FLOOD FORECASTING AND EARLY WARNING SYSTEMS (EWS) IN URUGUAY:

STEPS TO EXTEND THE EWS OF DURAZNO CITY TO THE CITIES OF ARTIGAS AND TREINTA Y TRES

Establishment of a Flash Flood Guidance System for South America
16 - 18 August 2016, Lima, Peru

INITIAL PLANNING MEETING

MSc. Ing. Alejandra De Vera

Met. Néstor Santayana

INUMet INSTITUTO URUGUAYO DE METEOROLOGÍA
UNIVERSIDAD DE LA REPÚBLICA URUGUAY
FACULTAD DE INGENIERIA
imfia 30 AÑOS 1986-2016

INSTITUCIONAL FRAMEWORK

INUMET (Uruguayan Institute of Meteorology)

- Article 4 of Law 19.158 in 2013 creates the INUMET.
- Only involves the INUMET in relation to the Meteorology, no Hydrology.

DINAGUA (National Water Directorate)

- Article 3 of Law 16.112 in 2000 creates the DINAGUA.
- But it does not have the power to issue Hydrologic Alerts.

Legal or Institutional void ?

INSTITUCIONAL FRAMEWORK

- **INUMET**: Meteorological Service. Oficial weather forecast and meteorological monitoring.
- **DINAGUA**: Design and implementation of the water resources management national policy. Operation of river level-flow network.
- **SINAE**: Coordination unit for the Integrated Risk Management at national level.
- **LOCAL GOVERNMENTS**
- **CECOED**: Local Emergency Coordination Center.
- **UTE & CTM**: Electric Co., telemetric hydrometeorologic networks.

INUMET INSTITUTO URUGUAYO DE METEOROLOGÍA
DINAGUA Dirección Nacional de Aguas
SINAE Sistema Nacional de Emergencias Presidencia de la República
CECOED ARTIGAS
UTE
salto grande Argentina-Uruguay

BACKGROUND

Durazno

Artigas

Treinta y Tres

- Population: 33576 inhabitants
- Basin area: 8750 km^2
- Tc = 54 hs
- May 2007 and February 2010 floods: 5.500 to 6.000 evacuees (about 20% of the population)

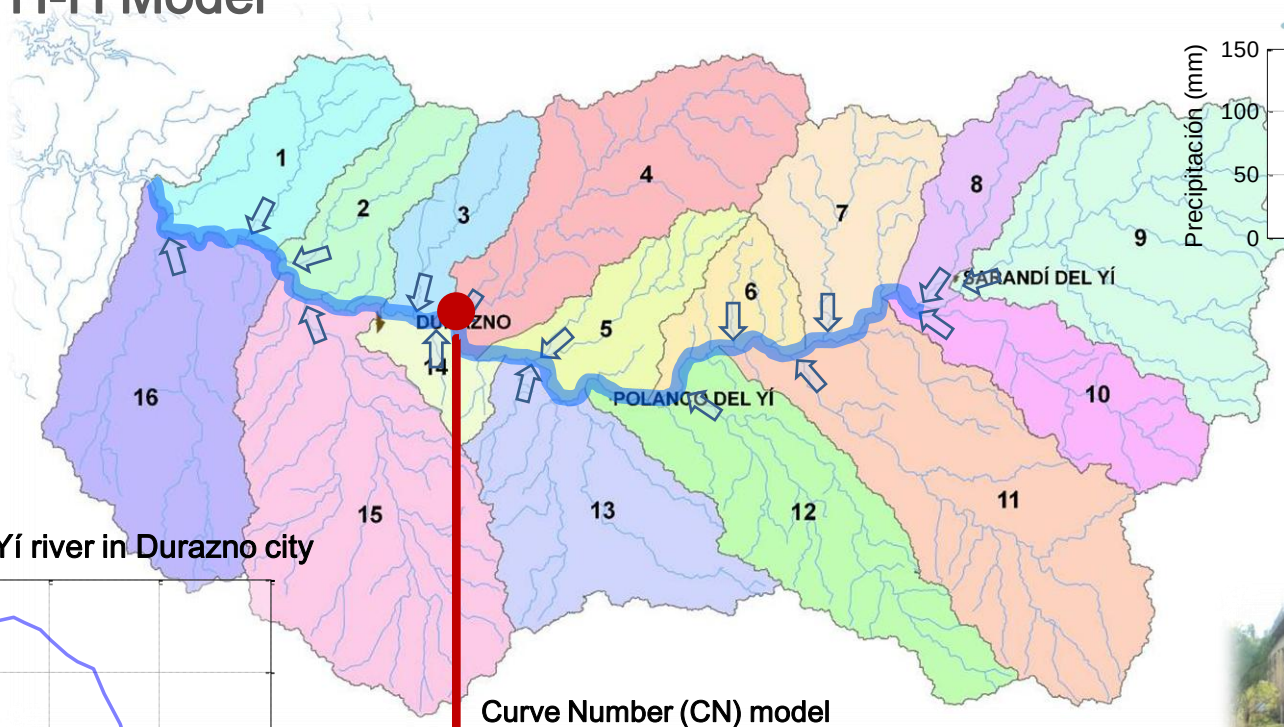
- Population: 40658 inhabitants
- Basin area: 4570 km^2
- Tc = 33 hs
- June 2001 flood: 7600 afected

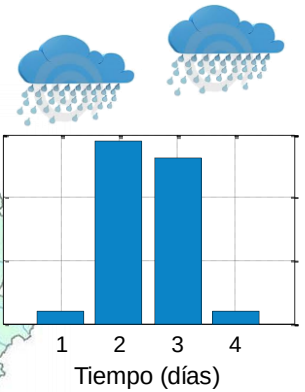
- Population: 25477 inhabitants
- Basin area: 4670 km^2
- Tc = 30 hs
- May 2007 flood: 2800 afected

EWS-DURAZNO

Pilot project PROHIMET (2009-2011): Early warning model for flood forecasting in Durazno city. Financing: WMO

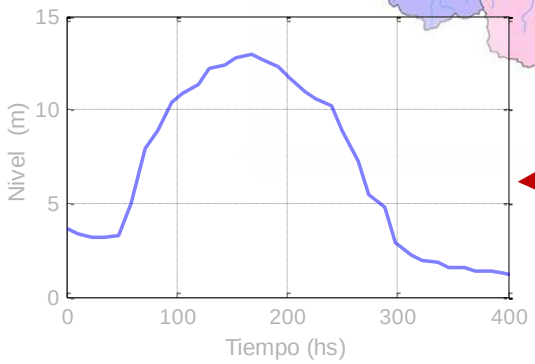
Coupled H-H Model





- Observations
- Weather Forecast

Water level of Yí river in Durazno city



Curve Number (CN) model
+ HEC-RAS model

EWS-Durazno

Web-Output

https://www.fing.edu.uy/imfia/prohimet/Prohimet-Yi/Durazno/Global/data/2014-02-09/WebO

RIESGO ALTO
2014-02-09

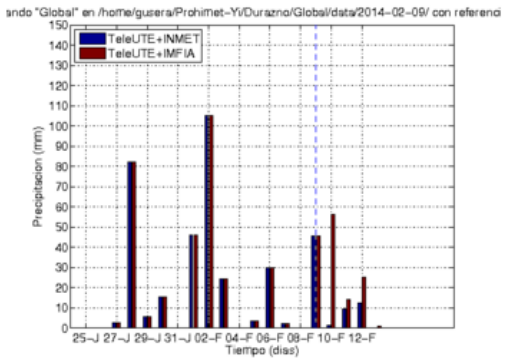
2014-02-08

ROJO
NIVEL DE ALERTA

2014-02-10

Niveles de Telemetrica
(Sarandi del Yi, Durazno, Barra de Porongos)
Precipitacion de Telemetrica
(Sarandi del Yi, Polanco del Yi, E.M.Durazno, Porongos-Aviacion)

Hietograma



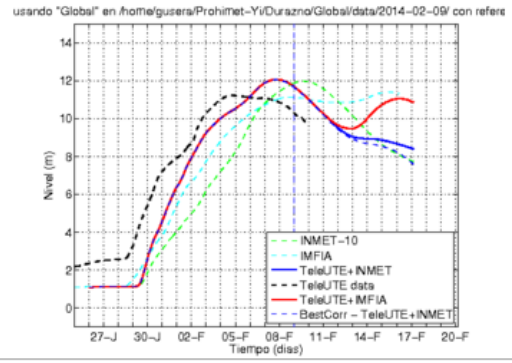
Nivel Maximo Pronosticado Puente Nuevo:
12.06 m.

Nivel Maximo Pronosticado Puente Viejo:
10.83 m.

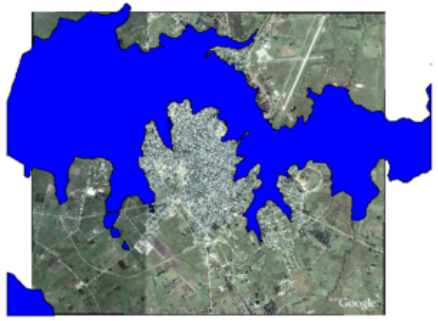
Fechas esperadas para Nivel maximo:
2014-02-07<->2014-02-09

Precipitacion Acumulada/Pronosticada Promedio:
442 mm

Niveles Puente Nuevo (referencia al 0m local)



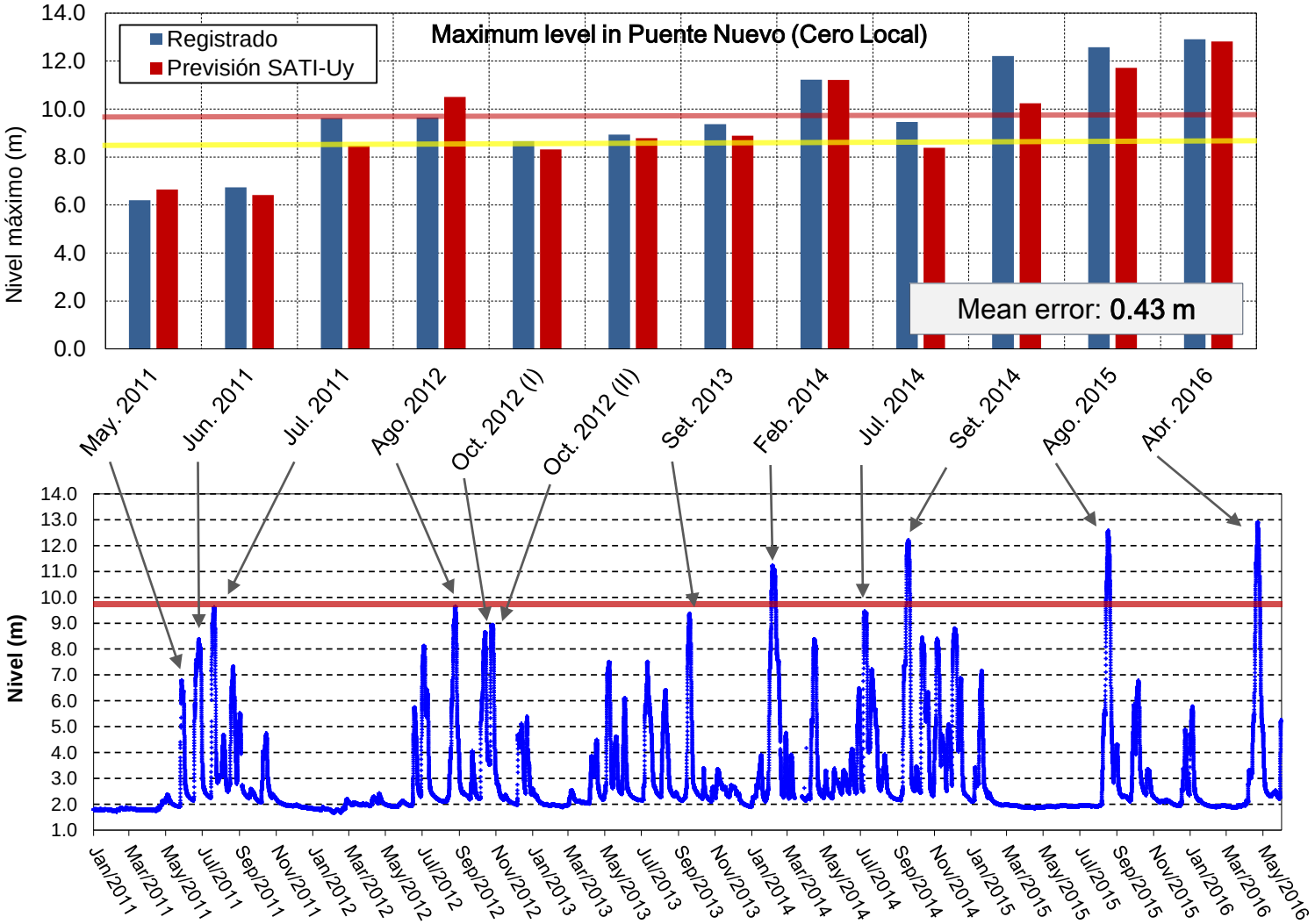
Curvas de Inundacion



https://www.fing.edu.uy/imfia/prohimet/Prohimet-Yi/Durazno/Global/data/2014-02-09/WebOutput.htm

EWS-DURAZNO

Performance assessment in past events



EXTENDING THE PILOT PROJECT

As consecuence of the Durazno pilot proyect, national autorities promoted and supported the **formulation of two complementary projects**:

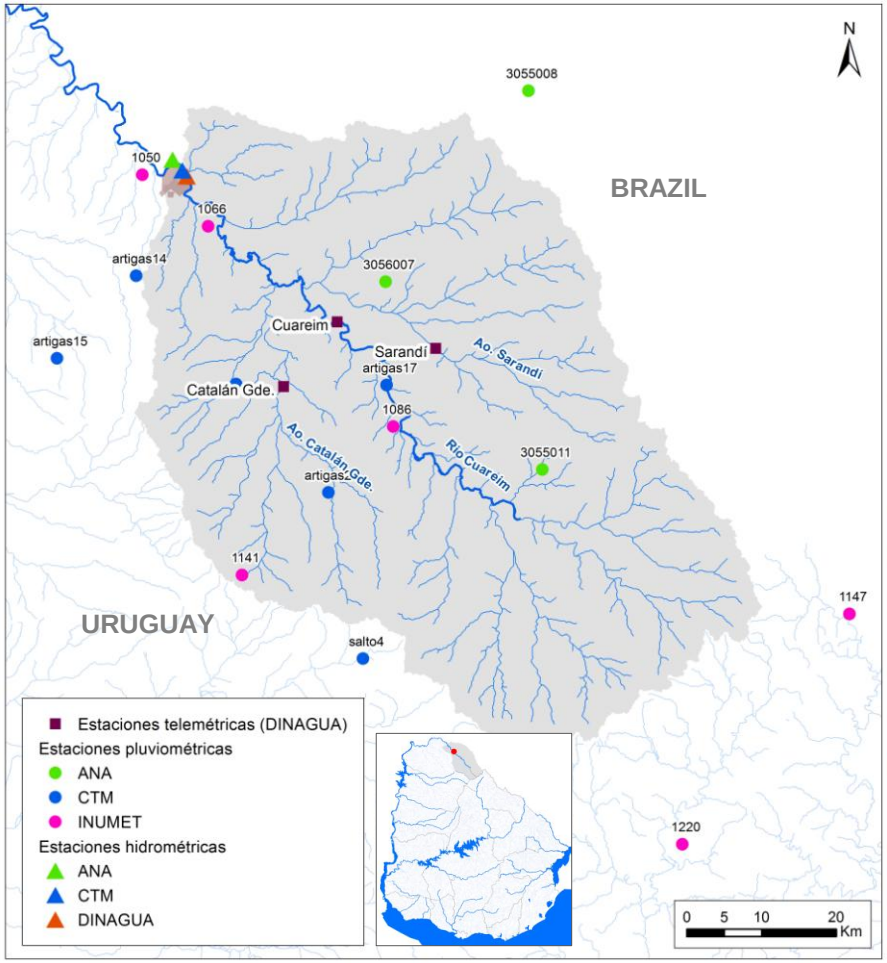
- **SATI-UY: EWS for flood forecasting and managment** (2014-2016). Financing: National Agency for Research and Innovation (ANII) & Partners counterpart.
  - Stablish the Follow-up Coordination Unit (technical support to local actors), USPI.

- **"Steps to extend the EWS to the cities of Artigas and Treinta y Tres"** (2014-2016). Financing: WMO.
  - Pre hydrologic-hydrodynamic model of the Cuareim & Olimar rivers, based on daily accumulated rainfall.

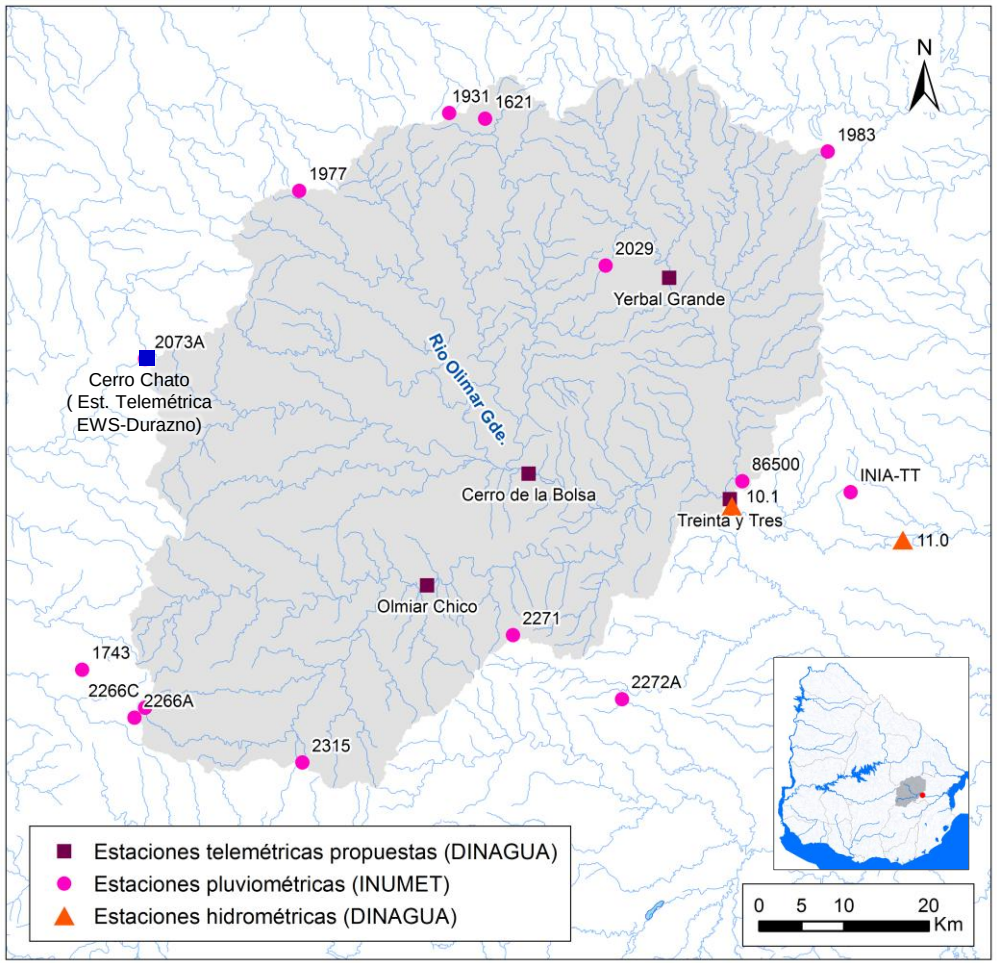
EWS OF ARTIGAS AND TREINTA Y TRES

Rainfall and water level stations

Artigas

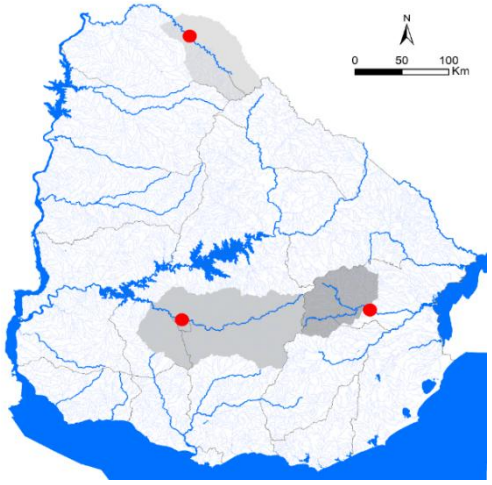


Treinta y Tres



CONCLUSIONS

- EWS-Durazno provides sufficient information on maximum water level and permanence, with sufficient lead time for the local authorities and civil forces to plan and manage the emergency (tents, food, clothing, medical attention).
- After its successful operation in Durazno the EWS earned the trust of local authorities first and national authorities after, who adopted the EWS nationwide (Artigas, Treinta y Tres, Rio Branco?)
- Strengthened institutional collaboration: SINAE-INUMET-DINAGUA-UDELAR. As a result a it will stablish the Follow-up Coordination Unit (technical support to local actors), USPI (“Unidad de Seguimiento Permanente de Inundaciones”).
- Institutional involvement will also ensure the continuous improvement of the EWS.



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THANKS!!!

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