

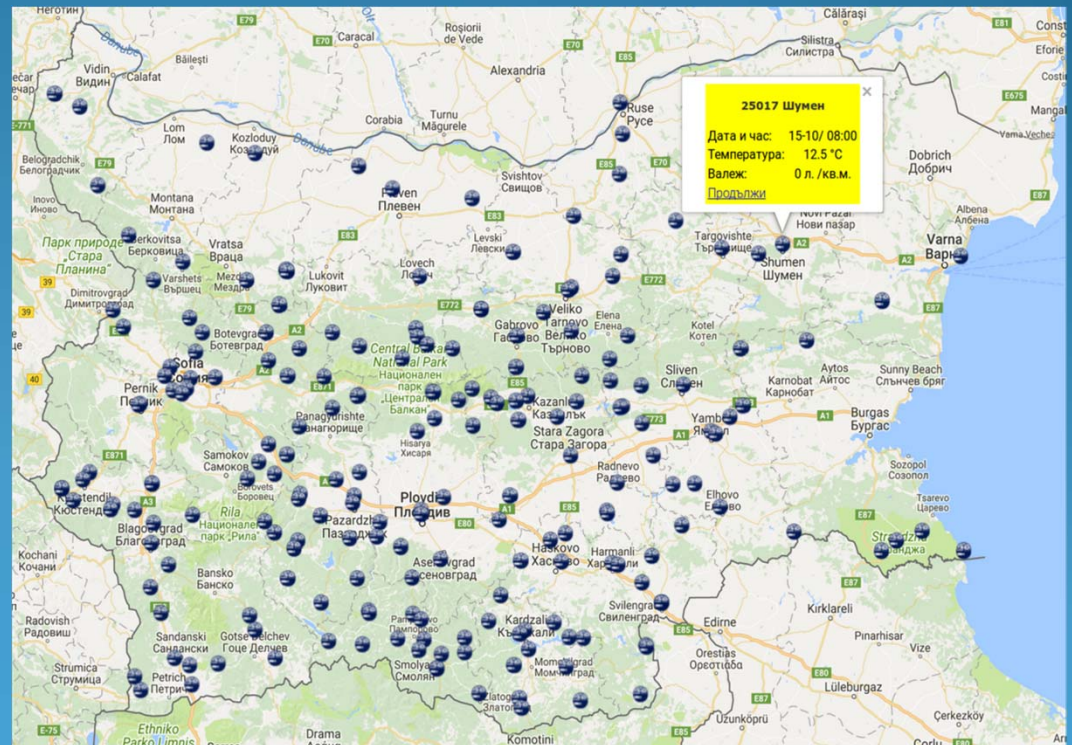


# From the sensors to the models, integrated hydro-meteorological systems in NIMH – BAS, Bulgaria

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## OBJECTIVES:

Automatic telemetric stations (ATS) provide irreplaceable data for flood warning systems (WS). Other meteorological variables measurements are required to feed natural disasters WS and for pollutant transport forecast systems. The target was to supply real-time homogenous spatial data with good quality for the Land Surface Models (LSM), distributed hydrological models (DHM) and pollutant dispersion and transport models. Data flow must be uninterrupted 24 hours a day, 7 days a week.



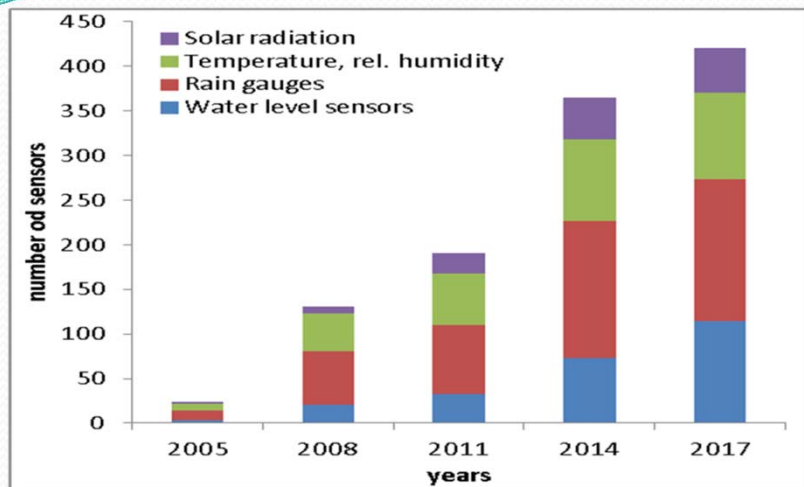


Fig.1. Number of measured sensors by years

## Gradual transition

Automated measures were firstly introduced as point sources of information to measure water levels and precipitation at certain points with 1h step. Next step was to enlarge the measurement network (Fig. 1) and the number of measured variables in order to produce digital maps at hourly step for some meteorological variables in real time (Fig. 3)

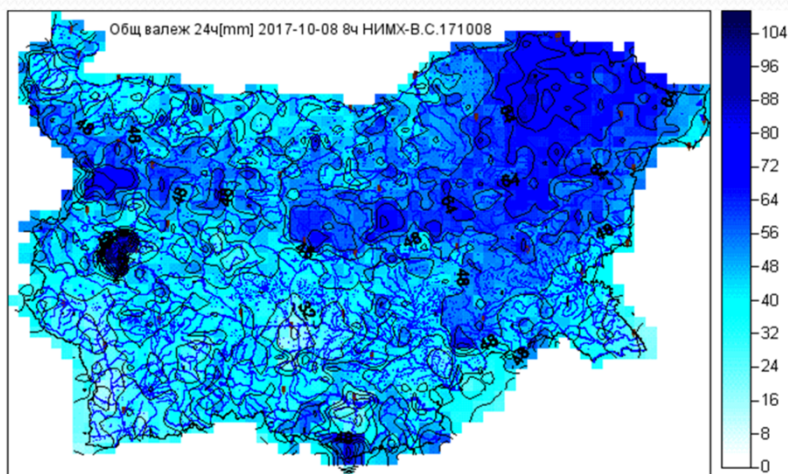


Fig.3. 24h precipitation field for 08-10-2017

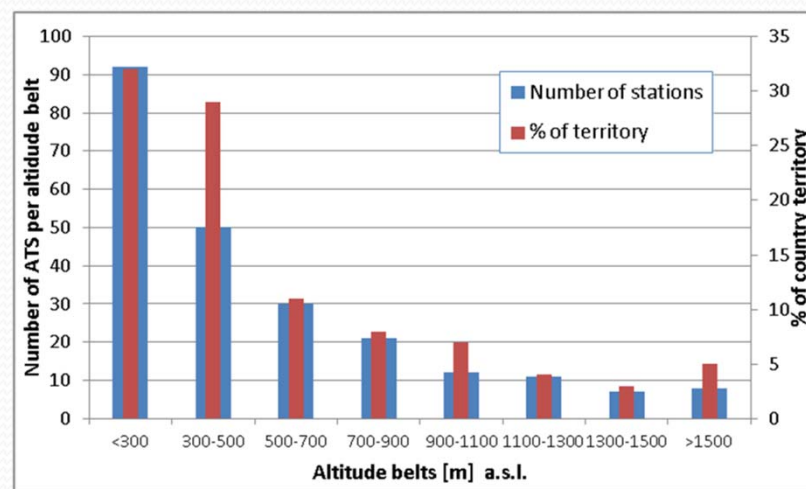


Fig.2. Partition of ATS by altitude belts

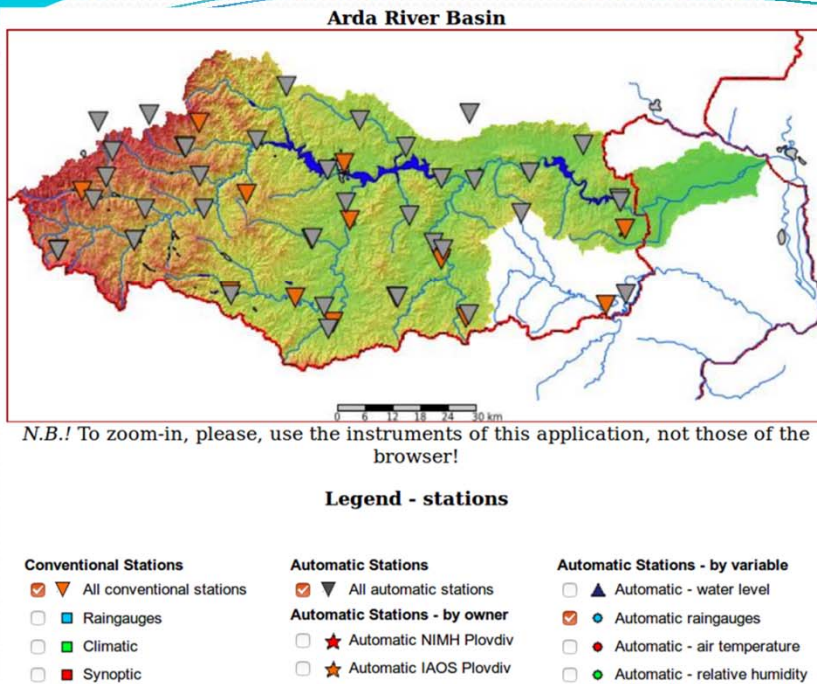


Fig. 4 Map of area covered by ARDAFORECAST flood warning system showing ATS locations

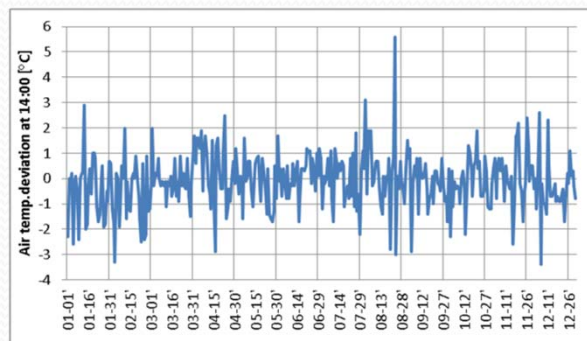


Fig. 5 Deviations between manual and sensor measures of air temperature at 14:00 – Rozhen station for 2016.

## Conclusions :

- ATS data series are successfully used for NIMH scientific projects like Maritsa-Tundzha Flood Warning system and ARDAFORECAST warning system (Fig. 4).
- Standardization and methodological issues, together with lack of funding are slowing down implementation of ATS.
- Deviations between manual readings and automatic ones exist. Air temperature at 14:00 results in a higher deviation and standard error of 1.07 °C (Fig. 5).
- The transition process from manual to automatic measures is easier in hydrology where water levels have to be measured at hourly step.

Find more information at poster No. P2.7