Workshop on :
GIS&RS Application in Simulation of Hydrological Process

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Venue: Tehran, Iran

Workshop schedule

- **Day 1**
- Morning: 08:30-10 Lecture 1-1, 10:30-12:30 Lecture 1-2
- Afternoon :14:00-15:45 Lecture1-3, 16:00-17:30 Lecture 1-4 and Exercise
- **Day 2**
- Morning: 08:30-10 Lecture 2-1, 10:30-12:30 Lecture 2-2
- Afternoon :14:00-15:45 Exercise, 16:00-17:30 Exercise

GIS and Hydrology

Hydrology study the motion of the earth's waters through the hydrologic cycle, and the transport of constituents such as sediment and pollutants in the water as it flows.

GIS is focused on representing the landscape by means of positional referenced data describing the character and shape of geographic features. A spatial hydrology model is one which simulates the rainfall-runoff process and transport on a specified region of the earth using GIS data structures.

The boundary of this region is represented by a polygon, such as a river basin boundary or an aquifer boundary.

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Type of Hydrological model

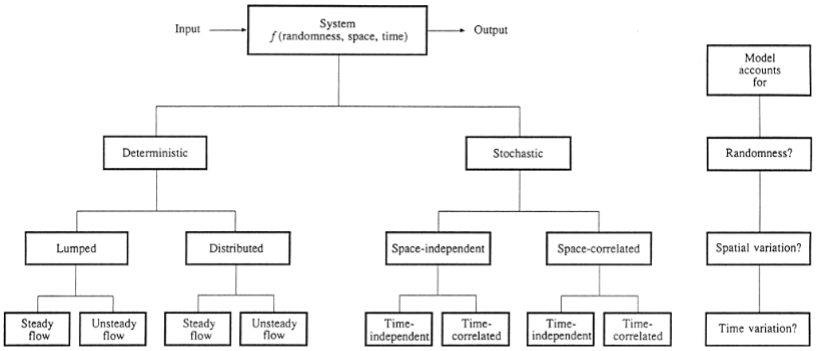
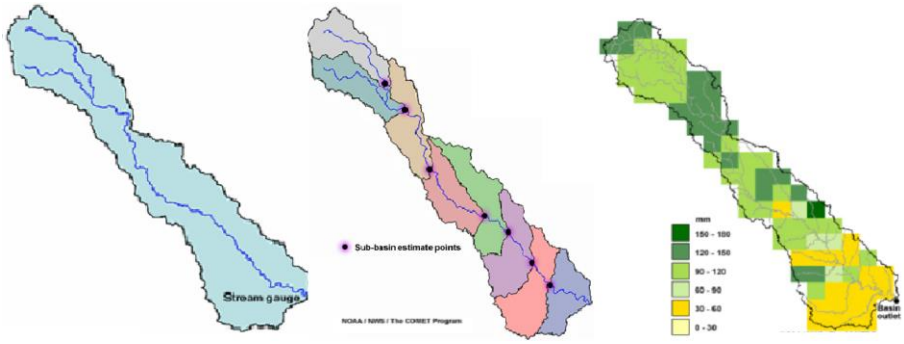


Fig. 2. A taxonomy of hydrological models (after Chow et al., 1988).

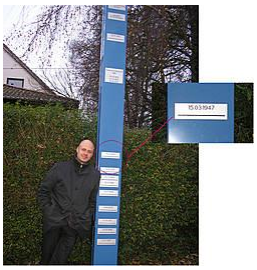
Spatial resolution of Hydrological model



Lumped model Semi-Distributed Distributed

Flood Inundation

Flood Inundation is a temporary condition of partial or complete inundation of normally dry land areas. Floods arise from an overflow of inland water or tidal waters or the unusual accumulation and runoff of surface waters from any source.



Flood hazard awareness describes the notion, the understanding of dangers that can emerge from a flood. Thus it is essential for self-protection, as it implies hazard-adapted behavior.

Flood Inundation map are considered as a baseline tool for increasing hazard awareness among the stakeholders and they also serve to support any flood mitigation and adaptation planning in the area. Thus, they should be available for all stakeholder groups, although their presentation and layout should be tailored to specific target groups. In some European countries it is connected with a given return period, as for instance: 10 years floods, 50 years floods or 100 years floods.

Flood risk maps quantify economic losses considering the exposure and vulnerability of material values. Risk maps do either show a classification of losses, mostly directly expressed as a monetary value, or they show different zones of risk - as a product from hazard, exposure and vulnerability.

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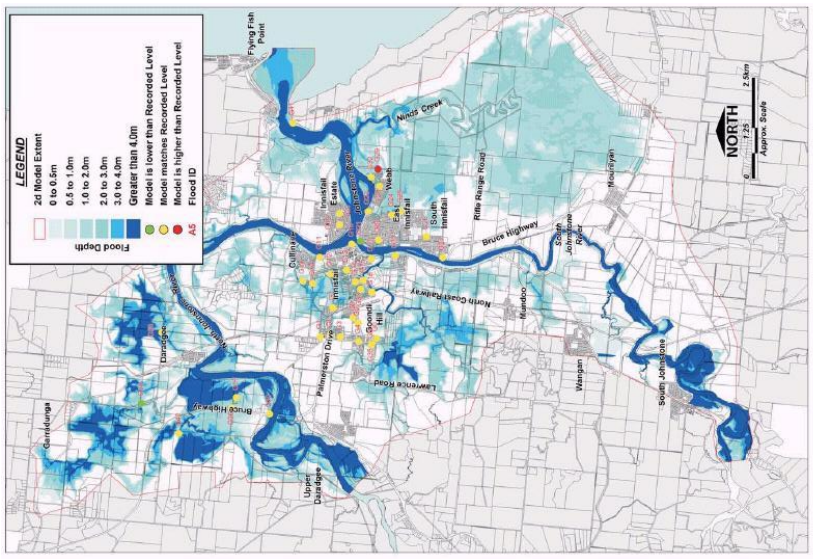

Figure 4-22
Hydraulic Model Calibration
February 1999

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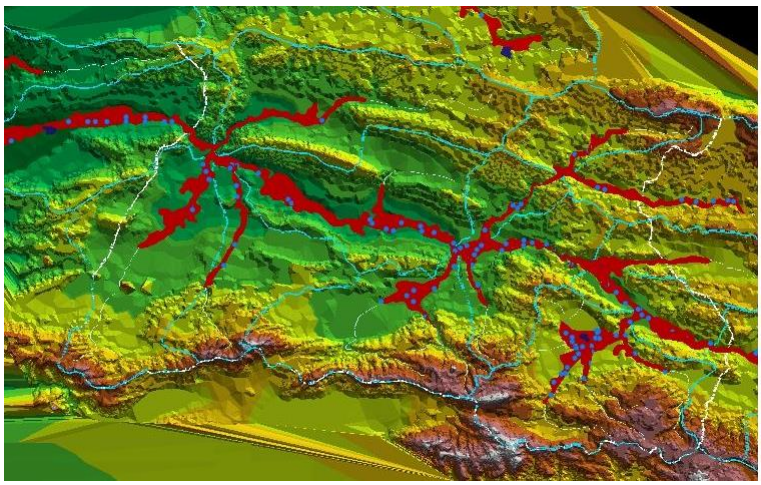

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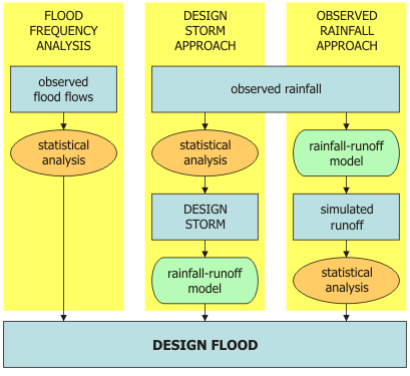
Flood Damage Assessment involve with Annual damage potential, Calculation of losses and providing Damage function. It consider direct or indirect damages, tangible or intangible damages, primary and secondary damage.

Flood estimation is the basic approaches for estimation of peak and volume of flood for design purpose. It is done by **statistical analysis** of observed stream flow data and **rainfall-runoff modelling**.



Flood forecasting system and warning, is a system designed to forecast flood levels before they occur and systematically aware people who are in danger of flood. Flood forecasting systems and warning can contain: gauging stations, flood action plans, services like hot line, sms, warnings in TV

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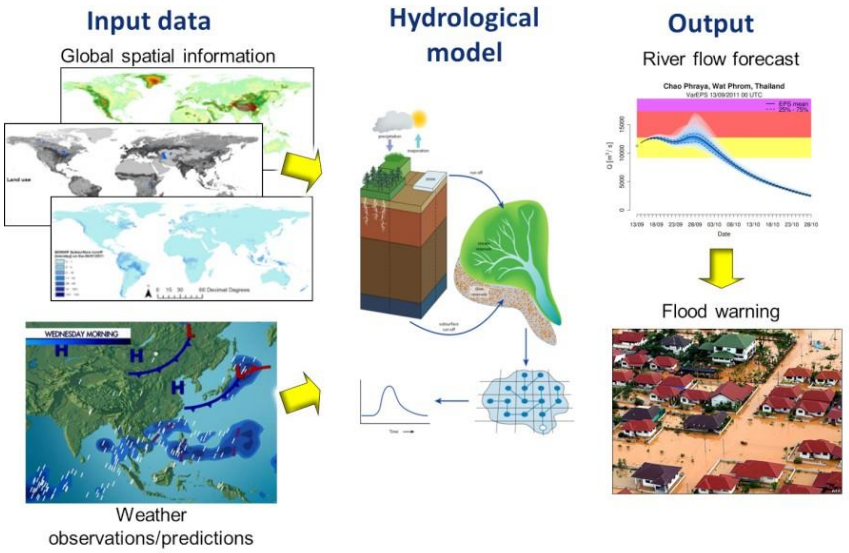

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Thank you

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