- **Selected Model structures**

Urban Land Surface Models (ULSMs)

Bulk Models:
2-tiles SUEWS

Urban Canopy Models:
Single Layer
VUCM, SLUCM, TEB, TARGET, UT&C
Multi Layers
BEP, VCWG

Building resolved:
3D
VTUF-3D,
Solene-Microclimate model

Summary and comparison

Urban Hydrology Models (UHMs)

Hydraulic models:
SWMM

Hydraulic-hydrological models:
Multi-Hydro model, URBS, WEP

Summary and comparison

- **Description of Hydro-meteorological process**

Urban surface energy balance

Net radiation Anthropogenic heat

Sensible heat flux Latent heat flux

Urban canopy near-surface condition

Temperature Humidity Wind

Urban surface water balance

Precipitation Runoff Irrigation

Depression storage and Infiltration

Evaporation and transpiration

Urban subsurface water cycle

Moisture transfer in and between soil layers

Pipe system

- **Challenges and future developments**

Model coupling significance and strategies:

Urban thermal environment adaptation

Urban flooding forecasting

Compound extreme events analysis

Collaboration within and across disciplines:

Interdisciplinary collaboration in urban geoscience

Standardized modelling protocol

Potential AI and machine learning benefits

practical technical framework