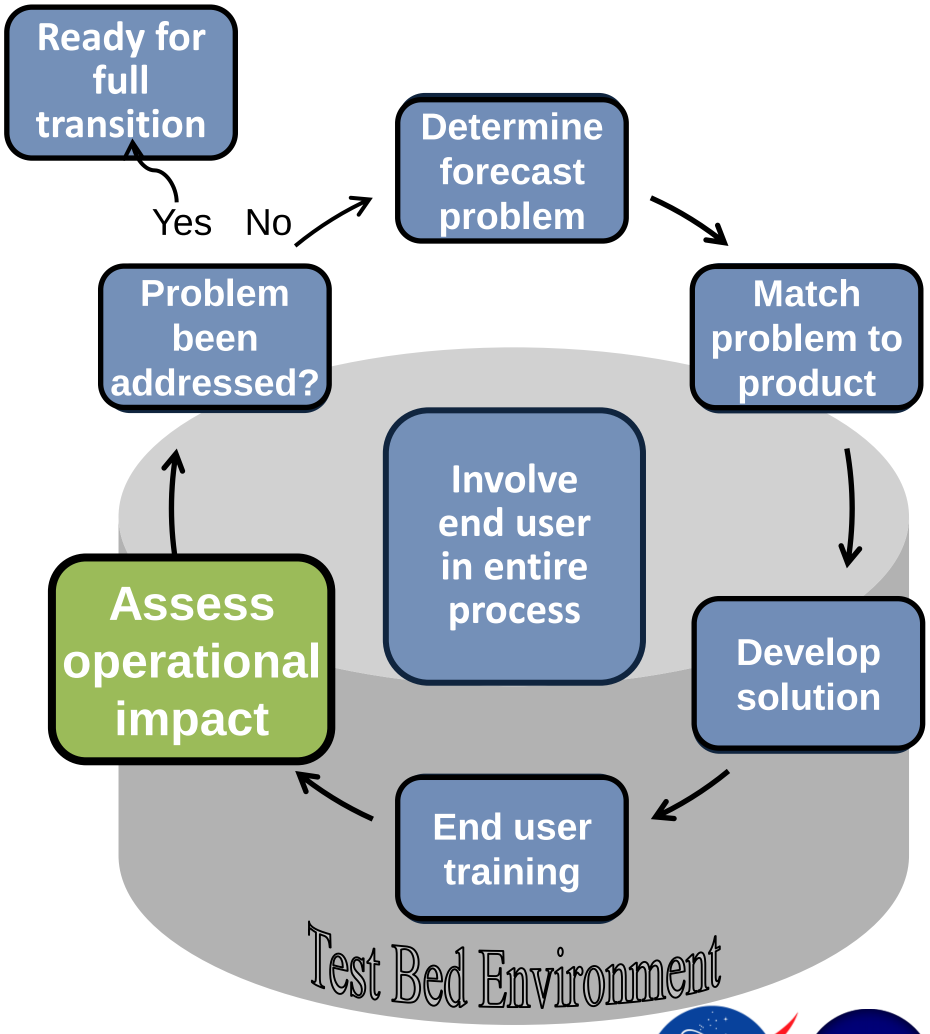
Example RGB Night-Time Microphysics Imagery from VIIRS – 2013, October 20

Multi-Spectral Imagery Training Experiences

1. Site visits: Materials presented over the course of 2013 at Alaska and SR & ER WFOs
   - Focus on Aviation and Cloud Analysis, specifically fog
   - Not all collaborators were visited
2. Module foundation
   - Relied on COMET for this
   - MFR already had COMET's "RGB Imagery Explained" in their plan
3. Testbed (season, ~3 months)
   - transitioned in previous season for CONUS, but not Alaska
4. Micro-lessons of operational application examples
   - Separate lessons for Alaska vs CONUS
   - Complemented the existing plan at MFR; largest feedback from them during evaluation period
5. Teletraining to office "advocates" (SOO + 1-2 staff)
   - Multiple sessions for differing users
   - SR inland (Fall 2013), SR coastal and High Latitude (Winter 13/14)
   - Involved Application Integration Met.
     - Could this concept be extended to WFOs?
6. Quick Guide
   - Alaska and CONUS versions
7. Intensive Eval. Period to practice and further refine knowledge/skill as well as share with other users
   - TFX Forecaster scored impact as low initially, but later presented same case in more positive light
   - Indicated additional need for training or different approach
     - NCs can use SEVIRI data. Can WFOs?

NASA-SPoRT Assessment

- Short (4-8 weeks) and intensive (aim for 1 survey per day)
- One or several products that meet similar needs
- Products matched to a forecast problem
- Efficient for forecasters and actionable feedback for product developers and project managers



Means of Collecting User Feedback

- Assessment page
  - Quantitative questions
  - Open comments
- Follow-up Emails/Phone calls
  - All submitted feedback receives a follow-up via e-mail (“Thank You”, and questions). Promotes SPoRT-user interactions.
  - Info exchange with product developers
- Blog
  - Case examples
- Assessment “Wrap-up” Telecon
- Results in an Assessment Report

VIIRS & MODIS Multi-Spectral Imagery Assessment Report for Aviation Weather and Cloud Analysis, 2013-14, Fall / Winter

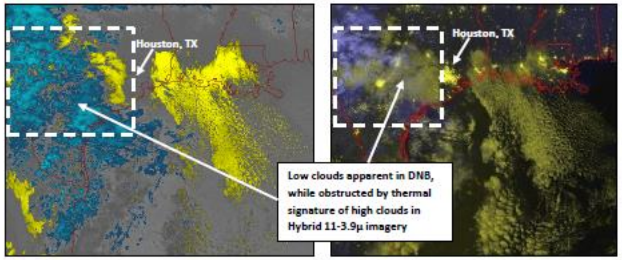


Figure 7. The SPoRT Hybrid GEO/LEO 11-3.9μ with VIIRS inserted (left) and the VIIRS Day-Night Band Radiance RGB Imagery (right) for 0749 UTC on 19 December 2013.

The SPoRT NWS chat room (address nasa_sport) was also provided to all forecasters at each participating NWSFO as a forum for feedback during the evaluation. The chat room was created to enable efficient communication between SPoRT and collaborators in an open forum setting. In addition, the chat room has proven to be valuable for communicating information about specific products and any related technical issues. Communication was also conducted via email with users to acknowledge their submitted feedback and respond to their comments or ask for clarification. These conversations lead to improved understanding of the product’s impact and uses that can then be shared with other forecasters during and after the assessment is completed.

Results

User Feedback to Assessment Questions

Online submission of feedback from operational forecasters came from 8 different WFOs stretching from Albuquerque, NM to Raleigh, NC (Figure 1). In all, 51 surveys were submitted during the two assessment periods described in the Methodology section above. In addition, a variety of blog posts and e-mail correspondence occurred as part of the feedback being considered here from users. Overall, the majority of responses indicated that the NTmicro RGB was the preferred product and 2/3rd of the users said it had some to large impact on general aviation forecast issues (Figure 8).

Example page from Assessment Report

Types of Questions on Assessment Form

- Impact of training:
  - Was the training (QG, modules, etc.) completed?
  - What resources were used during event (e.g., peers, Quick Guide)?
- Confidence in product
  - Likert scale
- Forecast Issue addressed
  - Multiple choice
- Other products complemented or used
- Impact of product on operational/forecast process
- Comments

SPoRT Short-term Prediction Research and Transition Center

SPoRT 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.

Real-Time Data | Core Projects | GOES-R PG | JPSS PG | Transitions | Library | Organization

RGB Imagery Evaluation for Aviation and Cloud Analysis

Please fill out the 2-minute feedback form below in order to provide NASA/SPoRT with end-user input to the RGB imagery for aviation and cloud analysis.

Rank the impact of the VIIRS Day-Night Band RGB on Aviation Forecasts in general (i.e. TAFs)

- Very Small
- Small
- Some
- Large
- Very Large

Choose all the items in which the VIIRS DNB RGB was used

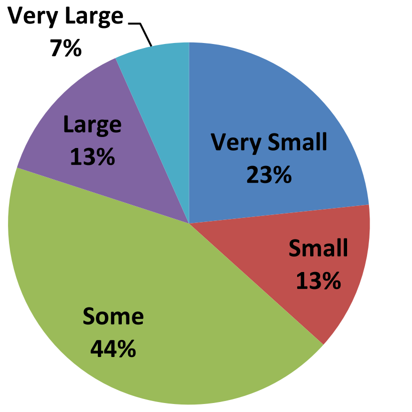
- Fog and low clouds
- Analysis of precipitating cloud structures at night
- Changes in city light patterns
- Lightning in active thunderstorms
- Smoke plumes and/or hotspot (i.e. fires, gas wells, etc.) analysis
- N/A
- Other:

What existing products were complemented by the use of SPoRT-transitioned products being evaluated?

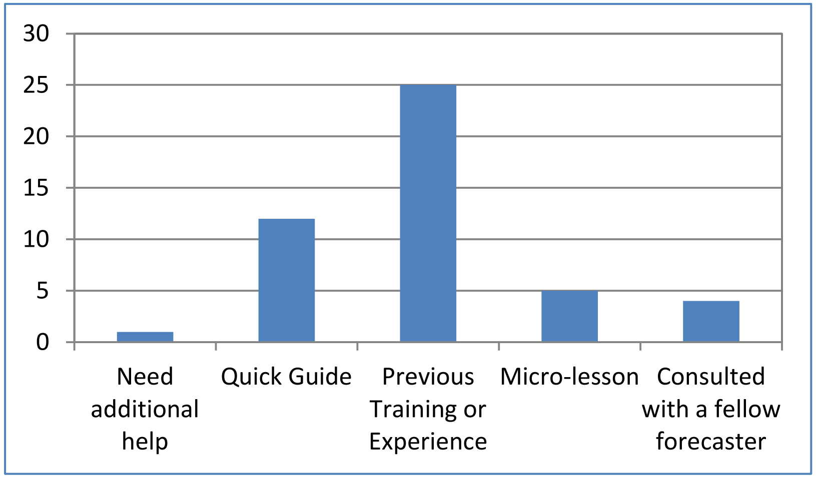
Additional Comments

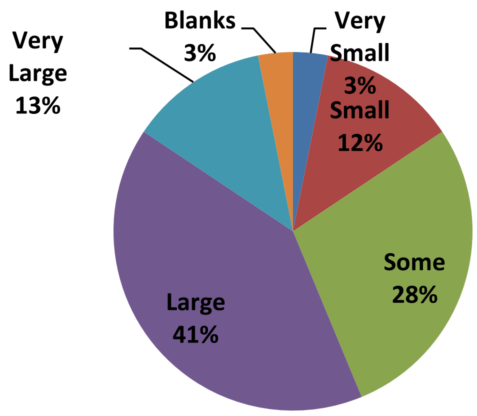
Example Quantitative Feedback

- While feedback on impact can be qualitative, the “rank” and Likert scale questions help to provide quantitative results



Impact of VIIRS DNB RGB to Aviation Forecast Issues





Impact of NTmicro RGB to Aviation Forecast Issues

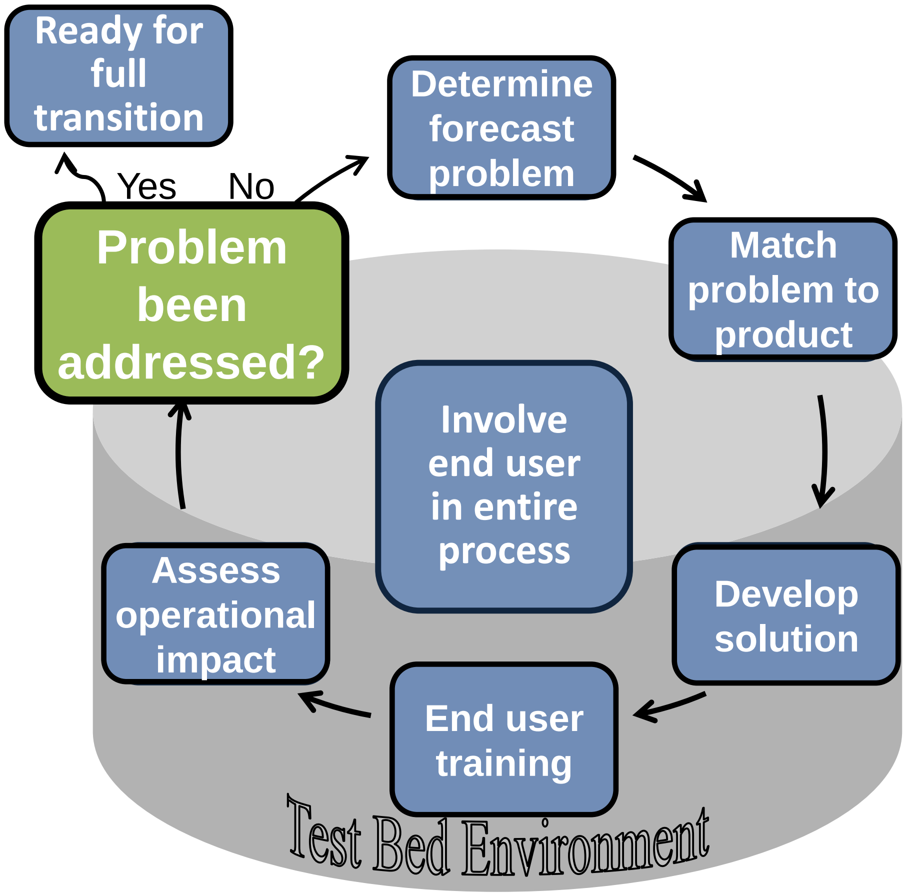
Actionable Feedback

- AK forecaster: “There have been multiple examples over the past week of similar appearance of fog vs. stratus in this very cold environment. Perhaps the cold sfc temps signal is dominant and not allowing differentiation between the fog and stratus?”

Product modification is needed

Another product fits issue

Additional Training



In Conclusion

- Training comes in many shapes and sizes
- User involvement in training development is key
- Several points along the transition path use training
- Product assessments are short, focused efforts with a collaborative partner on a specific problem
- Interactive relationship between users and developers is key to assessment "success"
- Assessments provide opportunity to strengthen O2R