ONTARIO CLIMATE CONSORTIUM

5th Annual Symposium

May 11-12 2017

York University

Session 1D: Future of the Water System

Friday May 12, 10:45 AM – 12:15 PM

CLIMATE CHANGE IMPACT ON HYDROMETEOROLOGICAL EXTREMES

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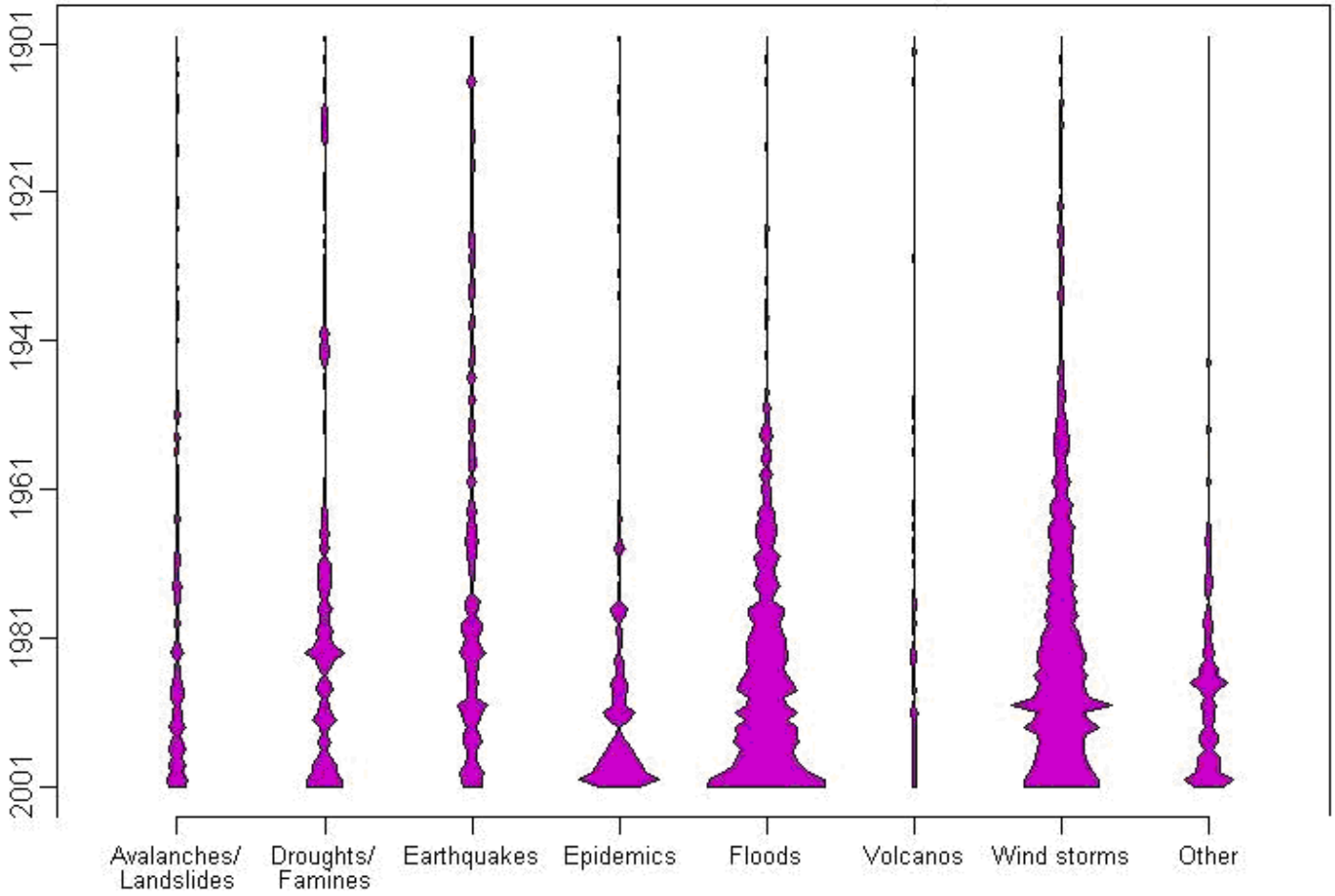
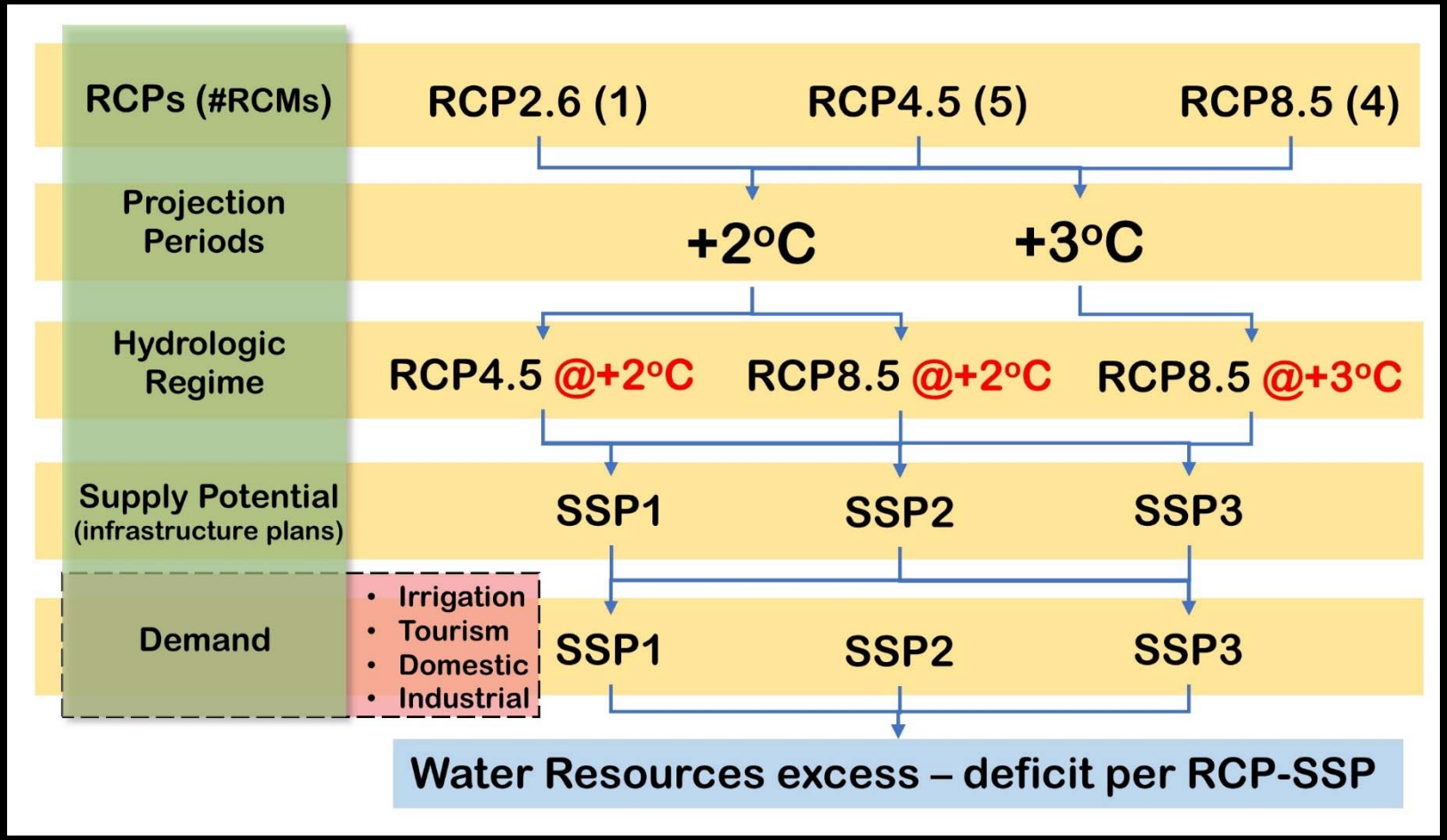
INCREASE IN THE FREQUENCY OF EXTREME EVENTS



EM-DAT: The OFDA/CRED International Disaster Database
(http://www.cred.be)

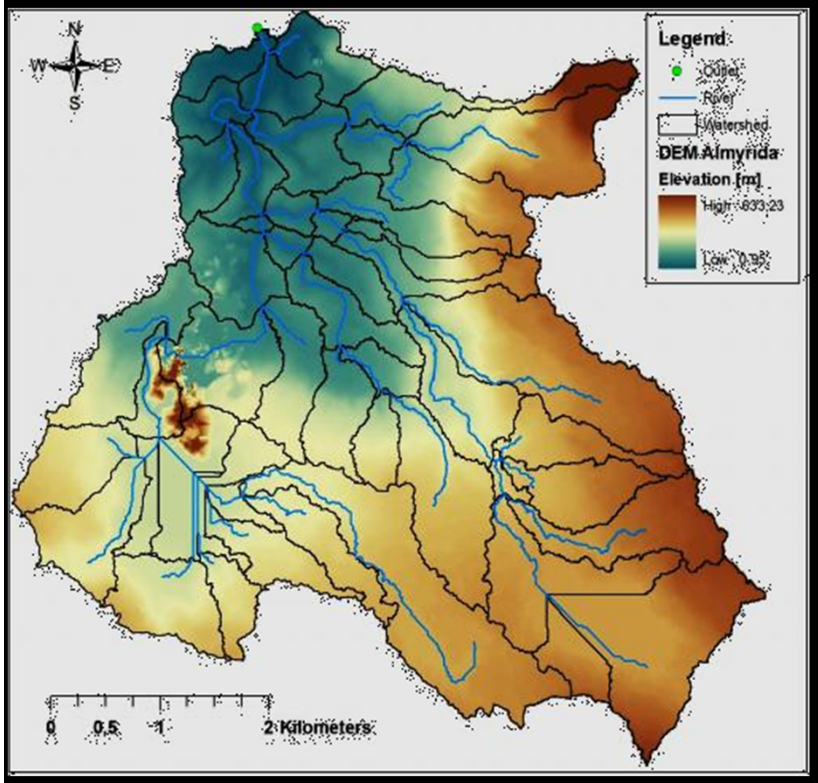
Vulnerable regions exposed to multiple (cross-sectoral) impacts

A generalized framework for multiple impact analysis



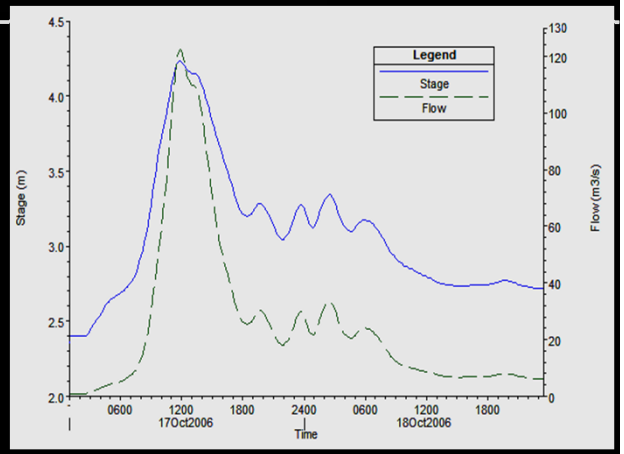
Analysis of a Major Flash flood event
Almyrida basin 17/10/2006

POST FLOOD FIELD INVESTIGATION

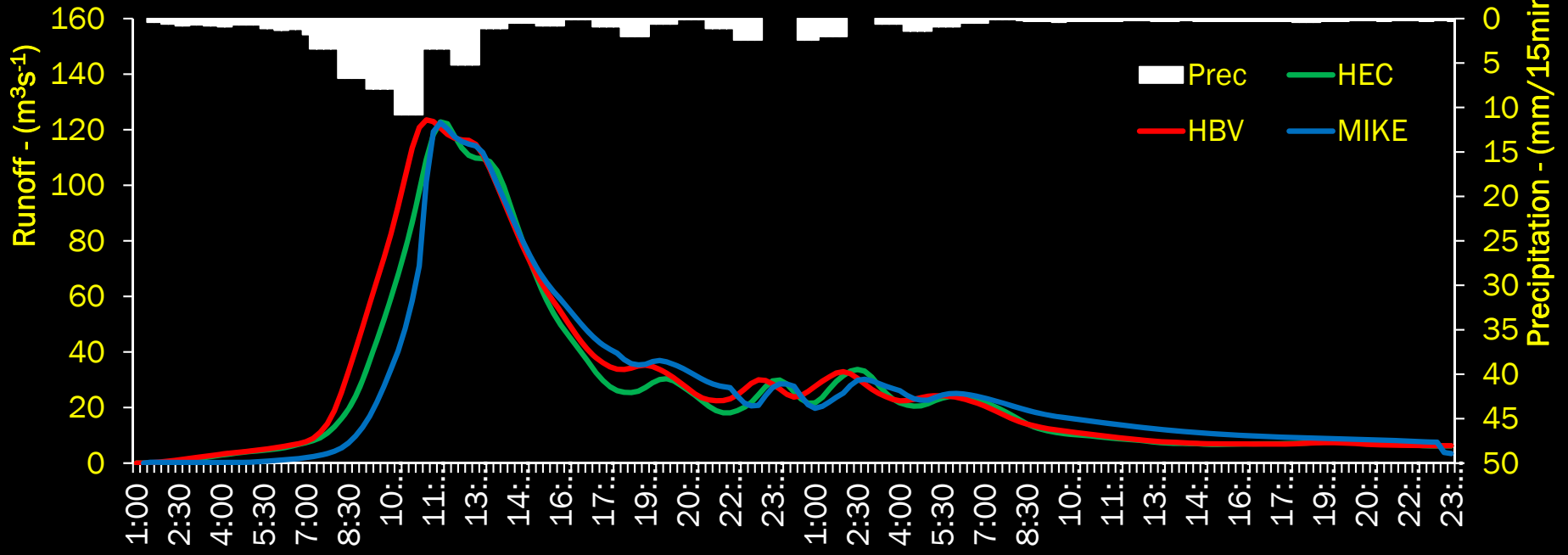


RAINFALL – RUNOFF MODELING

A peak discharge of 123m^3/s was simulated by a multi-model approach (three models) deriving similar results in terms of coefficient of determination R^2 = 0.97. The hydraulic simulation delivered a peak stage at the control cross section of 1.85m, which was very close the measured peak stage of 1.8 m



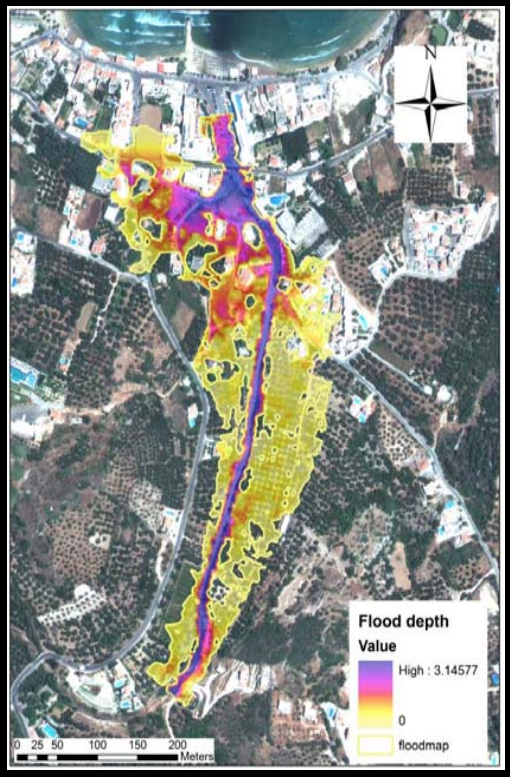
Three model hydrographs for Almirida flash flood event



FLOODED AREAL EXTENT

For the production of a high resolution DEM, two GeoEye-1 (0.5m x 0.5m) stereo-pairs

Almyrida flash flood simulation area

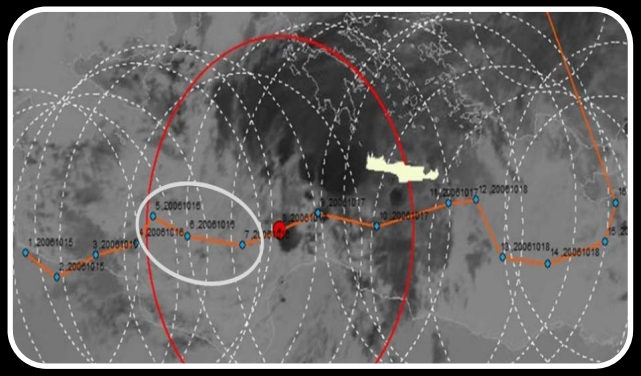


Flood depths and flooded area extent

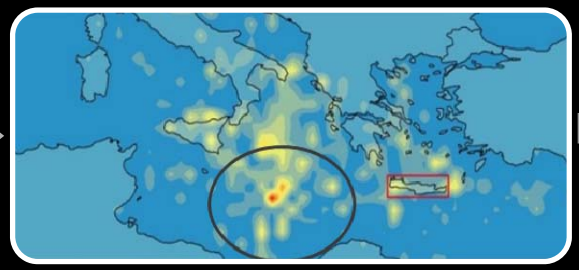
Predicting rainfall via cyclone analysis

Prediction steps:

a) A cyclone approaches,
b) map the cyclone to the probability map,
c) if the probability is higher than the decided threshold, give a rain warning.



STEP 1: A cyclone is detected in METEOSAT.



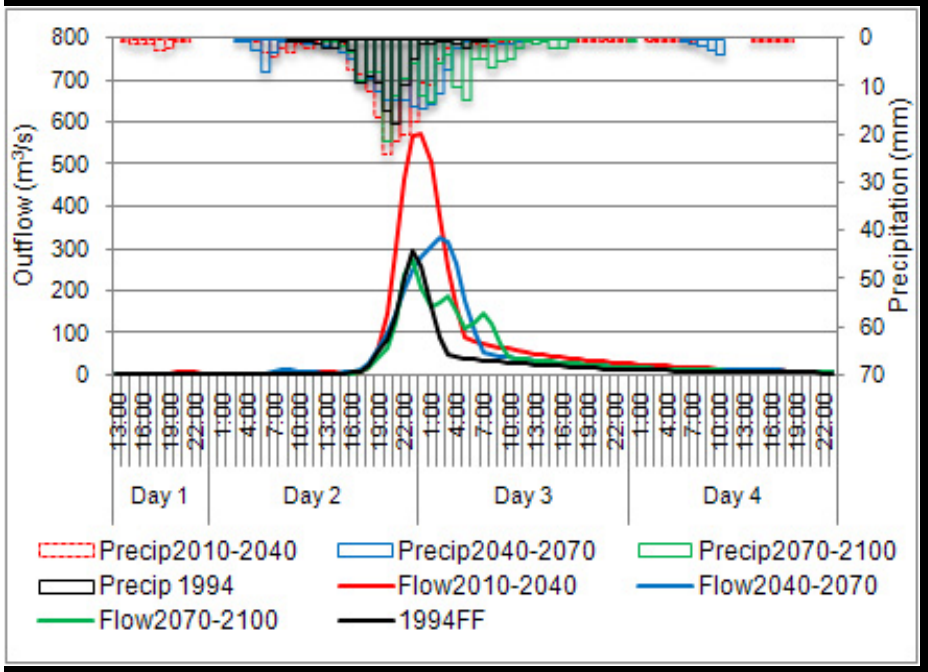
STEP 2: Find the cyclone position in the probability maps.

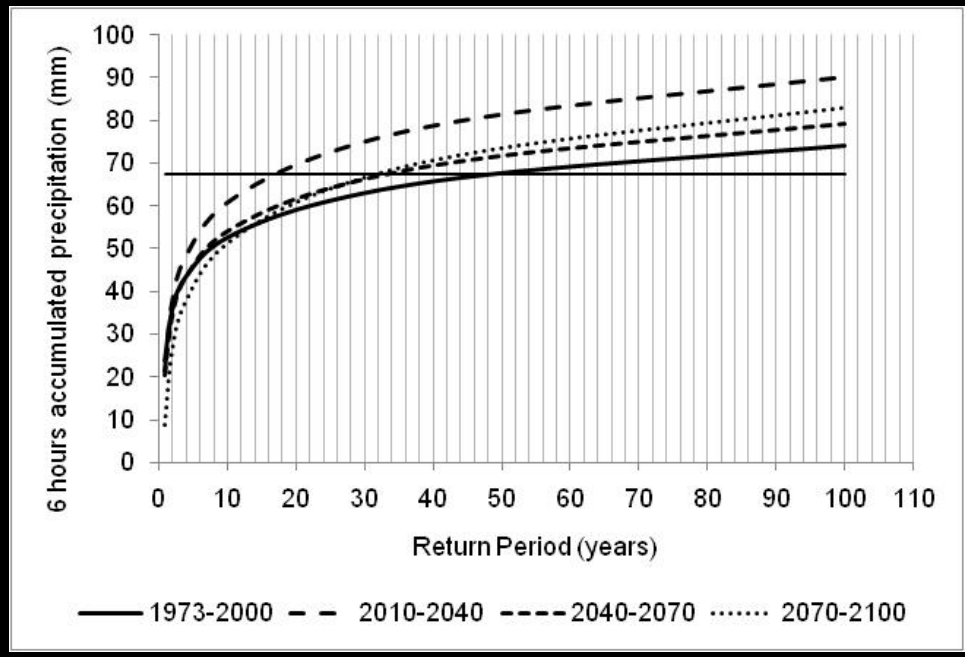
Compare the probability to the evaluation threshold and give a rain warning.

STEP 3: Compare the probability to the selected threshold.

Flood modeling using hourly climate data

Flood prone Giofiros basin





Simulation of 1994 flash flood event and future projections