



Pre-operational use of a meteorological and hydrological/hydraulic ensemble approach on the Po River

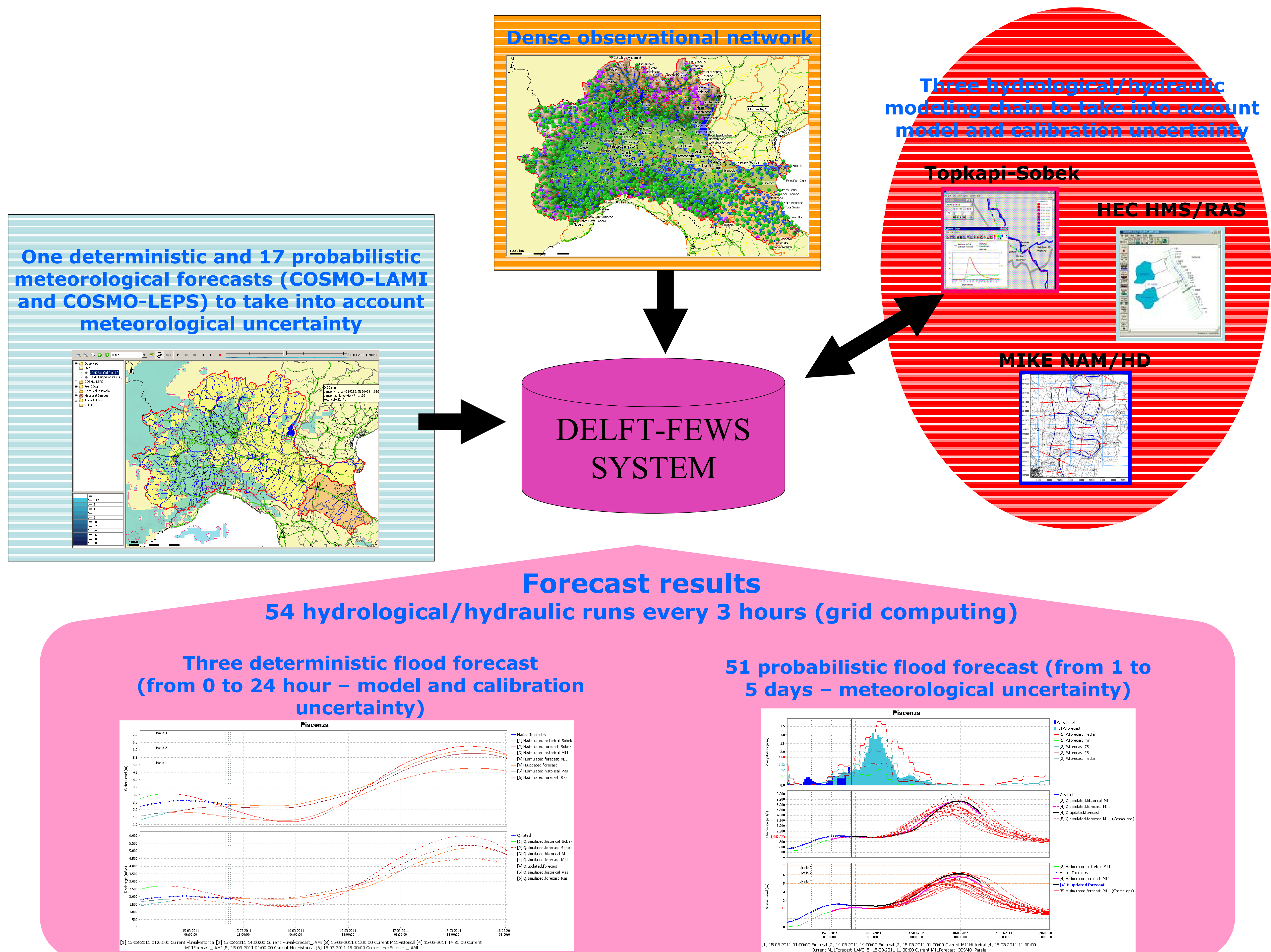
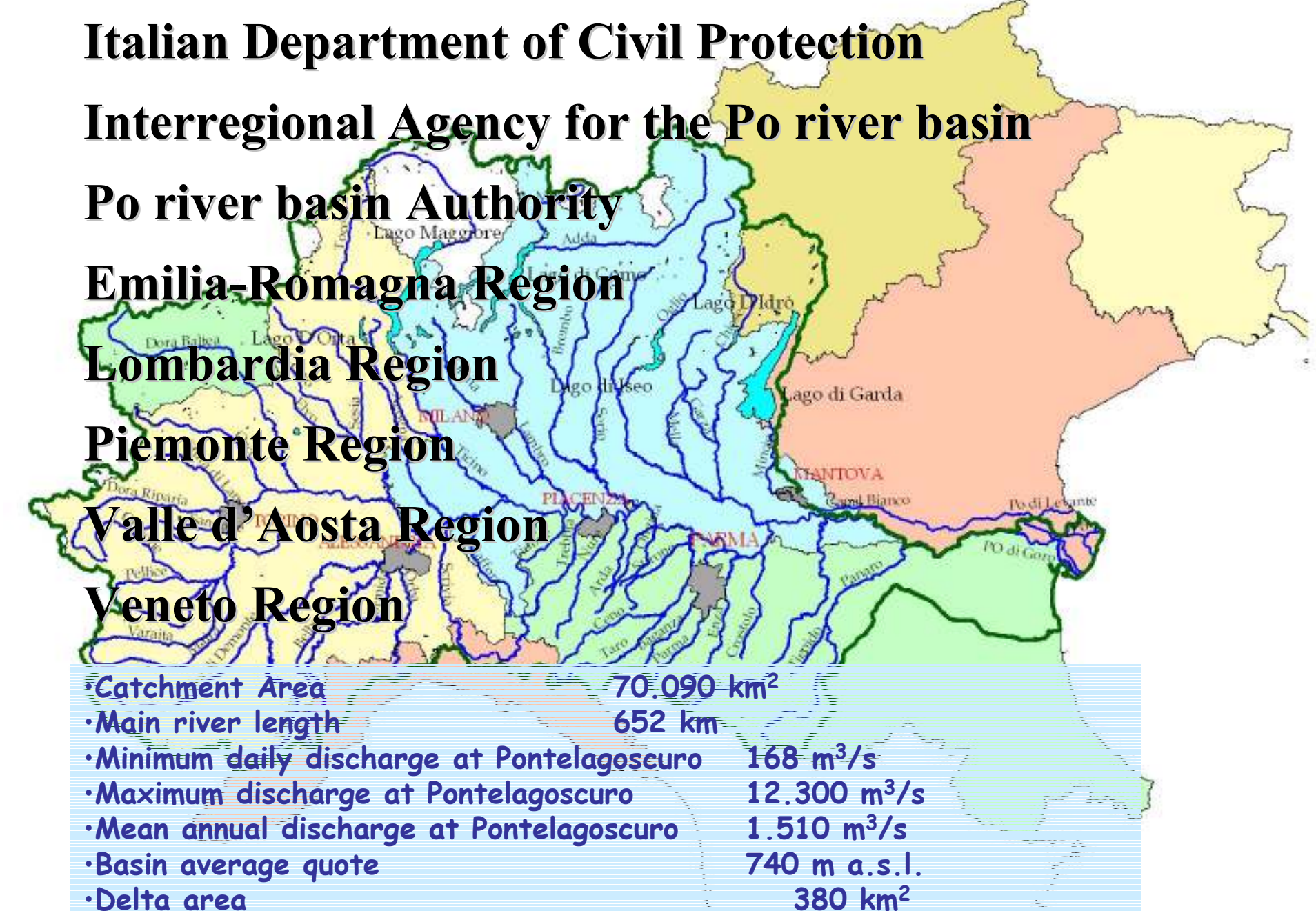
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The objectives of the Po project

- an adequate modeling system for planning and management
- a suitable forecasting system in real time applications
- an organization in advance of flood control services and of the whole soil defense actions, including civil protection measures to manage emergencies.
- **The purpose of the system is to provide a number of tools for the Po floods to be controlled and managed objectively by any civil protection unit and local/regional authority concerned, where the objective approach is a general consensus among all users concerning the validity of the methodology.**



- The “Po project” is based on a multi-model approach and uses three different hydrological-hydraulic chains coupled with deterministic and probabilistic weather forecasts
- The three deterministic chains are used to take into account the model and calibration uncertainties
- The probabilistic forecasts are used to try to take into account meteorological forecast uncertainty that are very important for tributaries for short to medium lead times (one to three days) and also for the main river for longer lead times. This use is now in a pre-operational phase and probabilistic forecasts are not distributed but only used internally.
- Also, the probabilistic forecasts are used to extend the forecast to longer lead times (5 days – pre-operational) and to take into account meteorological what-if scenarios
- The big amount of information is an important added value of the system but it also imposes important challenges. For the complete operational use of the system we need to:
 1. Increase our understanding on model performances doing more post-event analysis (which model is the best in certain sections or discharge ranges; which kind of error is dominant at a certain lead time)
 2. Add robust post-correction and predictive uncertainty estimation algorithms (for now an ARMA model is applied to the Mike11 deterministic chain only on the main Po river water-level gauges)
 3. Develop smart instruments to help in compiling forecast reports

