

NASA DEVELOP Feasibility Studies in Support of the NASA-SICA Partnership

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A graphic for the NASA DEVELOP program. It features a dark blue rectangular box on the left containing the word "DEVELOP" in white, bold, sans-serif capital letters. To the right of this box is a collage of various blue-toned images, including satellite imagery of rivers, lakes, and coastal areas, as well as abstract patterns. The entire graphic is set against a light blue background with a subtle grid pattern.

DEVELOP

Outline

1. Title
2. NASA-SICA Joint Statement
3. What is DEVELOP?
4. What is SICA?
5. What were initial objectives for DEVELOP to support the agreement
6. How DEVELOP initiated partnerships for projects
7. Overview of SICA projects
8. Overview of Outcomes
9. What's next
10. Thank you





Abstract

On March 20th, 2019, the National Aeronautics and Space Administration (NASA) and the Sistema de la Integración Centroamericana (SICA, Central American Integration System) issued a joint statement sharing their mutual desire to make Earth observations and remote sensing data and products more readily available to SICA member countries to inform their decision making. Regional capacity building in the use of Earth observations was one of the many opportunities for collaboration highlighted in this joint statement. As an initial capacity building effort, NASA deployed a series of feasibility projects through the DEVELOP Program to engage emerging and transitioning professionals with SICA member state partner agencies. The initial projects in summer 2019 addressed landslides in the Dominican Republic, near-coastal flooding in Guatemala and El Salvador, and environmental challenges to the Mesoamerican Reef off the coast of Belize. Additional projects were planned for fall 2019 with the objective of impacting environmental challenges for the remaining SICA member states. This presentation will summarize the results of projects conducted to date, address the lessons learned in the process of rapid engagement with regional entities, and consider how the partnership may evolve over time.

NASA DEVELOP Program



Empowered Participants + Earth Observations + Engaged Decision Makers

Science Serving Society



The **Central American Integration System (SICA)** is the institutional framework of Regional Integration in Central America, and includes the States of **Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Belize, and Dominican Republic.**

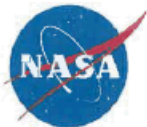


Peace

Freedom

Democracy

Development



**JOINT STATEMENT
BETWEEN THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
OF THE UNITED STATES OF AMERICA
AND
THE SISTEMA DE LA INTEGRACIÓN CENTROAMERICANA
FOR ACTIVITIES IN APPLIED SCIENCE RESEARCH AND EARTH
OBSERVATIONS FOR SOCIETAL BENEFIT**

The National Aeronautics and Space Administration (NASA) and the Sistema de la Integración Centroamericana (SICA, *Central American Integration System*) share a desire to make Earth observations and remote sensing data and products more readily available in SICA Member Countries to help inform decision making. To accomplish this, NASA and SICA will work with regional and local stakeholders in SICA Member Countries, including countries in the Mesoamerican Biological Corridor, in using Earth observing satellite information and geospatial technologies to better manage and protect natural resources, and to mitigate environmental and disaster risks. This includes focusing on issues such as forest cover and protected areas; water resources and hydrometeorology; agriculture and food security; flooding, especially in marine coastal areas; changes in land cover such as landslides and volcanic eruptions; disaster risk reduction and resilience; biodiversity and ecosystems; and health.

Earth observations and geospatial technologies can also be used to monitor progress on indicators of certain United Nations (UN) Sustainable Development Goals, including those related to hunger, health, water and sanitation, sustainable cities and communities, climate action, life below water, and life on land.

NASA's Earth Science Division seeks to understand the Earth as an integrated system through the use of remote sensing satellites, airborne science missions, and ground-based research to help address some of the critical challenges facing our planet. This important work informs our understanding of past, present, and future trends that may affect both our planet and its civilizations.

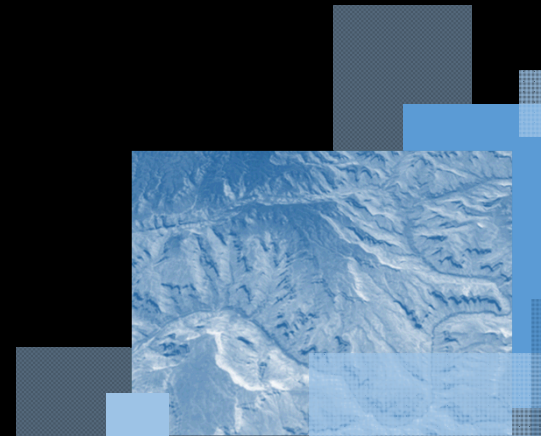
In NASA's Earth Science Division, the Applied Sciences Program brings together technology, science, and unique global Earth observations to provide important scientific information and data products to the general public and interested governmental and nongovernmental entities. The program also funds projects that enable innovative uses of NASA Earth science data to develop solutions and inform decision-making. Specifically, the Applied Sciences Program works in the areas of disaster response and risk reduction, ecological forecasting, public health and air quality, agriculture, and water resources. The program includes a Capacity Building element that engages with the remote sensing community, offering training opportunities that inform and build capacity



DEVELOP – SICA Engagement

Objectives: 8 projects in calendar year 2019

- Involving at least one project involving a government entity from each member state,
- Addressing as many ASP application areas as possible, and
- Engaging and working as much as possible with SICA General Secretariat and Sub-secretariats and Institutions



SICA



SICA
Sistema de la Integración
Centroamericana

8

Projects

Summer
2019

- ▶ Belize Water
- ▶ Central America TI
- ▶ Dominican Republic Disasters
- ▶ Belize & Honduras Water II
- ▶ Central America Dry Corridor Ag
- ▶ Central America HAQ
- ▶ Costa Rica & Panama Eco
- ▶ Panama Water

5

Embassies at AESAS

Costa Rica, Nicaragua, Panama,
Honduras, & Dominican Republic

5

Nodes

JPL, ARC, LaRC, NC, GA

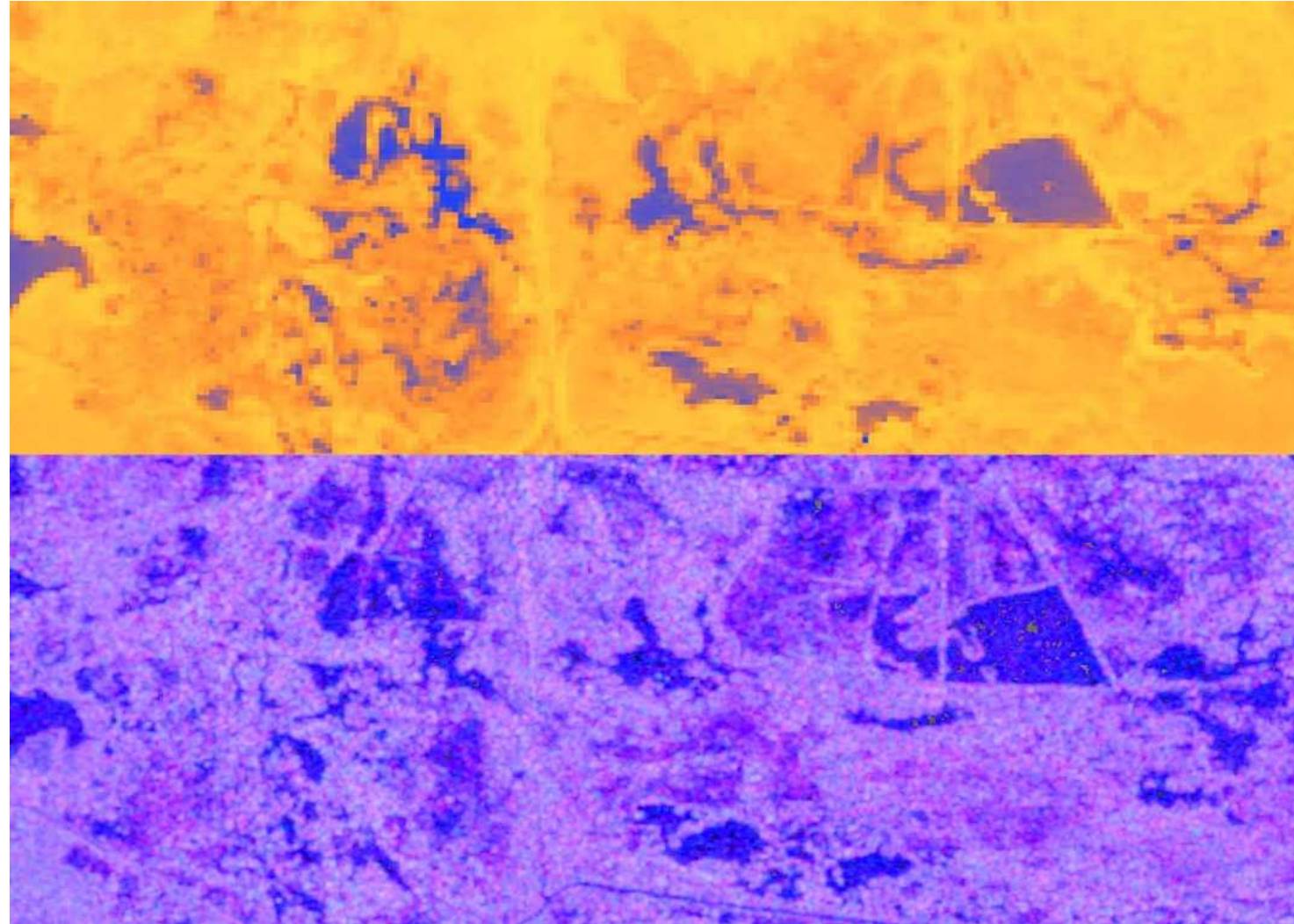
Central America Transportation & Infrastructure

Objectives:

- Create flood extent and depth estimation maps
- Assess compromised road infrastructure

Partners:

- CONRED (Guatemala)
- INSIVUMEH (Guatemala)
- MARN (El Salvador)



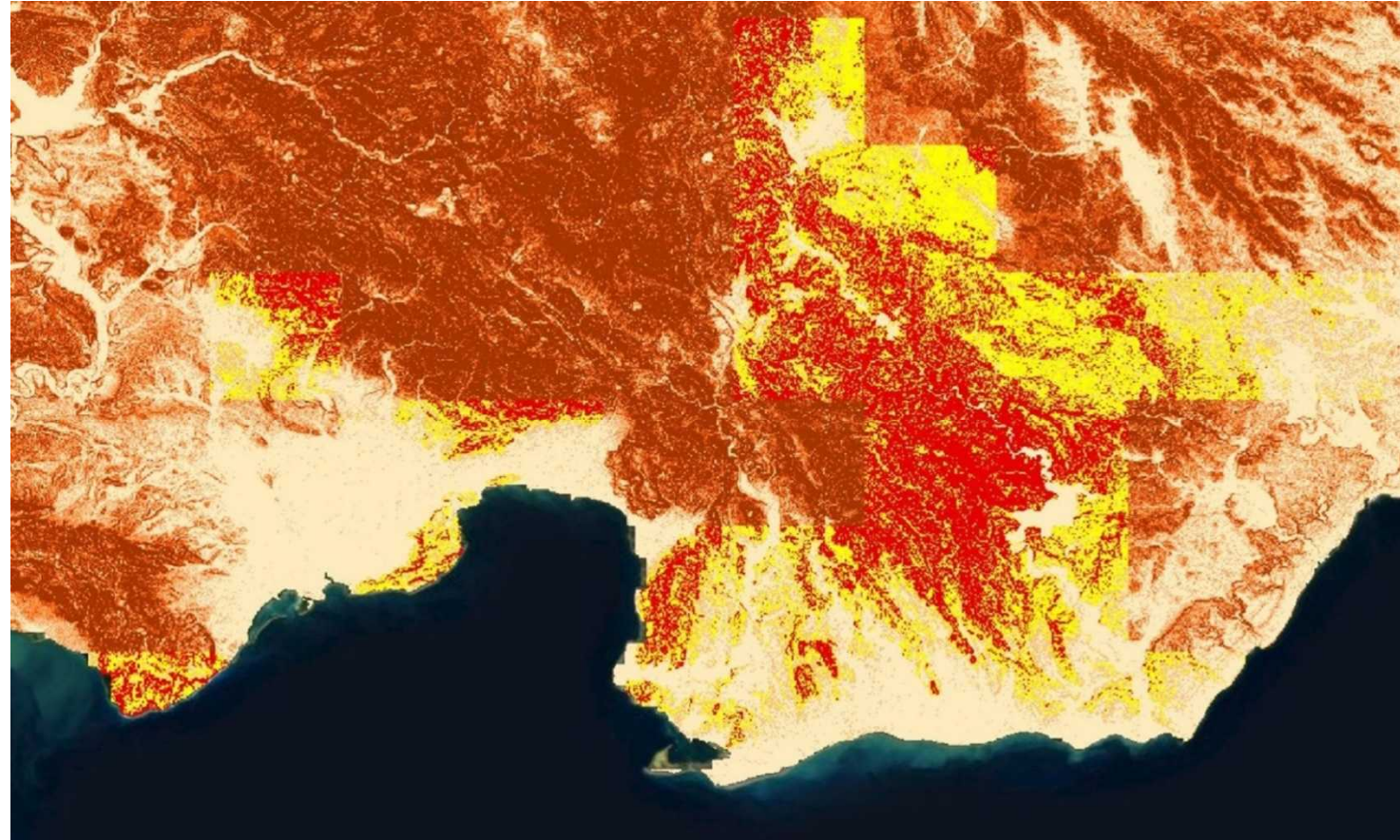
Dominican Republic Disasters

Objective:

- Create a landslide susceptibility map of areas most susceptible to rainfall-triggered landslides

Partners:

- SGN
- ONAMET



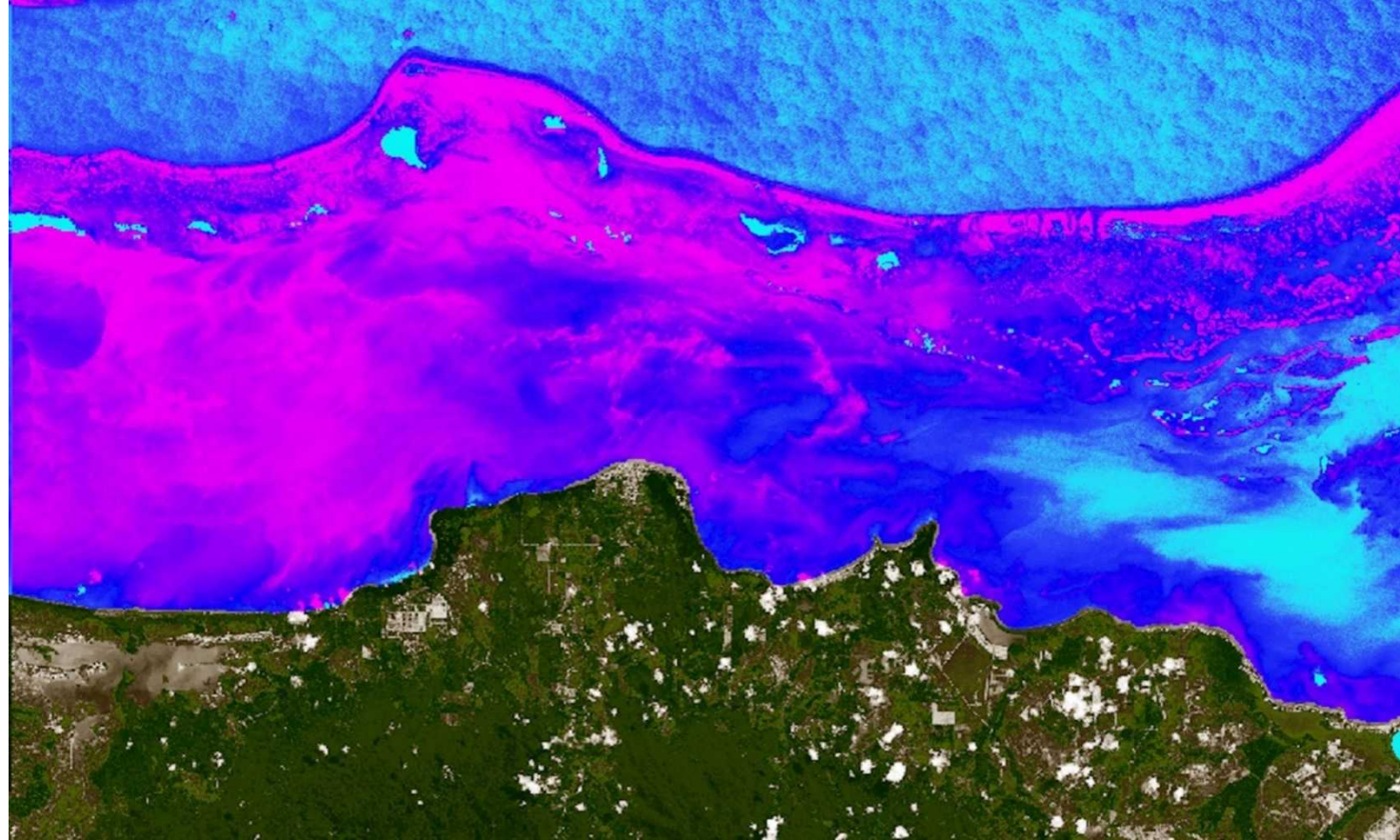
Belize & Honduras Water Resources I & II

Objectives:

- Analyze water quality parameters using EO
- Create a tool on GEE to understand current and changing water quality conditions

Partners:

- CZMAI
- MiAmbiente
- WCS



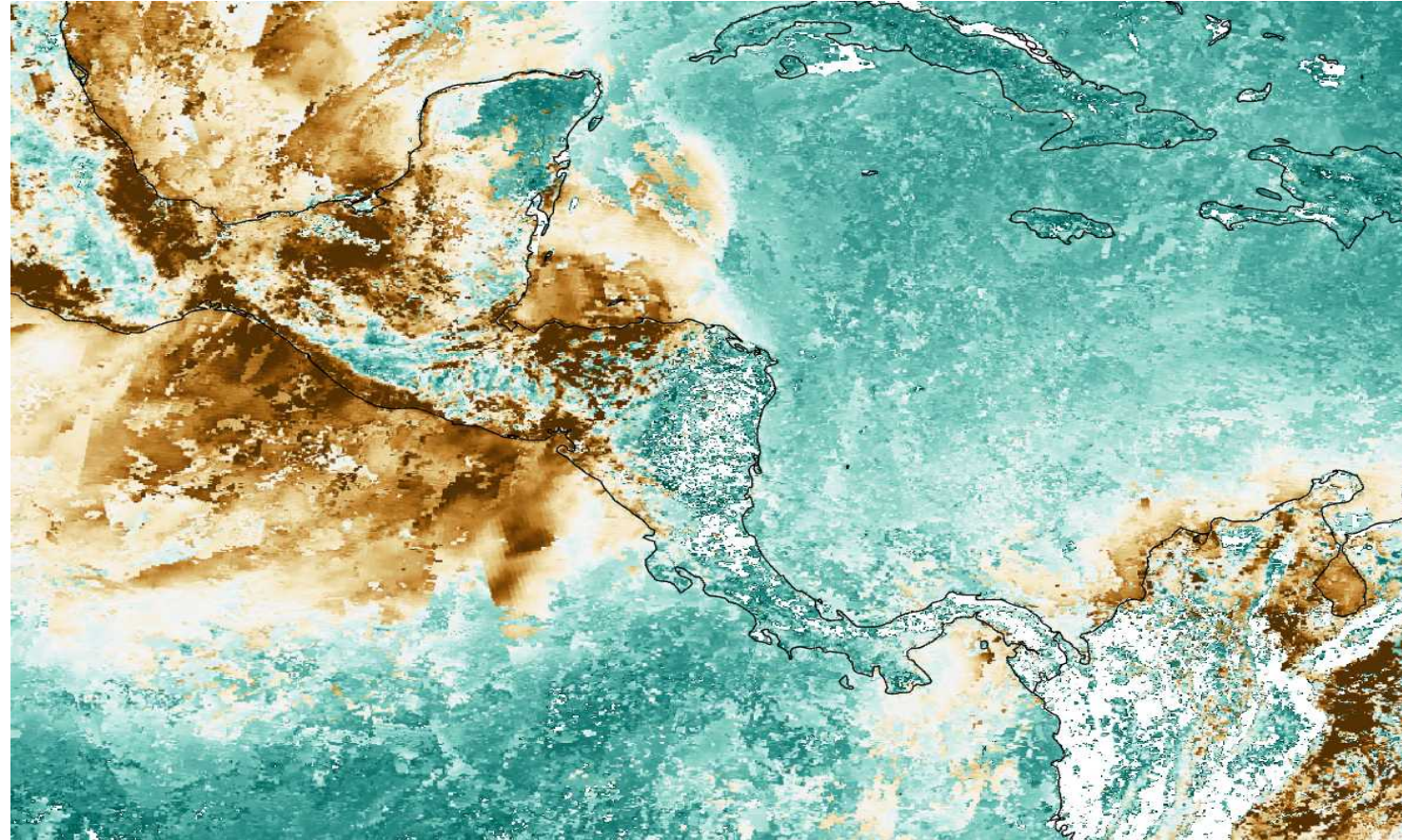
Central America Health & Air Quality

Objective:

- Quantify the relationship between PM2.5 and AOD

Partners:

- MARN (El Salvador)
- MARN (Guatemala)
- IEA
- Universidad Tecnológica de Panama
- La Universidad Autonoma de Ciriqi (Panama)



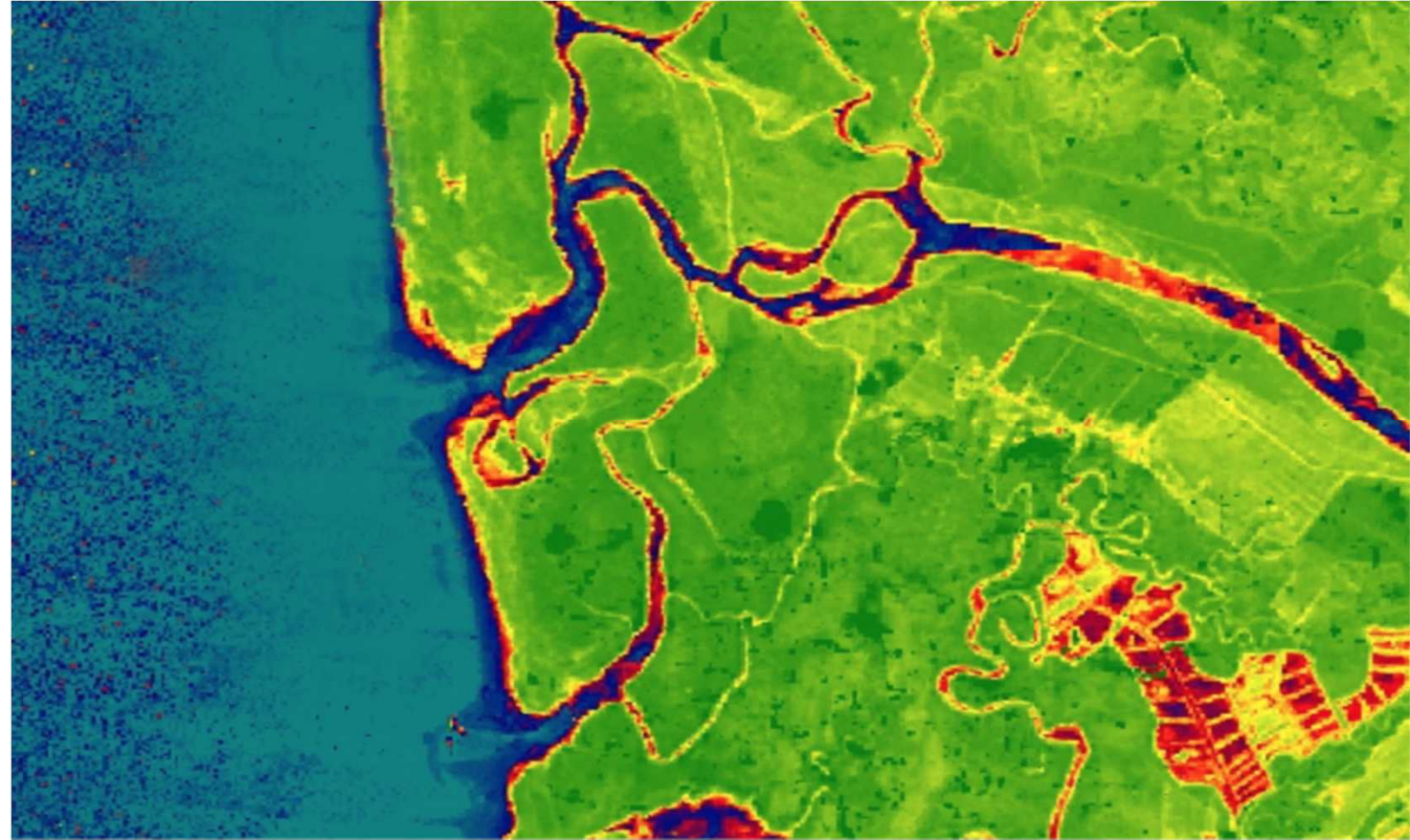
Costa Rica & Panama Ecological Forecasting

Objective:

- Analyze LULC in the Mesoamerican Biological Corridor
- Adapt a Forest Change Detection Tool for monthly LULC maps

Partners:

- MiNAE
- MiAmbiente



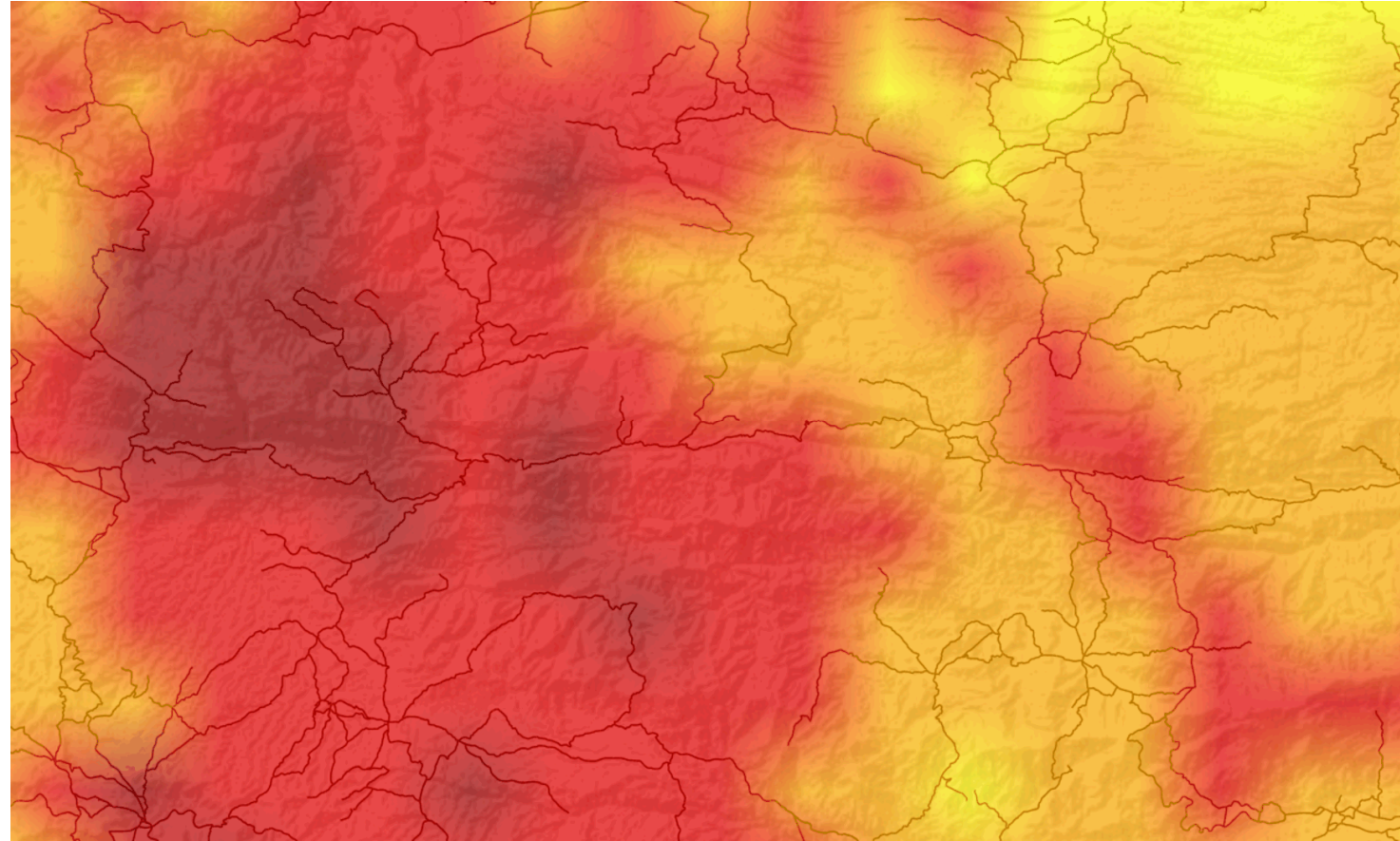
Central America Dry Corridor Agriculture & Food Security

Objectives:

- Derive SPI from GPM-IMERG time series
- Calculate precipitation & vegetation anomalies

Partners:

- MAG
- SAG
- UVG



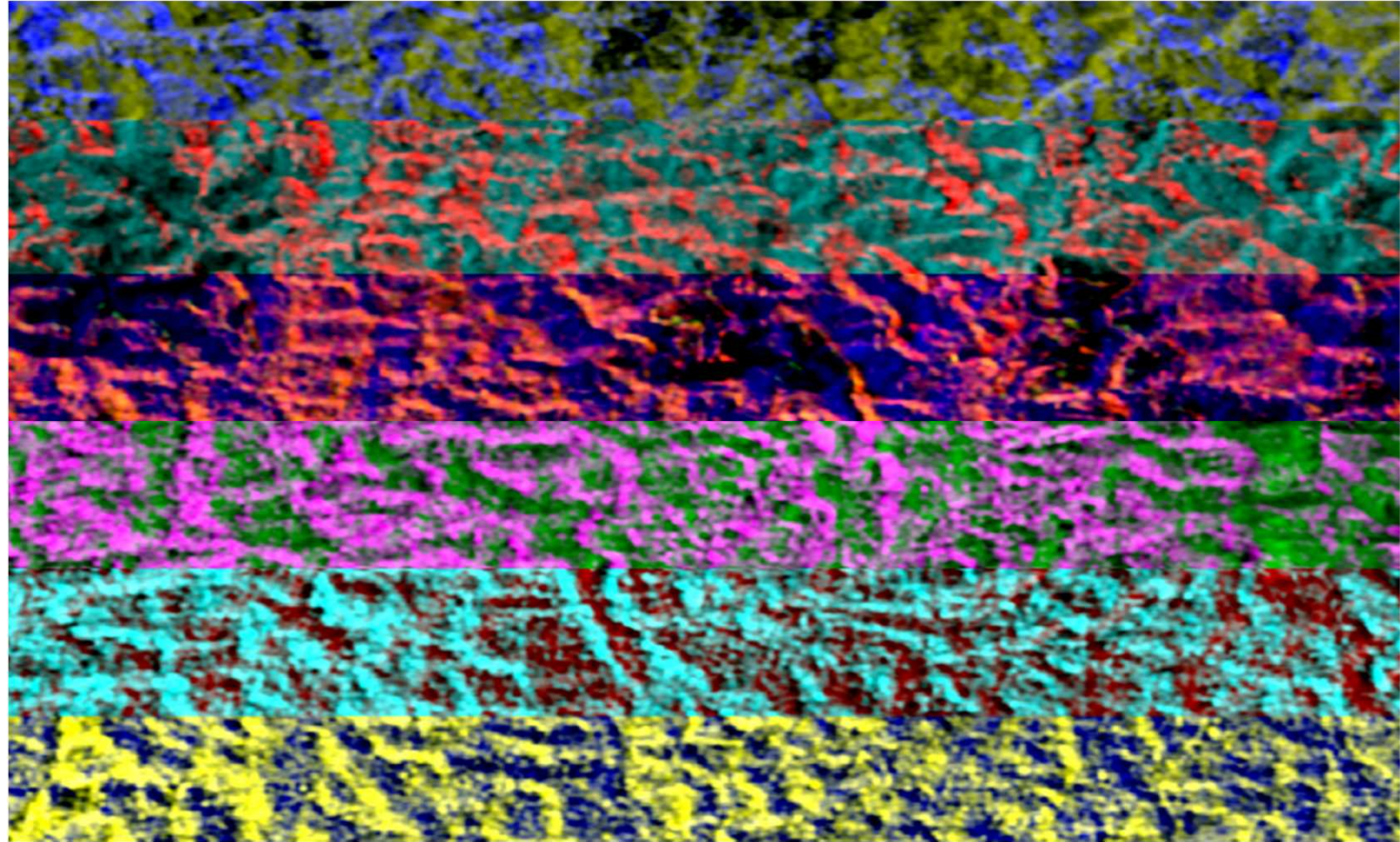
Panama Water Resources

Objectives:

- Create land cover water use maps using SAR and ET data
- Validate results with in situ data from STRI

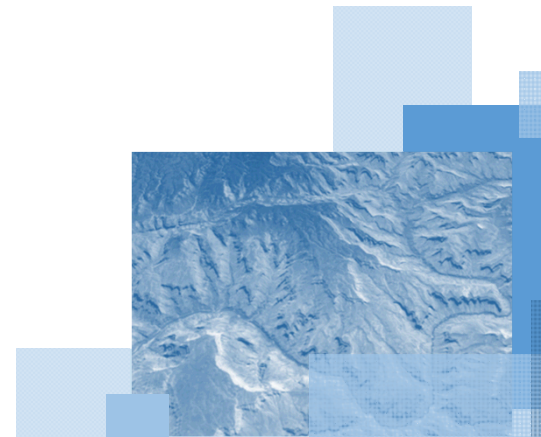
Partners:

- MiAmbiente
- STRI



Summary of Outcomes

- Programmatic coordination essential to success of all projects
- SICA Secretariat engagement critical to ensure buy-in from all countries
- Partners/End-users found value in Earth observations for environmental decision making
- Challenging logistics working multiple feasibility projects geographically dispersed and bilingual in nature.



Next Steps

- DEVELOP – delivering translated materials and project deliverables
- Maintaining engagement with SIICA to ensure continued exploration of opportunities to introduce Earth observations
- Coordinating with SERVIR to explore future SIICA engagement for co-developed products

