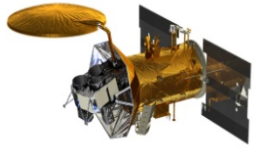
Summary of AO Argentina Projects

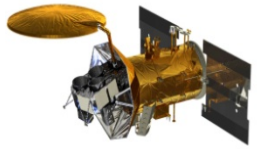


Project Title: *Assimilation of Soil Moisture Estimates into Flow-Forecasting Hydrologic Models*

Institutions: *the Hydrological Warning System, National Water Institute (INA, Argentina) & the Argentine Space Agency (CONAE)*

Objectives:

- To implement conceptual lumped hydrologic models of the continuous type in the catchments of the Gualeguay River (14,900 sq. km) and the Pergamino Brook (1,200 sq. km).
- To implement a data assimilation scheme for Aquarius/SAC-D soil moisture estimates into these hydrologic models

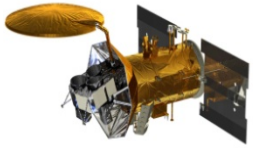


Hydrologic Models:
Modified Sacramento (Georgakakos & Baumer, 1996)
GRP (based on the GR4J, CEMAGREF, Perrin, Michel, Andréassian, 2001)

Data Assimilation Methods:
Ensemble Kalman Filtering (EnKF)

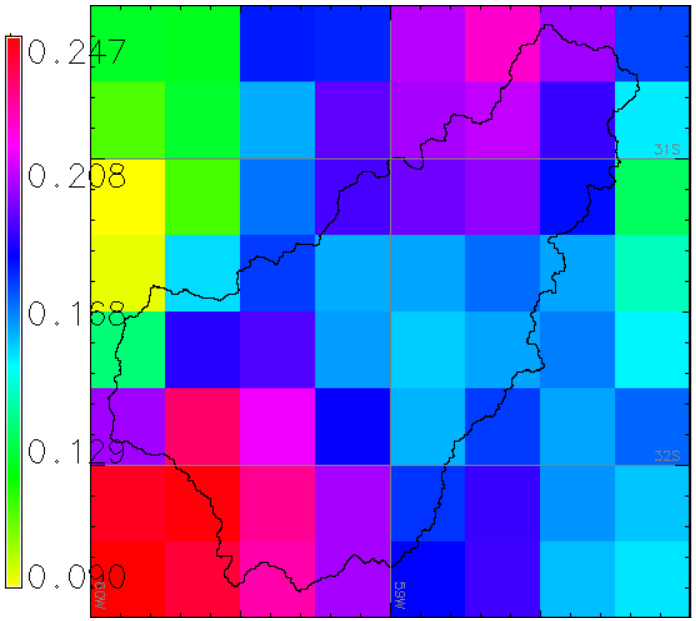
Remotely sensed soil moisture:

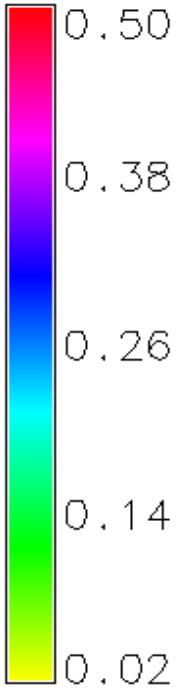
Instrument	MIRAS	AQUARIUS	AMSR2
Platform	SMOS (ESA)	SAC-D (CONAE/NASA)	GCOM-W1 (JAXA)
Revisit (mean)	1.15 / day	0.43 / day	1.6 / day
Spatial resolution	0.25°	1°	0.25°
Coverage	Global	Global	Global
Started	2010-01-15	2011-08-27	2012-07-03
Processing level	3	3	3
Bands(1)	1.4 GHz	1.414 GHz	6.9 GHz 10.65 GHz
Error (goal/max)	3%/10%	3%/5%	5%/10%



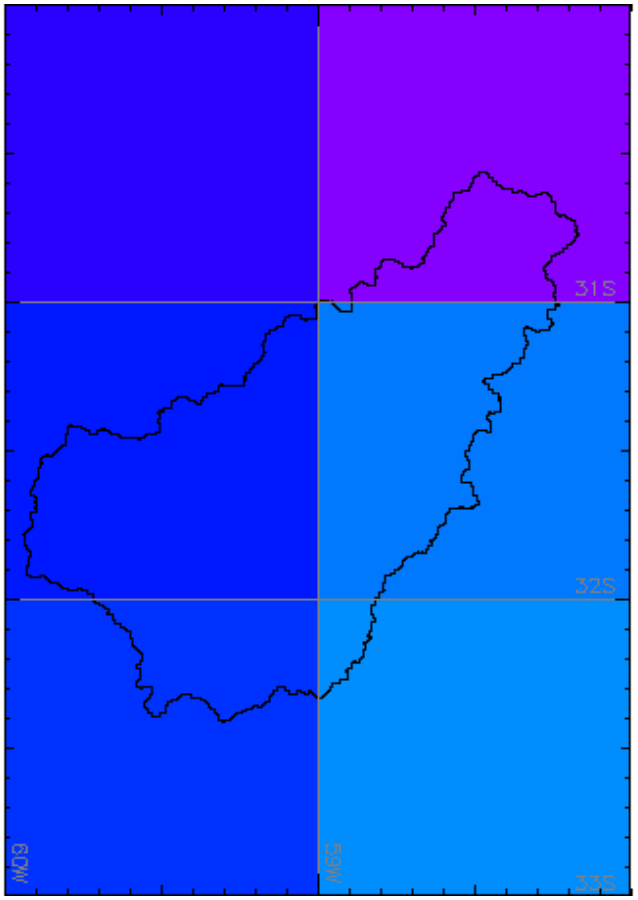
SPATIAL RESOLUTION

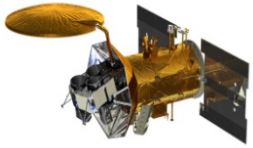
SMOS/AMSR2





AQUARIUS

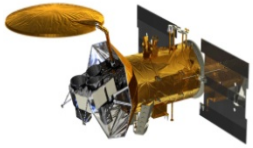




Results and discussion:

Two hydrologic models were implemented on the catchments, with the incorporation of an EnKF scheme for assimilation of remote sensing soil moisture estimates (from Aquarius/SAC-D, SMOS and AMSR2).

For technical details, results and discussion, please visit our poster



Number of Researchers: five (5) + one (1) contract
Goniadzki, D., Thibeault, M., Lozza, H., Uriburu Quirno, M., Dadamia, D. Bianchi, J.F.

Human Resources Training:

"*Fundamentos teóricos y prácticos de la teledetección ambiental: radares de apertura sintética y su sinergia con datos ópticos*", por Del Valle, Héctor, Universidad Autónoma de Entre Ríos, Facultad de Ciencia y Tecnología, 2012 (***Theory and practice of environmental remote sensing: SAR and Optical data synergy***)

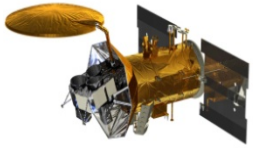
Acquired equipment:

- *Automatic stage recorder for the Pergamino Brook*
- *Laptop HP Pavilion dv7*

Field campaigns:

- *Streamflow gauging in three XS of the Gualeguay River*
- *River stage sensor leveling with differential GPS (Salto River)*

Summary of AO Argentina Projects

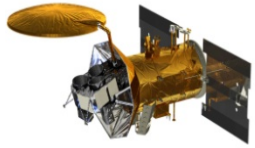


Publications / Congresses:

- **Aquarius, SMOS, and AMSR2 Soil Moisture Data Assimilation into Hydrologic Forecast Models**, Bianchi, J., Thibeault, M., Lozza, H., Uriburu Quirno, M., Dadamia, D., Goniadzki, D. 9th Aquarius / SAC-D Joint Science Team Meeting – 11-14 Nov, Seattle, WA, USA
- **Modelación hidrológica de la cuenca del río Gualeguay para pronóstico y alerta hidrológico utilizando información de sensores remotos de microondas**, Bianchi, J.F., Goniadzki, D. Argentina. Ezeiza, Buenos Aires. 2012. Primer Encuentro de Investigadores en Formación en Recursos Hídricos. Instituto Nacional del Agua
- **Asimilación de datos de humedad del suelo de sensores remotos a un modelo hidrológico de la cuenca del Río Gualeguay**, Bianchi, J.F. Argentina. Santa Fe. 2014. Congreso. II Congreso Internacional de Hidrología de Llanuras. Universidad Nacional del Litoral
- **Assimilation of Soil Moisture Estimates into Flow Forecasting Hydrologic Models**, Bianchi, J.F., Goniadzki, D., Dadamia, D., Thibeault, M., Lozza, H., Uriburu Quirno, M. Buenos Aires. 2012. 7mo. Encuentro de Ciencia de la Misión satelital SAC-D Aquarius. (Póster)

Other project outcomes:

An M.Sc. thesis**: "Development of a hydrologic forecasting tool for flood warning based on remote sensing observations"**, Juan F. Bianchi, Maestría en Manejo Integral de Cuencas Hidrográficas, Facultad de Ciencias Agrarias y Forestales, Universidad Nacional de La Plata



Thank you!