Applied Remote Sensing Training Program

http://arset.gsfc.nasa.gov

@NASAARSET

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BAERI/NASA Ames Research Center

NASA Wildland Fire Applications
2017 Team meeting
March 1, 2017
Capacity Building Program Elements

**SERVIR:** Building international capacity with hubs in East Africa, Hindu Kush-Himalaya, Mesoamerica, Southeast Asia

**Applied Remote SEnsing Training, ARSET:** Online and hands on basic/advanced training to build skills

**DEVELOP:** Dual workforce/local government capacity building using collaborative feasibility projects, internships
## ARSET Training Formats

<table>
<thead>
<tr>
<th>Online</th>
<th>In-Person</th>
<th>Train the Trainers</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Offered through the internet</td>
<td>• 2-7 days in length</td>
<td>• Trainings and materials</td>
</tr>
<tr>
<td>• Available live and recorded</td>
<td>• Held in a computer lab</td>
<td>• Offered online &amp; in-person</td>
</tr>
<tr>
<td>• Typically 1 hr session, once per week, over 4-6 weeks</td>
<td>• Mixture of lectures and exercises</td>
<td>• For organizers seeking to develop their own applied remote sensing training programs</td>
</tr>
<tr>
<td>• Available at all training levels:</td>
<td>• Locally relevant case studies</td>
<td></td>
</tr>
<tr>
<td>– Fundamentals of Remote Sensing</td>
<td>• Available levels:</td>
<td></td>
</tr>
<tr>
<td>– Introductory</td>
<td>– Introductory</td>
<td></td>
</tr>
<tr>
<td>– Advanced</td>
<td>– Advanced</td>
<td></td>
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</tbody>
</table>
ARSET Training Levels

**Fundamentals**, Level 0
- Online only
- Assumes no prior knowledge of remote sensing

**Basic Training**, Level 1
- Online and in-person
- Requires level 0 training or equivalent knowledge
- Specific applications

**Advanced Training**, Level 2
- Online and in-person
- Requires level 1 training or equivalent knowledge
- More in-depth or focused topics

**Fundamentals of Remote Sensing**: Satellites, Sensors, Data, and Tools for Land Management & Wildfire Applications

**Basic Training**: Remote Sensing of Forest Cover and Change Assessment for Carbon Monitoring

**Advanced Training**: Advanced Webinar: Land Cover Classification with Satellite Data
ARSET’s Global Footprint

- 81 trainings
- 8,000+ participants
- 1,600+ organizations
- 140+ countries
- All 50 U.S. States

ARSET Participants by Country
2009 – 2016
ARSET Team

Program Support
Ana Prados, Program Manager (GSFC)
Brock Blevins, Training Coordinator (GSFC)
David Barbado, Spanish Translator (GSFC)
Annelise Carleton-Hug, Program Evaluator
Elizabeth Hook, Technical Writer/Editor (GSFC)
Marines Martins, Project Support (GSFC)

Disasters & Water Resources
Amita Mehta, Disasters Lead (GSFC)
Tim Stough, Water Lead (JPL)
Erika Podest, Instructor (JPL)

Land & Wildfires
Cynthia Schmidt, Lead (ARC)
Amber Jean McCullum, Instructor (ARC)
Sherry Palacios, Instructor (ARC)

Health & Air Quality
Pawan Gupta, Air Quality Lead (GSFC)
Melanie Cook, Instructor (GSFC)
Sue Estes, Health Lead (MSFC)
ARSET Growth

Participants & Organizations Over Time

Countries and U.S. States* Over Time

Participants
Organizations
0 50 100 150 200 250 300 350

Countries
U.S. States, Territories, and the District
0 50 100 150 200

National Aeronautics and Space Administration
Applied Remote Sensing Training Program
New Training Approaches

• Advanced/Technical:
  – 4-5 weeks with exercises (using web tools) and case study
  – 4 weeks with exercises using open source GIS software (NDVI)
  – 2 weeks with exercises using open source GIS software lasting 4 hours each session

• Introduction/Awareness:
  – Quick introductions on very specific topics or methods: 15-30 minutes (not done yet)
Extensive Post-Training Assessment

- ARSET Training Course Application Forms
- Interviews with key informants
- Informal feedback during webinar Q&A period
- Survey 1: completion of each training
- Surveys 2: 6 months post training; measures impact and changes in NASA data use
- Ad hoc interviews to collect “success stories”

How useful were the following training elements to help you improve your understanding of working with remote sensing data?

Table 5. Participant ratings of utility of various training elements. N = 52

<table>
<thead>
<tr>
<th>Training Element</th>
<th>Not useful</th>
<th>Moderately useful</th>
<th>Extremely useful</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overview of fundamentals of remote sensing</td>
<td>1.92%</td>
<td>53.85%</td>
<td>44.33%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Instruction on available web tools to visualize, access, and analyze data</td>
<td>0.00%</td>
<td>25.00%</td>
<td>73.88%</td>
<td>1.92%</td>
</tr>
<tr>
<td>Instruction on image pre-processing and processing</td>
<td>3.92%</td>
<td>27.45%</td>
<td>66.67%</td>
<td>1.92%</td>
</tr>
<tr>
<td>Examples and case studies of data applications</td>
<td>0.00%</td>
<td>26.92%</td>
<td>73.98%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Hands-on exercises using online web tools</td>
<td>0.00%</td>
<td>21.15%</td>
<td>75.00%</td>
<td>3.85%</td>
</tr>
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</table>
Wildfire trainings

• Introductory webinar, followed by in-person workshop, Boise, ID, October 2015

• 1-day workshop, International Smoke Symposium, November 2016

• Multiple hyperwall presentations, AGU (Dec. 2016); IUCN World Conservation Congress (Sept. 2016) – Ambrosia, Soja, Schmidt

• Upcoming: 1-day workshop, Fairbanks, Alaska, April 2017

International Smoke Symposium, Long Beach, CA
Webinars and In-Person Trainings 2017 (partial list)

- **Advanced Webinar**: Land Cover Classification with Satellite Imagery, Jan 31-Feb. 7
- **Intro Webinar**: Overview of the Global Disaster and Coordination System, February 21
- **Intro Webinar**: Satellite Derived Annual PM2.5 Data Sets in Support of UN Sustainable Development Goals, March 15 – 29
- **In-Person Training**: Remote Sensing in Arctic/Boreal Wildfire Management and Science, April 3, Fairbanks, AK
- **In-Person Training**: NASA Remote Sensing for Flood Monitoring and Management, April 18-20, Fairfax, VA
- **In-Person Training**: Satellite Remote Sensing of Air Quality, May 23-26, India
- **Intro Webinar**: Remote Sensing of Drought, June 2017
- **Intro Webinar and In-Person Training**: Species Distribution Modeling, June and August 2017
- **In-Person Training**: Remote Sensing of Water Resources, August, Brazil
How can we help you?
How can you help us?
Introductory/Awareness Webinars
Remote Sensing for Wildfire Applications

Week 1
Overview of satellite remote sensing

Week 2
Platforms and sensors for wildfire applications

Week 3
Products for pre and post-wildfire

Week 4
New techniques and technologies

Week 5
Terrain data applications
Targeted Workshops for Specific Communities:
Remote Sensing for Boreal/Arctic Wildfire Management

Opportunities to Apply Remote Sensing in Boreal/Arctic Wildfire Management and Science

Training: April 3, 2017 at Alaska Fire Service
Workshop: April 4-6, 2017 at University of Alaska Fairbanks
Advanced Webinars in Specific Technical Areas: Land Cover Classification

Week 1:
Introduction to Land Cover Classification

Week 2:
Improving a Supervised Classification
Be a Guest Speaker in one of our Webinars/Workshops
More Information

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