National Institute of Meteorology and Hydrology of Bulgaria
Coupled Aladin-ISBA-Modcou models used for hydrologic modeling and forecast

**SHORT RANGE ATMOSPHERIC MODEL**

**ALADIN**
48 h forecast of following fields:
- Air temperature at 2 m
- Air moisture
- Wind speed
- Global Solar Radiation
- Nebulosity

**SURFACE SCHEME**
(Noilhan J. et J. F. Mahfouf, 1995)

**REAL TIME PRECIPITATION FIELDS FOR ERROR CORRECTION**

**INTERFACE SOIL-BIOSPHERE-ATMOSPHERE**
*ISBA*
Evaluates the following parameters:
- Soil Moisture
- Soil Temperature
- Snow Height and Density
- Total Evaporation

**REAL TIME MONITORING OF THE SNOW COVER, SOIL MOISTURE AND STREAMFLOWS, AND 48 h HYDROLOGICAL FORECAST**

**DISTRIBUTED HYDROLOGICAL AND HYDRO-GEOLOGICAL MODEL**
Ledoux E., G. Girard, G. Marsily, 1989

**MODCOU**
- Water table variation
- Streamflows’ computing
2. HYDROLOGIC MODELING USING MEASURED PRECIPITATION FIELDS

- **NOT ANTHROPOGENIZED WATERSHEDS:** 0.8x10^3 km^2
- **ANTHROPOGENIZED WATERSHEDS:** 21x10^3 km^2; 5.5x10^3 km^2

3. HYDROLOGIC MODELING AND FORECAST USING ALADIN PRECIPITATION FIELDS

- Soil moisture variable is modified every 48 h by a surface scheme running at the same time but using measured precipitations.

RESULTS COMPARISON: 1. ALADIN ACCUMULATED 5 MONTHS PRECIPITATION (on the right) VERSUS MEASURED PRECIPITATION FIELD (on the left) in mm

DAILY STREAMFLOW DISCHARGES 16/09/02-20/02/03