



Modelling Approach

By Job Udo



Flood Forecasting and Early Warning System Workshop

11/30/2007
Page 1

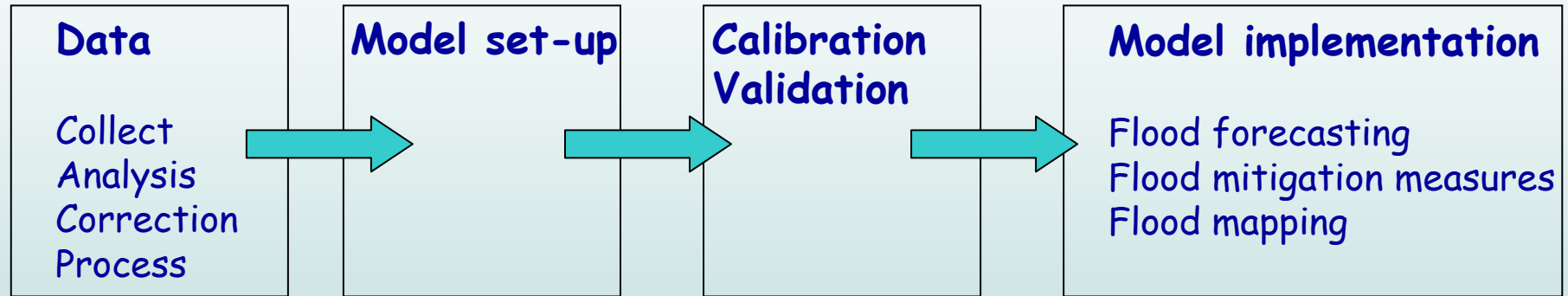


Presentation breakdown

- ≡ General modelling approach
- ≡ Modelling approach Maritsa/Tundja
- ≡ Training
- ≡ Reservoirs



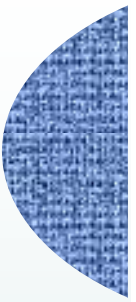
General modelling approach





General modelling approach

Data

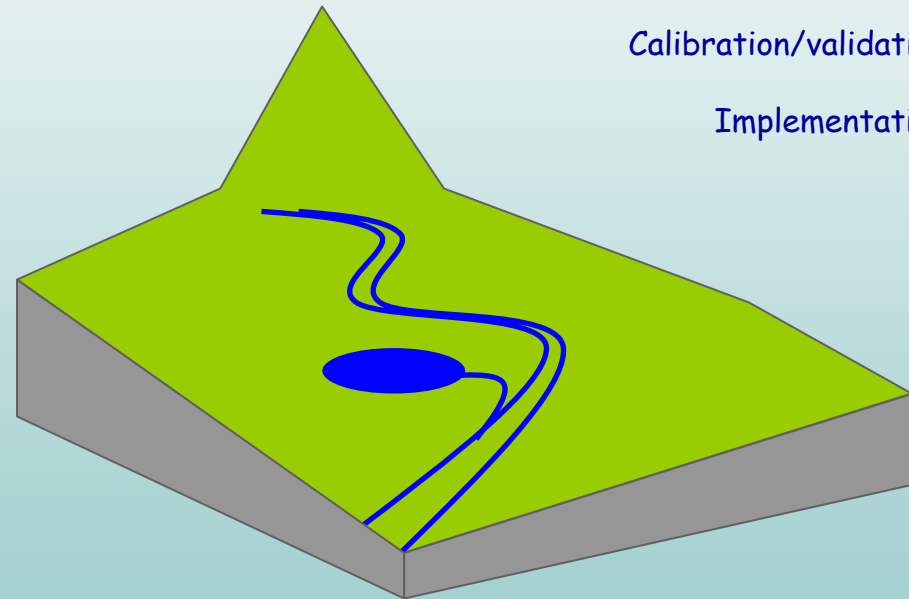


Data

Model Set-up

Calibration/validation

Implementation

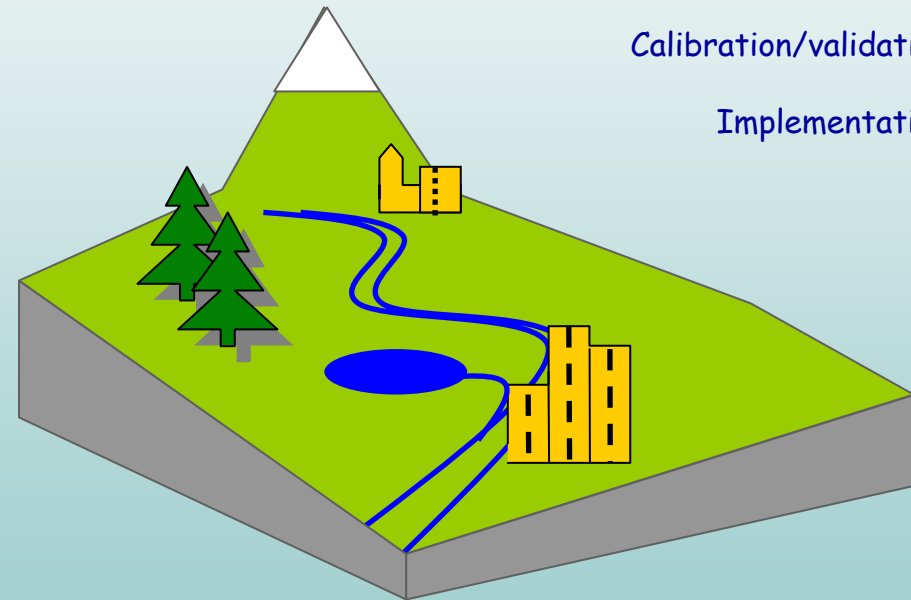




General modelling approach

Data

Catchment characteristics



Data

Model Set-up

Calibration/validation

Implementation

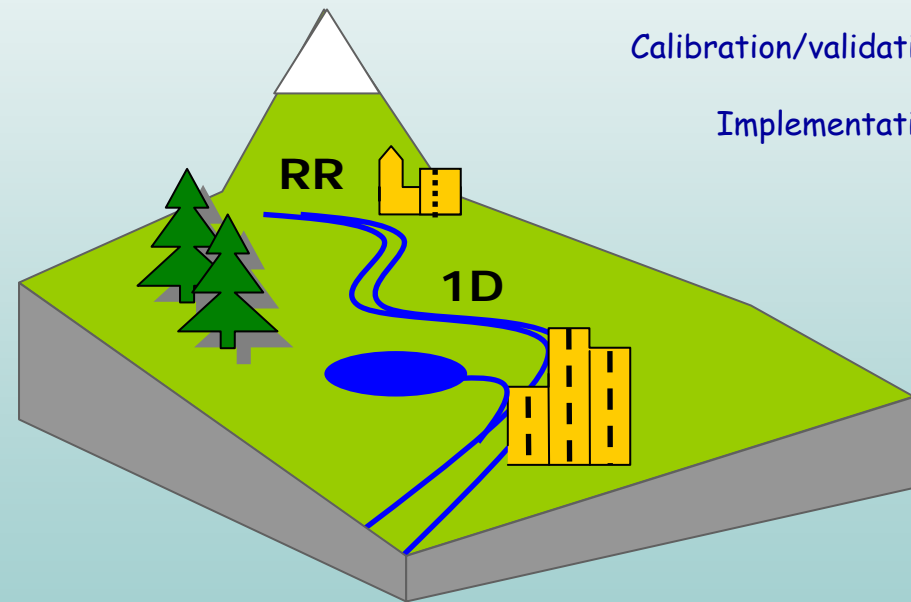


General modelling approach

Data

Catchment characteristics

How to model area
(Rainfall Runoff and 1-D flow)



Data

Model Set-up

Calibration/validation

Implementation



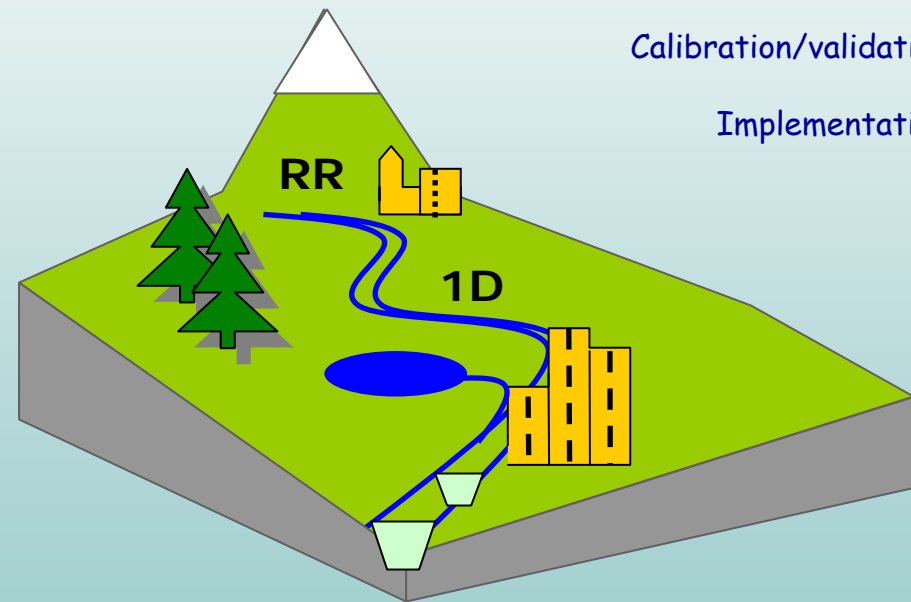
General modelling approach

Data

Catchment characteristics

How to model area
(Rainfall Runoff and 1-D flow)

River geometry



Data

Model Set-up

Calibration/validation

Implementation





General modelling approach

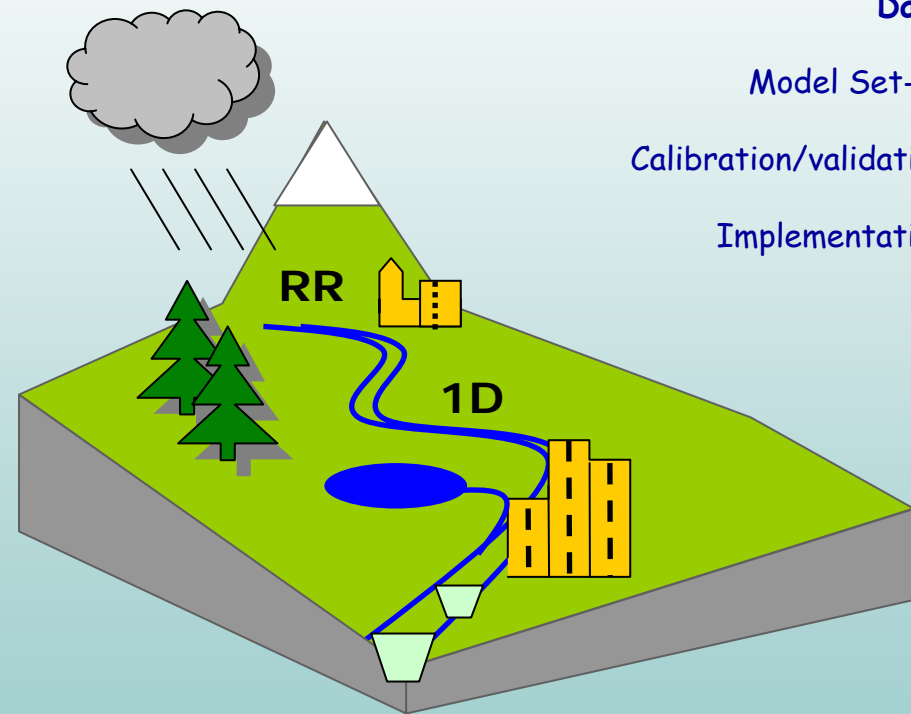
Data

Catchment characteristics

How to model area
(Rainfall Runoff and 1-D flow)

River geometry

Meteorological data



Data

Model Set-up

Calibration/validation

Implementation





General modelling approach

Data

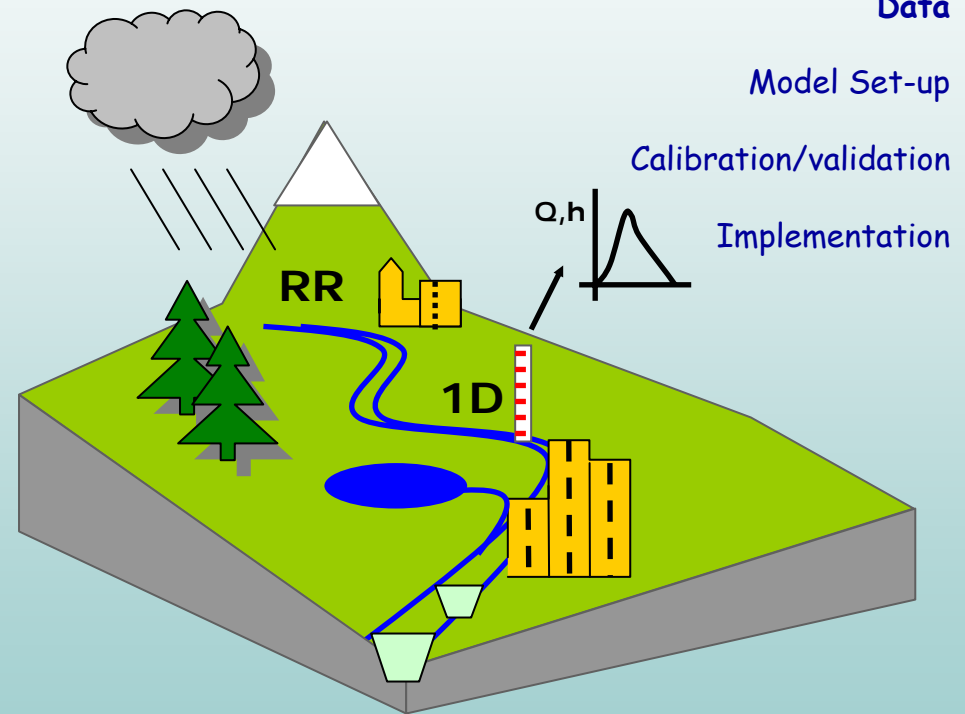
Catchment characteristics

How to model area
(Rainfall Runoff and 1-D flow)

River geometry

Meteorological data

Hydrological data

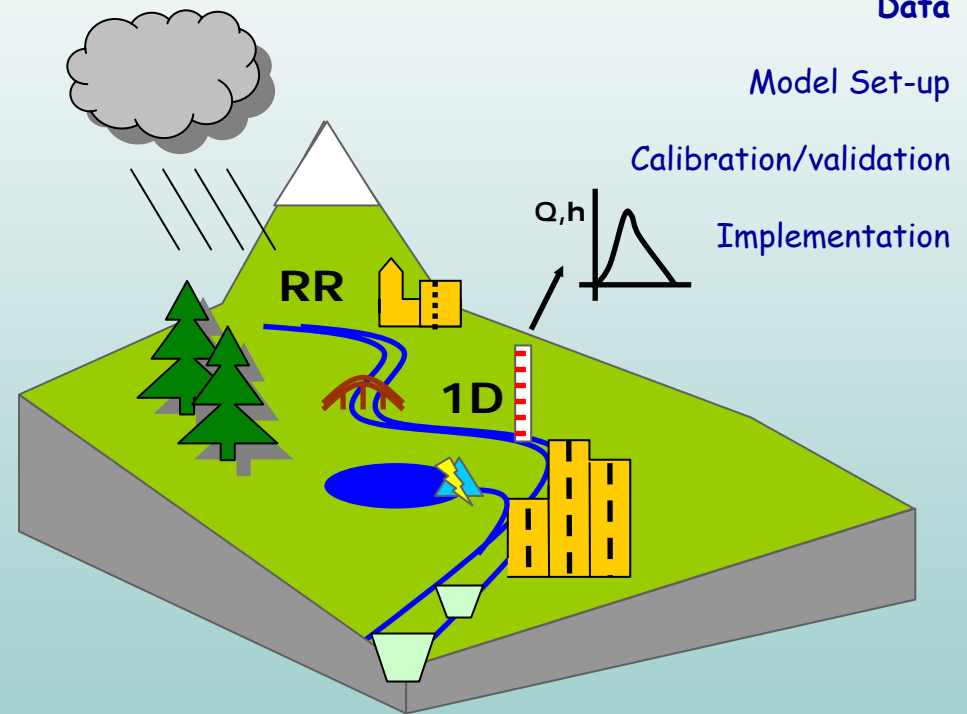




General modelling approach

Data

- Catchment characteristics
- How to model area (Rainfall Runoff and 1-D flow)
- River geometry
- Meteorological data
- Hydrological data
- River structures





General modelling approach

Data

Catchment characteristics

How to model area
(Rainfall Runoff and 1-D flow)

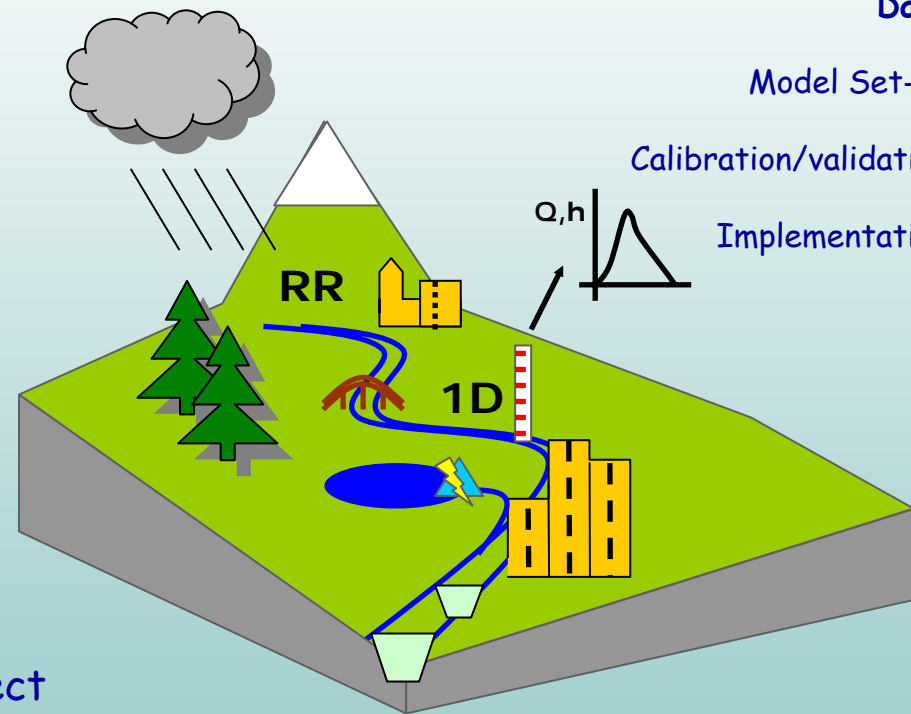
River geometry

Meteorological data

Hydrological data

River structures

Analyse, process en correct



Data

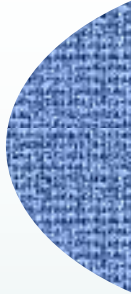
Model Set-up

Calibration/validation

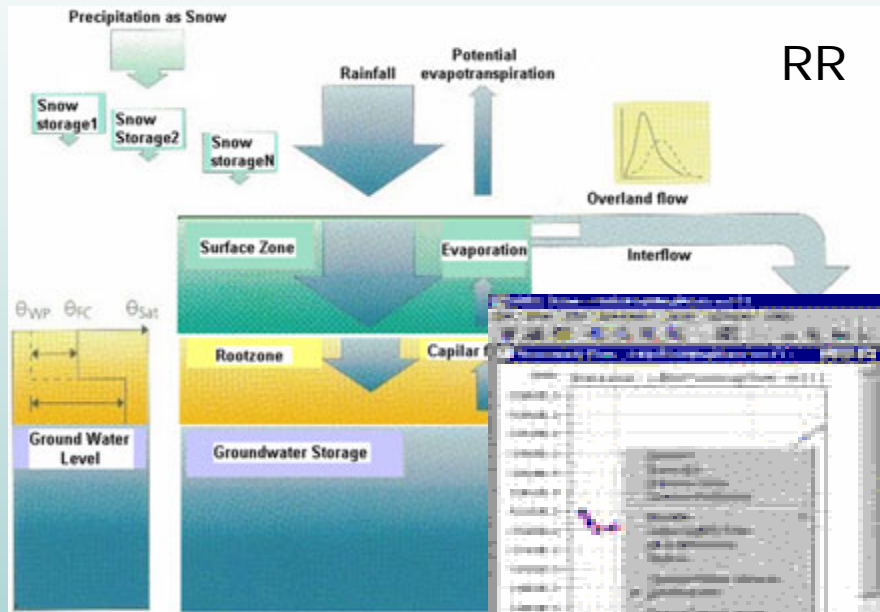
Implementation



General modelling approach



Model Set-up



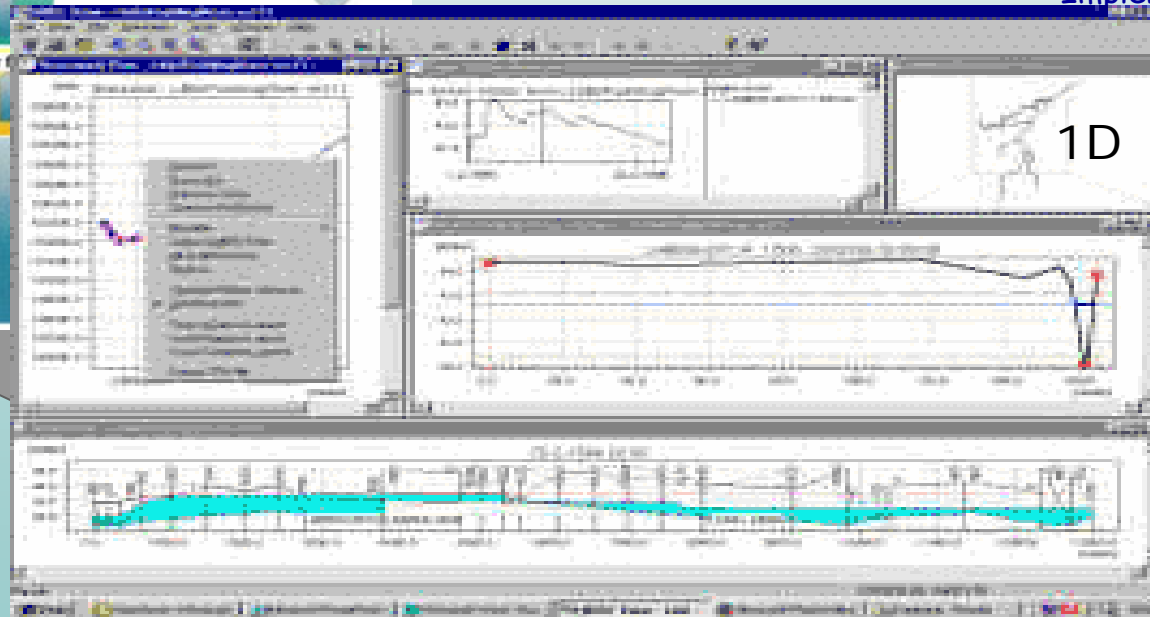
RR

Data

Model Set-up

Calibration/validation

Implementation

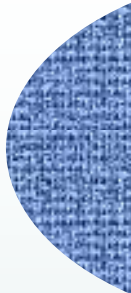


1D

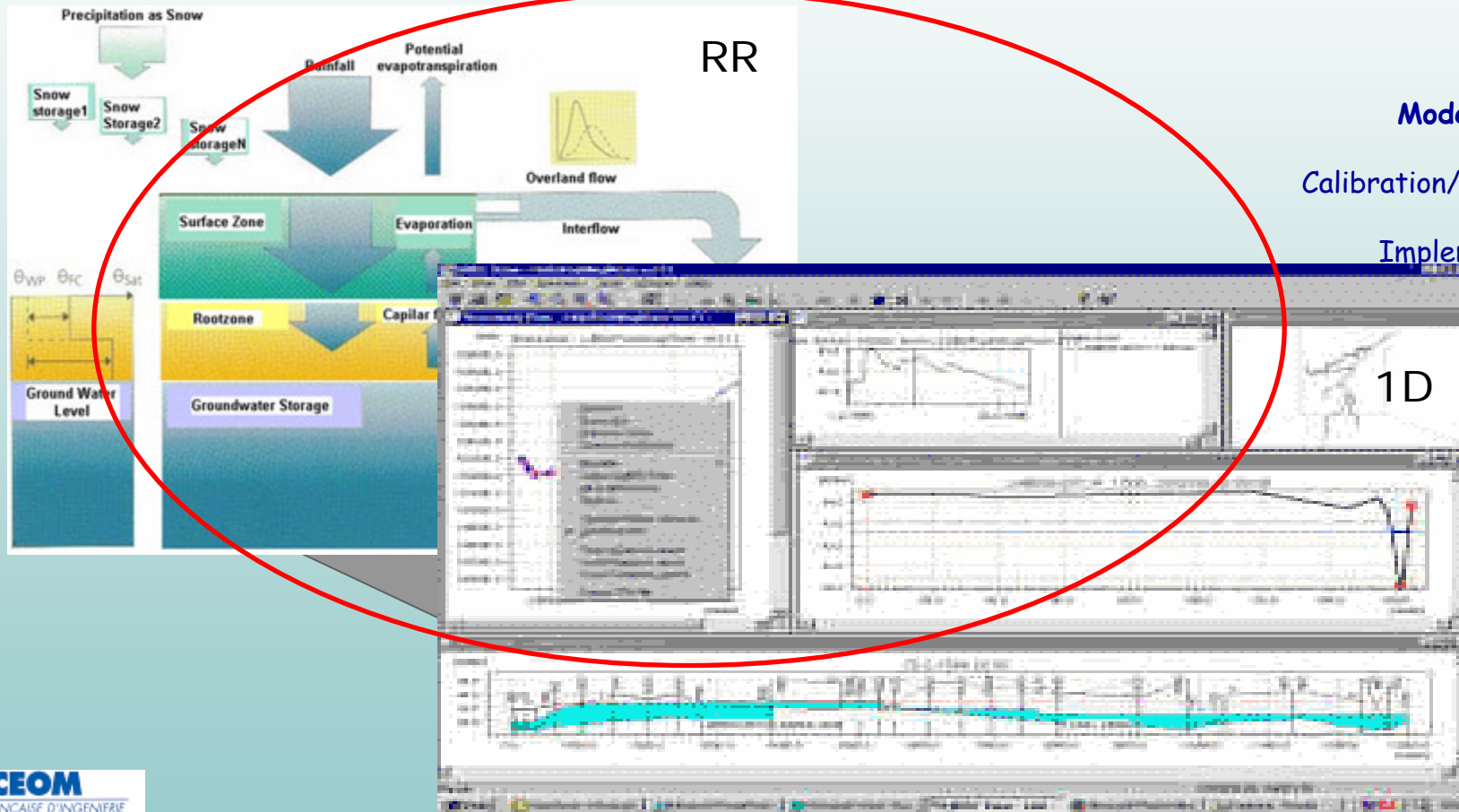




General modelling approach



Model Set-up



Data

Model Set-up

Calibration/validation

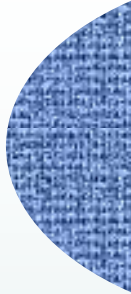
Implementation

1D

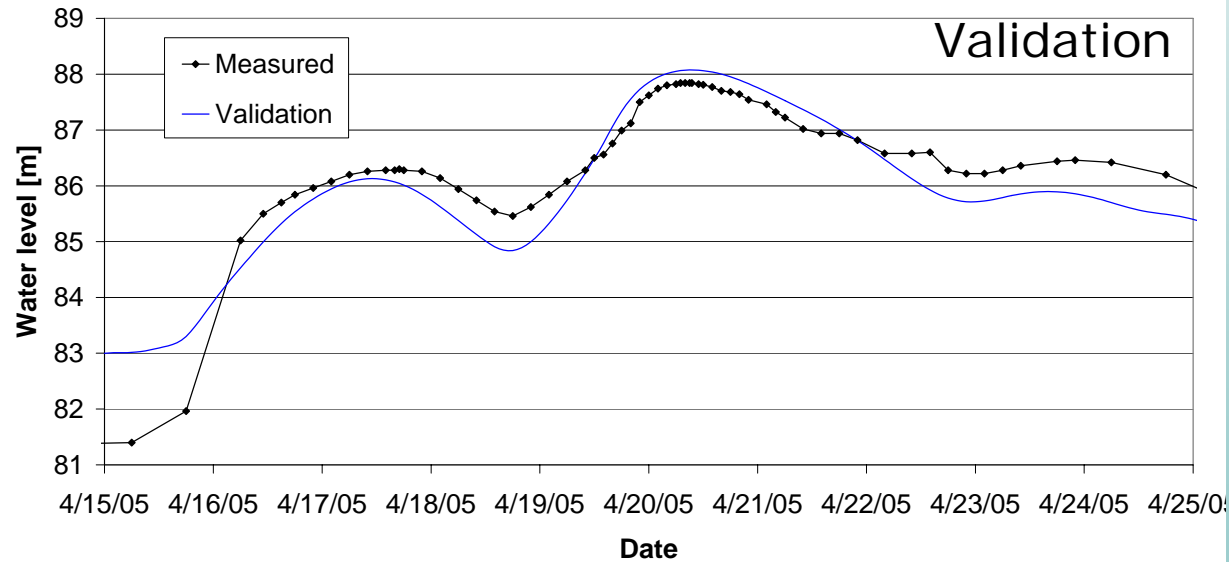
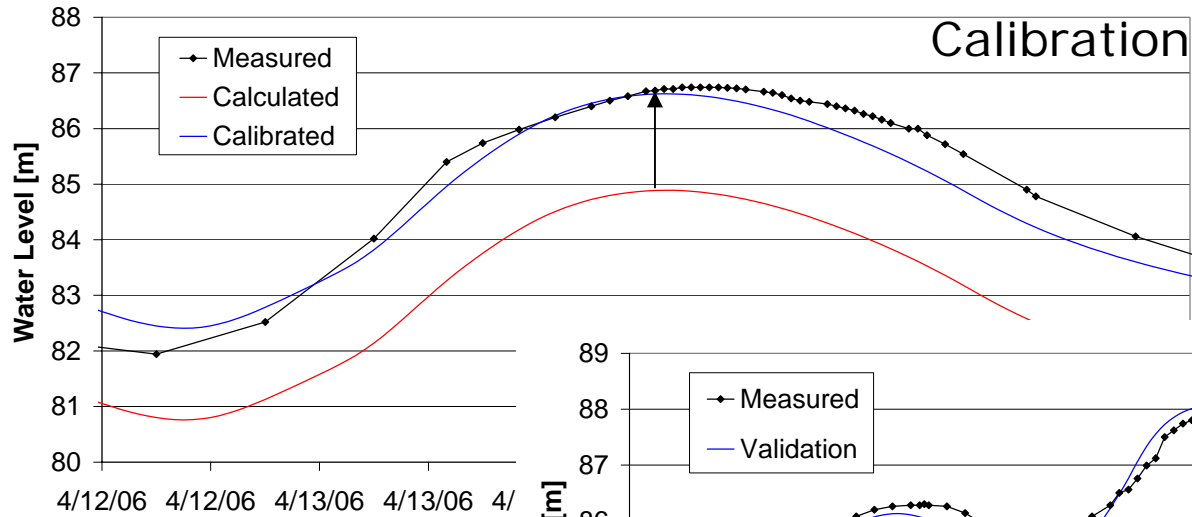




General modelling approach



Calibration and validation



Data

Model Set-up

Calibration/validation

Implementation



General modelling approach

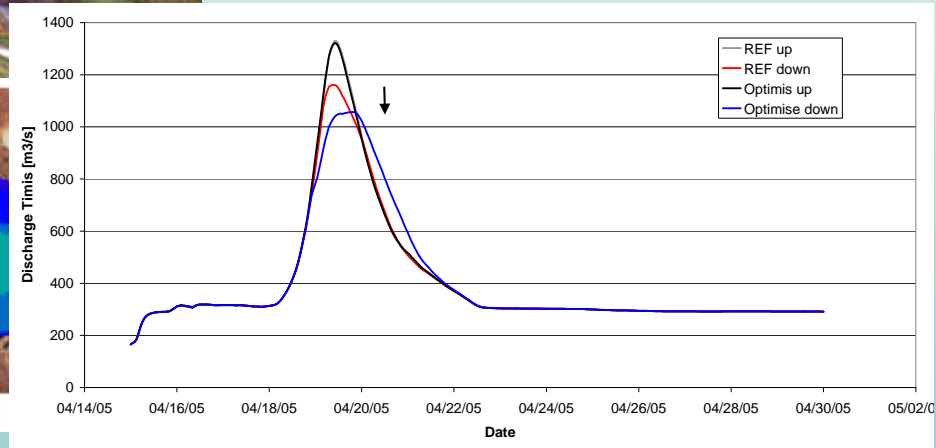
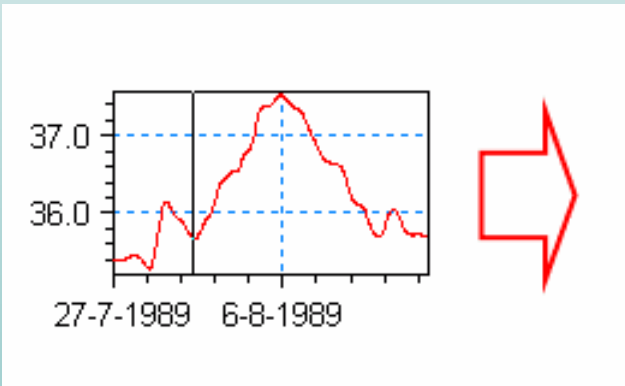
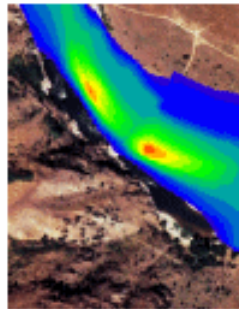
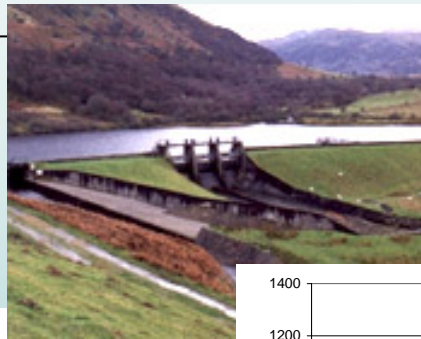
Model implementation

Flood forecasting

Flood mapping

Reservoirs

Flood mitigation



Data

Model Set-up

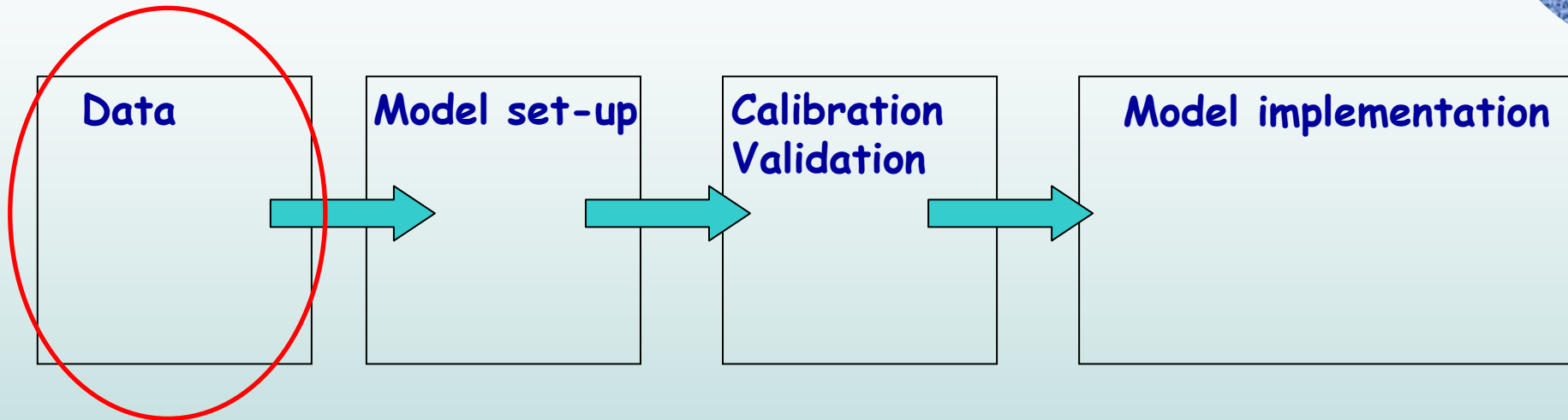
Calibration/validation

Implementation





Modelling approach Maritsa/Tundja



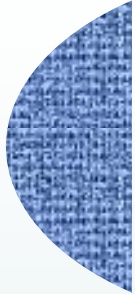
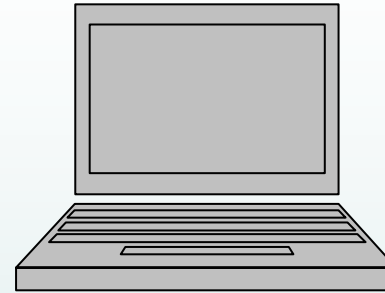


Modelling approach Maritsa/Tundja

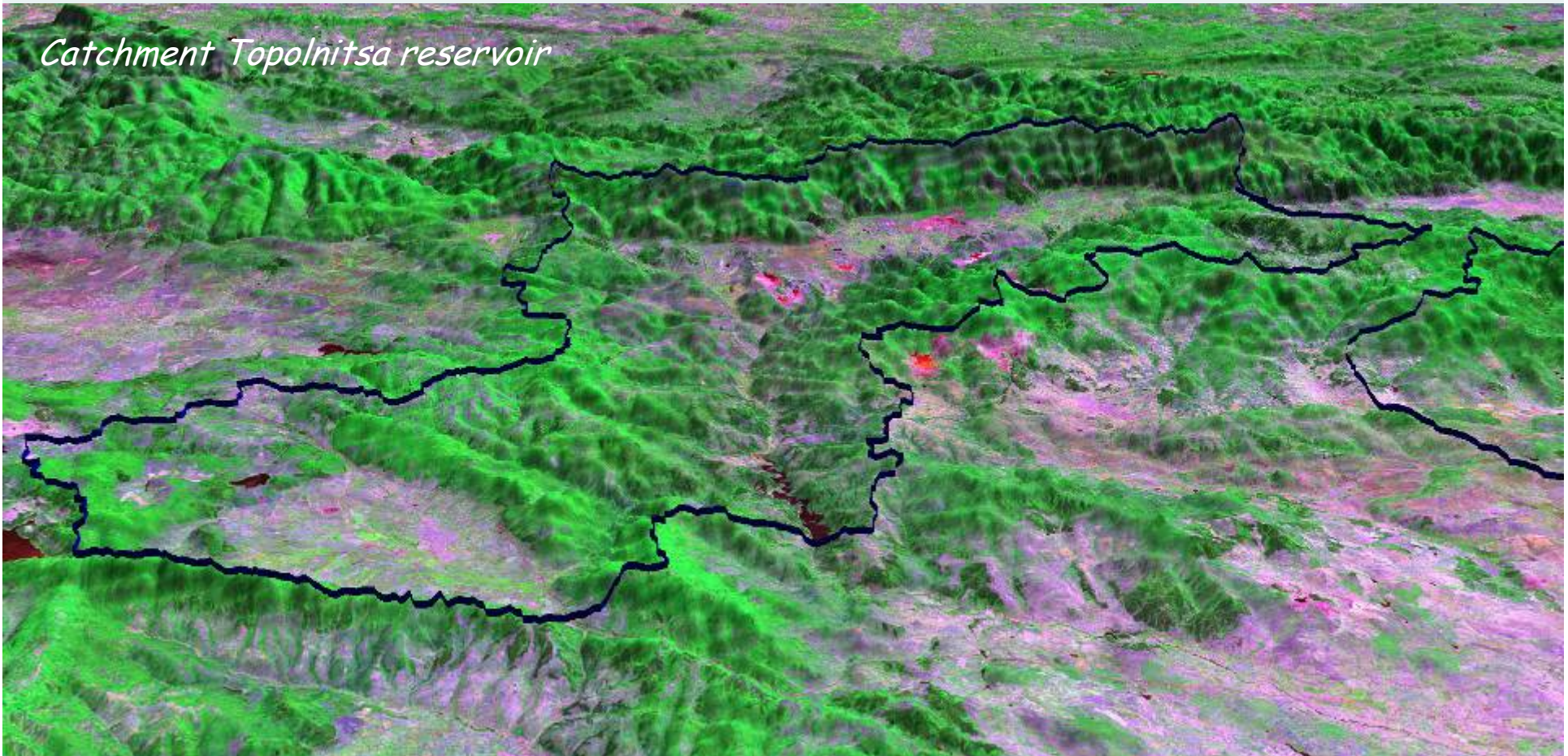
Data

Catchment characteristics

GIS database



Catchment Topolnitsa reservoir





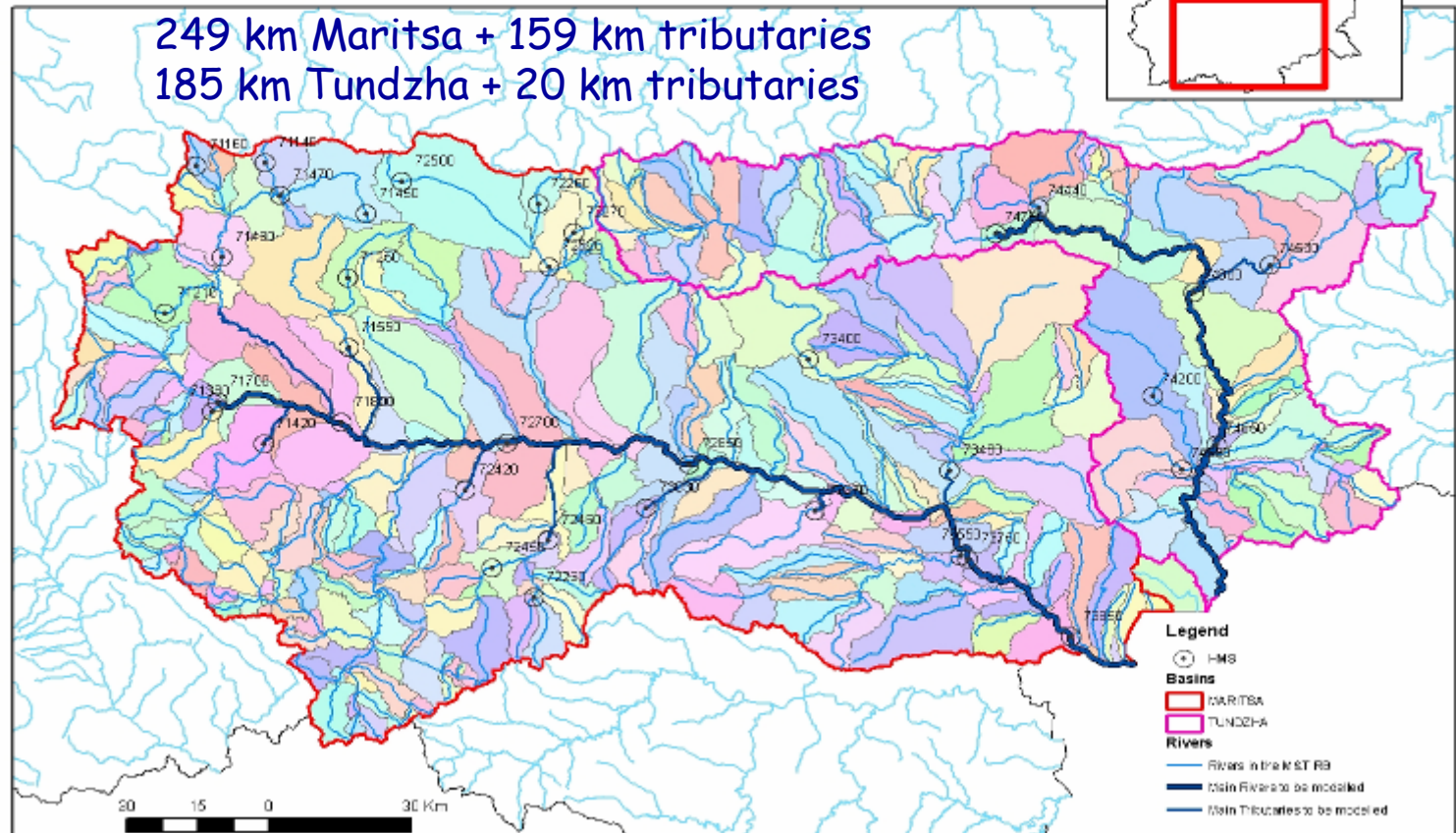
Modelling approach Maritsa/Tundja

Data

Catchment characteristics

How to model area
(Rainfall
Runoff and 1-D
flow)

Map of the subcatchments in the Maritsa and Tundja Basins





Modelling approach Maritsa/Tundja

Data

Catchment characteristics

- River courses

How to model area

- Satellite

(Rainfall Runoff and 1-D flow)

- Cross-sections (about 300 to be measured)

River geometry

- Topomaps

- DEM (levels of the land)

- Orthophoto

(not available, but present in agricultural ministry)

- Only governmental data

- Presentation Mr. Vassilev



Modelling approach Maritsa/Tundzha

Data

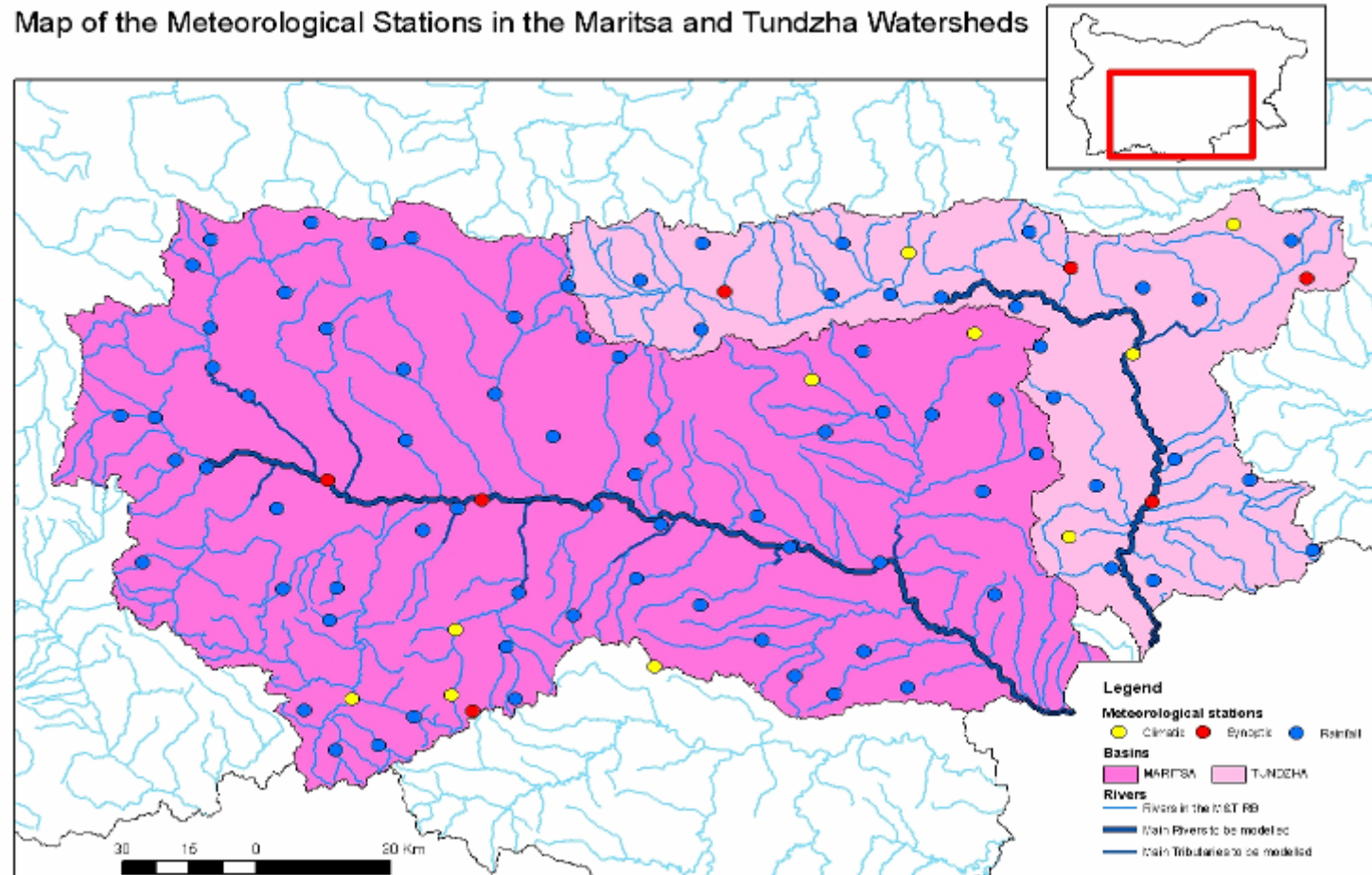
Catchment characteristics

How to model area
(Rainfall Runoff and 1-D flow)

River geometry

Meteorological data

Map of the Meteorological Stations in the Maritsa and Tundzha Watersheds





Modelling approach Maritsa/Tundja

Data

Catchment characteristics

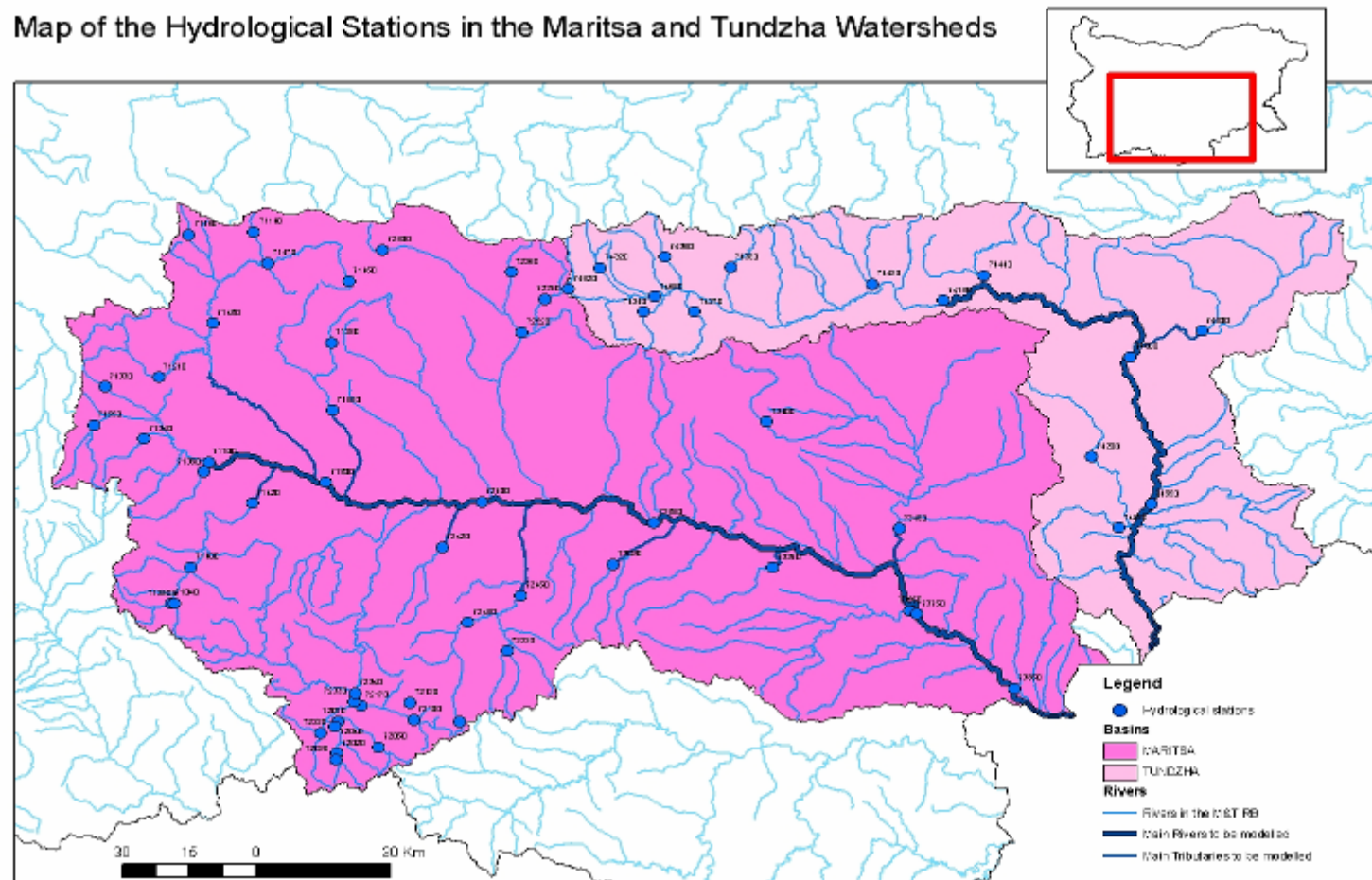
How to model area
(Rainfall Runoff and 1-D flow)

River geometry

Meteorological data

Hydrological data

Map of the Hydrological Stations in the Maritsa and Tundzha Watersheds





Modelling approach Maritsa/Tundja

Data

Catchment characteristics

- Bridges (from CRS survey)

How to model area
(Rainfall Runoff and 1-D flow)

- Reservoirs (discussion)

- Other?

River geometry

Meteorological data

Hydrological data

River structures



Modelling approach Maritsa/Tundja

Data

Catchment characteristics

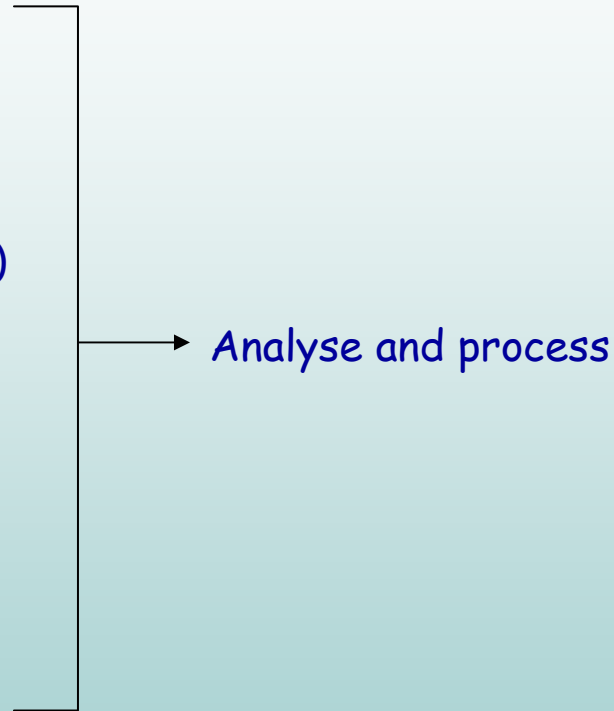
How to model area
(Rainfall Runoff and 1-D flow)

River geometry

Meteorological data

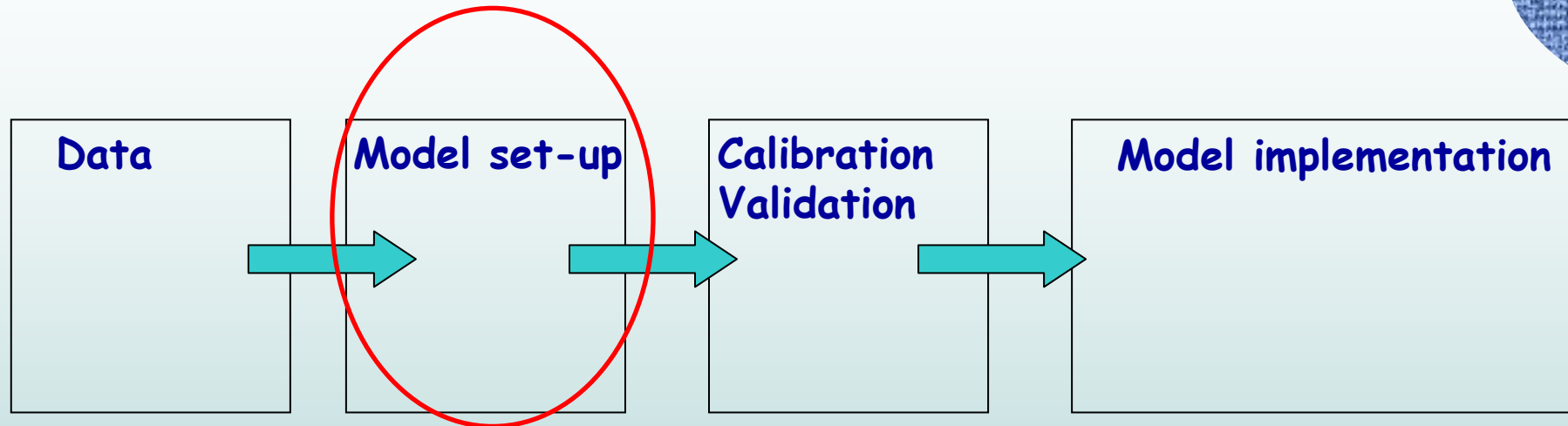
Hydrological data

River structures



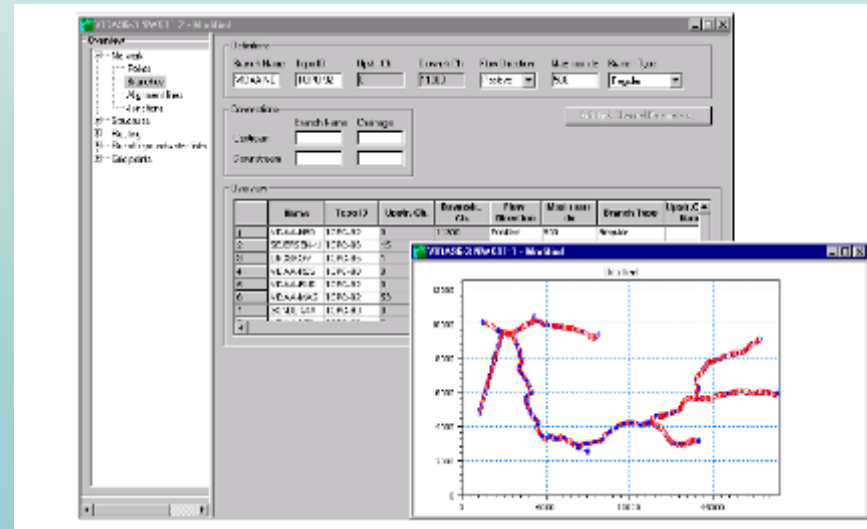


Modelling approach Maritsa/Tundja



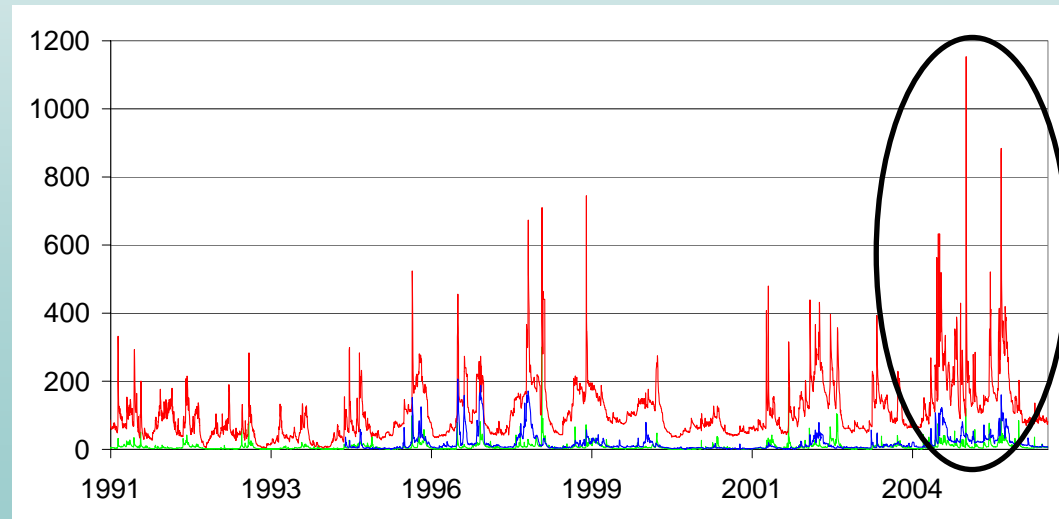
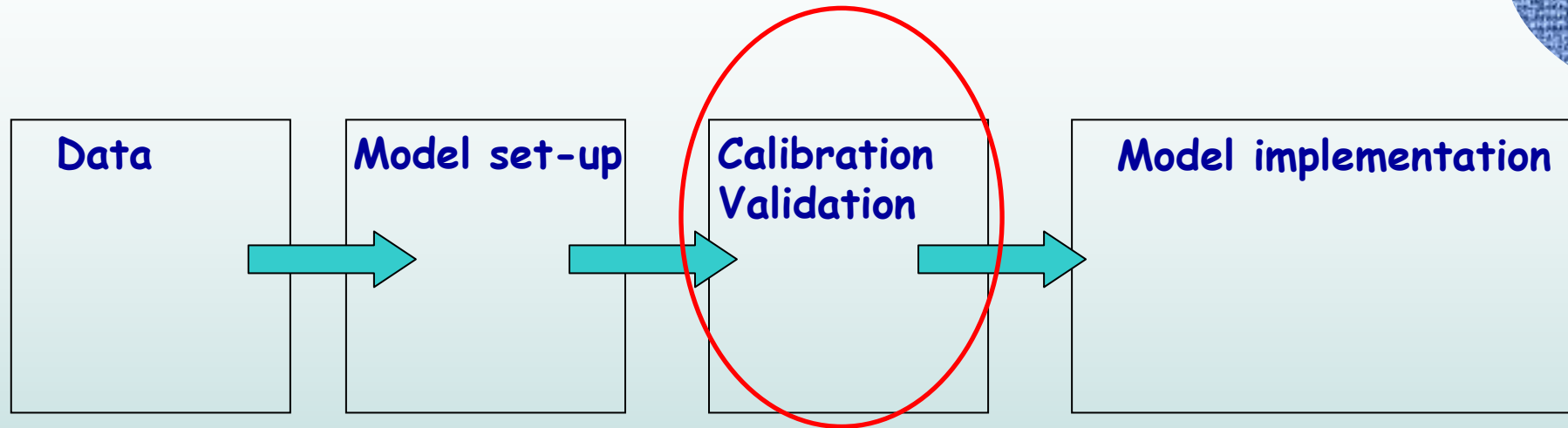
Mike11

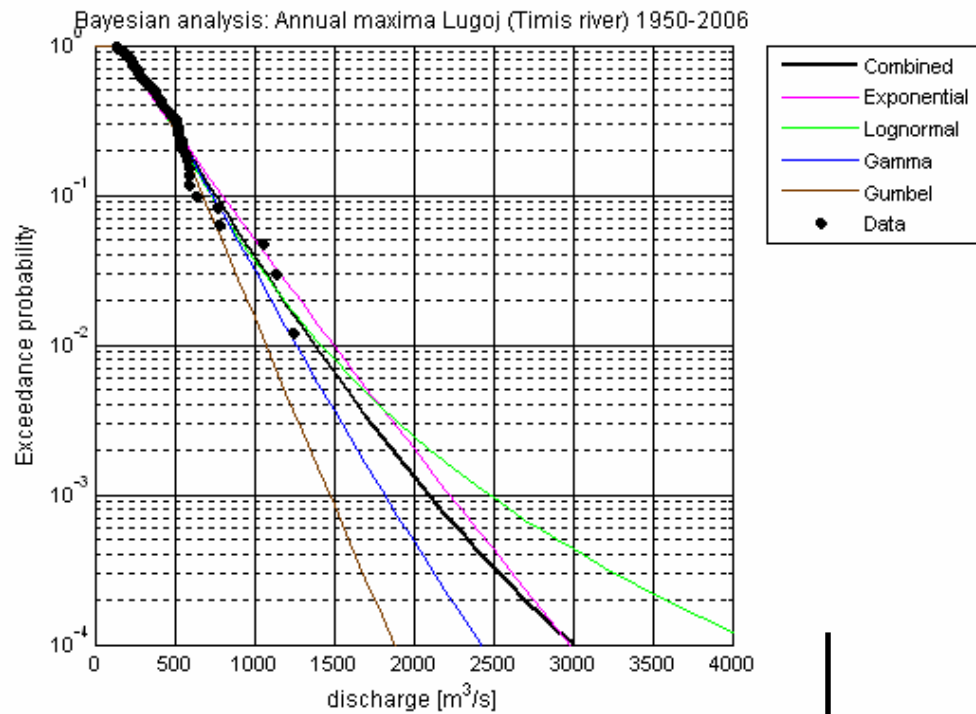
- Mike NAM
- Mike HD
- Mike Flood Watch
- Mike Flood Forecasting





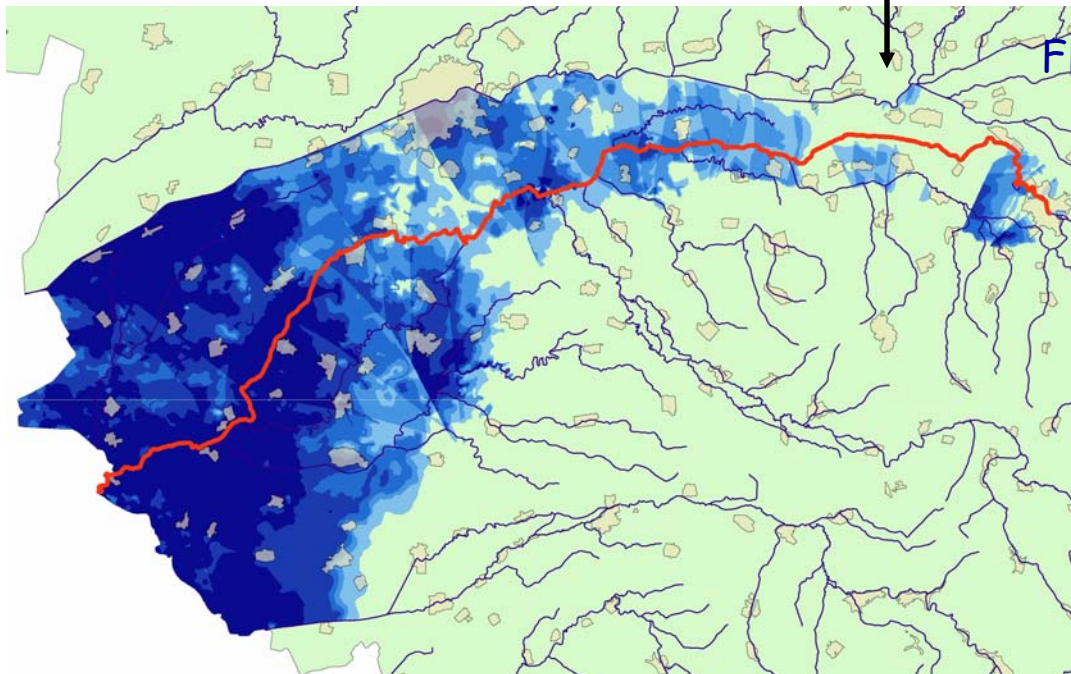
Modelling approach Maritsa/Tundja

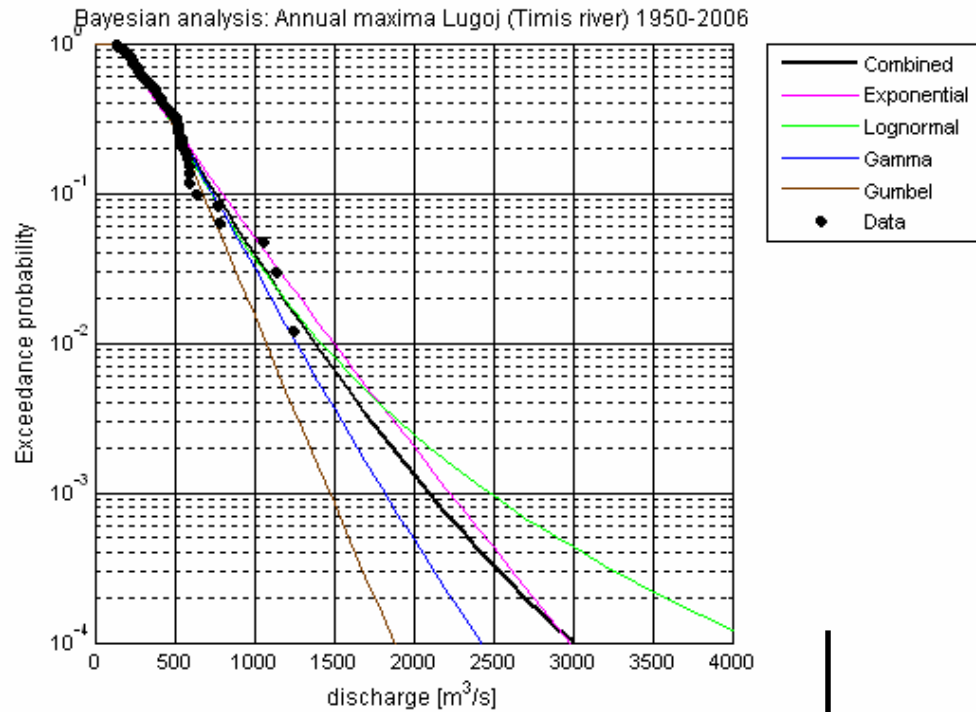




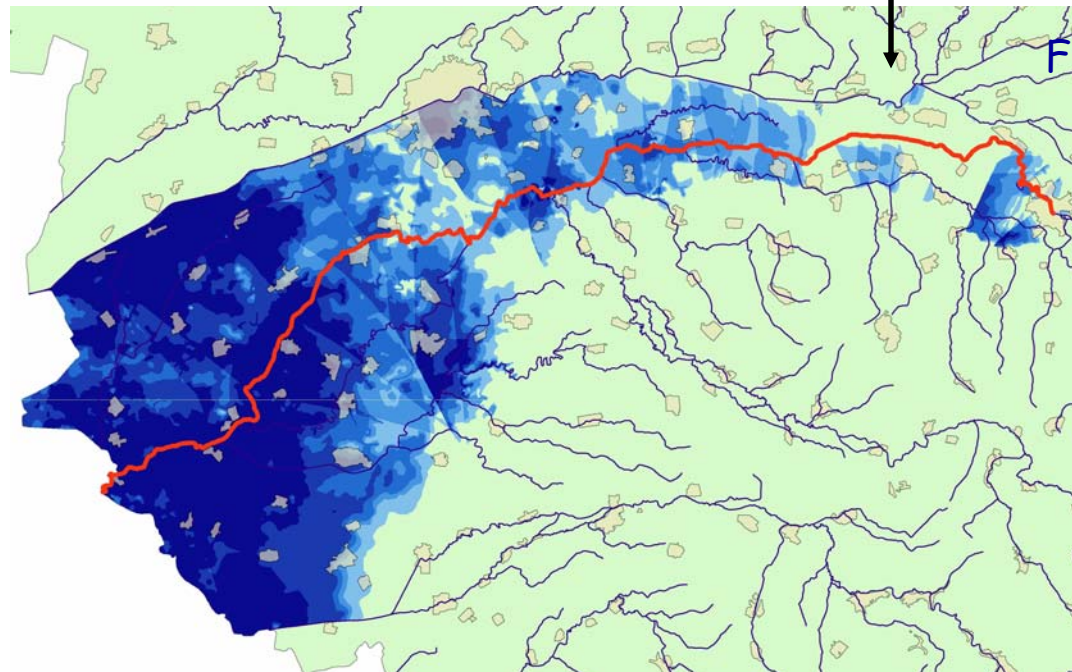
Model implementation

Flood Scenario's 1/20, 1/100, 1/1000 years
Flood maps





Model implementation



Flood Scenario's 1/20, 1/100, 1/1000 years
 Flood maps
 Flood forecasting

Other:
 Flood mitigation analyses
 Reservoir optimisation

...

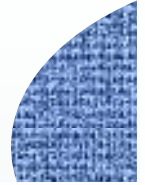


Training

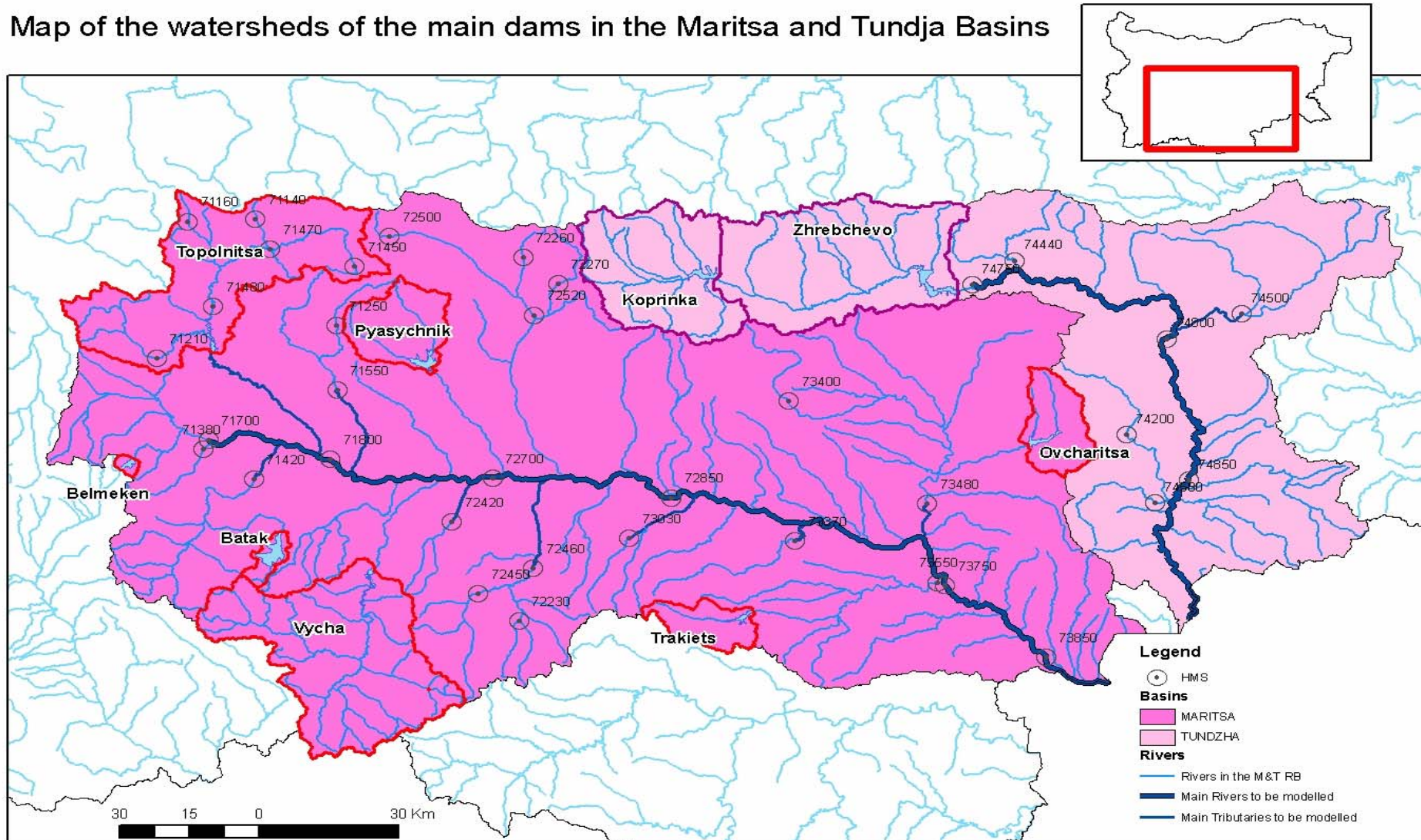
Code	What	Who	When	How
T1	General modelling Calibration, Analysis Presentation	NIMH Sofia and Plovdiv, RBD Plovdiv	After supply component (March 2008?)	Introduction, Projectteam, On-the-job
T2	Implementation Mapping	NIMH Sofia and Plovdiv, RBD Plovdiv	July 2008	Short sessions Homestudy
T3	Flood forecasting	NIMH Sofia and Plovdiv	August 2008	Short sessions Homestudy



Reservoirs

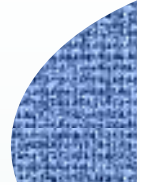


Map of the watersheds of the main dams in the Maritsa and Tundja Basins

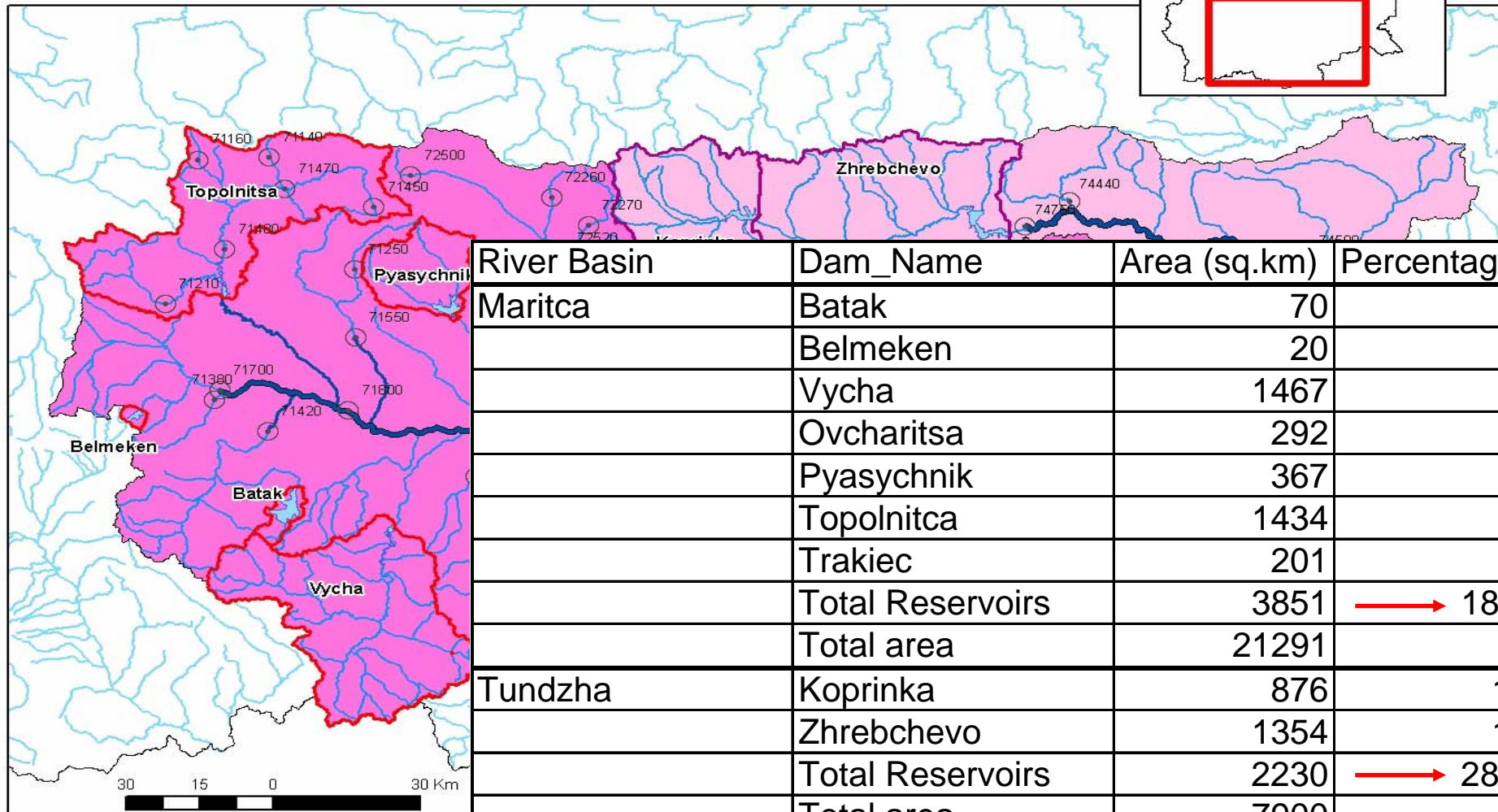
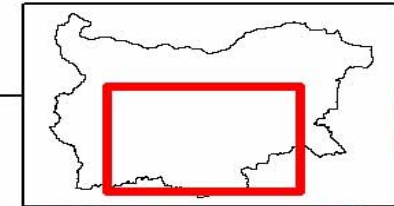




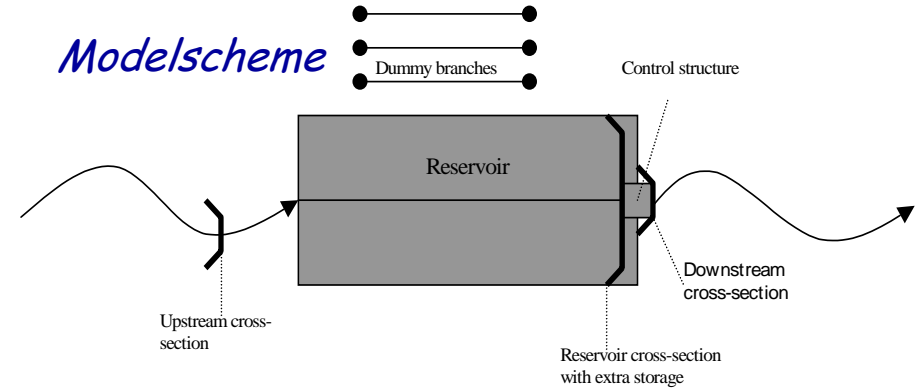
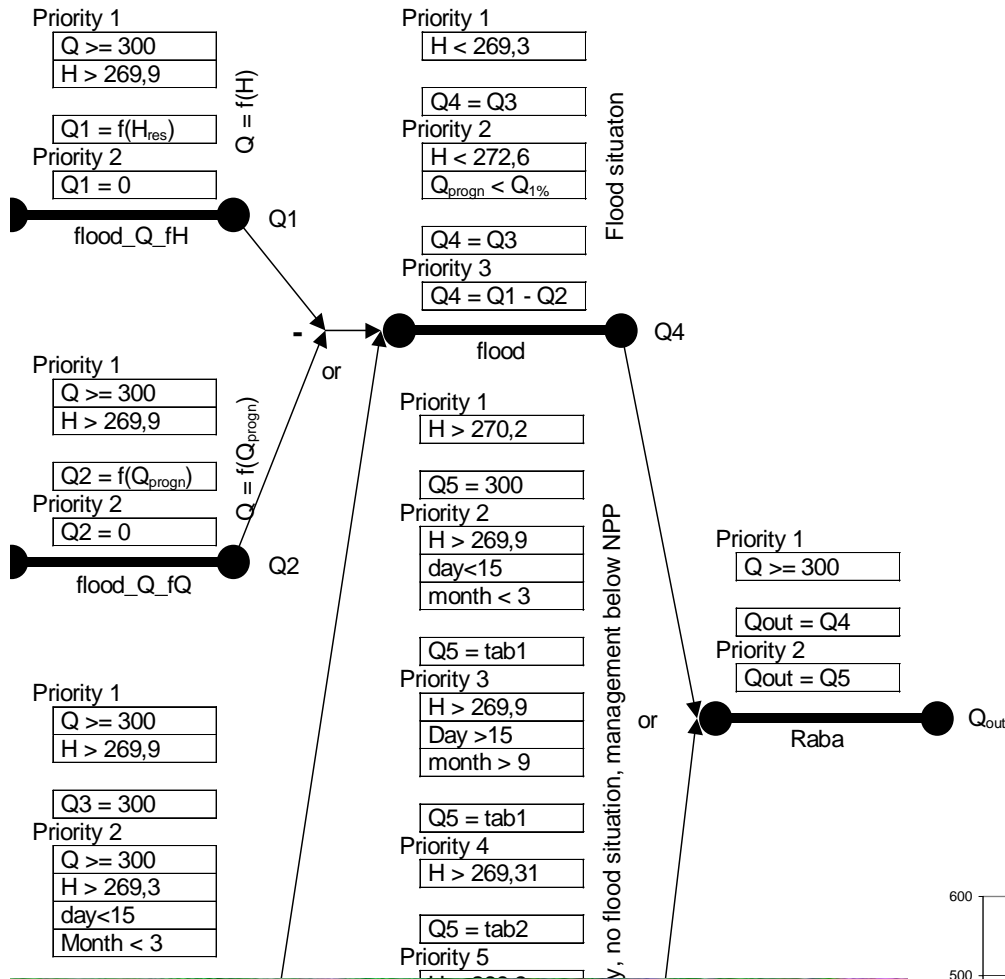
Reservoirs



Map of the watersheds of the main dams in the Maritsa and Tundzha Basins



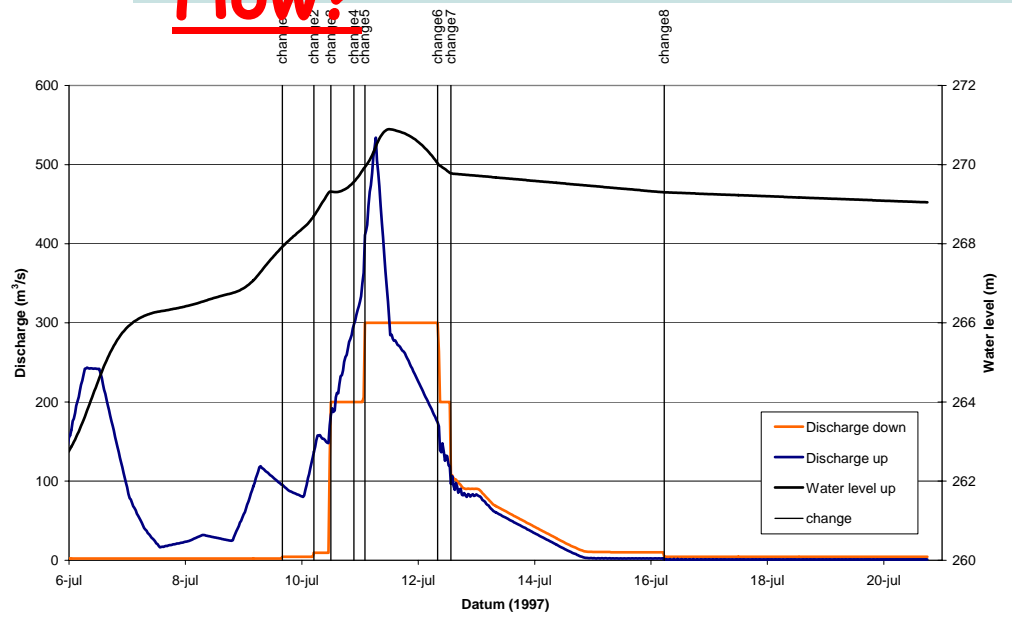
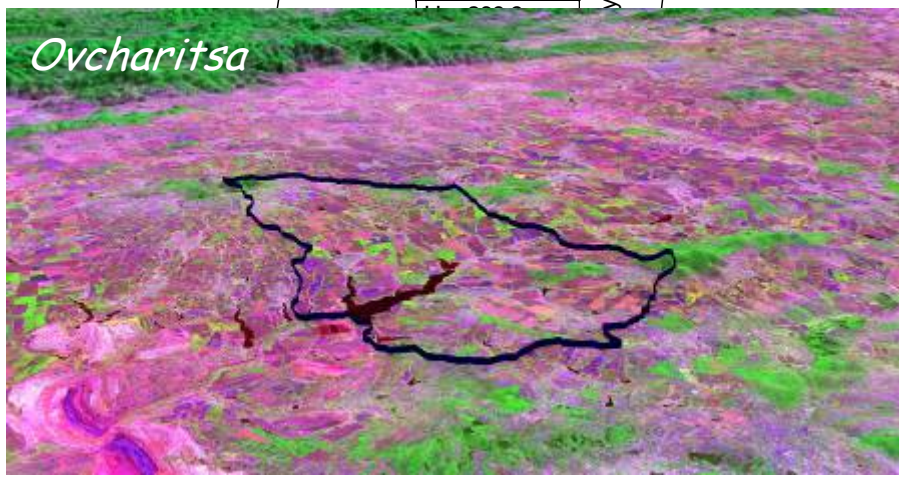
River Basin	Dam_Name	Area (sq.km)	Percentage
Maritca	Batak	70	0
	Belmeken	20	0
	Vycha	1467	7
	Ovcharitsa	292	1
	Pyasychnik	367	2
	Topolnitca	1434	7
	Trakiec	201	1
	Total Reservoirs	3851	→ 18%
	Total area	21291	
Tundzha	Koprinka	876	11
	Zhrebchevo	1354	17
	Total Reservoirs	2230	→ 28%
	Total area	7900	



The reservoirs in Maritsa/Tundja catchments have a big influence on building up of floods

We would like to know the operational rules during flood situation

How?





Questions?

