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Sensitivity analysis for the water-air heat exchange term

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RivMix

Institute of Geophysics
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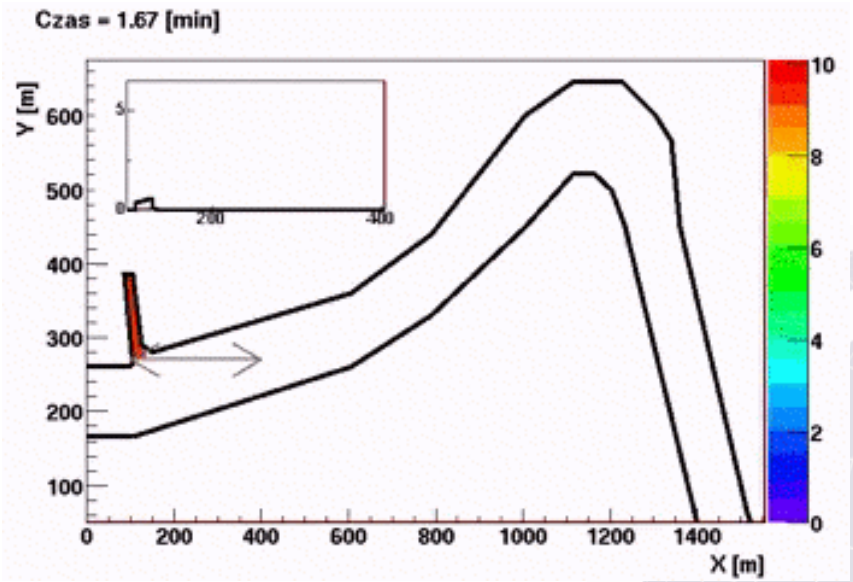
2D modeling of thermal pollution spreading in rivers

- **RivMix (River Mixing Model)**
  2D numerical model of the spread
  of passive pollutants
  in flowing surface water
  - implemented
    in Institute of Geophysics
    Polish Academy of Science solving
  - the 2D advection-diffusion equation
    with the included off-diagonal dispersion
    coefficients

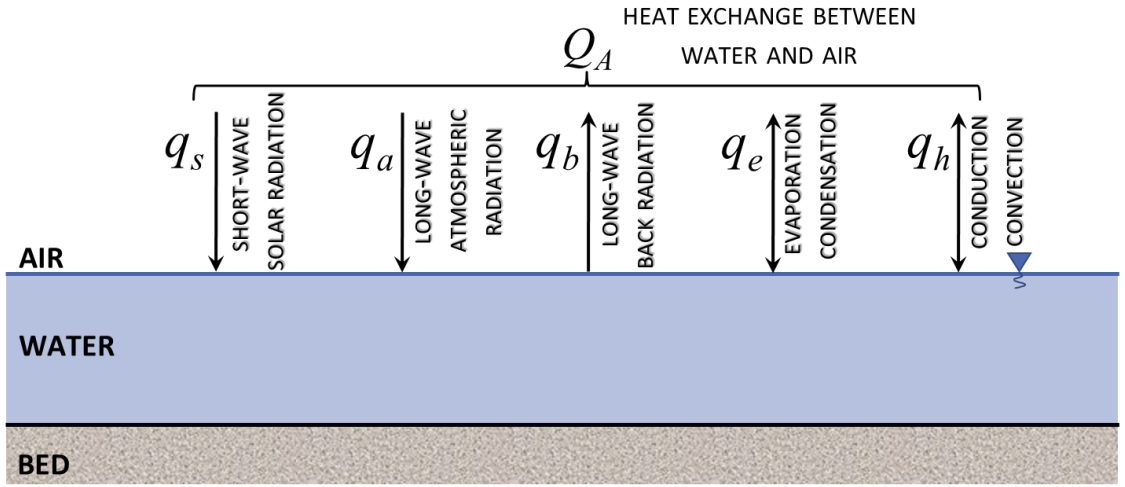
RivMix



INTRODUCTION

HEAT EXCHANGE BETWEEN WATER AND ATMOSPHERE

✓ THE HEAT FLUX RESULTS FROM THE ENERGY BALANCE AT THE WATER-AIR INTERFACE



$$Q_A = q_s + q_a - q_b \pm q_e \pm q_h = f(T_w, T_a, Rh, p_a, q_{SR}, u)$$

T_w – water temperature [°C],
T_a – air temperature [°C],
Rh – air humidity [%],
p_a – air pressure [mb = HPa],
q_{SR} – measured shortwave solar radiation [W/m^2],
u – wind speed [m/s]

OBJECTIVE

✓ THE OBJECTIVE OF THIS STUDY IS TO VERIFY **WHICH OF THE NECESSARY INPUT DATA NEEDED FOR THE NET HEAT FLUX CALCULATIONS ARE OF UTMOST IMPORTANCE** AND WHICH OF THEM INFLUENCE ITS FINAL VALUE MOST.

✓ THE ANALYSES WERE PERFORMED FOR SEVERAL SETS OF DATA FOR REAL CASE STUDIES, FOR DIFFERENT SEASONS.

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