



GEO GLOWS

GEO - Global Water Sustainability

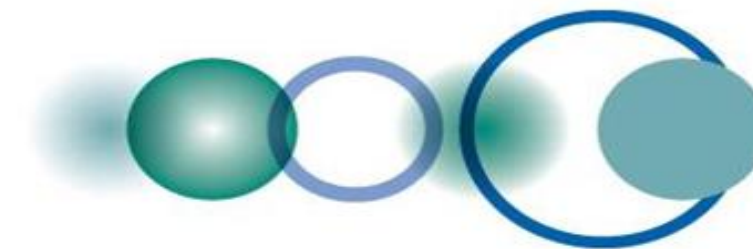
**International Flood Initiative Workshop
(IFI)**

January 10, 2017

Angelica Gutierrez-Magness

(on behalf of the GEOGLOWS team)





GEO Global Water Sustainability (GEOGLoWS)

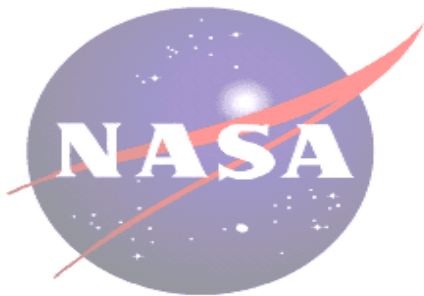
OBJECTIVES

- 1) Strengthen capacity to understand water data needs and develop user-driven applications products from EO data and applications
- 2) Engage end users and boundary organizations to understand needs and decision making process by region, and to prioritize activities based on vulnerability analyses
- 3) Coordinate and leverage GEOGLOWS partners to more effectively provide information and expertise to stakeholder and end-user communities
- 4) Strengthen capacity to use science and water EO effectively across spatial and temporal scales
- 5) Contribute to the assessments of population and economic growth impacts on water resources availability and climate change, to inform planning and adaptation activities



GEOGLOWS Framework includes activities focusing on:

1. Enhancing Global Water Sustainability;
2. Minimizing Basin and Regional Risk;
3. Essential Water Variable (EWV) Understanding (water quality and use; water cycle Variables);
4. Earth Observations, Integrated Data Products and Applications, and Tool Development;
5. Data Sharing, Dissemination of Data, Information, Products, and Knowledge.
6. User Engagement, Capacity Building.



Surface Water Mission Concept (SWOT) Stream Discharge and Surface Water Height

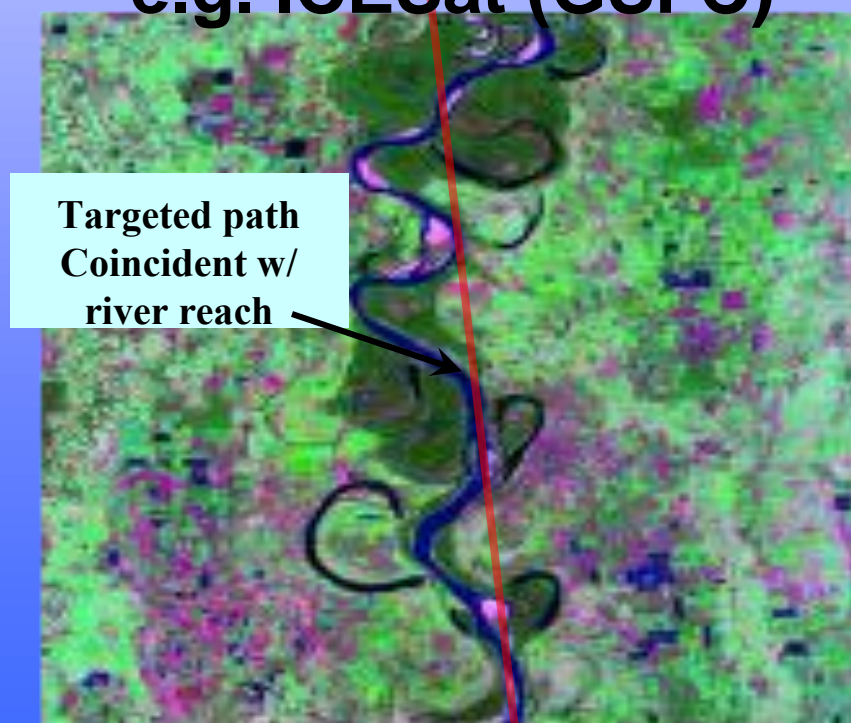


Motivation:

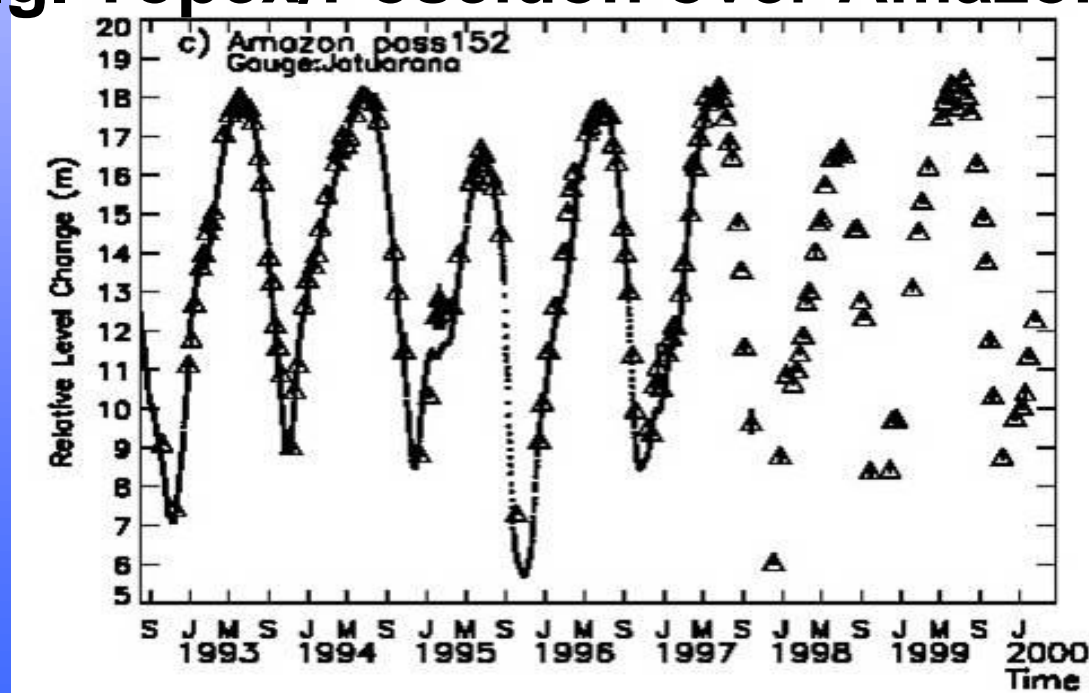
- critical water cycle component
- essential for water resource planning
- stream discharge and water height data are difficult to obtain outside US
- find the missing continental discharge component

Mission Concepts:

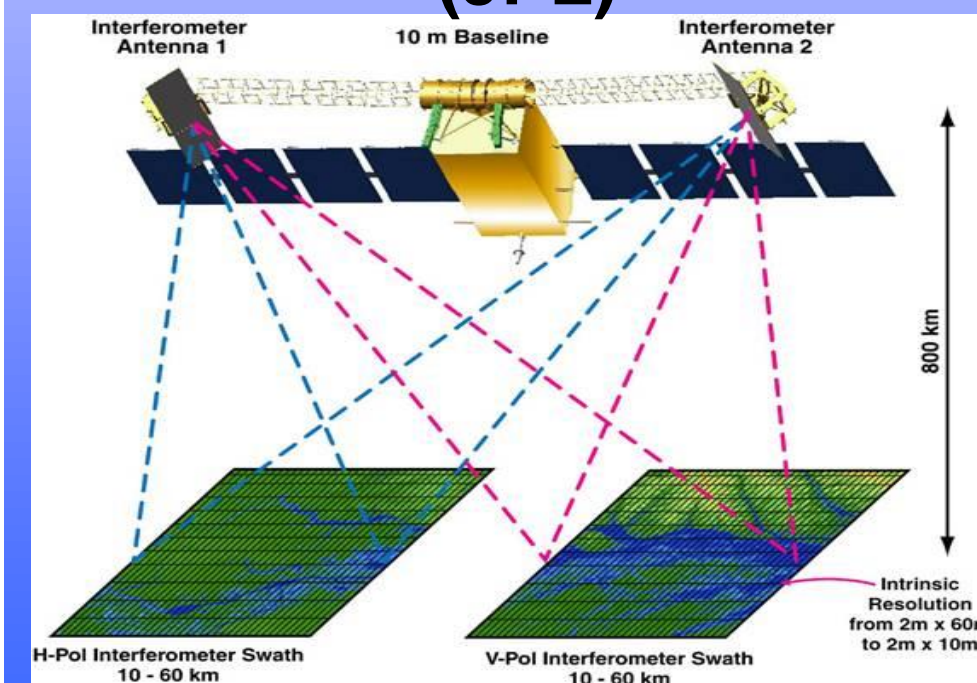
Laser Altimetry Concept e.g. ICESat (GSFC)



Radar Altimetry Concept e.g. Topex/Poseidon over Amazon R.

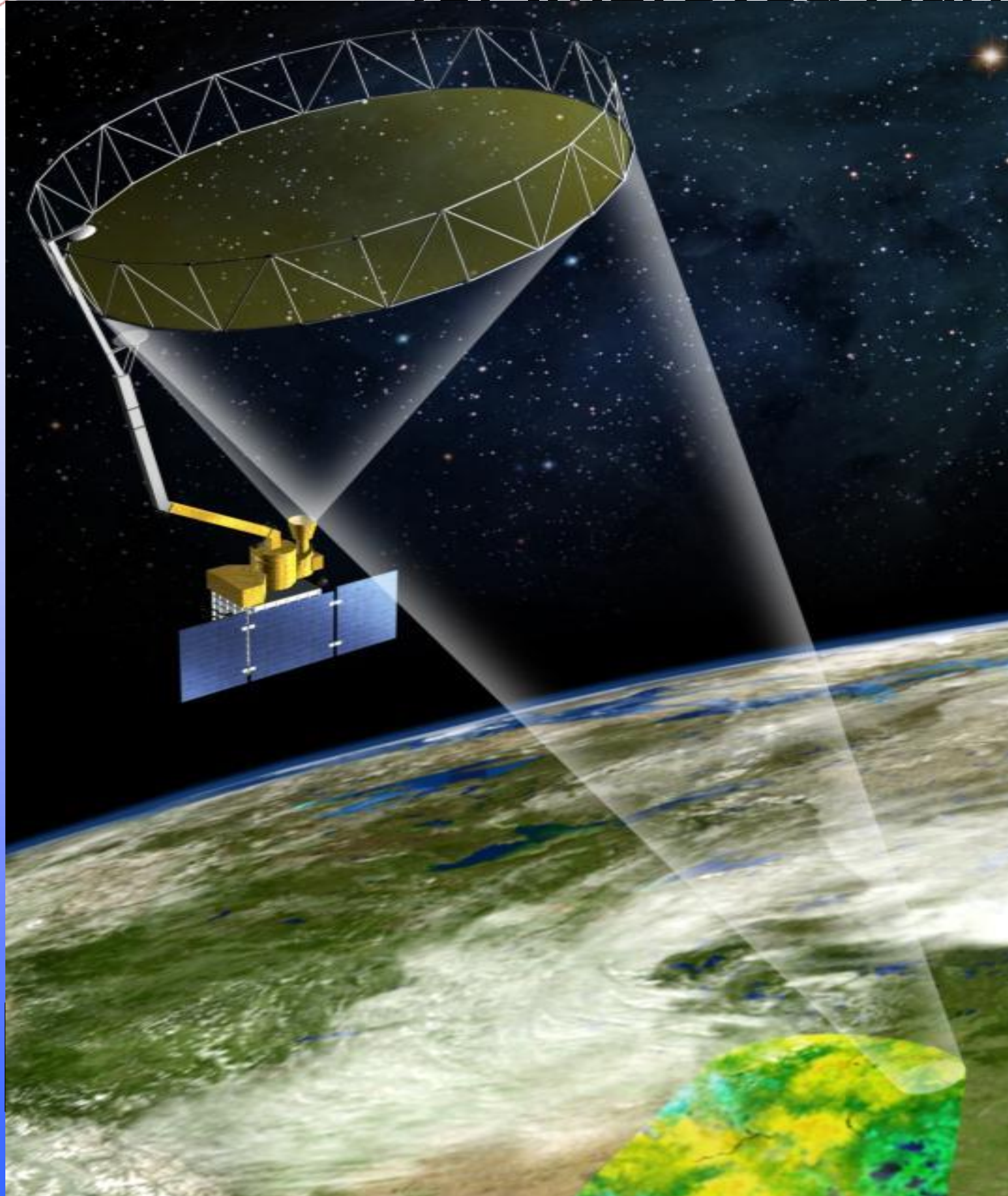


Interferometer Concept (JPL)



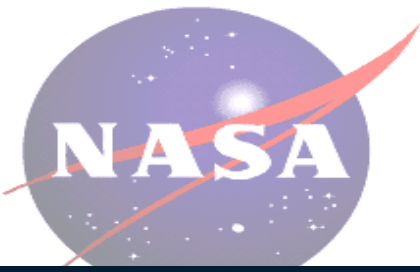


SMOS and SMAP Based Soil Moisture Used by USDA/FAS for Improved Agricultural Forecasting

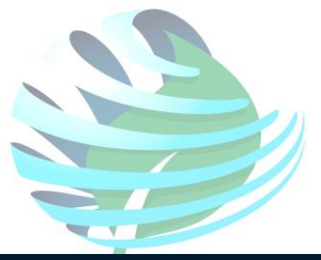


SMAP Facts

- **Resolution: 10 km**
- **Instruments: L-band Radar and Radiometer**
- **Launch: January 31, 2015**
- **Mission Duration: 3 years**



SERVIR HUBS (NASA and USAID)



The SERVIR Network

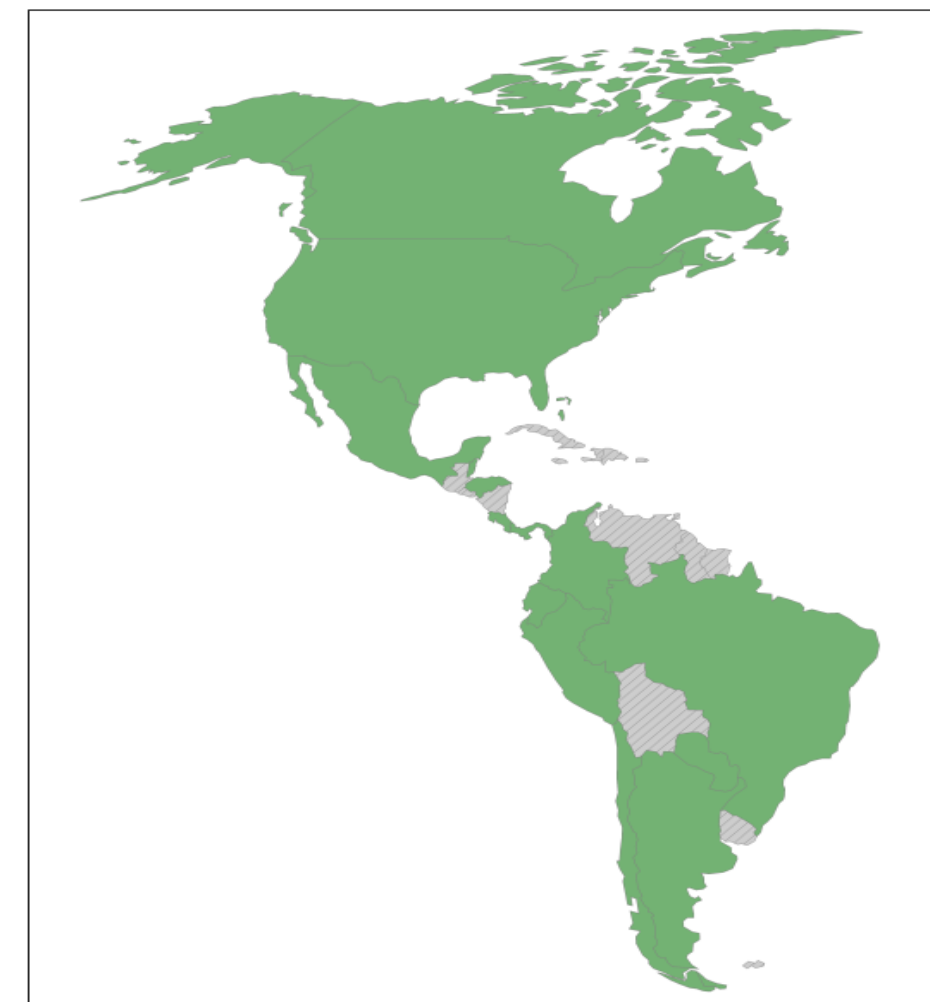


AmeriGEOSS

Initiative & Regional Coordination

Is a cooperative effort of the 16 GEO member countries in the Americas that:

- Reflects local, national, and regional interests of the GEO country-members for short and long-term planning, development, and implementation aligned with GEO activities.
- Is entrenched in the institutional and technical capabilities of its country members and in the resources of other global initiatives available for the benefit of the region.
- Seeks to increase institutional and personal capacity and engage experts, stakeholders, and decision makers in the process of decision making.



- Argentina
- Bahamas
- Belize
- Brazil
- Canada
- Chile
- Colombia
- Costa Rica
- Ecuador
- Honduras
- Mexico
- Panama
- Paraguay
- Peru
- United States
- Uruguay 7

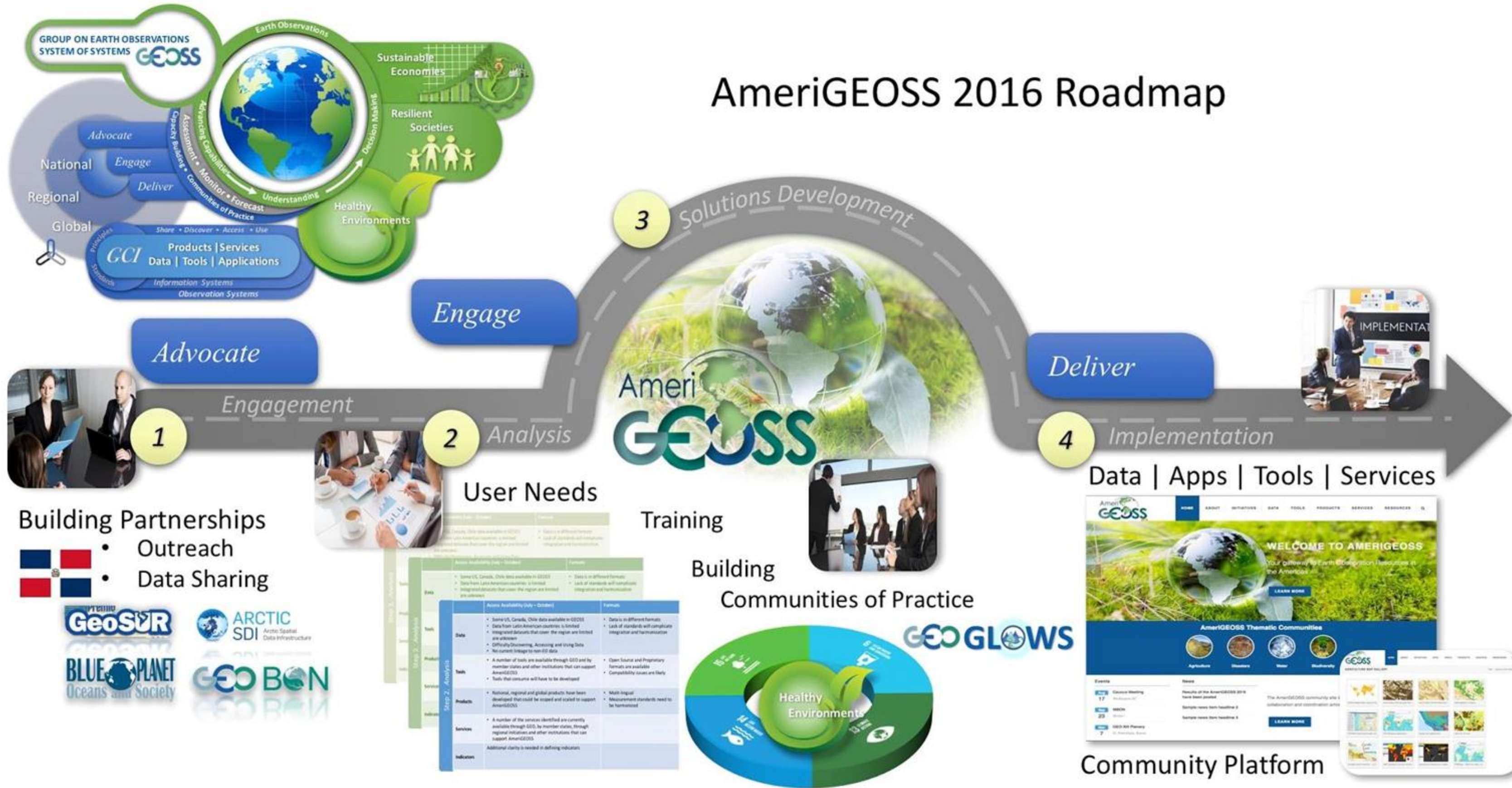
AmeriGEOSS Initiative & Regional Coordination

Coordination Process



Next: to develop TORs for each step in this Coordination Process

AmeriGEOSS 2016 Roadmap



- Building Partnerships**
- Outreach
 - Data Sharing

User Needs

Training

Building Communities of Practice

Step 2 - Analysis	Findings
<p>Data</p> <ul style="list-style-type: none"> Some US, Canada, Chile data available in GEOSS Data from Latin American countries is limited Integrated datasets that cover the region are limited or unknown Difficulty Discovering, Accessing and Using Data No current linkage to non-EO data 	<ul style="list-style-type: none"> Data in different formats Lack of standards will complicate integration and harmonization
<p>Tools</p> <ul style="list-style-type: none"> A number of tools are available through GEO and by member states and other institutions that can support AmeriGEOSS Tools that consume will have to be developed 	<ul style="list-style-type: none"> Open Source and Proprietary formats are available Compatibility issues are likely
<p>Products</p> <ul style="list-style-type: none"> National, regional and global products have been developed that could be wrapped and scaled to support AmeriGEOSS 	<ul style="list-style-type: none"> Multi-lingual Measurement standards need to be harmonized
<p>Services</p> <ul style="list-style-type: none"> A number of the services identified are currently available through GEO, by member states, through regional institutions and other institutions that can support AmeriGEOSS 	
<p>Indicators</p> <ul style="list-style-type: none"> Additional clarity is needed in defining indicators 	

Data | Apps | Tools | Services



Community Platform

Partnerships for Institutional Capacity: GEONETCast



GEONETCast Américas Costa Rica



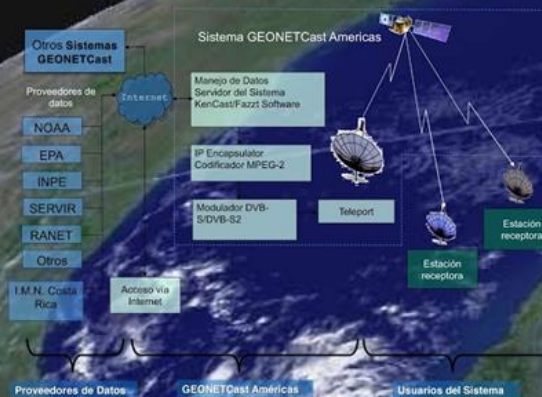
Transmisión

Los datos se transmiten a través del satélite geoestacionario Intelsat-9 (IS-9), que cubre la mayor parte de las Américas con un transponder DVB-S de banda C

Area de cobertura



Estructura del Sistema GEONETCast Américas



Ubicación de estaciones emisoras / receptoras

Estación: Experimental Fabio Baudrit
 Latitud: 10° 00' / Longitud: 84° 15'
 Altitud: 840 msnm
 Provincia de Alajuela

Estación: Aeropuerto Internacional Daniel Oduber Quirós
 Latitud: 10° 36' / Longitud: 85° 32'
 Altitud: 85 msnm
 Provincia de Guanacaste

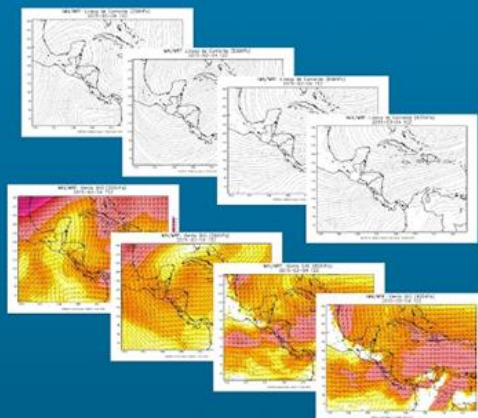
Estación: Aeropuerto Internacional Juan Santamaría
 Latitud: 10° 00' / Longitud: 84° 12'
 Altitud: 932 msnm
 Provincia de Alajuela

Estación: Limón
 Latitud: 10° 00' / Longitud: 83° 04'
 Altitud: 5 msnm
 Provincia de Limón, Caribe Norte

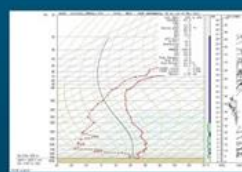
Estación: San José
 Latitud: 09° 56' / Longitud: 84° 05'
 Altitud: 1172 msnm
 Provincia de San José

Lista de productos transmitidos por Costa Rica

Modelo de investigación predicción del tiempo / WRF

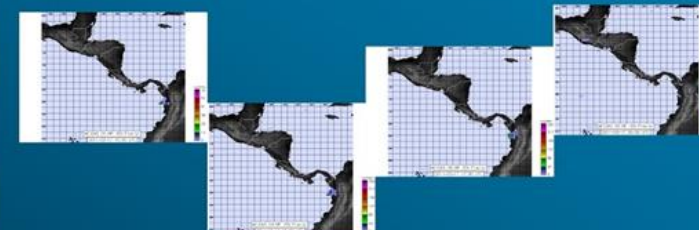


El WRF, es un modelo de pronóstico del tiempo y de investigación de nueva generación a mesoescala, y un sistema de predicción numérica del tiempo diseñado para servir tanto a la previsión operativa y las necesidades de la investigación atmosférica. Cuenta con múltiples núcleos dinámicos, uno de 3 dimensiones variacional (3DVAR), que es un sistema de asimilación de datos y cuenta con una arquitectura de software que permite el paralelismo computacional y la extensibilidad del sistema. WRF es adecuado para un amplio espectro de aplicaciones a través de escalas que van desde metros hasta miles de kilómetros. El modelo WRF concede a los investigadores la capacidad de realizar simulaciones que reflejan bien los datos reales o configuraciones idealizadas. El WRF ofrece la simulación de predicción de un modelo que es flexible y eficiente desde el punto de vista computacional, al tiempo que ofrece mayores avances en la física, métodos numéricos, y la asimilación de los datos aportados por la comunidad científica.



Radiosondeo

Guía de inundación instantánea areal para Centroamérica / CAFFG



El Sistema CAFFG, es un estimador de cantidades de lluvias capaces de producir desbordamientos, con base en las cantidades de lluvia caída y estimada con base en las imágenes satelitales desarrollado para Centroamérica con datos de salida del modelo a escala de cuencas centroamericanas.

Lista de algunos productos actuales recibidos por GEONETCast

- Alertas
- FENGYUNCast
- IMN-Costa Rica
- INPE
- NADM
- SERVIR
- NOAA-NESDIS
- RANET

GEOGLOWS Partners in the Americas

US Government: (NOAA, NASA, USGS)

UBY (University of Brigham Young)

GEONETCast community in the Americas (Br, US, CR, MX, SL, Col, Ch)

European Union (JRC - Joint Research Centre)

Colombia (IDEAM - Instituto de Desarrollo del Ambiente), **CIRMAG (Centro de Investigación Científica del Rio Magdalena)**, ENAP (Escuela Naval Almirante Padilla), UNAL (Universidad Nacional de Colombia)

Costa Rica - IMN -Instituto Meteorológico Nacional, SENARA (Costa Rica's National Service of Underground Water, Irrigation and Drainage),

El Salvador -Ministerio de Medio Ambiente y Recursos Naturales;

Mexico - SEMARNAT (Mexican Secretariat of the Environment and Natural Resources)

Argentina



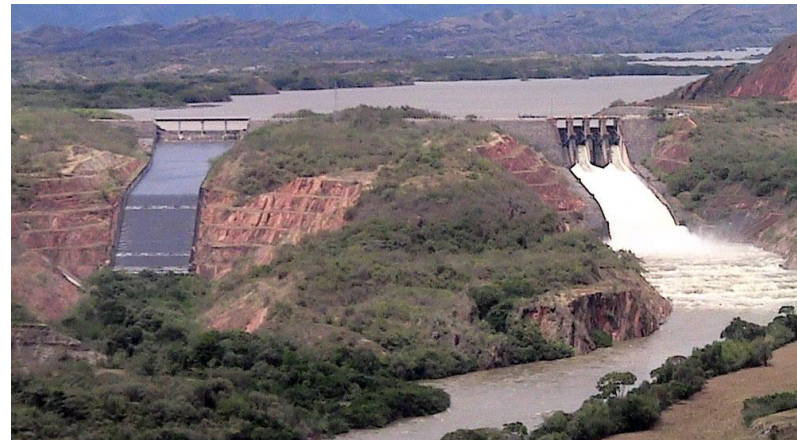
CORPORACIÓN CENTRO DE INVESTIGACIÓN CIENTÍFICA DEL RÍO MAGDALENA "ALFONSO PALACIO RUDAS"

Is a government organization of a scientific nature, of common utility, defined by Law 161 of 1994 to develop a high technical and scientific capacity to place knowledge and research As the argumentative route in the decision making related to the Magdalena River, its environmental policies and actions for the management and integral management of the basin and its resources.

Focal Point for Interinstitutional cooperation

R & D : Aplied and Integrated

Efective Communication



MAGDALENA BASIN COMPLEXITY



CIRMAG & AMERIGELOSS/GEOGLOWS

Starting in 2015, the Research Center began its cooperation with AmeriGeoss, which has generated great contributions for the development of the research center, allowing it to create training spaces related to water resources and platforms that allow free access to The hydrometeorological information of the basin.

Main Areas of cooperation:

- Implementation and capacity building for Hydroserver (2015)
- GEO-CIEHLYC Webinar: Consideraciones del Contexto Legal, Institucional y Técnico para los análisis integrados del Recurso Hídrico en Colombia.
- Participation in the Second GEO-CIEHLYC Water Cycle Capacity Building Workshop. (2015)
- AmeriGeoss Week (2016)
- Joint Research Centre - Italia (GloFAS)
- Acquisition of GEONETCast system (2015)
- Funes methodologies and test case for the
 - AmeriGEOSS platform (2017)



CIRMAG

Centro de Investigación del Río Magdalena
Alfonso Palacios Rivas

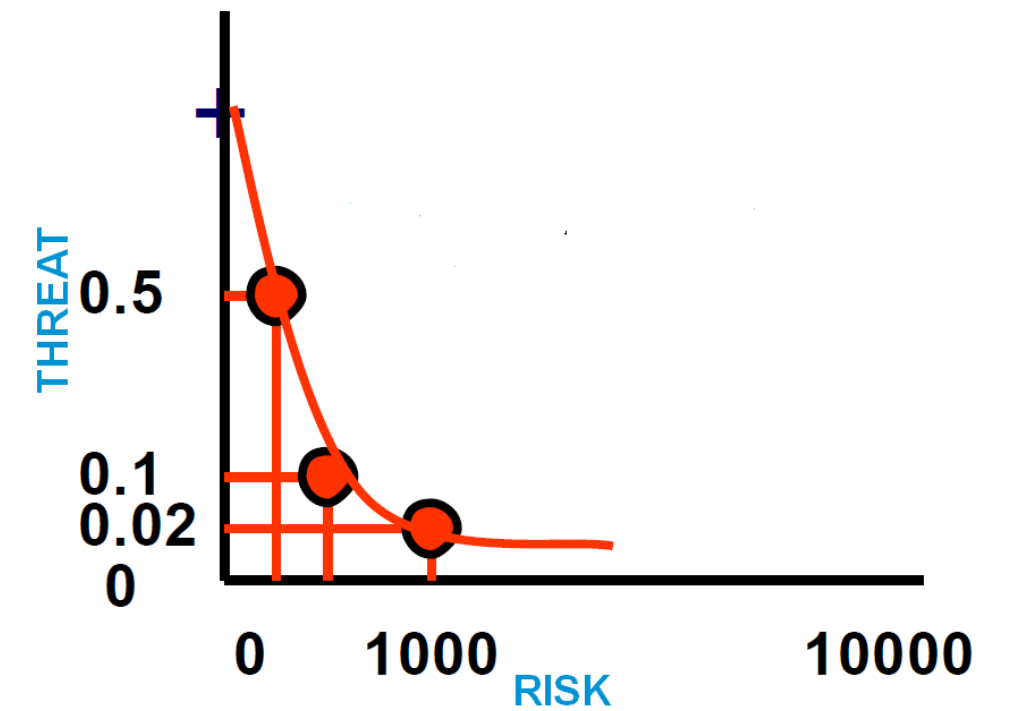
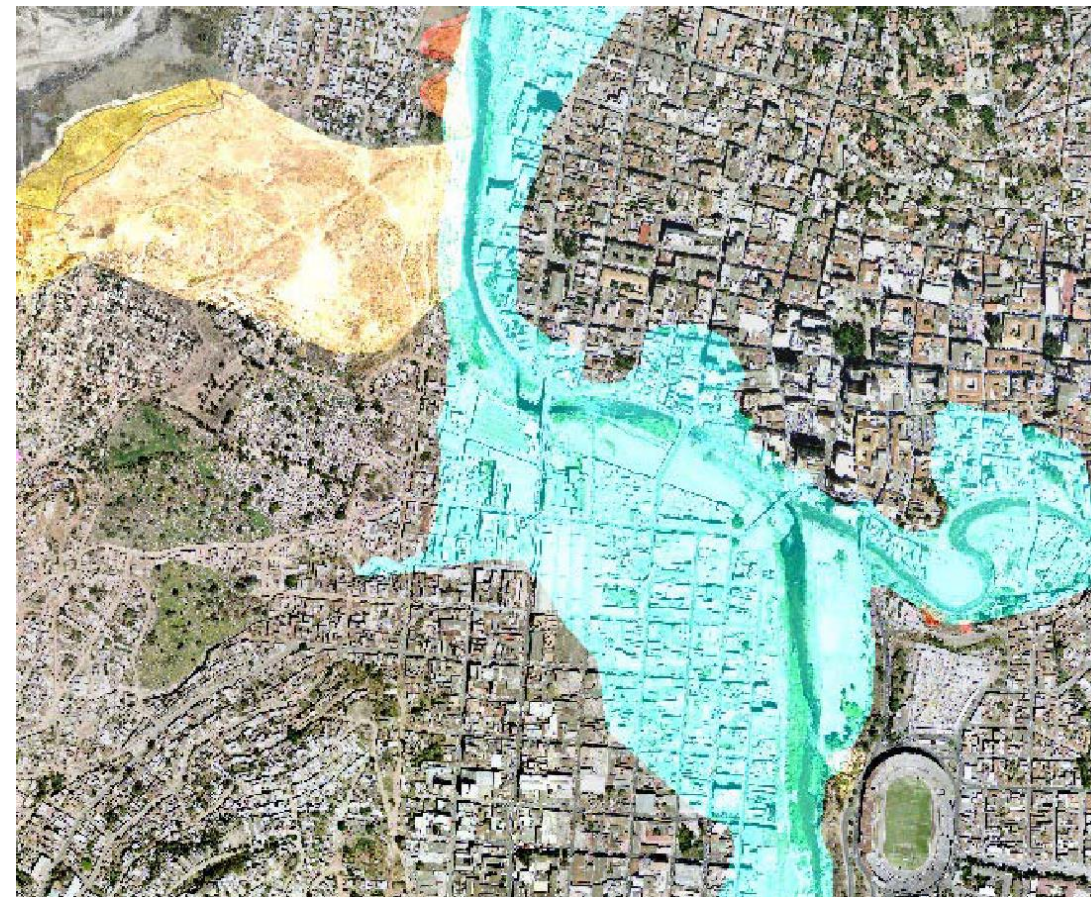
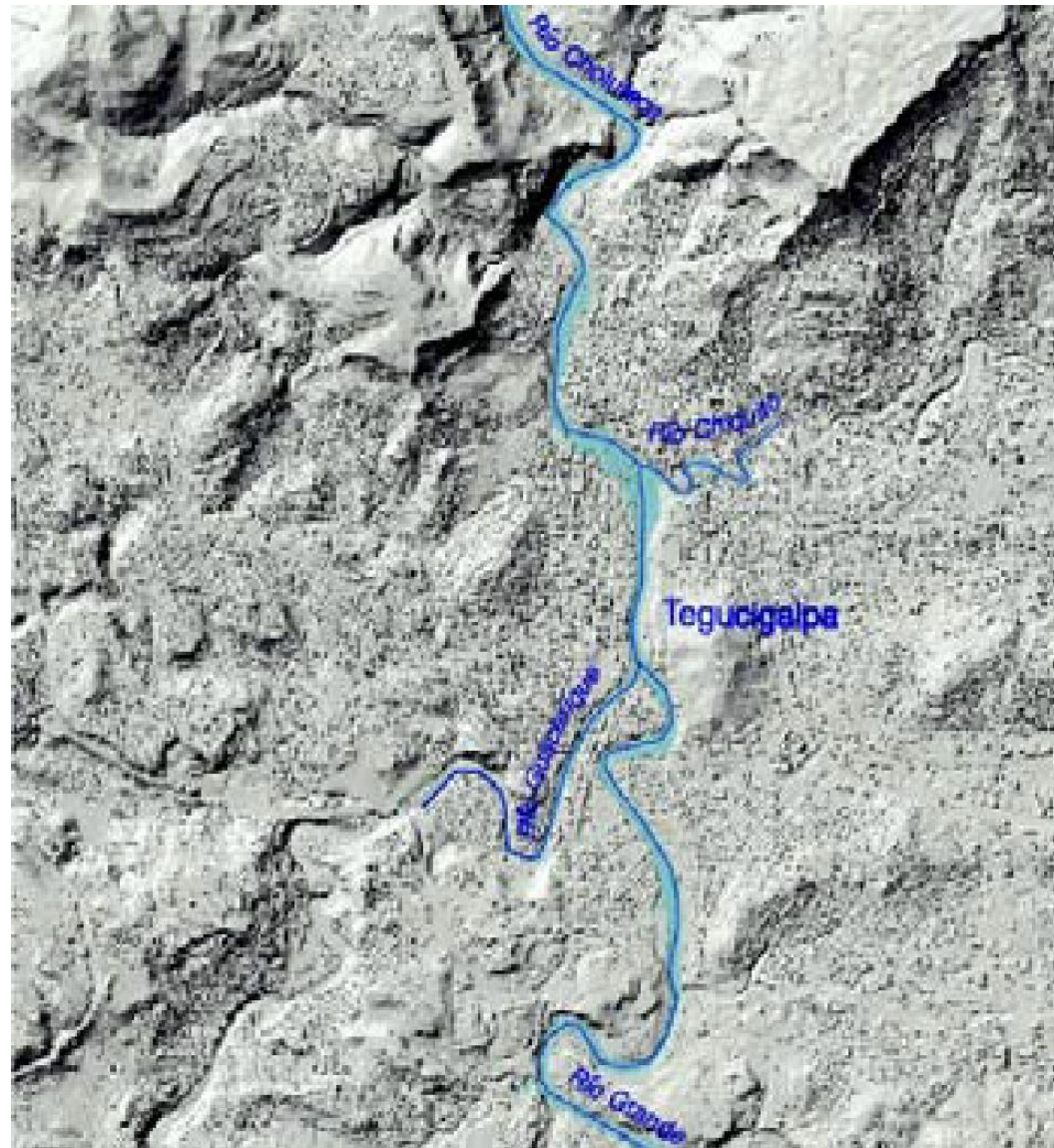
FLOOD RISK MANAGEMENT IN URBAN AREAS IN MAGDALENA RIVER

THREAT VULNERABILITY AND RISK ASSESSMENT

THREAT

VULNERABILITY

RISK



Economic analysis

Social work

Hydraulic and hydrologic modelling



Participation in Capacity Building Activities

2011, 2015, 2016

- GEO-CIEHLYC Capacity Building Activities: Focus on Water
- 4 Cursos:
 - Hydroserver/ECMWF-RAPID
 - NASA/ARSET Variabilidad Climática
 - Oceanografía Operacional
 - Uso de datos Ópticos en Oceanografía



- 105 Participants
- 8 countries
- 33 participant institutions

GEOsec Presentation: "Blue Planet"



Poster session



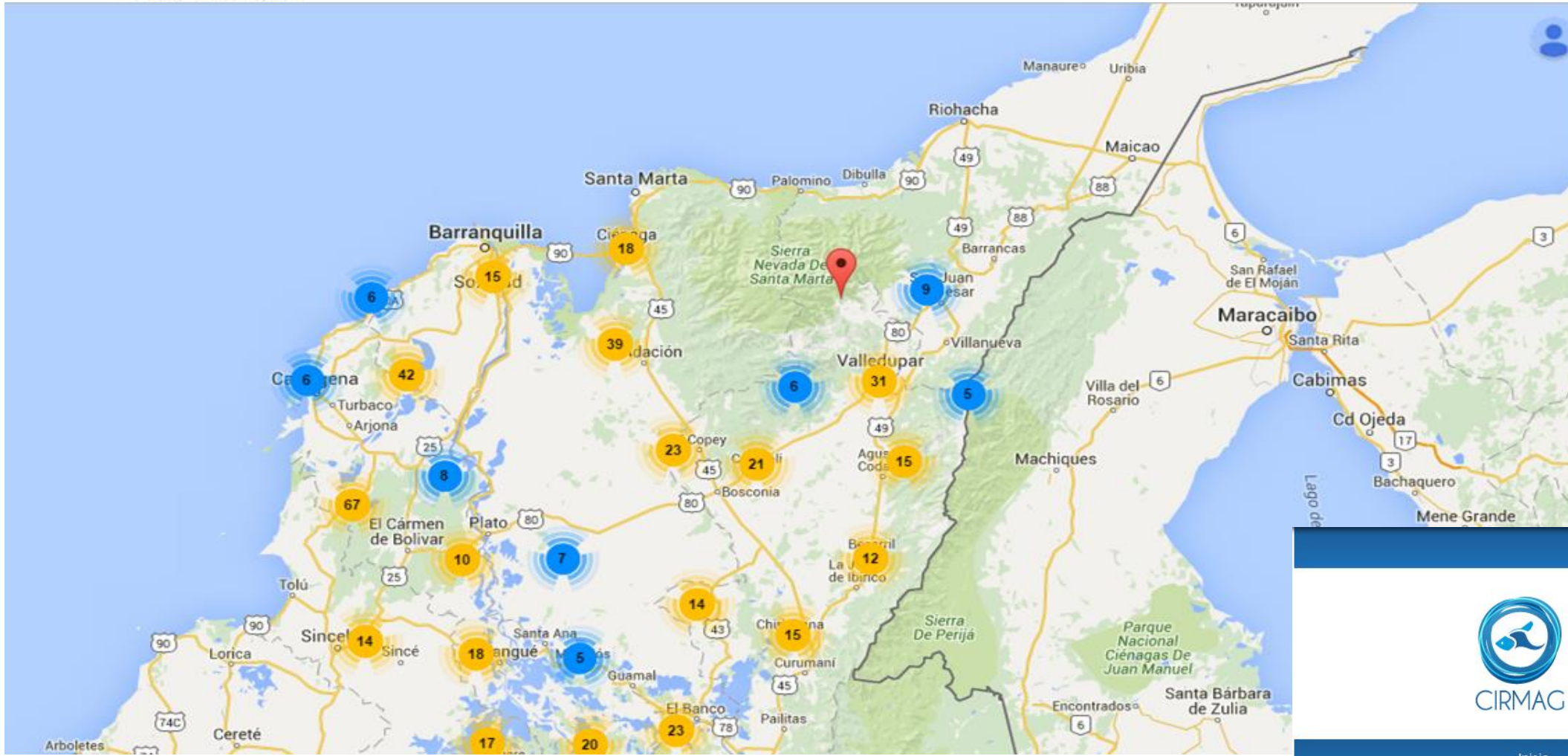


CIRMAG
Centro de Investigación del Río Magdalena
Alfonso Palacio Rudas

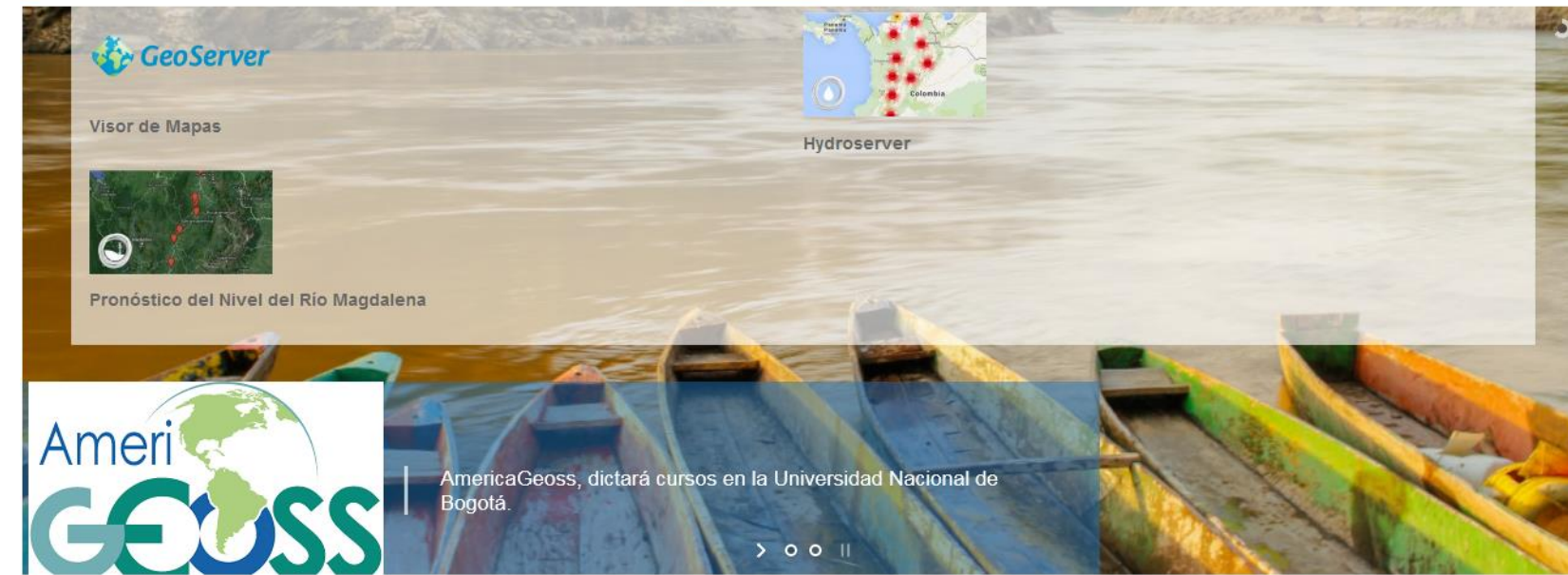
In 2015



HYDROSERVER *lite*



In Hydroserver Lite you can access to the historical (hydrologic and meteorological) information of Magdalena-Cauca large basin from entities like IDEAM





CIRMAG

Centro de Investigación del Río Magdalena
Alfonso Palacios Rivas

2015 Acquisition of the GEONETCast system

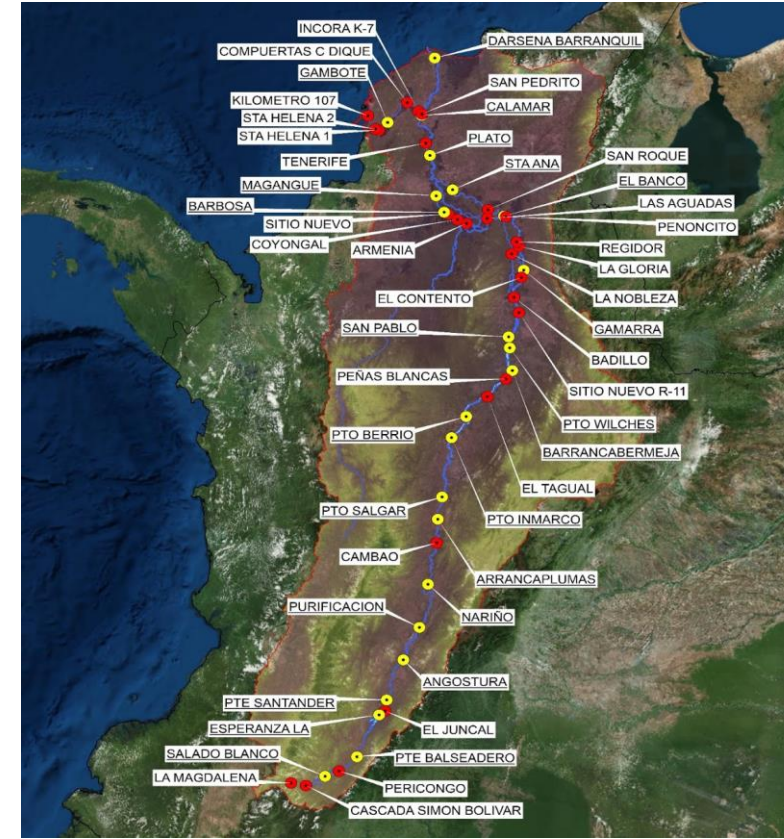


www.cirmag.org.co

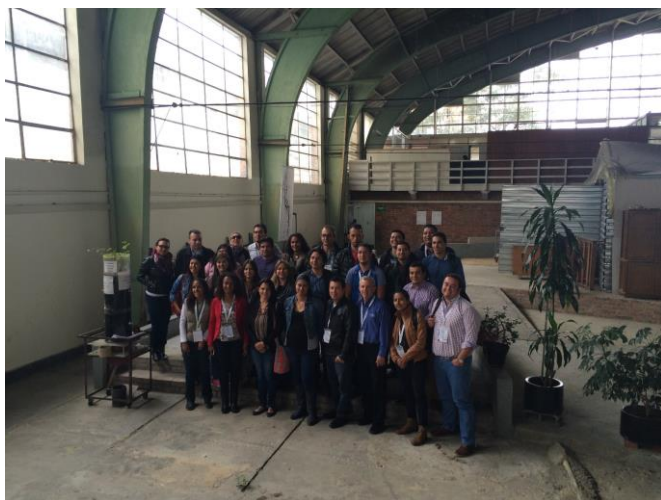
Activities in 2017

FUNES

AQUAVEO™ "If History is any guide..."



Joint Research Centre - Italia (GloFAS)



Training AMERIGEASS Week (2016) BOGOTÁ

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AmeriGEOSS Your Source for Earth Observation Data

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Agriculture Disasters Water Biodiversity Foundational

The AmeriGEOSS community site is a regional resource to *share, find, discover, learn and participate* in efforts to discover, understand and respond to societal needs

US- ARGENTINA (2017)

Partner organizations:

- Comisión Nacional de Actividades Espaciales (CONAE)
- Ministerio de medio ambiente y Desarrollo Sostenible - (MAyDS)
- autoridad de aplicación del Gobierno de La Pampa
- Waterlex
- Instituto de Hidrología de Llanuras (IHLLA)
- Instituto de Clima y Agua – INTA
- GEOGLAM
- National Oceanic and Atmospheric Administration (NOAA)
- National Aeronautics and Space Administration (NASA)
- U.S. State Department
- U.S Geological Survey
- Brigham Young University, University of Maryland, Morgan State University

Thank you!

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