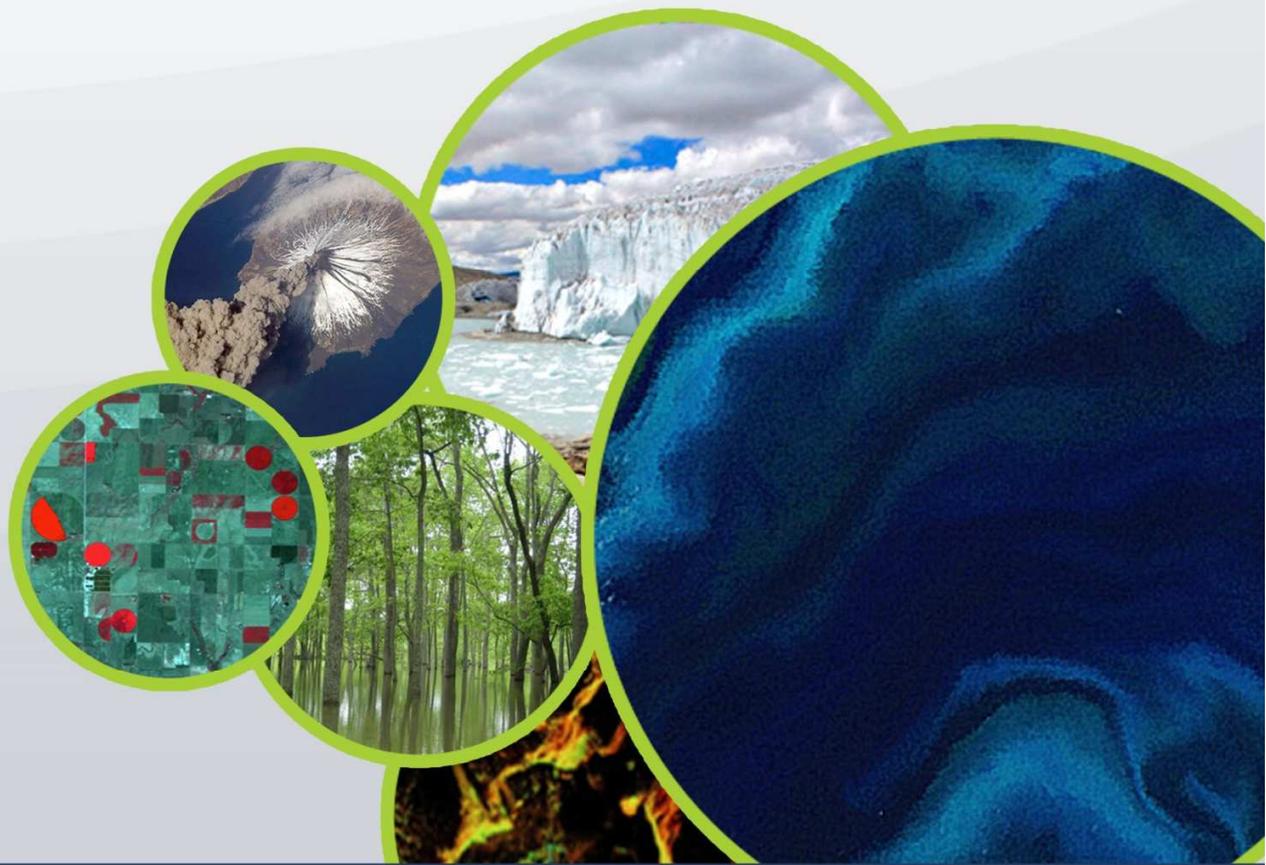




Committee on Earth Observation Satellites



Remote Sensing Images Processing for Disasters Response – Use of CBERS-4 and Sentinel images and INPE's and ESA's Tools

AmeriGEOSS Week 2018

August 9-10, 2018

INPE – São José dos Campos, Brazil



Summary

AmeriGEOSS is the GEO regional initiative framework for the members from the Americas. AmeriGEOSS Week 2018 was held at INPE between 6 and 10 of August, 2018.

One of the objectives of the AmeriGEOSS Week 2018 meeting was to provide training in the use of Earth Observations. In this scope, the group at the Image Processing Division (DPI), Earth Observation Coordination (OBT) at INPE offered a course on Disaster Risk Reduction.

The two components of the course were on the use of TerraMA2 – Platform for Monitoring, Analysis and Alert of Environmental Extremes - and the use of Remote Sensing Images for Disasters Response. This second part of the course was a WGCapD initiative, supported by 2 space agencies: ESA and INPE.

The course presented digital image processing techniques for identifying damages and producing maps in support of disaster response, as well as, the use of Sentinel data and ESA tools for Disaster mapping. TerraView and SPRING, INPE's free and open source tools, and ESA's toolboxes GEP (Geohazards Exploitation Platform) and SNAP (Sentinel Application Platform) have been used during hands-on activities.

Unfortunately, although there were 10 registered participants, the attendance of the course was very low, with two participants at the TerraMA2 component and three at the Remote Sensing part. However, the participants were highly motivated and skilled ones and the interaction with participants was facilitated. The course fulfilled participants expectations and was very productive. This low attendance might be attributed to the concurrent training sessions and side meetings during the event – overall structure of the event.



Figure 1: Participants and instructor.



Objectives

As per stated in the course folder, the objective of the course was to present digital image processing techniques for identifying damages and producing maps in support of disaster response. The data and tools used in the course were from INPE and ESA. In addition, a demonstration of the ESA's RUS and GEP (Geohazards Exploitation Platform) was performed.

Hands-on and demonstrations

In the course, students were given instructions to execute hands-on exercises, divided in two parts; use of INPE data and tools; and use of ESA data and tools. The INPE part focused on using optical imagery and ESA part was focused on radar imagery.

The INPE part consisted of using CBERS4 imagery to detect burnt areas in a Brazilian National Forest. The study case fire was in October/2017 and more than 600 square kilometers were burned in one week. The topics were: Imagery selection and download; Cut/Trim Image; Registration; Classification (pixel and region, unsupervised); Area Calculation; and KML export.

The ESA part consisted of using Sentinel-1 imagery to detect flooded areas around Uruguay river during June/2017. The topics were: Imagery selection and download; Cut/Trim Image; Radar Processing; Flooded Area Estimation; and KML export.

All the exercises were prepared with a step by step document. Radar processing and area estimation were carried out using the material provided by ESA.

In addition, one hour was dedicated to demonstrate RUS and GEP. For RUS, the machine that was allocated to use in the course was presented, highlighting that SNAP was available and that imagery had to be in RUS storage. Regarding GEP, the provided license was used to login and demonstrate how imagery and some of the algorithms are available, highlighting how GEP can be useful when lots of data are required, especially for temporal analysis and monitoring scenarios. It was informed to the participants about the availability license of licenses fir testing the platform.

Profile of participants

The participants of the course were:

- Undergraduate Student in Environmental Sciences;
- Graduate Student in Transportation Engineering; and
- Professor at Federal University.



Instructor

- INPE: Laercio Massaru Namikawa

Workshop material

The training material is available at: <http://wiki.dpi.inpe.br/doku.php?id=trein:pdidesastres>.

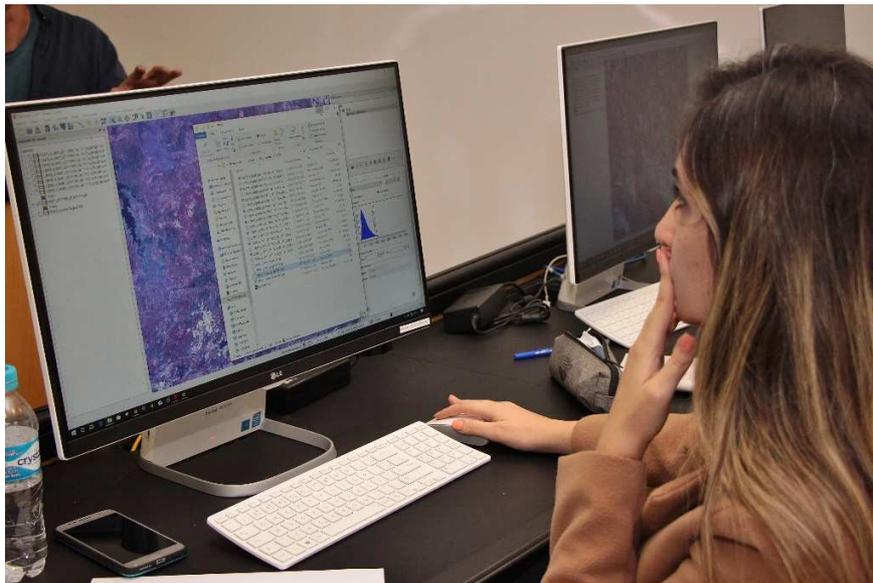


Figure 2: Participant working on images to map burnt areas.

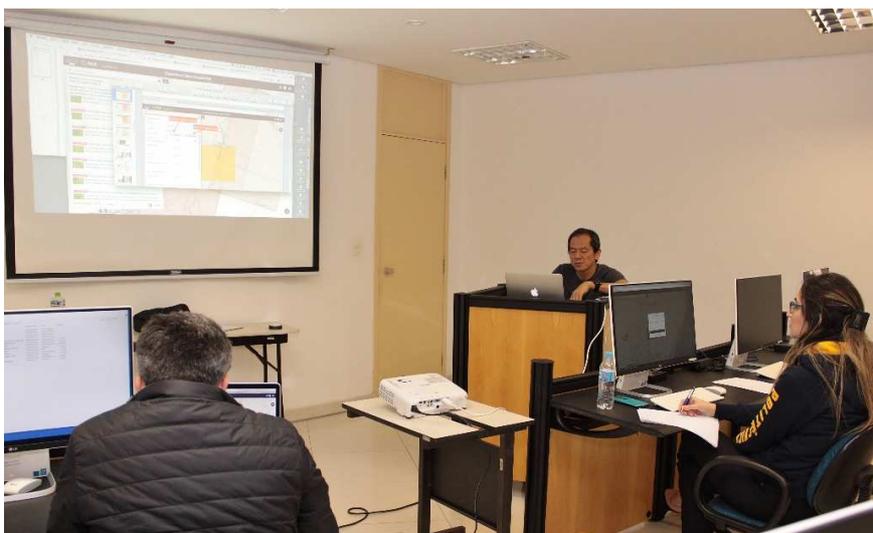


Figure 3: Participants working on images to map flood.