

Regional satellite training needs

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SHN-SMN



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- ❖ **SDR FOR RA III AND RA IV - SURVEY REPORT/Capacity building issues**
- ❖ **Forecast Offices Challenges**
- ❖ **Training Requests**
- ❖ **SMN: Current approaches to the application of remote sensing for education**
- ❖ **Current University Course in Argentina at UBA (University of Buenos Aires)**
- ❖ **Conclusions/Suggestions**

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SDR FOR RA III AND RA IV - SURVEY REPORT/Capacity building issues

- ❖ **Total answers: 31 answers from 23 countries: 18 answers were provided from national meteorological and hydrological services, 9 answers from research institutions, 3 answers from space agencies and 3 answers were from universities.**
- ❖ **(Argentina 5 (five) institutions: Comisión Nacional de Actividades Espaciales (CONAE); Facultad de Agronomía de Buenos Aires; Servicio de Hidrografía Naval (SHN); Servicio Meteorológico Nacional (SMN); Unidad de Geociología de IANIGLA (CONICET)**

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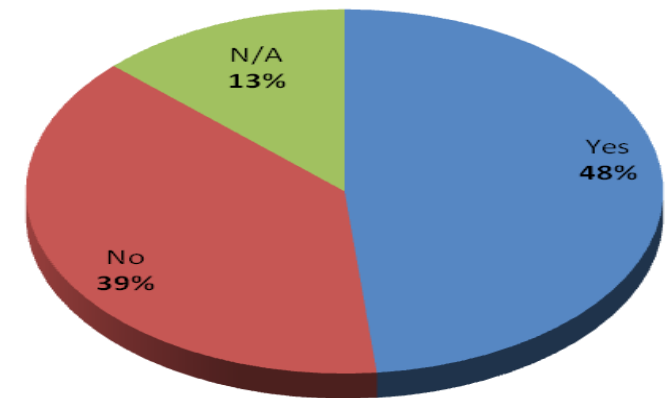
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SDR FOR RA III AND RA IV - SURVEY REPORT/Capacity building issues

Most institutions answered that their country would consider covering the costs to send employees for training in Regional Centers for longer periods (48%).

It is clear that the great obstacle for the institutions is the cost involved,

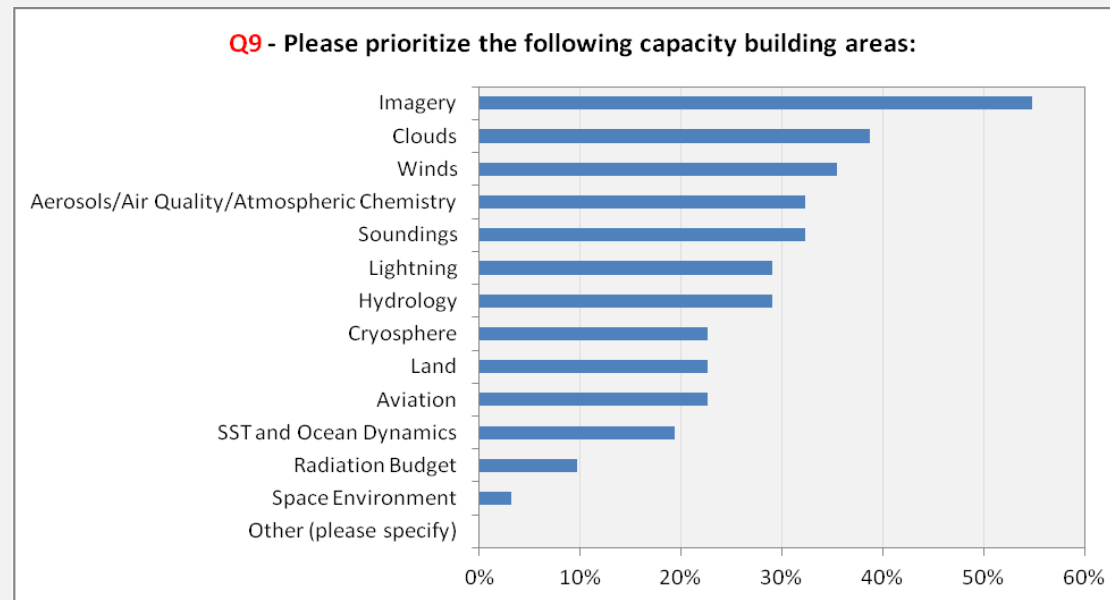
Q8 - Would your country consider covering the costs to send employees for training in Regional Centers for longer periods (e.g.: 1 – 3 months)?



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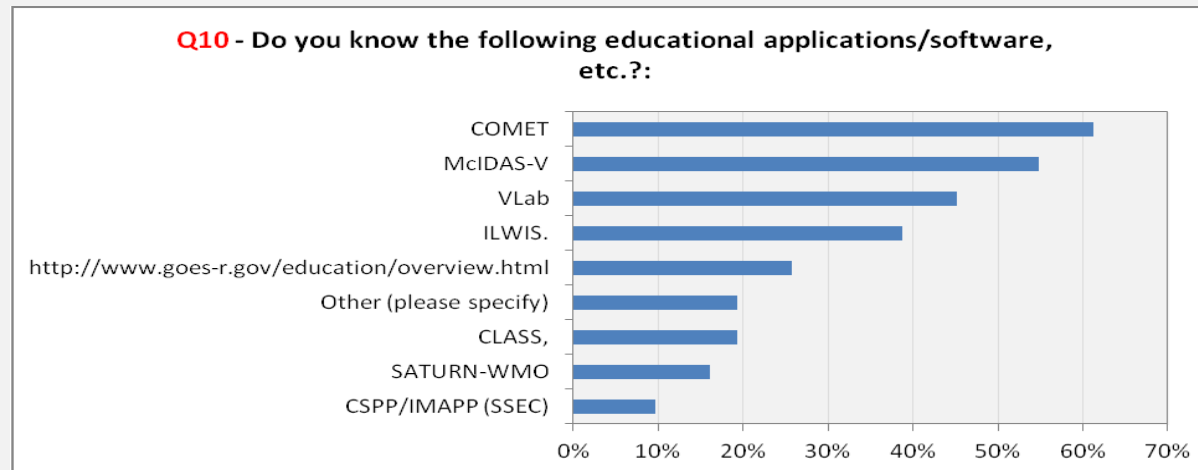
The users also prioritized the capacity building areas that they need the most. Capacity building activities related to satellite imagery is the greatest need (55%), followed by clouds (39%), winds (35%), soundings (32%) and aerosols (32%).



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As for the educational applications and softwares, the COMET Program is the most known (61%), followed by McIDAS-V (55%), WMO VLab (45%), ILWIS (39%), GOES-R Education Page (26%), NOAA CLASS (19%), WMO-SATURN (16%) and CSPP (10%). Other softwares and platforms were specified, like SOPI, NASA Worldview, EUMETRAIN, NCL, ESRI, GrADS and GEMPAK.



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SDR FOR RA III AND RA IV - SURVEY REPORT/Capacity building issues

- ❖ **Most institutions would consider organize local theoretical courses (58%) and local training workshops (69%). The economic factor is a key obstacle for the realization of these courses. In the other hand, 90% of the institutions consider giving time to their employees for virtual training.**
- ❖ **Most institutions (55%) do not have specialized human resources to operate a GOES-R station. According to the comments, they do not exist, need to be updated, or are limited.**
- ❖ **We have only a few institutions that are able to properly operate a GOES-R direct readout station. The requested training varies from basic operation, maintenance and applications to advanced training on raw data processing**

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Forecast Offices challenges

- ❖ **Processing the images received by the new equipment.**
- ❖ **Handling the GOES R new products, and understanding the new algorithms and their capabilities**

The goal of the training plan is to ensure that forecasters are ready to integrate GOES-R data and products into forecast and warning operations from the beginning of GOES-R operations. (from GOES-R Training Plan for NOAA National Weather Service (NWS) Forecasters; LeRoy Spayd Jr. , NOAA/NWS, Silver Spring, MD, 21st Conference on Satellite Meteorology, August 2016)

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Forecast Offices challenges

After forecasters complete the training modules they should be able to:

- 1) understand the differences between legacy GOES and GOES-R observations;**
- 2) interpret and utilize GOES-R ABI imagery and derived products in the preparation of NWS forecasts and warnings;**
- 3) utilize the GLM in forecast and warning operations; and**
- 4) understand the fundamentals of Red-Green-Blue (RGB) satellite product techniques and apply these to the identification of meteorological phenomena.**

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Training Requests

- ❖ **At the VLAB Conference at Barbados, May 2016, there was a recommendation from the Argentina Centre of Excellence (CoEs) focal point about the convenience of the organization of satellite data regional training courses focused on GOES R as well as Polar satellites.**
- ❖ **Although, there is a lot of information on the websites and links to the on-line courses, but it will be important to rationalize the use of this huge and sparse amount of information in different chapters by experts, who would take the lead on the training of future trainers:**

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Training Requests

- ❖ **Rationalize the use of this huge and sparse amount of information** Creating an orientative web page (Semantic Web?) with a searching menu ordered (among others) by
 - **Personnel qualification (level of knowledge)**
 - **Type of product**
 - **User needs**
 - **Type of event**

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Training Requests

❖ Classroom courses:

Must convene international experts on the operation as well processing of satellite equipment and imagery respectively. Therefore, it is recommended that they should take place at some country in the region with regional scope. Argentina as an unique Spanish speaking South American Centre of Excellence is willing to house them.

❖ Training material language:

The need of spanish/portuguese translations it is strong institutions' technicians, researchers and forecasters requirement

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Training Requests

Each country Meteorological Service should

- ❖ **Send at least two Forecasters/Supervisors to “in-situ” training (1-3 months) to return with the enough expertise to attend the forecasts challenges for developing the tasks of a SOO (Science and Operation officer). Pre launch (hopefully) and post launch training.**
- ❖ **Creation of a similar to NCEP South American desk oriented to remote sensing?**

The SOO in his/her country will be in charge of the reception of the equipment , supervising the installation, verification that it works properly and establish a fluent communication with the vendor.

The SOO must be the liaison between the Research and Development group and the Operational personnel. (Science into Operations)

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Training Requests

Each country should

❖ **Send a young scientist graduate on Atmospheric Science to a Proving Ground and Training Center in the USA, with the aim to research about this matter.**

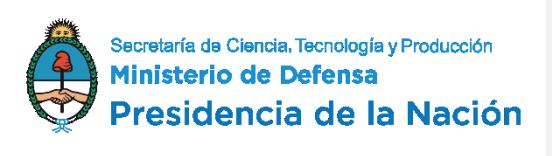
PhD candidates under collaborative programas between RAll & IV countries and USA universities?

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SMN: Current approaches to the application of remote sensing for education

- I) Course of Environmental Teledetection**
- II) SMN participation in the development of Conceptual Models**
- III) SMN participation in the development of Train the Trainer online course 2016**
- IV) SSEC University of Wisconsin course**

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SMN: Current approaches to the application of remote sensing for education

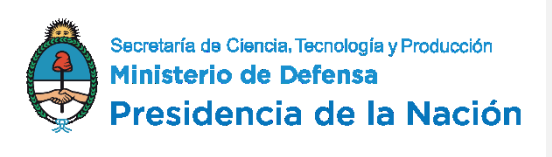
I) Course of Environmental Teledetection:

SMN of Argentina offers an introductory course in spanish, on yearly basis, about Environmental Teledetection, for students and professionals of Meteorology, Environmental and Natural Sciences, Geography and other related disciplines.

<http://www.noticiasenvuelo.faa.mil.ar/articulos.asp?idn=1679>

In agreement to the objectives of the Regional Centre for the professional education on meteorology of the WMO at Buenos Aires this capacity building course provides of basic knowledge of different types of remote sensors, the teledetection techniques and its applications, complemented with the physical fundamentals and satellite systems characteristics.

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SMN: Current approaches to the application of remote sensing for education

I) Course of Environmental Teledetection (cont.)

Goals: The attendees must obtain

- **Knowledge about the sensors onboard of the different satellite platforms**
- **Ability to download the satellite data in raster and/or pre-processed formats from different spatial agencies (native as well as foreign).**
- **Ability to distinguish the different coverage from the electromagnetic spectrum**
- **Skill in visual interpretation of the satellite images.**
- **Capability to identify the application of a specific satellite data based on the case of study**
- **Knowledge to apply the techniques and methodology of indices, algebras and color composition.**

Regional satellite training needs

SMN: Current approaches to the application of remote sensing for education

I) Course of Environmental Teledetection (cont.)

RECOMMENDATION: To update this agenda for future courses with the help of GOES R experts

Train to trainers' chapter

Polar new generation of satellites (NPP, JPSS1, TERRA y AQUA) and Geostationary (GOES-R)

Tools:

On line and classroom courses: Free Software: Ilwis, Hydra II, Qgis,

For details, contact: Lic. Diana Marina Rodriguez (dmr@smn.gov.ar)

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SMN: Current approaches to the application of remote sensing for education

II) SMN participation in the development of Conceptual Models:

The use of the satellite data to build them: See the cloud structure in satellite images item.

- **Conceptual Models published in English;**

a) <https://sites.google.com/site/cmsforsh/CoE-Argentina>

b) http://www.eumetrain.org/satmanu/index_conc.html

c) <http://www.eumetrain.org/satmanu/index.html>

- **Conceptual Models published in Spanish:**

<https://sites.google.com/site/cm4shespanol/>

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SMN: Current approaches to the application of remote sensing for education

III) SMN participation in the development of Train the Trainer online course 2016

a) The Calbuco eruption: A case of study

link: <http://www.caem.wmo.int/moodle/course/index.php?categoryid=1>

b) Severe storm simulator

Link : <http://nykolaiperezvelez.uphero.com/>

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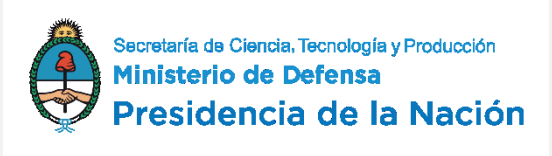
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IV) SSEC University of Wisconsin workshop

During the 2015 NOAA Satellite Conference, there were talks with the SSEC group led by Allen Huang and Mitch Goldberg in order to organize a workshop in Buenos Aires to explain the characteristics of the software they offered. There is a preliminary date for this workshop on April 2017 after the JPSS launch scheduled for March 2017.

SMN will restart the conversations by November 2016 with the aim to coordinate the organization of the event.

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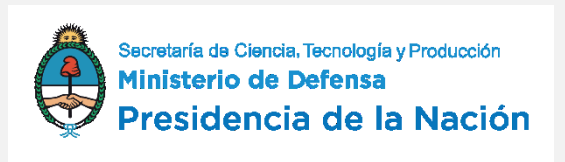
Current University Course in Argentina at UBA (University of Buenos Aires)

❖ **“Sensoramiento Remoto de la Atmósfera desde el Espacio” Departamento de Ciencias de la Atmósfera y los Océanos (DCAO)/FCEyN – University of Buenos Aires (UBA)**

Postgraduate course in spanish for graduate students on Atmospheric Science and related disciplines. August-October 2016 (60hrs classroom)

Contact: lvidal@smn.gov.ar

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Current University Course in Argentina at UBA

Sensoramiento Remoto de la Atmósfera desde el Espacio: Remote Sensing of the Atmosphere from Space:

The Department of Atmospheric and Oceanographic Sciences at the University of Buenos Aires offers an introductory course in Spanish about Satellite Meteorology, for graduate students, PhD students, and professionals of Meteorology, and related disciplines.

This capacity building course provides of basic knowledge of different types of meteorological satellites with focus in severe weather forecast, complemented with the physical fundamentals of atmospheric radiation, satellite systems characteristics, and an introduction of the new GOES-R capabilities using data from the Himawari satellite.

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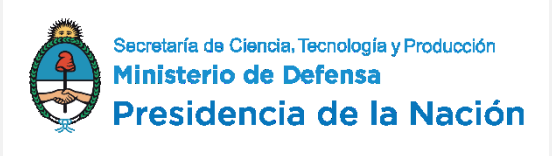
Current University Course in Argentina at UBA

GOALS:

The attendees must obtain:

- **Basic knowledge about principles of atmospheric radiation and remote sensing.**
- **Basic knowledge about meteorological satellite orbits, and different sensors: imagers and sounders.**
- **Skill in visual interpretation of meteorological satellite images: visible, infrared and microwave.**
- **Ability to identify severe weather signatures in different meteorological satellites images.**

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Current University Course in Argentina at UBA

GOALS

The attendees must obtain (cont.):

- Knowledge in RGB images interpretation using AHI sensor onboard Himawari-8 satellite (similar capabilities of the new GOES-R)
- Basic knowledge in satellite-based precipitation estimations.

Theoretical and practical classes using different programming languages, and visualization packages like Python and Matlab.

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Conclusions/Suggestions

- ❖ Creation of an equivalent to NCEP South American Desk but oriented to remote sensing.
- ❖ Create a Semantic WEB to rationalize the info on the internet.
- ❖ Translation of the training material to spanish and portuguese
- ❖ Creation of a RA III and IV Forum for discussion

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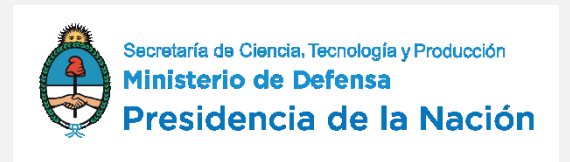
Conclusions/Suggestions

- ❖ **Classroom training course**, that must convene international experts on the operation as well processing of satellite equipment and imagery respectively. Argentina as an unique Spanish speaking South American Centre of Excellence is willing to house them.
- ❖ **Current course: “Sensoramiento Remoto de la Atmósfera desde el Espacio”**
Departamento de Ciencias de la Atmósfera (DCAO)/FCEyN -UBA Postgraduate course in spanish for graduate students on Atmospheric Science and related disciplines. August-October 2016 (60hrs)

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Many thanks for your attention

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