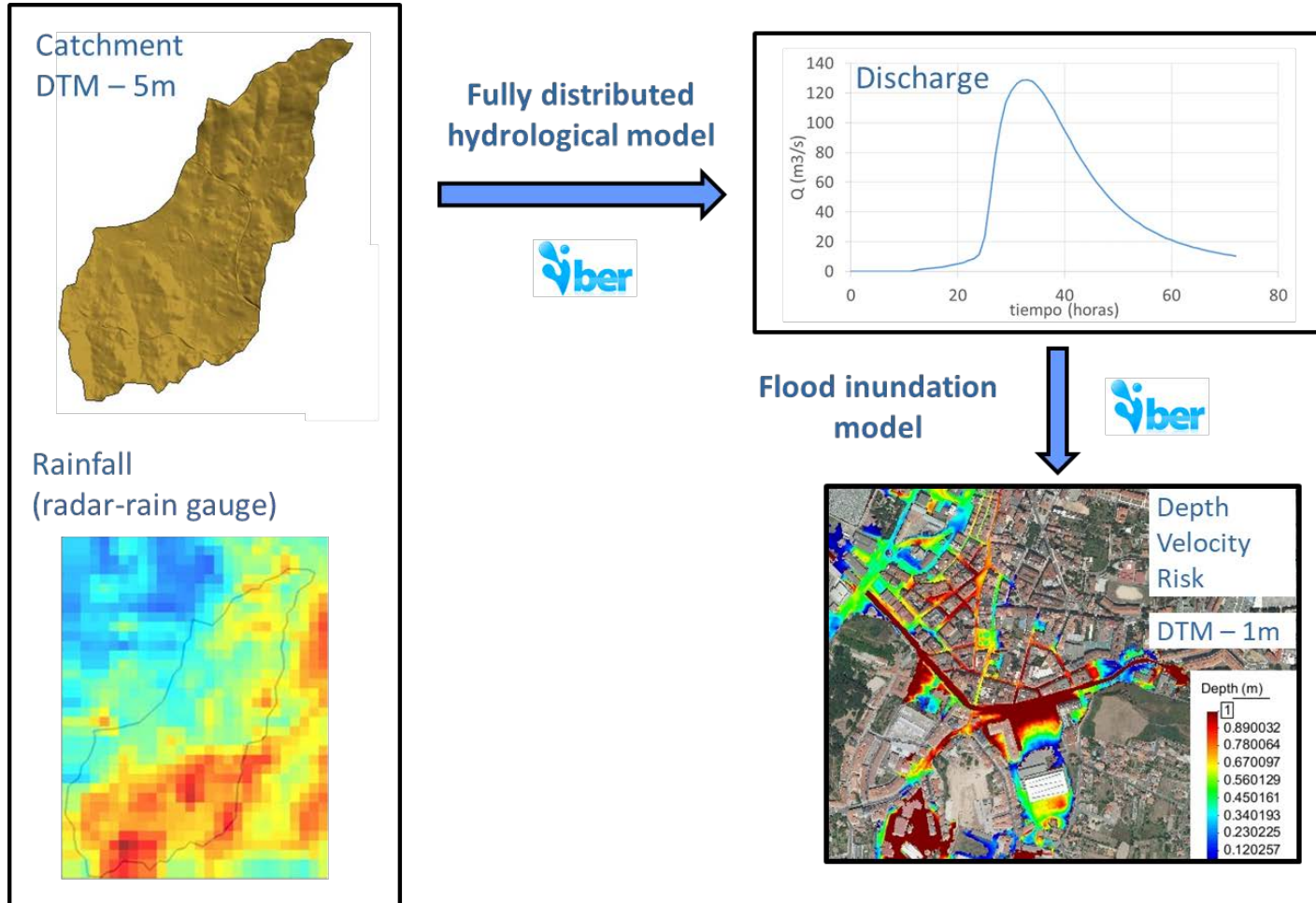


CAPRI

Probabilistic flood prediction with high resolution hydrologic models



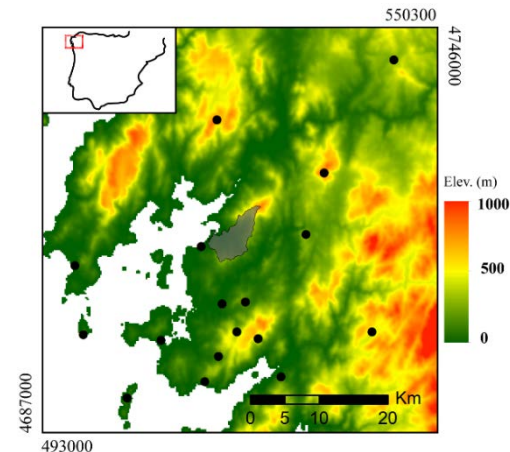
CAPRI

Probabilistic flood prediction with high resolution hydrologic models

The project CAPRI (Probabilistic flood prediction with high resolution hydrologic models from radar rainfall estimates) was focused on the study and development of new methodologies for flood prediction from precipitation data. The project involved the analysis of methodologies to combine radar precipitation estimates with more conventional rainfall data sources, in order to obtain a precise characterization of the precipitation. These precipitation fields were used in a high spatial resolution hydrologic model to calculate generated peak discharges and depths and velocities for the most vulnerable areas.

The project was developed in the pilot basin of the Con river (24 km²), that flows into the sea in the coastal town of Vilagarcía de Arousa (Pontevedra, Spain). The study of this basin is particularly interesting since it combines rural and urban areas with a high potential flood risk. The urban core is recurrently affected by flooding due to the hydrologic characteristics of the basin (low concentration time, steep slopes, soil covered by ash in some areas), that contribute to the generation of floods with large volumes of sludge and ash, causing important material damages and environmental affections in the estuary.

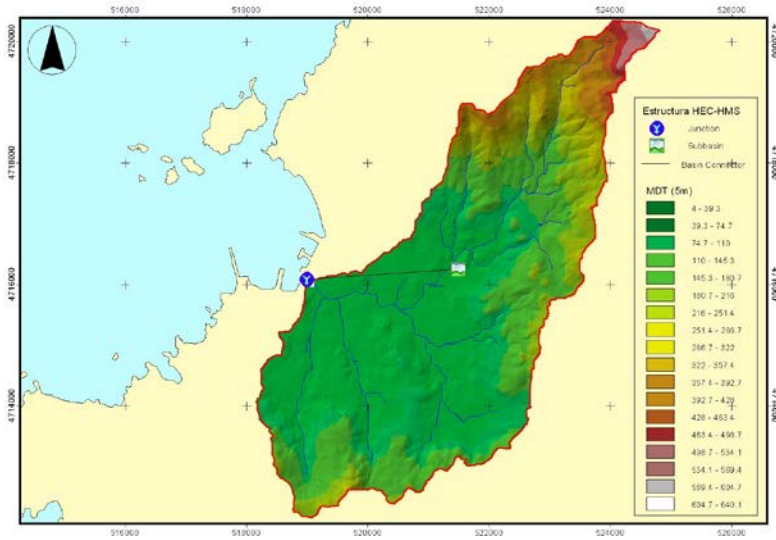
To accomplish the goals of the project we used data of the weather radar of Monte Xesteiras (MeteoGalicia), located 10 Km away from the study watershed, and from the meteorological stations of MeteoGalicia. In order to complete this data network, 3 rain gauges were installed in the pilot basin, and the river will be gauged near the end of the basin to record the hydrographs generated by the maximum registered storms. The hydrologic and hydraulic model used was Iber (www.ibereaula.es).



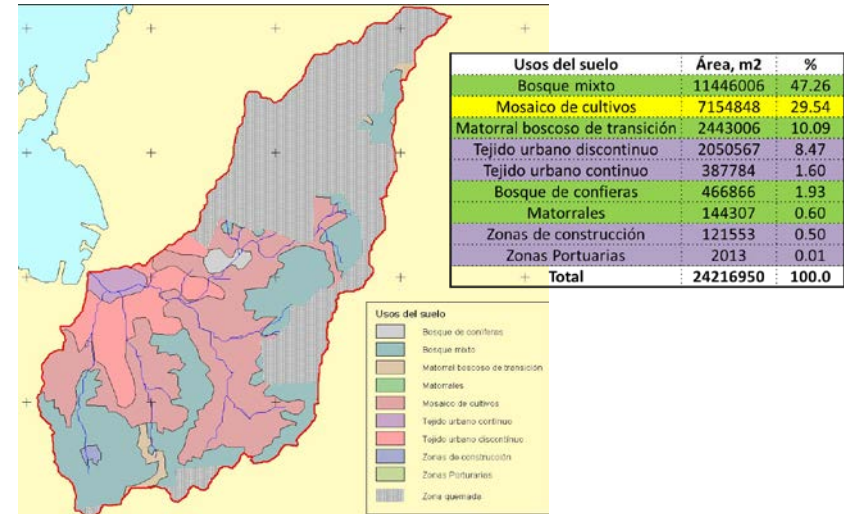
CAPRI

Probabilistic flood prediction with high resolution hydrologic models

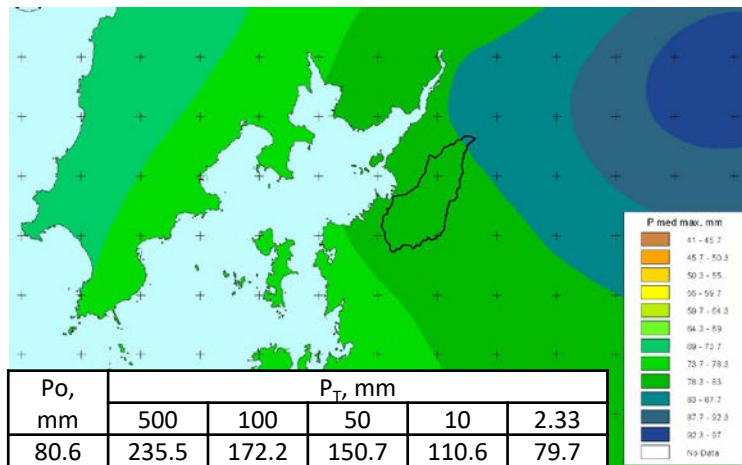
Topography (0 m - 640 m)



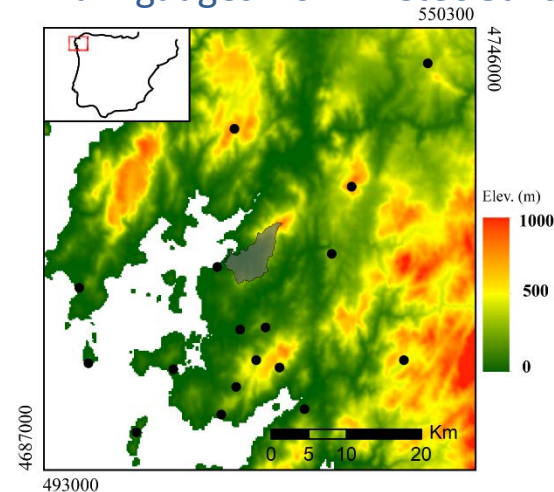
Land use



Maximum daily rainfall depth



Rain gauges from MeteoGalicia



+ 3 new rain gauges deployed during the project in the catchment

CAPRI

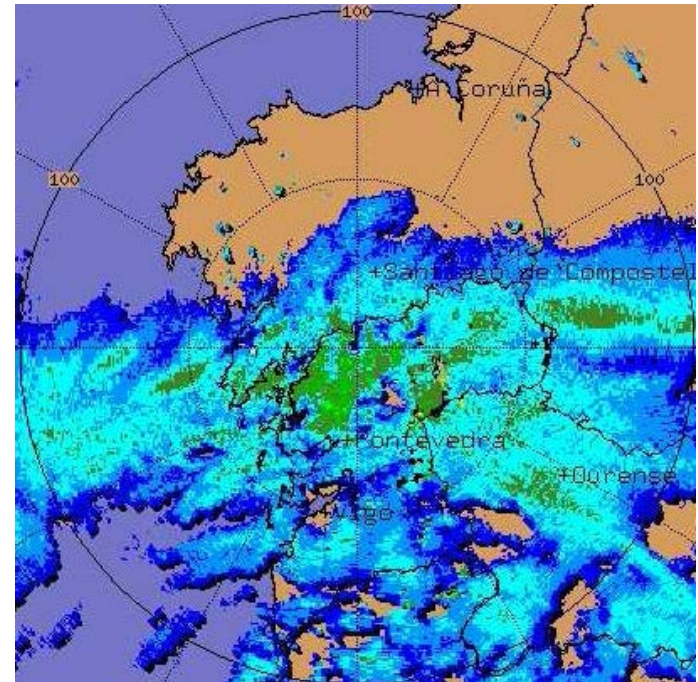
Probabilistic flood prediction with high resolution hydrologic models

Vaisala Weather Radar WRM200 (MeteoGalicia)

C-band dual polarization radar. Coverage:

- 400 km diameter
- 9 km height
- spatial resolution at 200 km: 3 km x 300 m
- temporal resolution: 5 min
- PPI angle in vigilance mode: 0.2°
- PPI angles if rain: 0.5, 1, 2, 3, 5, 7.5, 10, 15, 30°

Location: 42.61N, 8.19W; z=750m.;



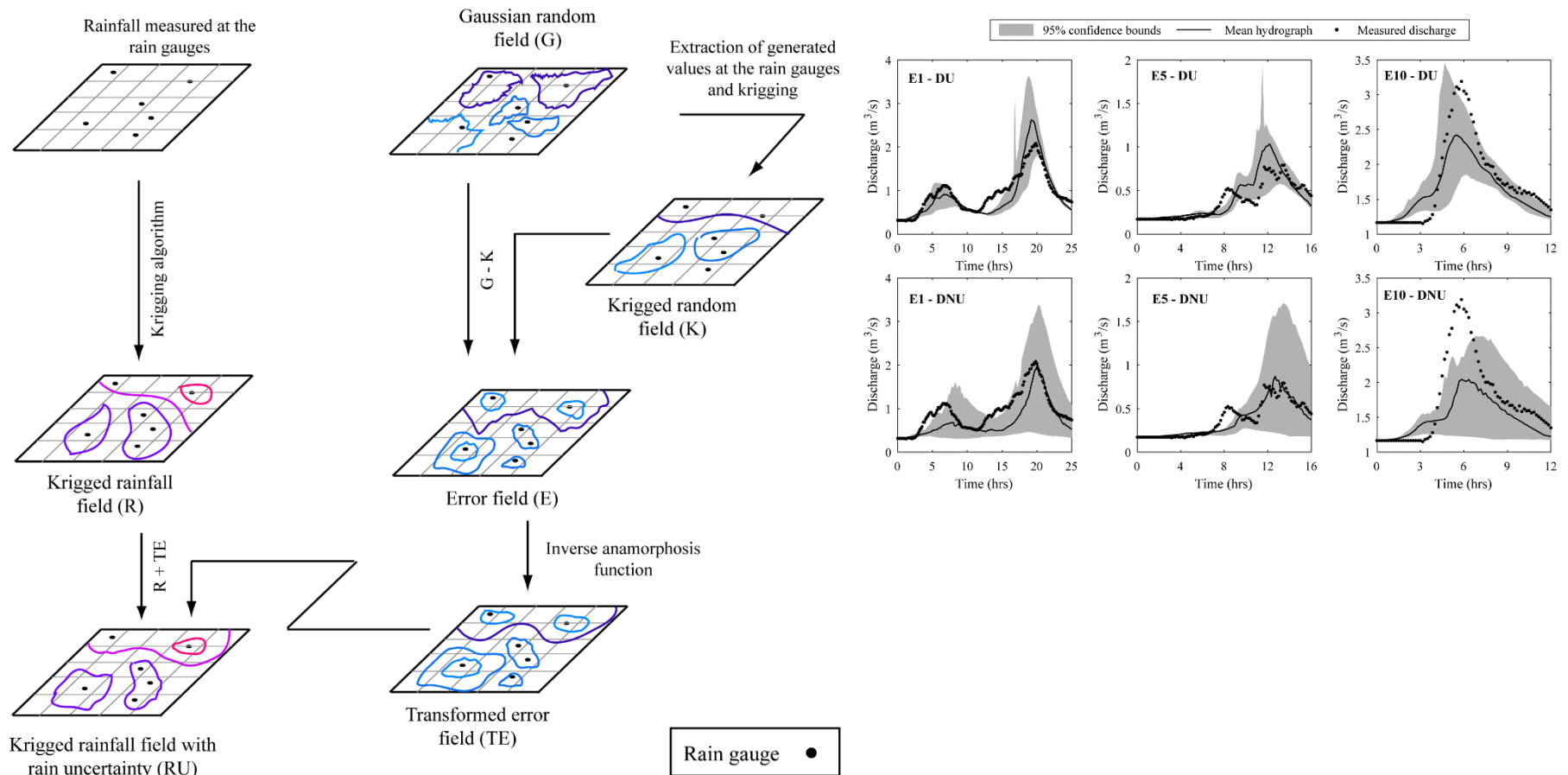
- Reflectivity (Z)
- Differential reflectivity (Zdr)
- Specific differential phase (Vh drops)
- Correlation HV (phv)

CAPRI

Probabilistic flood prediction with high resolution hydrologic models

Quantification of rainfall uncertainty

Fraga, I., Cea, L., Puertas, J. (2019). Effect of rainfall uncertainty on the performance of physically-based rainfall-runoff models. *Hydrological Processes*, 33, 160-173. [DOI:10.1002/hyp.13319](https://doi.org/10.1002/hyp.13319)



CAPRI

Probabilistic flood prediction with high resolution hydrologic models

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Financial support

The CAPRI project (Probabilistic Flood Prediction with High Resolution Hydrologic Models from Radar Rainfall Estimates; CGL2013-46245-R) was supported by the Spanish Ministerio de Economía y Competitividad.