



# 2017 Summer Preview

INTEGRATING NASA EARTH OBSERVATIONS WITH  
SOCIETY TO FOSTER FUTURE INNOVATION AND  
CULTIVATE THE PROFESSIONALS OF TOMORROW BY  
ADDRESSING DIVERSE ENVIRONMENTAL ISSUES TODAY.

1<sup>st</sup> TERM (20)

2<sup>nd</sup> TERM (9)

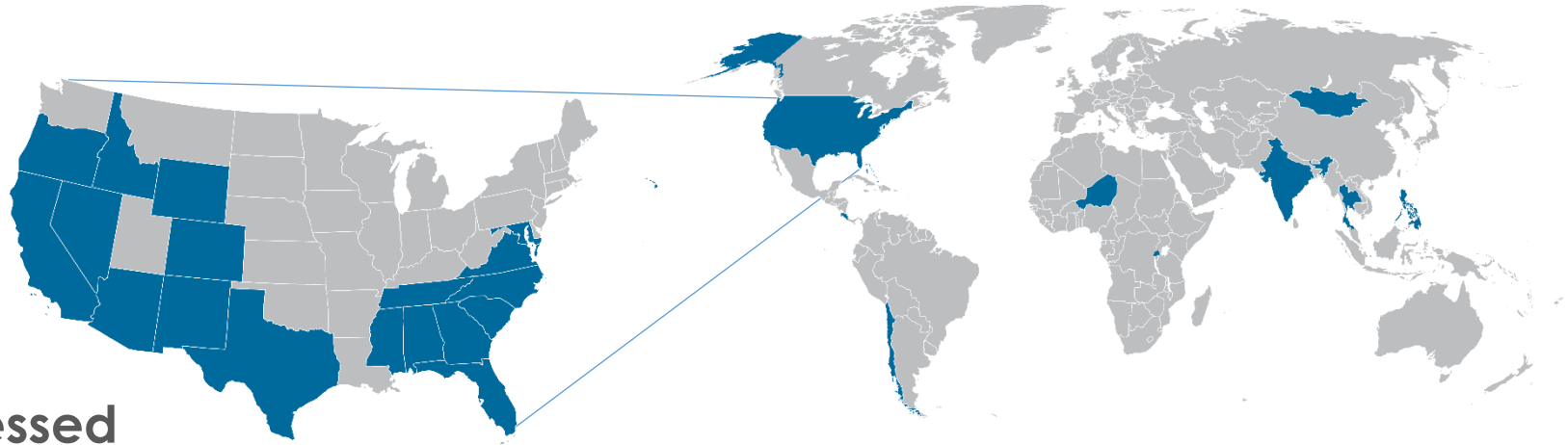
3<sup>rd</sup> TERM (1)

# 2017 Summer Portfolio

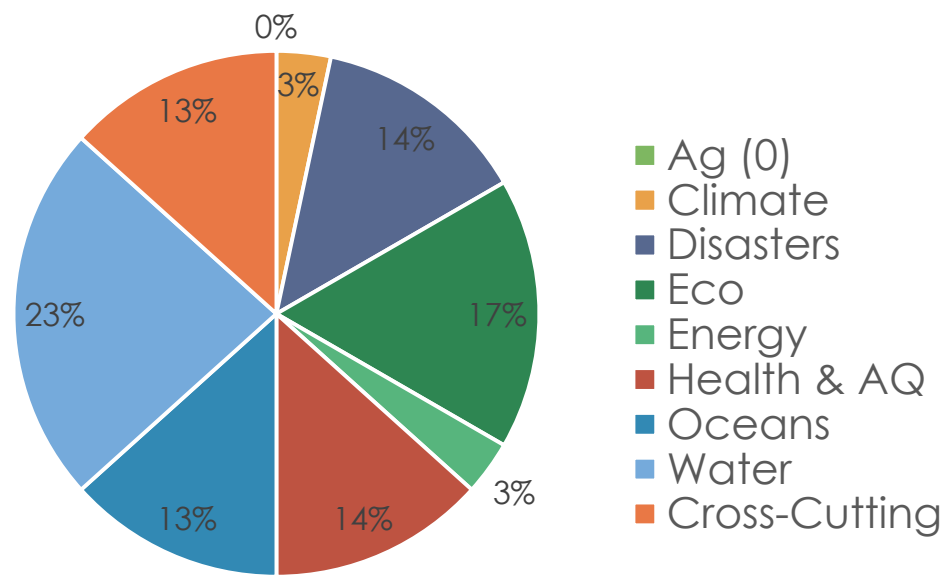
19 States &  
7 Countries Impacted

30 Projects

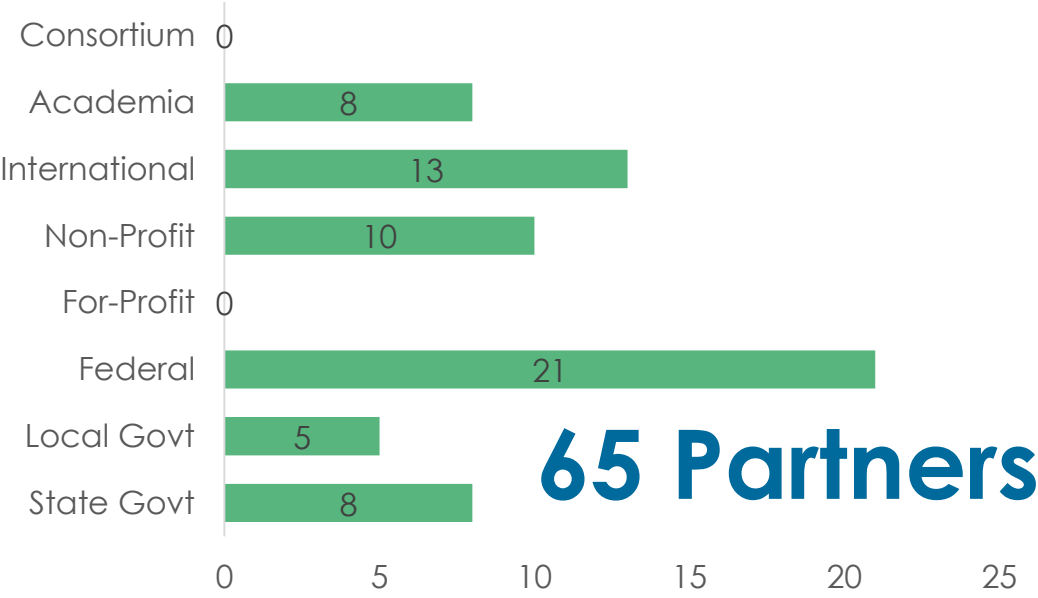
77% Domestic  
23% International



## Application Areas Addressed



## Partner Total by Type



\*Impacts and partners are not final

# 2017 Summer Project Preview

1. **Alaska** Climate
2. **Lassen Volcanic National Park** Disasters
3. **Philippines** Disasters II
4. **Southern Appalachia** Disasters II
5. **Southern Idaho** Disasters
6. **Chesapeake Bay** Ecological Forecasting
7. **Colorado National Monument** Ecological Forecasting
8. **Eastern India** Ecological Forecasting III
9. **Rwanda** Ecological Forecasting
10. **U.S. Virgin Islands** Ecological Forecasting
11. **Georgia** Energy
12. **Las Cruces** Health & Air Quality
13. **Los Angeles** Health & Air Quality
14. **Shenandoah** Health & Air Quality
15. **Texas** Health & Air Quality
16. **Coastal Alabama** Oceans
17. **Costa Rica** Oceans
18. **Southern California** Oceans
19. **U.S. Pacific Islands** Oceans
20. **Arizona** Water Resources II
21. **Chesapeake Bay** Water Resources II
22. **Chile** Water Resources II
23. **Miami Beach** Water Resources
24. **Mississippi Sound** Water Resources II
25. **Niger & Mongolia** Water Resources
26. **San Francisco Bay-Delta** Water Resources II
27. **CALIPSO** Cross-Cutting
28. **Pacific Southwest** Cross-Cutting
29. **Thailand** Cross-Cutting
30. **Wyoming** Cross-Cutting II





# Alaska Climate

## Community Concern:

Alaskan wetlands are at risk of encroachment by invasive species, particularly purple loosestrife (*Lythrum salicaria*) and reed canarygrass (*Phalaris arundinacea* L.). These species were not observed in abundance in the state until recently and both pose ecologic and economic threats.

## Partners:

- Aaron Martin, US Fish and Wildlife Service

## Earth Observations:

- Terra MODIS
- Aqua MODIS
- SRTM V3

**Impact & Benefit:** End products produced through this project will guide the USFWS's preemptive monitoring efforts, allowing them to focus their staff's limited monitoring resources in areas that are most likely to have been recently invaded by purple loosestrife and reed canarygrass. The project will save our partners time and money by reducing the amount of area required to be surveyed and increase the likelihood of detection.





# Lassen Volcanic National Park Disasters

**Community Concern:** Past fire suppression policies, climatic change, and recent spikes in tree mortality have resulted in heavy fuel loading. Careful reintroduction of fire is essential to reducing fuel load and restoring ecosystem processes, but the park currently lacks integrated models and assessment tools to quantify and evaluate wildfire risk.

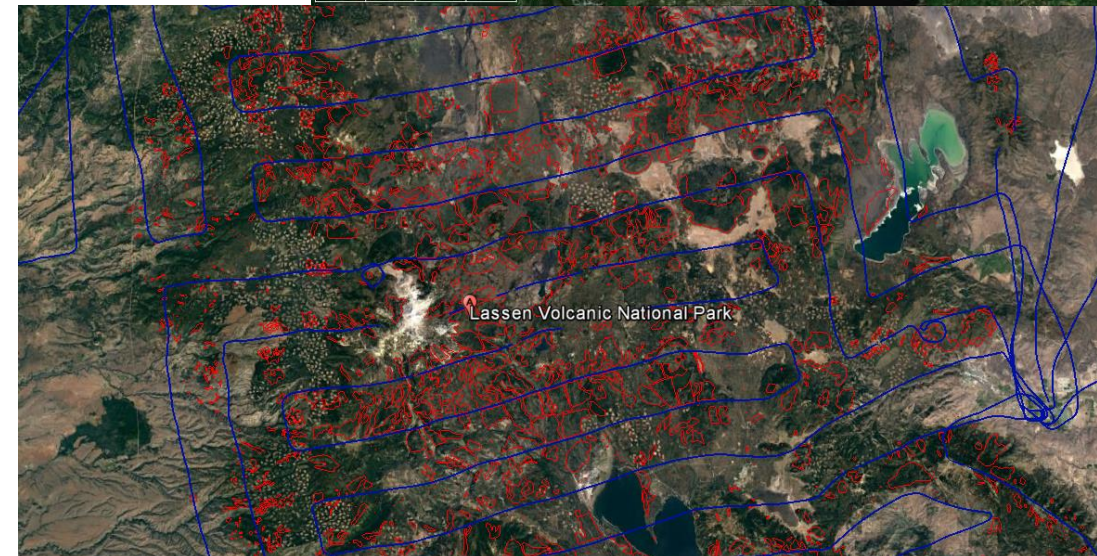
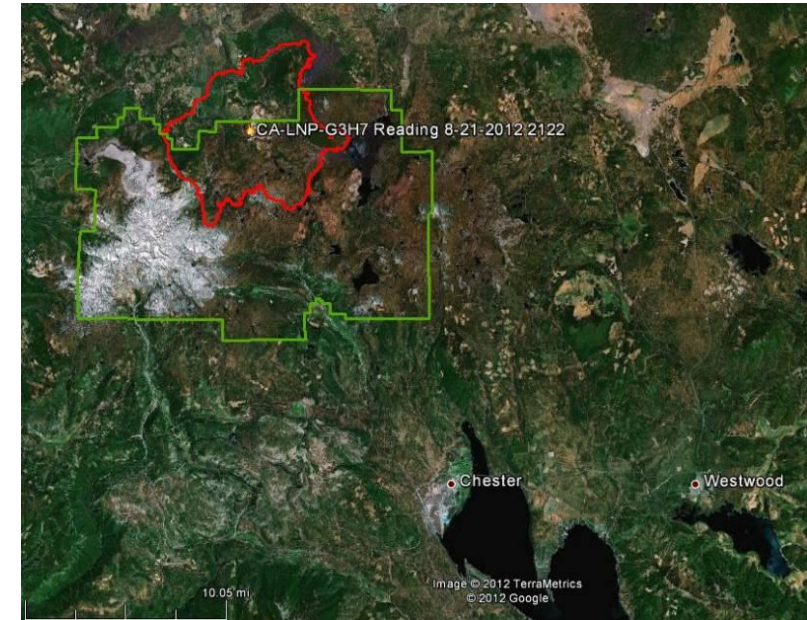
## Partners:

- National Park Service, Lassen Volcanic National Park

## Earth Observations:

- Landsat 8 OLI
- Sentinel 2A
- UAVSAR
- LiDAR
- STRM

**Impact & Benefit:** Pre-fire analysis, tree mortality, and associated mapped-risks in Lassen National Park will benefit park managers by providing new tools derived from remotely sensed imagery along with tools and methods to repeat models successive years







# Philippines Disasters II

**Community Concern:** Approximately 20 tropical cyclones near the Philippines each year with 6-9 making landfall. Recently, the United Nations has started to address gender specific impacts to increase the efficiency and relevance of humanitarian response to hazards.

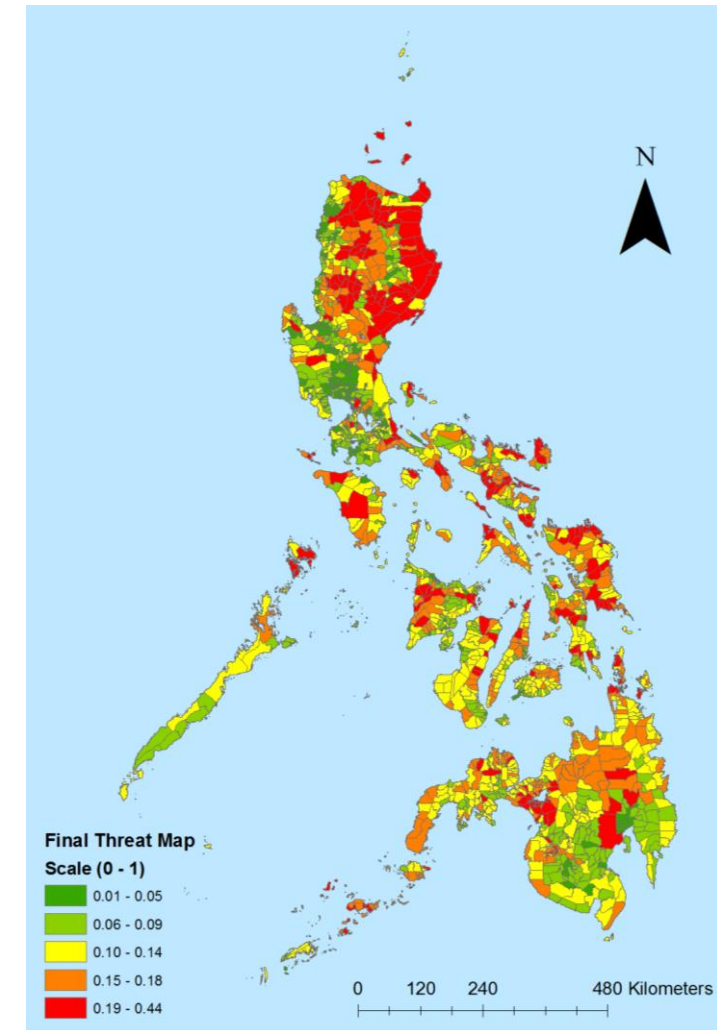
**Partners:**

- United Nations Office for the Coordination of Humanitarian Affairs (OCHA)
- The Netherlands Red Cross

**Earth Observations:**

- CALIPSO CALIOP
- Aqua MODIS
- Suomi-NPP VIIRS
- ISS CATS

**Impact & Benefit:** End-users will be able to incorporate these end-products into current storm intensity monitoring methodology and cyclone vulnerability management.



Final Threat Map

# Southern Appalachia Disasters II

**Community Concern:** Dozens of wildfires across the Southeast United States have recently burned and destroyed forests and residential areas. Over 15,000 acres within Great Smoky Mountains National Park burned due to fires spread by 80 mph winds, low humidity and drought. The wildfires damaged hundreds of buildings, caused power outages, and led to the evacuation of several populated areas.

## **Partners:**

- US Forest Service

## **Earth Observations:**

- Aqua/Terra MODIS
- Landsat 8 OLI

**Impact & Benefit:** This project will enhance the Forest Service's management efforts in the southeastern US by demonstrating the use of NASA data for monitoring wildfire susceptibility, vegetation changes, and early forest recovery. The results will also provide researchers at the US Forest Service with an increased understanding of how property ownership and community management practices can affect the risks for future wildfires.







# Southern Idaho Disasters

**Community Concern:** Wildfires are a major cause of ecosystem and urban disturbance in the western United States, a disturbance that is increasing in frequency and severity. The locations of these wildfires are not easily accessed and field work is time intensive. In addition, prior field surveys for vegetation composition is normally unknown and wildfire recovery cannot always be regularly monitored.

## Partners:

- Bureau of Land Management
- USDA Agricultural Research Service
- Idaho Department of Fish and Game
- NASA RECOVER

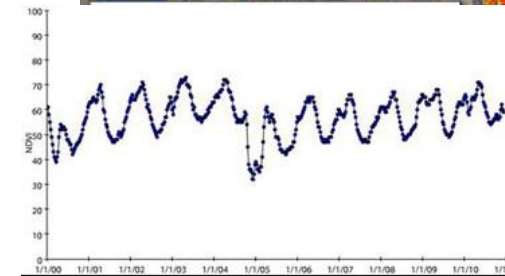
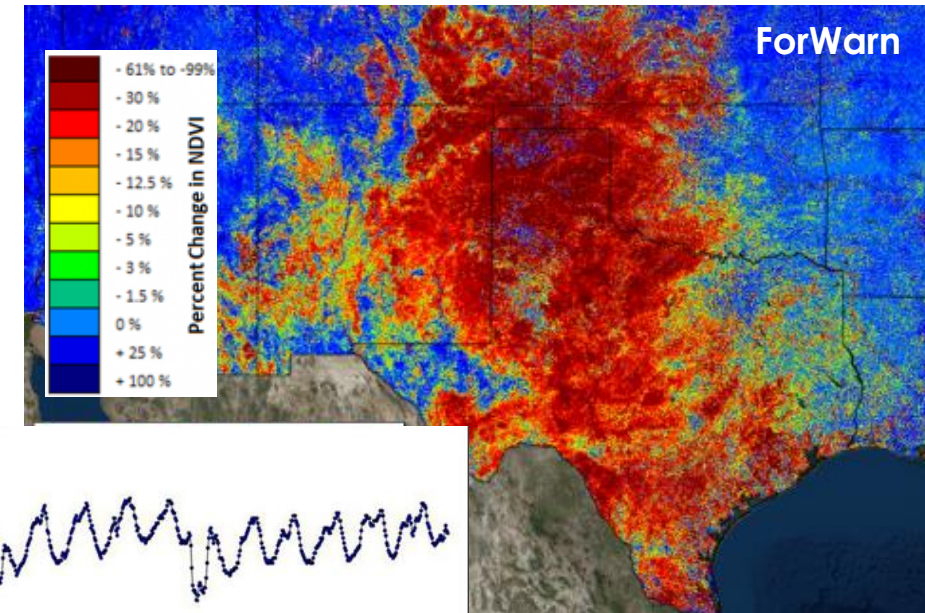
## Earth Observations:

- Landsat 8 OLI
- SRTM Version 2
- Terra and Aqua MODIS

**Impact & Benefit:** This project will provide partners with the power to regularly monitor recovery sites and give increased assurance on the use of Earth observations for monitoring efforts.



Ron Cogswell





# Chesapeake Bay Eco Forecasting

**Community Concern:** Wetlands are critical in supporting the healthy waters and diverse wildlife of the Chesapeake Bay watershed. Protecting and restoring wetlands is a key way to promote clean water, healthy habitats, and a restored Bay.

## **Partners:**

- Maryland Department of Natural Resources
- The Nature Conservancy

## **Earth Observations:**

- Landsat 5 TM
- Landsat 7 ETM+
- Landsat 8 OLI
- Aqua or Terra MODIS
- Sentinel 2 MSI

**Impact & Benefit:** The end-user will have an improved ability to assess the need for marsh restoration efforts, and will be empowered to use adaptive management approaches to improve conservation program performance.





# Colorado National Monument Eco Forecasting

**Community Concern:** While invasive species management is effective and efficient within park boundaries, invasive sources are unknown in the BLM lands surrounding the park.

## Partners:

- NPS, Colorado National Monument
- Colorado Mesa University

## Earth Observations:

- Landsat 5 TM, Landsat ETM+, Landsat 8 OLI
- Sentinel-2 MSI
- Terra MODIS

**Impact & Benefit:** NPS is actively managing and monitoring cheatgrass stands within COLM, but developing tools and resources to enhance early season detection of invasives would be especially valuable to the park.





# Eastern India Eco Forecasting III

**Community Concern:** Mangroves have been overexploited or converted to other forms of land use. These forests provide valuable services such as food, raw materials, and medicinal and ornamental resources. There is growing concern for the effective management and conservation of these mangrove forests because they support families from 36 villages around the Odisha region.

**Partners:**

- Government of Odisha; DFE; Chilika Development Authority (CDA)

**Earth Observations:**

- Terra MODIS, ASTER
- Sentinel-1A, Sentinel-2A
- Landsat 4, 5, 7, 8

**Impact & Benefit:** CDA will receive long-term spatio-temporal estimations of mangrove physiological status. The results will allow them to identify 'hotspots' for early stages of mangrove degradation.





# Rwanda Eco Forecasting



**Community Concerns:** Degradation of Rwandan wetlands is becoming more apparent due to increasing of industrial and urban growth. Wetland protection will ensure the presence of freshwater to communities, impede soil degradation, and safeguard local biodiversity.

## Partners:

- Rwanda Environment Management Authority (REMA)
- NASA SERVIR
- Regional Centre for Mapping of Resources for Development (RCMRD)
- GEO-Wetlands Initiative

## Earth Observations:

- Landsat 8 OLI
- Landsat 7 ETM+
- SRTM v3
- Sentinel-2 MSI



**Impact & Benefit:** This project also can help improve understanding of wetlands in Rwanda, their change over time, and potential extent in the future. Additionally, the methodology and the use of Google Earth Engine can add to research to the collaborators' current initiatives.



# U.S. Virgin Islands Eco Forecasting

**Community Concern:** The condition of the islands' coastal environments is critical to the economic success of the territory, yet many of these environments, like coral reefs, have seen extreme declines in health and cover of major reef-building coral species and biodiversity correlated to the increase in local human population.

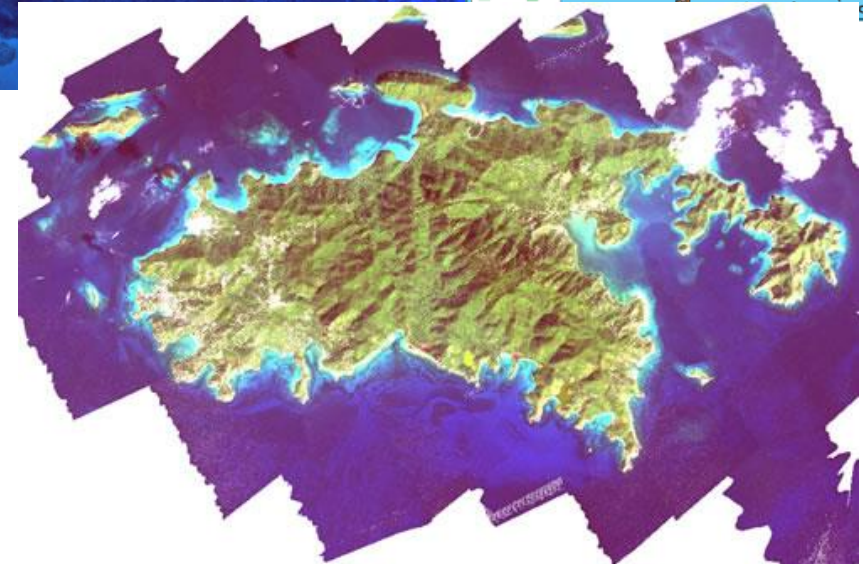
## Partners:

- USVI Department of Planning and Natural Resources, Coastal Zone Management
- University of the Virgin Islands (UVI)

## Earth Observations:

- EO-1 Hyperion
- Landsat 5 TM
- Landsat 8 OLI/TIRS
- Sentinel 2 MSI

**Impact & Benefit:** To gain a better understanding of the risks to coastal habitats associated with land-use changes and their impacts on coastal water quality and adjacent marine ecosystems





# Georgia Energy

**Community Concern:** Georgia is planning to expand its solar power generating facilities and while this form of energy has several environmental benefits, it can impact sensitive habitats for vulnerable, keystone species such as the gopher tortoise. To avoid siting new solar farms where these impacts would be most damaging, environmental information needs to be made readily available to state officials involved with siting and permitting these facilities.

**Partners:**

- The Nature Conservancy
- Georgia Department of Natural Resources
- US Fish and Wildlife Service

**Earth Observations:**

- Landsat 5,8
- Terra CERES
- TRMM CERES

**Impact & Benefit:** The end products of this project will be extremely valuable in helping The Nature Conservancy in Georgia work with their partners to achieve a more sustainable energy portfolio while protecting sensitive habitats. Our team will provide them with suitability model results to avoid conflict between the need to generate renewable energy and the need to protect habitats from incompatible development when possible.







# Las Cruces Health & AQ

**Community Concern:** Climate scenarios suggest that Las Cruces is expected to experience increasingly higher temperatures during the summer months. Additionally, the low-income, elderly, those with poor health status, and ethnic minority populations experience a greater vulnerability to extreme heat.

## Partners:

- City of Las Cruces, Sustainability Office
- Climate Assessment for the Southwest (CLIMAS)
- ASU Urban Climate Research Center (UCRC)

## Earth Observations:

- Landsat 8 OLI TIRS
- Landsat 5 TM
- Terra ASTER

**Impact & Benefit:** An assessment of the Las Cruces urban heat island and heat vulnerability assessment will help advance our partners current efforts to curtail heat related health impacts and prepare for future impacts of extreme heat.



Las Cruces Farmers and Crafts Market. Courtesy of Las Cruces Convention & Visitors Bureau.



# Los Angeles Health & AQ

**Community Concern:** Quantifying GHG emissions from metropolitan areas is an important part of understanding anthropogenic impacts on climate. Spatially-concentrated emission sources produce elevated CO<sub>2</sub> and CH<sub>4</sub> levels, which may be useful for determining the efficacy of current and future emissions control efforts.

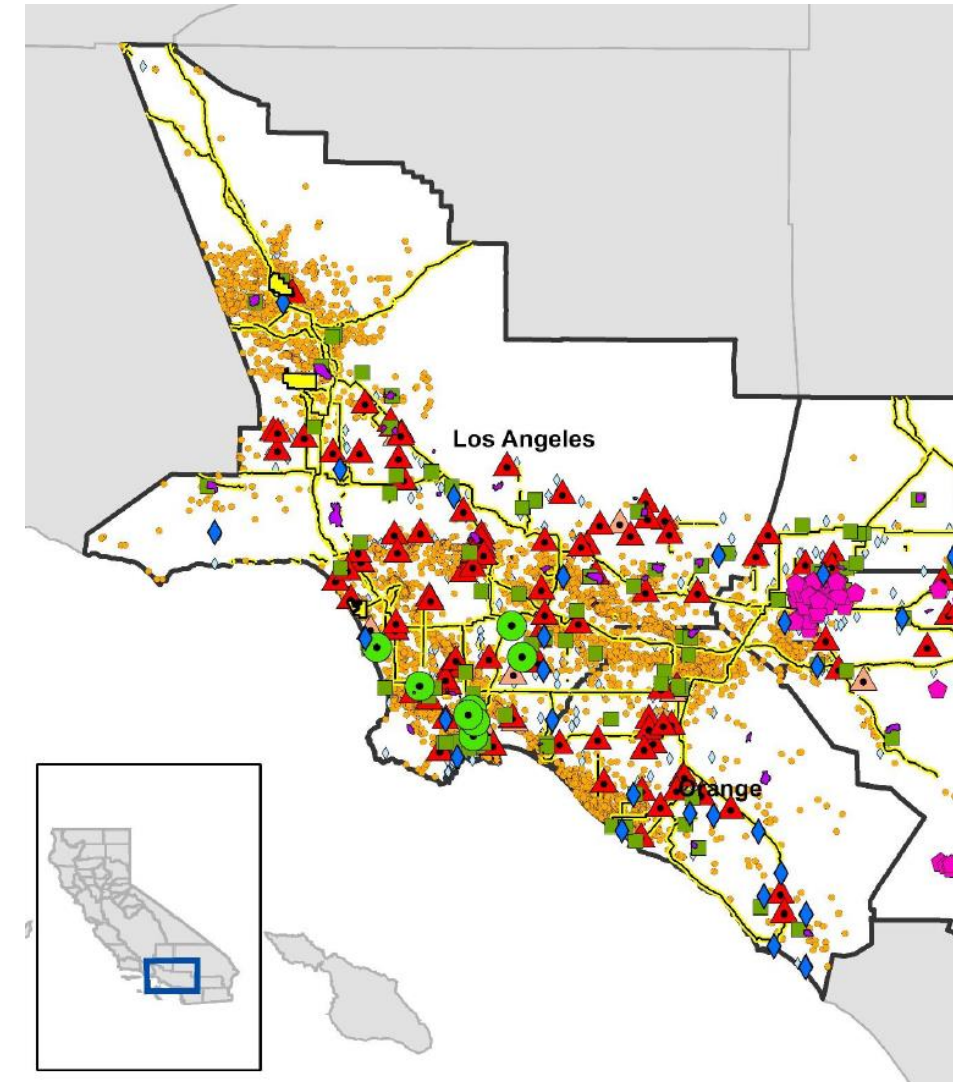
**Partners:**

- California Air Resources Board
- South Coast Air Quality Management District
- University of California Riverside

**Earth Observations:**

- OCO-2
- AVIRIS-NG
- MODIS

**Impact & Benefit:** The fusion of data products developed as part of this project will benefit the project partners by offering new and unprecedented insights into facility-level GHG emissions by pinpointing areas that emit GHGs. It will also help the end-users validate their inventory data and check their effectiveness in emission reduction management.







# Shenandoah Health & AQ



**Community Concern:** Over the past 30 years, 90% of park visitors say that scenic views are extremely/very important to their visit; with 1.45 million visitors in 2016, providing consistently visible scenic views is essential to continued high park attendance.

**Impact & Benefit:** This project will provide information on visibility and atmospheric pollutants that impact both park resiliency and visitor attendance. These resources will help educate park guests, enhance management practices, and improve overall monitoring efforts.

## Partners:

- NPS, Shenandoah National Park



## Earth Observations:

- Aura OMI, TES
- Suomi-NPP OMPS, VIIRS
- Aqua MODIS, AIRS
- Terra MODIS



# Texas Health & AQ

**Community Concern:** Detection and quantification of exceptional air pollution events caused by non-anthropogenic or non-U.S. sources is critical to developing appropriate and effective responses to protect public health.

**Partners:**

- Texas Commission on Environmental Quality, Air Quality Division

**Earth Observations:**

- Aqua MODIS
- Terra MODIS
- Suomi NPP VIIRS Aerosol EDR
- Aura OMI
- Aura MLS
- CALIPSO CALIOP
- Orbiting Carbon Observatory-2 (OCO-2)

**Impact & Benefit:** Enhancing existing TCEQ competencies with NASA Earth observations will contribute to analytical efficiencies such as decreased time and staff resources devoted to documenting transported pollution, as well as improved scientific understanding of characteristics of these phenomena.







# Coastal Alabama Oceans

**Community Concern:** Many community leaders, researchers, and commercial fisheries in the coastal Alabama area rely heavily on measurements of temperature, turbidity, and salinity to assist their business, hobbies, or research. Understanding manatee movement is important to understand these trends and salinity plays a role in the animals' movement patterns. In addition, oysters are an important part of the local ecosystem and economy: thirty-five percent of the nation's oysters comes from the Gulf of Mexico and, globally oyster reefs are the single most impacted marine habitat with more than 85% loss of historic coverage.

## Partners:

- Alabama Coastal Foundation
- Mobile Bay National Estuary Program
- Weeks Bay National Estuarine Research Reserve
- Dauphin Island Sea Lab, Manatee Sighting Network
- Universities Space Research Association (USRA)

## Earth Observations:

- Aqua MODIS
- Suomi NPP VIIRS
- Landsat 8 OLI & TIRS
- Sentinel-2 MSI



**Impact & Benefit:** The end-products from this project will assist decision-makers in filling critical data gaps that are important for revitalizing oyster habitat and understanding manatee movement in the coastal Alabama area.



# Costa Rica Oceans

**Community Concern:** The Isla del Coco Marine Reserve, a national park located off the coast of Costa Rica, is currently facing a number of environmental concerns including coral bleaching, shoreline erosion, and changes in ocean temperatures. These changing conditions pose a risk for not only the primary framework of the local reefs but also their ecological services. Further, the isle's shoreline has experienced increased coastal erosion that could jeopardize park infrastructure.

**Partners:**

- Embassy of Costa Rica to the United States
- Ministry of Environment and Energy, Water Directorate (DA-MINAE)
- Sistema Nacional de Áreas de Conservación de Costa Rica, Área de Conservación Marina Isla del Coco (ACMIC) (Costa Rica)

**Earth Observations:**

- Landsat 5,7,8
- Aqua MODIS
- Terra ASTER

**Impact & Benefit:** The project methodologies will provide a replicable process for Isla del Coco Marine Reserve managers to enhance remote monitoring capabilities, providing a new means for measuring change. Improved understanding of the island's vegetation health, coastal erosion, and water quality variables will support the Isla del Coco Marine Reserve in continued environmental decision making.







# Southern California Oceans

**Community Concern:** As grunion are vulnerable to changes in water, chemistry and temperature, increased salinity, and changing climatic variables are shifting the spawning season and the health of embryos.

**Partners:**

- Grunion Greeters Project

**Earth Observations:**

- Landsat 7 ETM+
- Landsat 8 OLI
- Aqua MODIS
- SMAP
- SMOS
- Suomi NPP VIIRS



**Impact & Benefit:** Products created for this project can be used to help the Grunion Greeters Program and other stakeholders predict where future spawns may take place by looking at the trends in sea surface temperature, chlorophyll-a, and salinity that bolster specific areas along California's coast. Based on the results of this project, the partners will have an improved ability to assess their current management approaches and will be empowered to improve their conservation management practices based on the results of this project.

# U.S. Pacific Oceans

**Community Concern:** The majority of US Affiliated Pacific Islands are low lying islands that are highly vulnerable to coastal hazards influenced by sea-level. Between 1993 and 2009 these islands experienced a sea-level rise rate 4 times the global average.

**Partners:**

- NOAA Regional Climate Services, Pacific Region

**Earth Observations:**

- Ocean Surface Topography Mission/Jason-2  
Poseidon-3 Altimeter and AMR

**Impact & Benefit:** The Near-Real Time Island Inundation Risk Tool will enable the project partner to measure abnormal sea-level conditions throughout the USAPI and help relevant, regional decision makers prepare accordingly for potential inundation events.







# Arizona Water Resources II

## Community Concern:

Riparian areas of the Colorado River Basin are threatened by invasive species such as tamarisk (*Tamarix spp.*) and Russian olive (*Elaeagnus angustifolia*), which alter flow regime and evapotranspiration rates.

## Partners:

- Walton Family Foundation
- US Geological Survey, Fort Collins Science Center
- US Geological Survey, North Central Climate Science Center

## Earth Observations:

- SRTM V3
- Landsat 8 OLI/TIRS
- Landsat 7 ETM+
- Landsat 5 TM

**Impact & Benefit:** Maps of total potential riparian area and the percentage of that area negatively impacted by invasive species will enhance Walton Family Foundation efforts in outreach and planning of environmental programs in the Colorado River Basin, including water resource management efforts.



Image Source: United States Forest Service



# Chesapeake Bay Water Resources II

## Partners:

- U.S. Geological Survey, Water Science Center
- Virginia Department of Environmental Quality

## Earth Observations:

- Landsat 5 TM, Landsat 7 ETM+, Landsat 8 OLI
- Sentinel-2

**Impact & Benefit:** The addition of remote sensing to current monitoring efforts would increase the spatial and temporal research capabilities of the partners, which would allow for more informed and consistent decision-making.

**DEVELOP** @ NASA Langley Research Center

**Community Concern:** SAV beds are essential habitats and food resources, and provide ecological services important to coastal resiliency. Due to limited manhours, widespread monitoring of the Bay is currently unfeasible, resulting in assumed poor water quality.







# Chile Water Resources II

**Community Concern:** Chile is vulnerable to drought and, with sub-regions of Chile relying on contrasting irrigation practices, balancing the management of supply and demand of water across the country proves a difficult task. Currently, Chile's Ministry of Agriculture reduces vulnerability to drought and other agriculture-climate events by disseminating response information serving as early warning for decision-makers and stakeholders of the agriculture industry.

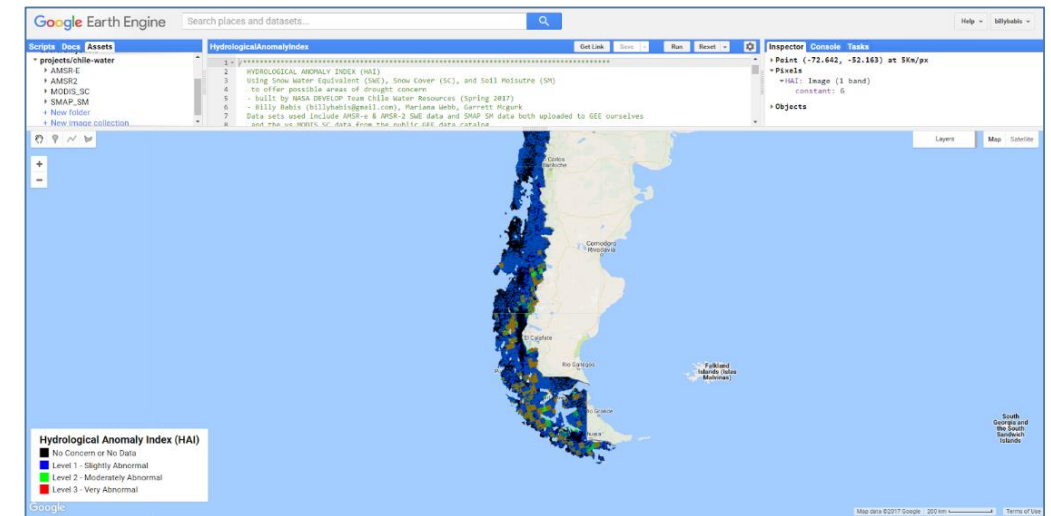
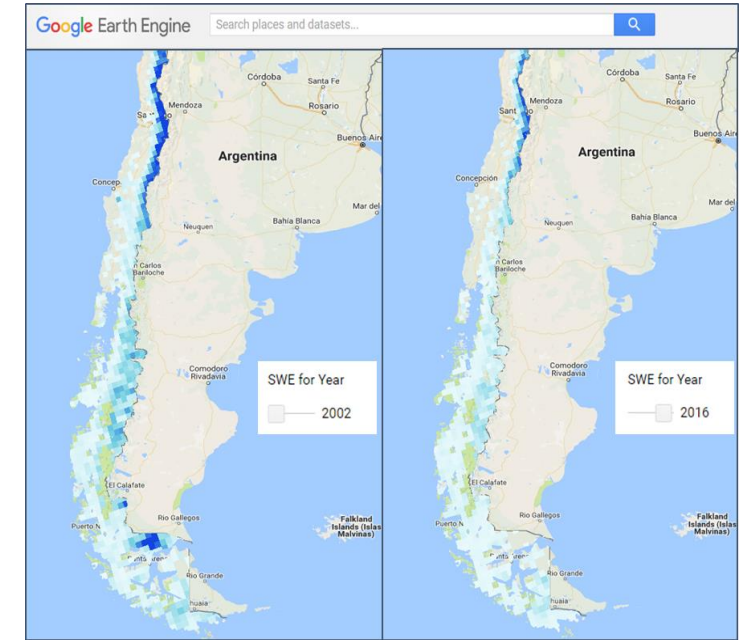
## Earth Observations:

- SMAP
- Terra MODIS
- Aqua AMSR-E
- ASTER MODIS
- JAXA GCOM-W1- AMSR2
- Landsat 8 OLI
- Landsat 5 TM
- STRM

## Partners:

- Chilean Ministry of Agriculture
- Chilean Embassy of the United States

**Impact & Benefit:** The Aconcagua agricultural region is highly dependent on the water from surrounding glaciers for irrigation, and water availability is a challenging measure to make from the ground. Remote sensing techniques using NASA Earth Observation data will be applied to this region to estimate glacier mass balances and quantify their relationship to water availability for agriculture.





# Miami Beach Water Resources



**Community Concern:** Due to increasing development and population growth, pumping stormwater from Miami Beach is impacting the surrounding bodies of water, including SAV beds, algal blooms, and turbidity.

**Impact & Benefit:** Miami Beach needs updated water quality information for the surrounding bays, including sources of pollutants and significant sediment and nutrient inputs. As the demand for stormwater pumping increases, the products will assist in the development of updated water quality management.

## Partners:

- Miami Beach Government, Public Works Department

## Earth Observations:

- Landsat 5 TM, Landsat 7 ETM+, Landsat 8 OLI
- Aqua MODIS
- Sentinel-2 MSI







# Mississippi Sound Water Resources II



**Community Concern:** Since 2004, oyster harvest has decreased by more than 90% in the Sound, resulting in economic and ecological issues.

**Partners:**

- Mississippi Department of Marine Resources

**Earth Observations:**

- Aqua MODIS
- Sentinel-2 MSI
- MUR
- SMOS
- SMAP
- Landsat 8 OLI

**Impact & Benefit:** In accordance with the Governor's Oyster Council, this project will assist MDMR with understanding different event types affecting water quality, as well as increase the use of NASA data in studies of the Sound.

# Niger & Mongolia Water Resources

**Community Concern:** Resiliency – the ability to recover from or adjust easily to environmental change – is a critically important factor in the field of international development.

**Partner:**

- Mercy Corps

**Earth Observations:**

- TRMM, TMI
- SRTM
- GMP, GMI
- Grace

**Impact & Benefit:** Products generated by this project will enhance Mercy Corps and its in-country stakeholders' ability to accurately assess precipitation's role as shock or stressor for which a community must plan for.







# San Francisco Bay-Delta Water Resources

**Community Concern:** Seventy percent of California's water originates in the northern part of the state, such as the San Francisco Bay-Delta, with the south accounting for over seventy percent of the demand. Water quality, specifically turbidity, is extremely important within this region as a result of the Delta smelt, a rare and endemic species listed as threatened under both the California and U.S. Endangered Species Act.

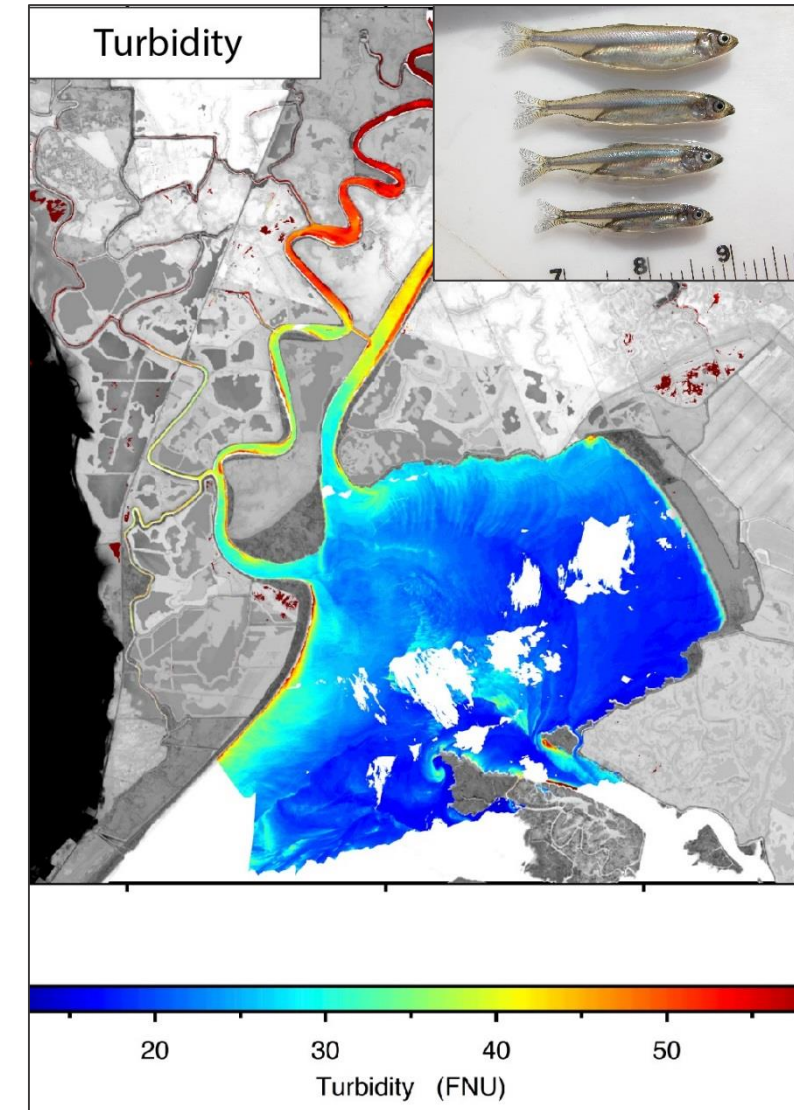
## Partners:

- Metropolitan Water District of Southern California (MWD)

## Earth Observations:

- Landsat 8 OLI
- Sentinel 2A MSI

**Impact & Benefit:** The resulting maps from this project will improve MWD's understanding of drivers and spatial variability of turbidity and can be incorporated in future research in improving Delta smelt habitat and turbidity forecasting. The end product will increase the MWD's accessibility to remote sensing data and allow them to utilize satellite information to improve future monitoring and management strategies.





# CALIPSO Cross-Cutting

**Community Concern:** Current visualization and data management efforts are not user-friendly, and do not allow for functionality and maneuverability while accessing the data.

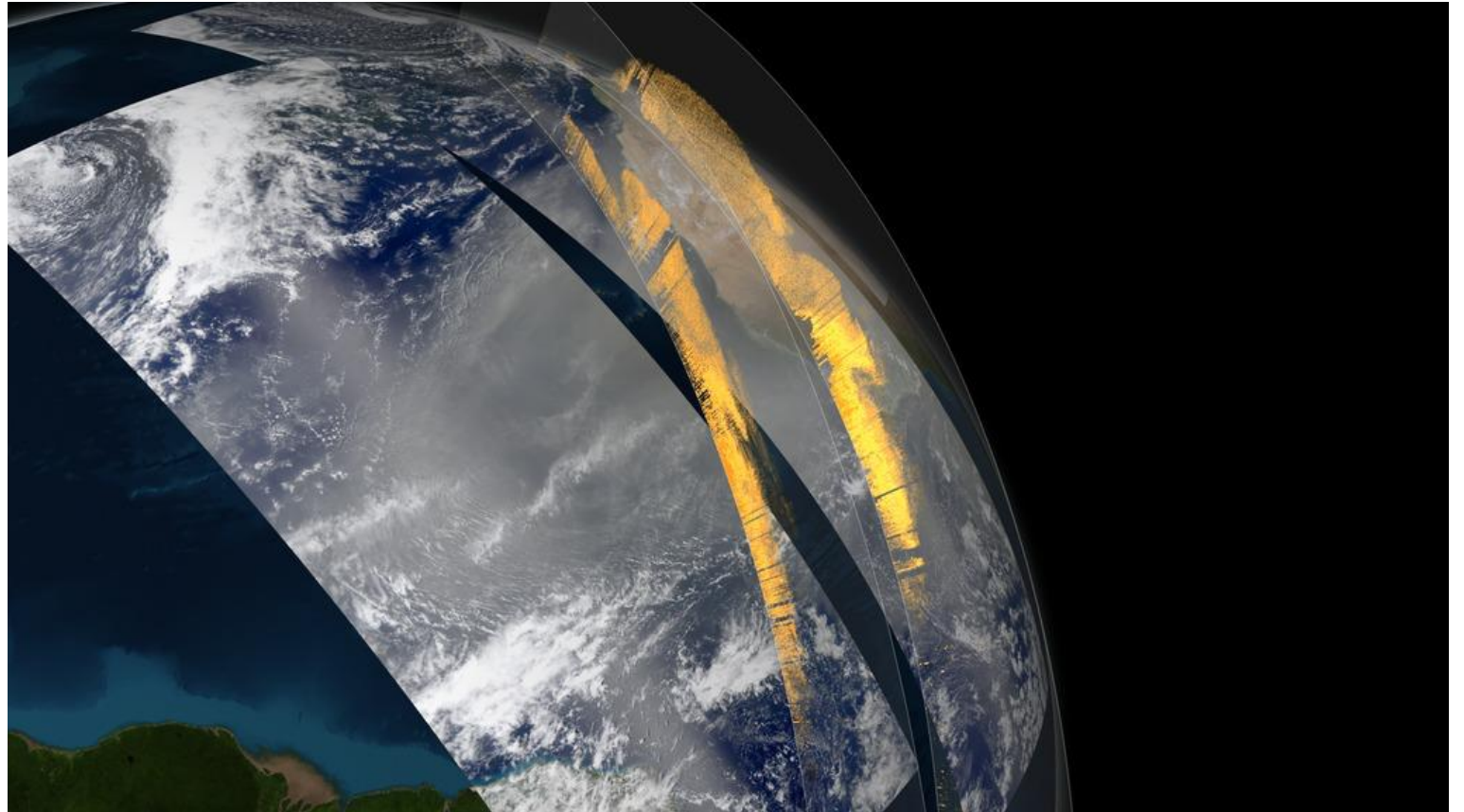
**Partners:**

- NASA CALIPSO Science Team

**Earth Observations:**

- CALIPSO, CALIOP

**Impact & Benefit:** Further updates to VOCAL will increase functionality, selection tools, and flexibility of input and output means.







# Pacific Southwest Cross-Cutting

**Community Concern:** The USFWS is responsible for monitoring millions of acres, and attempts to protect land and mitigate impacts through Habitat Conservation Plan areas. Due to limited manhours, monitoring of conservation plans is haphazard.

## Partners:

- U.S. Fish and Wildlife Service, Pacific Southwest Region

## Earth Observations:

- Landsat 5 TM, Landsat 7 ETM+, Landsat 8 OLI
- Sentinel-1 C-SAR
- Sentinel-2 MSI



**Impact & Benefit:** By developing a widespread monitoring tool, the USFWS will be able to prioritize their *in situ* monitoring efforts.





# Thailand Cross-Cutting

**Community Concern:** Poverty in Thailand has been reducing in the past 30 years due to periods of economic growth. Currently 13% of the population is impoverished—however, due to reoccurring droughts, decreases in agricultural prices, and, therefore, an unstable economy can all contribute to rises in poverty over the next few decades.

**Partners:**

- The Royal Thai Embassy
- Asian Disasters Preparedness Center (ADPC)
- NASA SERVIR

**Earth Observations:**

- Suomi NPP VIIRS

**Impact & Benefit:** These products are beneficial to the end user by identifying areas where aid should be directed for members of the population that are impoverished. This study offers a less costly and time-intensive survey of poverty in Thailand. These products will also increase partners' capacity to use remote sensing methods of analyzing socioeconomic issues throughout Southeast Asia.







# Wyoming Cross-Cutting II

**Community Concern:** Grand Teton National Park and the surrounding area have had some of the clearest night skies in the country due to the region's low humidity and isolation from human development. However, as light from Jackson, WY and Idaho Falls, ID has increased and suburban areas have encroached on the park, this world class night sky visibility has decreased.

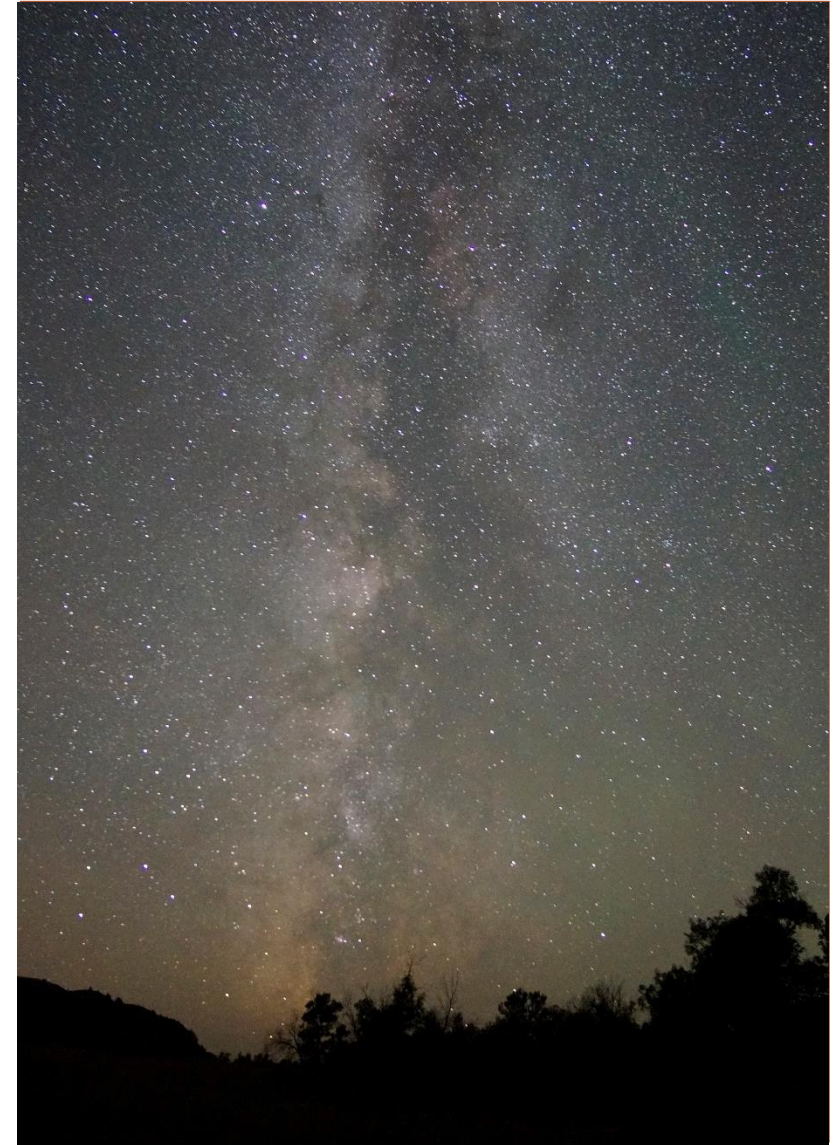
**Partners:**

- National Park Service, Grand Teton National Park
- International Dark-Sky Association
- Wyoming Stargazing

**Earth Observations:**

- Suomi National Polar-orbiting Partnership (NPP) Visible Infrared Imaging Radiometer Suite (VIIRS)

**Impact & Benefit:** The Sky Glow Visualization Toolbox will help personnel at Grand Teton National Park identify areas where changes in lighting policy and practices have been effective.



# 2017 Summer Deliverables & Deadlines

Week	Due Date	Deliverables Due
1	6/8	Handbook Forms, Participant Info Sheet, Personality Assessment, Entrance Personal Growth Assessment, DEVELOPedia Participant Page, Orientation Completed
3	6/22	<b>Project Summary</b> RD
4	6/29	<b>Tech Paper</b> RD, Code Meeting
5	7/4	Offices Closed for Independence Day
5	7/6	<b>Poster</b> RD, <b>Presentation</b> RD, <b>VPS Outline</b> , <b>Software Release Forms</b> (if applicable)
6	7/13	<b>Project Summary</b> FD, <b>Study Area Shapefiles</b> , <b>Website/Booklet Image</b>
7	7/20	<b>HQ Poster</b> FD, <b>HQ Presentation</b> FD
8	7/25	<b>VPS Video &amp; Transcript</b> , <b>Draft Code</b> (if applicable)
9	8/3	<b>Poster</b> FD, <b>Presentation</b> FD, <b>DEVELOPedia Project Page</b> , Exit Personal Growth Assessment
10	8/10	<b>Tech Paper</b> FD, <b>Technical Image</b>
10	8/11	Exit Survey, <b>Optional Deliverables</b> , <b>Code with README</b> (if applicable)