

# Applied Remote Sensing Training (ARSET)

<http://arset.gsfc.nasa.gov>

**GOAL:** Increase utilization of NASA observational and model data for decision-support through training activities for environmental professionals.

**Webinars:** Live and recorded, 4-6 weeks in length. Include demos on data access, GIS and NASA webtools

**In person training:** In a computer lab, 2- 4 days, partnering with 1 or more stakeholders.

**Application Areas:** water resources, disasters, health/air quality, land, and wildfire management.



## Accomplishments (2008 – 2014)

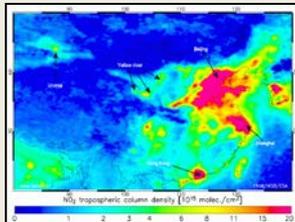
- 46 trainings completed
- 2300+ participants worldwide
- 700+ Organizations

# Applied Remote Sensing Training (ARSET)



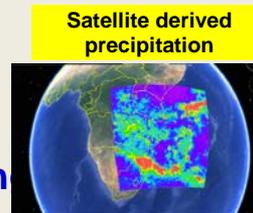
## Health (Air Quality)

- 2008 – present
- 33 Trainings
- 1000+ end-users
- Analysis of dust, fires and urban air pollution.
- Long range transport of pollutants
- Satellite and regional air quality model inter-comparisons.
- Support for air quality forecasting and exceptional event analysis



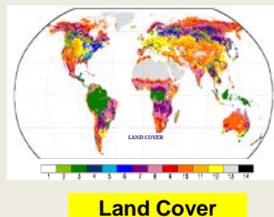
## Water Resources and Flood Monitoring

- April 2011 – present
- 11 Trainings
- 1000+ end-users
- Flood/Drought monitoring
- Severe weather and precipitation
- Watershed management
- Climate impacts on water resources
- Snow/ice monitoring
- Evapotranspiration (ET), ground water, soil moisture, and runoff.



## Land Management

- Launched in 2014
- 2 Trainings, +300 end-users
- GIS Applications
- Vegetation indices
- Fire products (beginning in 2015)



## Train the Trainers (Starting in 2015)

- Courses and guidance on how to design and develop, *YOUR OWN* online and/or computer based remote sensing training
- How to develop effective presentations and exercises.

# Gradual Learning Approach

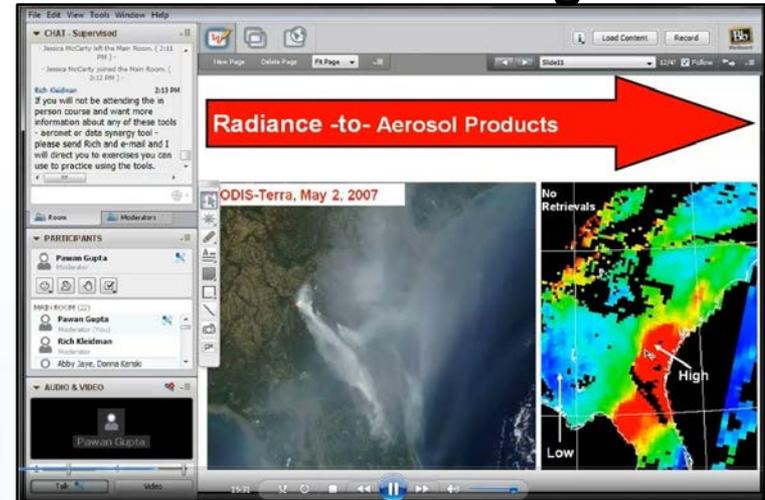


**Basic Training**  
**Webinars**  
**Hands-on**  
Assumes no prior knowledge of RS



**Advanced Training**  
**Hands-on**  
Webinar course generally required  
Focused on a specific application/problem/Data: for example **dust or smoke monitoring in a specific country or region**

## Online Training



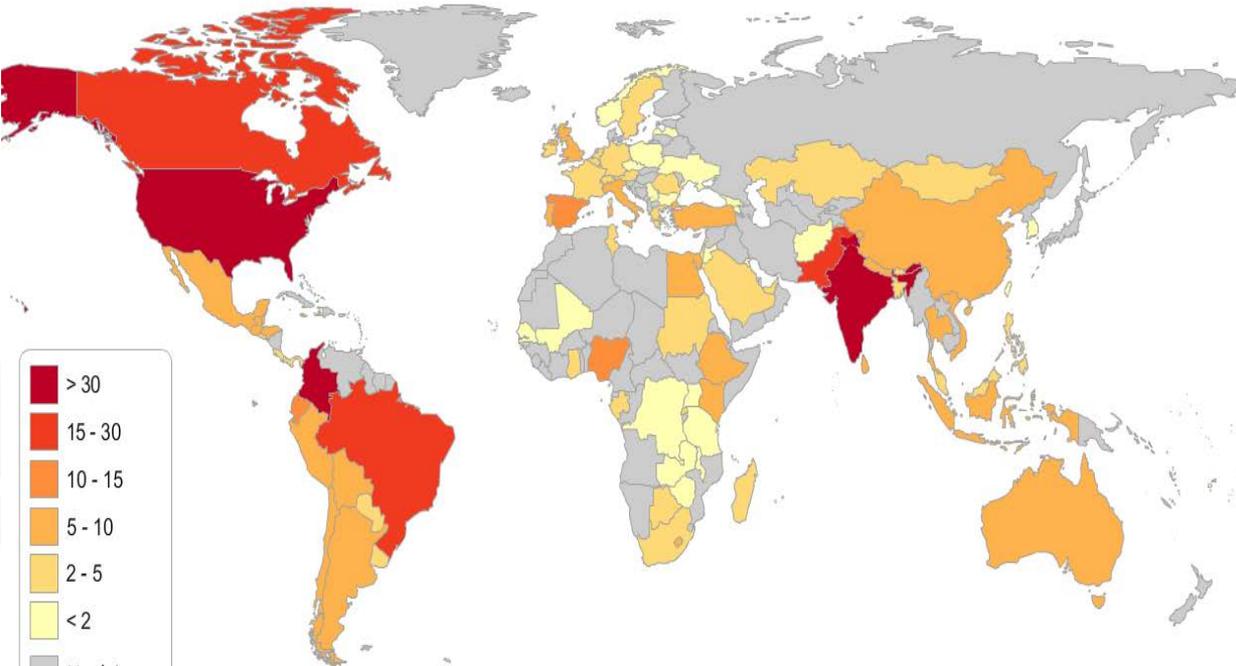
## In-Person Training



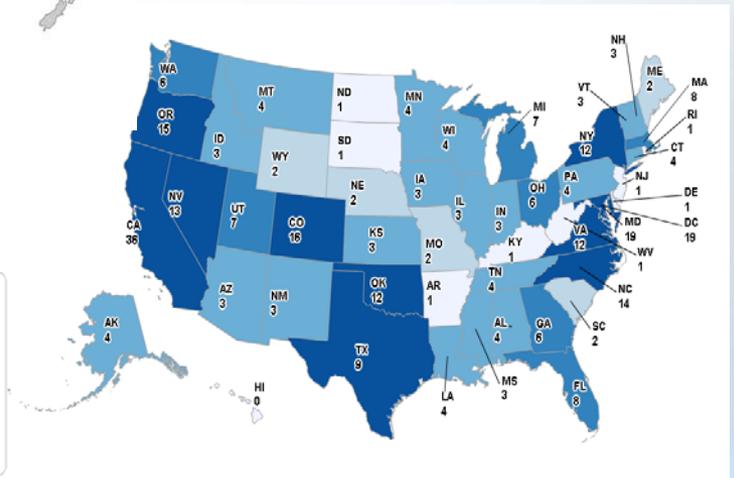
# 2300+ End-users 700+ Organizations



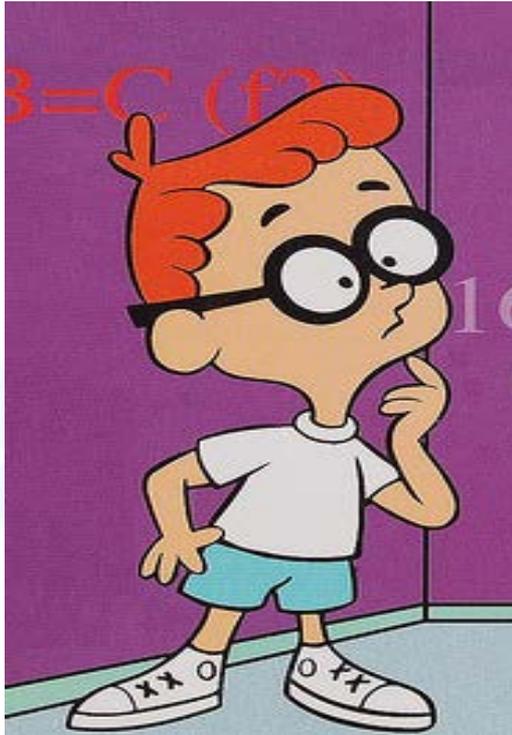
## 2008 – 2014 (46 trainings)



Number of participating organizations per country:  
Air Quality, Water, Flood,  
and Land management



# We Connect Decision-Makers With Other Parts of NASA



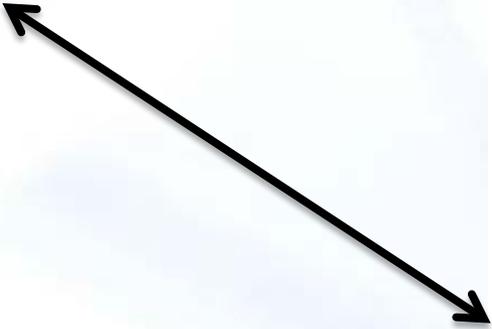
**Decision- Makers**



**Scientists/PIs and Mission Science Teams**



**Data Producers & NASA DAACS**



# ARSET works directly with NASA funded PIs



- ARSET can help disseminate YOUR applied research, data and application tools to a large number of national and international stakeholder organizations
- PIs frequently participate in ARSET trainings as guest speakers (*examples: John Bolten, Charon Birkett, Tom Painter, Bob Adler, Blake Schaeffer, George Huffman*)
- Let us know if you are interested in training activities for your stakeholders to help with the transition/hand-off of your project.

# Recent and Upcoming Trainings: Water Resources/Flooding



## Hands-on Trainings:

- **Summer 2012:** University of Oklahoma, National Weather Center Water Resources.
- **Winter 2013,** World Bank, Flooding Applications
- **Winter 2014:** Snow product applications (California).
- **May 2015:** Cartagena, Colombia, May 2015, Climate Variability and Flooding

## Webinars

- **Fall 2012 :** Precipitation/Flooding/Drought
- **Spring 2013:** Snow Products
- **Fall 2013:** Water Resources Management
- **Fall 2013:** Flood Monitoring
- **Fall 2014:** Water Quality Monitoring
- **Spring 2015:** GPM Data and Applications



## Presentation and Data Demonstration:

February 2014: USAID GeoCenter, Va,  
NASA Data for Water Resources and  
Disaster Management

# Trainings on new NASA Missions



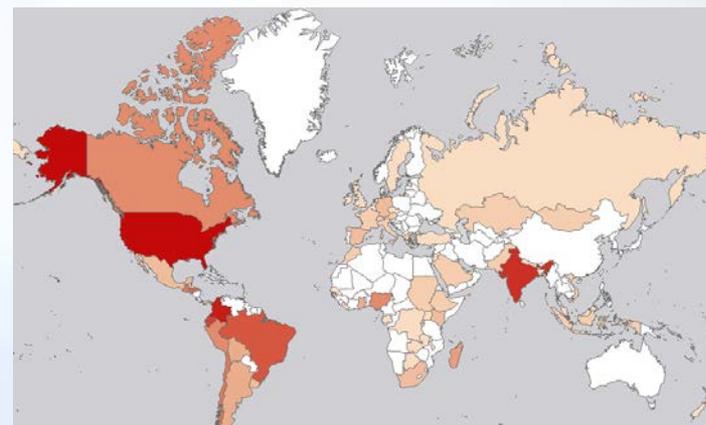
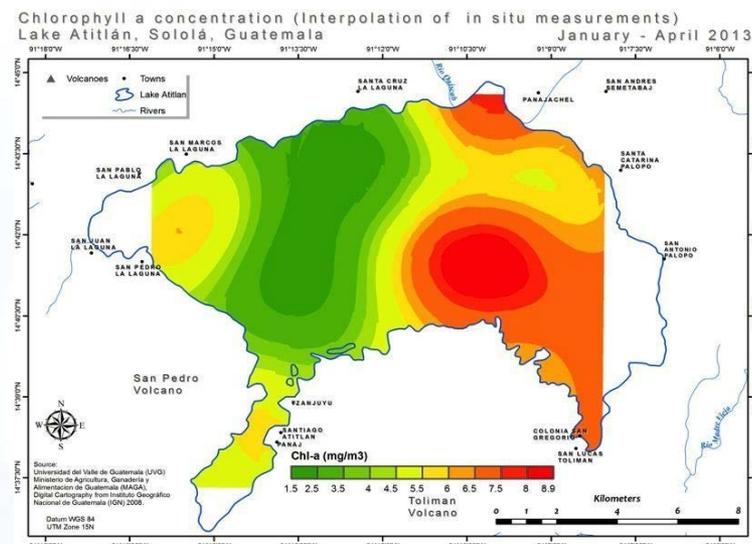
- **GPM:** ARSET will provide a 3-session webinar beginning in March 2014 introducing the global Precipitation Measurement (GPM) mission, launched on February 27, 2014. The webinar will focus on various precipitation data products, tools to access the data, examples of applications, and GIS demos.
- **SMAP:** A webinar and/or in-person training November/December 2015 to introduce Soil Moisture Active Passive (SMAP) data, access and applications

# First ARSET Water Quality Training: Introduction Water Quality Monitoring Using Remote Sensing Measurements, Fall 2014



- **Objective:** Introduce remote sensing observations and data access tools for water quality monitoring and other management activities in coastal oceans, estuaries, and inland lakes.
- **First ARSET webinar with a separate Spanish session:** enabled participation from 12 countries and 100 attendees within Latin America.
- **Training Partners:** Blake Schaeffer (EPA), Africa Flores (SERVIR)
- **320 participants, 216 organizations, 70 countries, 24 states.**
- **International and National Organizations:** WRI, World Bank, Ocean Conservancy, UNESCO, National Environment Office of Madagascar, CATHALAC, Argentina Weather Service
- **End-of –Training Survey:** Majority of attendees (78%) indicated that in general the webinar met their expectations while 14% indicated that the webinar exceeded their expectations/ 42% indicated a need for in-person trainings

**Course over-subscribed  
+480 registrants**



Participants from 70 countries



Earth Science Division Applied Sciences ASP Water Resources

**NASA ARSET**  
Applied Remote Sensing Training

DISASTERS ECO FORECASTING HEALTH & AIR QUALITY WATER RESOURCES

**ARSET**

- Webinars
- Workshops
- Apply for Training
- Personnel
- Links
- Upcoming Webinar

**Applied Remote Sensing Training**

The goal of the NASA Applied Remote SENSing Training (ARSET) is to increase the utility of NASA earth science and model data for policy makers, regulatory agencies, and other applied science professionals in the areas of Health and Air Quality, Water Resources, Eco Forecasting, and Disaster Management.

The two primary activities of this project are webinars and in-person courses.

**Webinars (Free)**

Webinars are offered throughout the year in all four application areas, generally 4-5 weeks in duration, 1 hour per week. They are intended for those new to remote sensing. For more information and to register please go to the webinars section of the website.

**In-Person Courses**

ARSET in-person courses are a combination of lectures and computer hands-on activities that teach professionals how to access, interpret, and apply NASA data at regional and global scales with an emphasis on case studies. ARSET works with organizations who will host the training for groups within their geographical region, tailoring the curriculum to the needs of the projected participants. NASA does not charge an attendance fee, but attendees must make their own arrangements to travel to the course meeting location.

**Skills Taught:**

- Search, access, and download of NASA data products and imagery
- Appropriate use and interpretation of satellite imagery.
- Visualization and analysis of NASA imagery using NASA, EPA, and NOAA webtools and other resources such as GIS, Google Earth, Panoply, RSIG, and HDFLook

ARSET is sponsored by the Applied Sciences Program within NASA's Earth Sciences Division. We would like to thank Nancy Searby, Applied Sciences' Capacity Building Program Manager for her support of this project.

Last updated: August 18, 2014  
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## ARSET

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**Applied Remote Sensing Training**

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## DISASTERS    ECO FORECASTING    HEALTH & AIR QUALITY    WATER RESOURCES

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### ARSET

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### Webinars

#### NASA Earth Observations and Tools for Air Quality Applications in South East Asia

Wednesday, April 1, 2015 to Wednesday, April 29, 2015

Application Area: **Airquality**

Keywords:

**Aerosols, Air Pollution, Dust, Fires and Smoke, PM2.5, Satellite Imagery, Smoke, Trace Gases**

Instruments/Missions: **CALIPSO, MISR, MODIS, VIIRS**

[Read more](#)

#### Introduction to Global Precipitation Measurement (GPM) Data and Applications

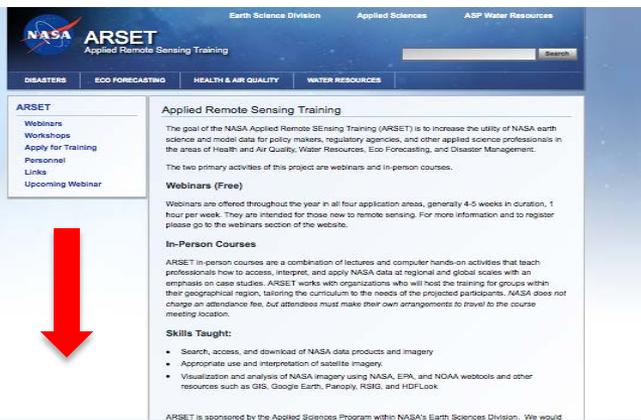
Tuesday, March 17, 2015 to Tuesday, March 31, 2015

Application Area: **Disasters, Water Resources**

Keywords: **Flooding, Satellite Imagery, Tools**

Instruments/Missions: **GPM, TRMM**

[Read more](#)



## Apply for Training

The NASA Applied Remote Sensing Training Program provides webinars and in-person courses. The goal of these training activities is to build the capability and skills to utilize NASA earth science observations and model data for environmental management and decision-support. Courses are primarily intended for applied science professionals and decision makers from local, state, federal agencies, NGOS, and the private sector. ARSET also offers a Train the Trainers program, which is recommended for establishing or growing your organizations' capacity in applied remote sensing.

*ARSET trainings are NOT designed for research but for operational and application driven organizations.*

To apply for a training email Ana Prados at [Ana.I.Prados@nasa.gov](mailto:Ana.I.Prados@nasa.gov)

The program offers four types of courses. For in-person courses, applicants must provide a computer laboratory or similar facility.

1. Overview webinar course: held over a period of 4-5 weeks, 1 hour per week
2. Basic hands-on: In person applied remote sensing course for those new to remote sensing. Generally 2-3 days in length held. It is highly recommended that attendees first take the webinar course.
3. Advanced hands-on: In person applied remote sensing course that builds the skills to use NASA data for a specific environmental management problem. Intended for those who have already taken the basic course or have previous experience using NASA data and resources. Generally 1-2 days in length.
4. Train the Trainers: In person applied remote sensing course intended for existing remote sensing/geospatial trainers within the organization/institution/agency.

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**For information on upcoming courses and program updates sign up to the listserv**

**<https://lists.nasa.gov/mailman/listinfo/arset>**



**How are we doing ?**

**Value of ARSET for Stakeholders**

# ARSET Program Assessment



- **Survey 1:** Administered at the end of each webinar and hands-on training for feedback on perceived utility of topics and tools taught, and interest in additional ARSET trainings.
- **Survey 2:** Administered 6 months after each hands-on training to gauge the impact of the program such as changes in remote sensing data access and use for decision support.
- **Add-hoc interviews:** several months after the hands-on trainings.

# Respondents' Opinions about ARSET Air Quality Trainings: Hands-on Courses

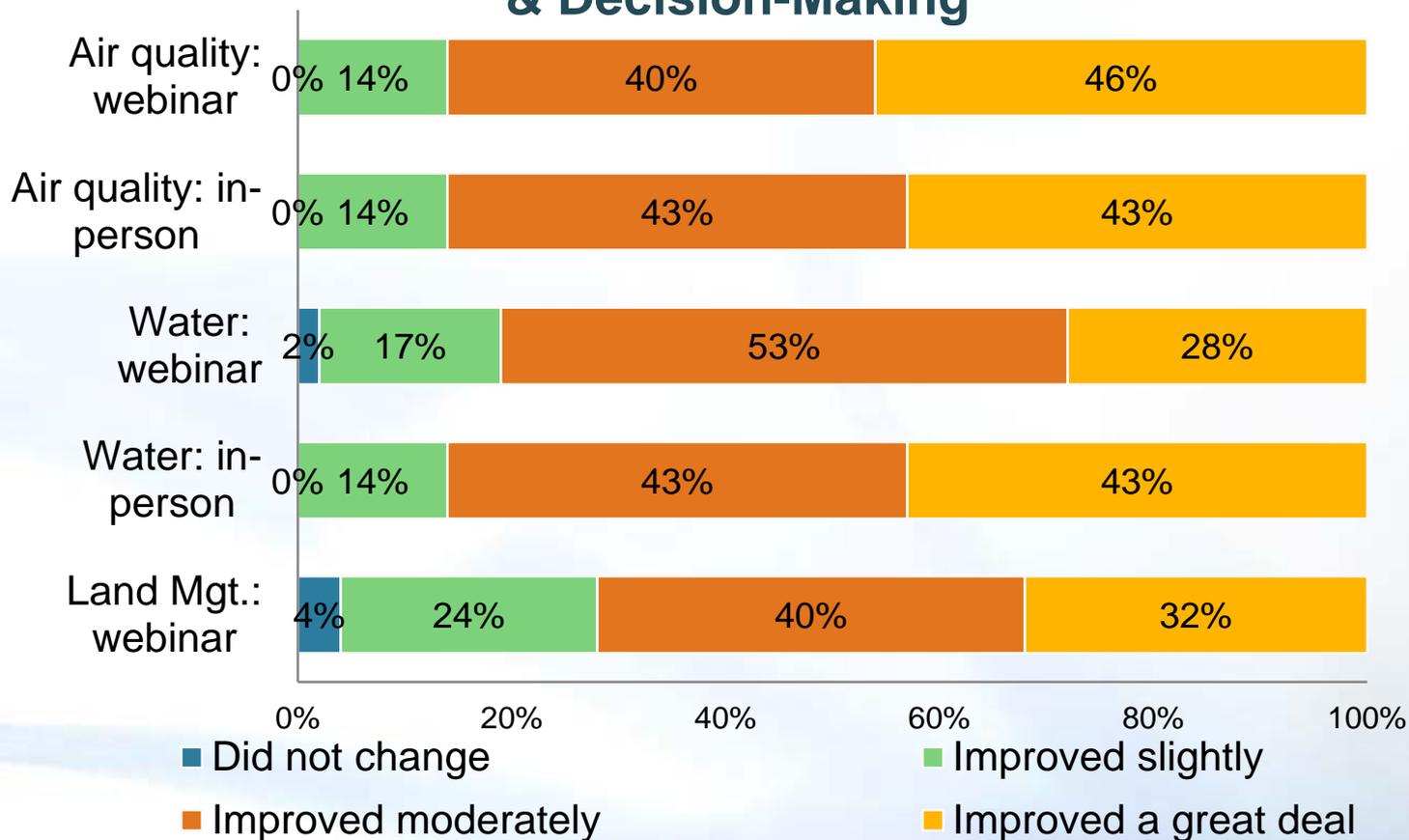


- 100% of U.S. respondents & 95% of non-U.S Respondents agreed or strongly agreed:
  - The ARSET training **increased my knowledge** of remote sensing data products.
- 89% of U.S. respondents & 82% of non-U.S Respondents agreed or strongly agreed:
  - The ARSET training **increased my ability to access** remote sensing data products.
- 55% of U.S. respondents & 54% of non-U.S Respondents agreed or strongly agreed:
  - The ARSET training **improved my ability to make decisions** regarding air quality.

# Post-training Survey Results



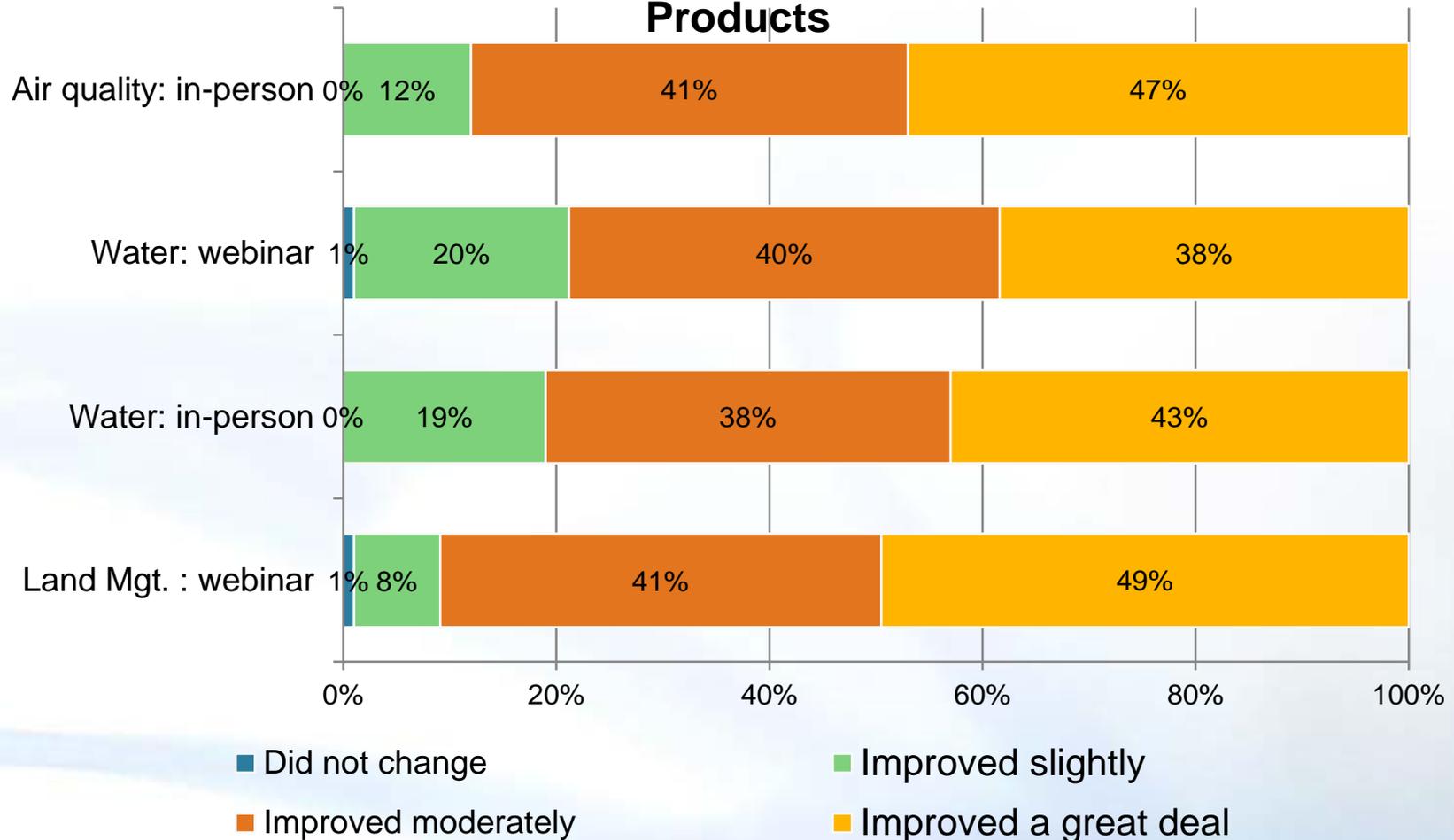
## Changes in Understanding of Remote Sensing Data use for Environmental Monitoring & Decision-Making



# Post-training Survey Results



## Ability to Access Necessary Remote Sensing Data Products



# Extra slides



# In-person Training: Snow Applications in California, Feb 10-20



- Fresno, CA, Feb. 19-20, 2014.
- Paul Ramirez, Karl, Rittger, Andrew Hart, Tom Painter
- **27 Participants, ½ new to Remote Sensing.**
  - DWR
  - US Water masters, USBR, USACE
  - Irrigation Districts
  - Utilities (PG & E) and other private sector.
  - Hetch Hetchy water reservoir managers.
- **Products and Tools**
  - MODIS snow cover, grain size, albedo, dust radiative forcing, SWE (ASO), and tower data
  - JPL SnowMap server access to products (rated by nearly all as moderately to very useful)
- **Feedback (discussion session) and Surveys:**
  - More interest in 8 day products than daily products, also NRT. Discussion of rolling 8-day composite distributed on Mondays.
  - Interest in a script that generated yearly plots per basin, and use of data products in operational hydrological models.
  - Insufficient hands-on time, instructions.
  - 1/3 stated that training **Exceeded Expectations**; strong interest in more courses.



# ARSET Webinar: Introduction to NASA Earth Science Data Products Portals, and Tools: September 16-October 14, 2014



- **Objective:** Webinar for stakeholders completely new to NASA, with a special focus on DAACs, data access, and an overview NASA Earth science and applications in general.
- **Participation:** 111 participants, 96 organizations, 34 countries, 19 states.
- **Training Partner:** DAACs at multiple centers (provided slides and guidance).
- **15 International and National Conservation organizations:** WWF, IUCN, WCS, UNOSAT, UNEP-WCMC, UNITAR, Conservation International
- **US Federal and State agencies:**
  - EPA, BLM, USGS, USDA, Delaware DNR

## Participants from 34 countries



ForWarn:  
Forest  
Change and  
Assessment  
Viewer

