



# Climate Change & The Water Sector

Copernicus for Climate Change  
Adaptation and Mitigation



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## WHY IS COPERNICUS NEEDED IN WATER SECTOR?

- Climate and the water cycle are closely linked
- Climate change poses direct challenge to water management
- Water sector companies in Europe are already experiencing effects of climate change
- A plan is essential for the industry to grow and adapt
- Copernicus can provide data and tools to help
  - understand climate change impacts
  - inform policy and decision-making
  - ensure resilience in the future



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## WHAT IS SWICCA?

### Service for Water Indicators in Climate Change Adaptation (SWICCA)

- A proof-of-concept study (Nov 2015 – Feb 2018)
- Aims to provide data and guidance for climate change impact assessments in the water sector
- Aims to bridge gap between:
  - climate data providers
  - water managers
  - policy makers
- Aims to demonstrate the impact climate change datasets can have on their sector
- SWICCA web portal delivers pan-European data for visualisation, inspection and download: <http://swicca.climate.copernicus.eu>



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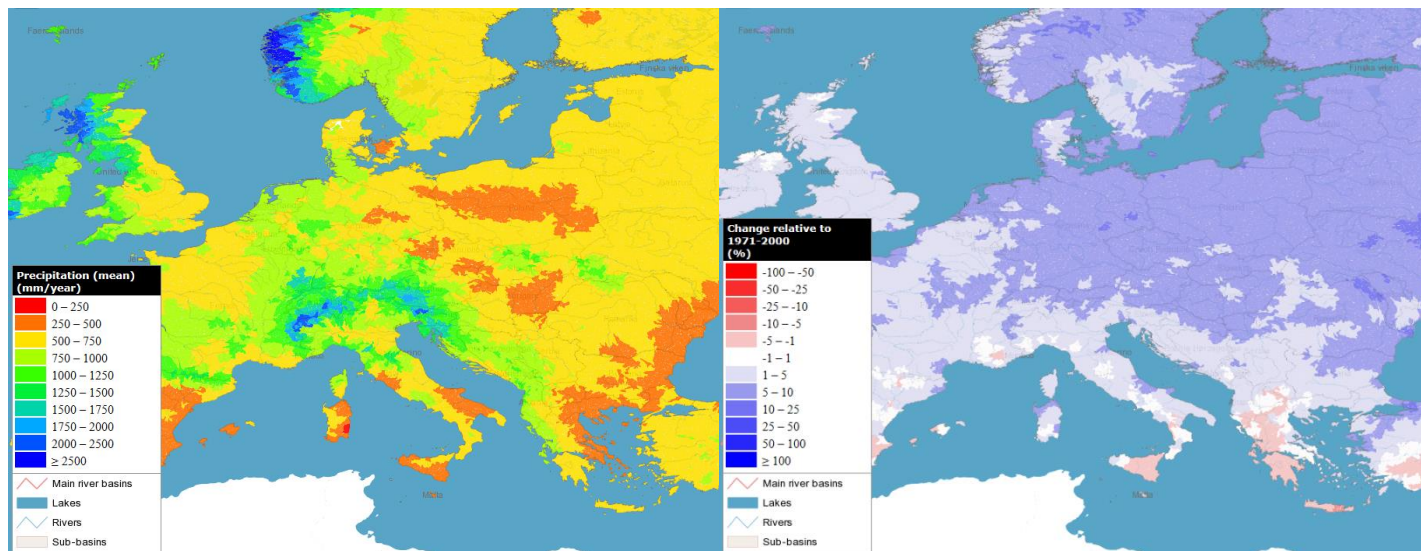
## WHAT DOES SWICCA PROVIDE?

- Climate Impact Indicators are used to show the impact of climate change on environmental phenomena
- Over 15 Indicators are accessible through SWICCA – chosen based on their relevance and importance to the water sector.
  - Temperature
  - Freezing degree days
  - Precipitation
  - Relative humidity
  - Water runoff
  - Soil water content
  - River flow
  - Flood recurrence
- Indicators will be combined with climate scenarios and local data to create practical products for clients



## WHAT DOES SWICCA PROVIDE?

- Interactive data visualisation tool allows you to plot Climate Impact Indicators and future projections



*Mean precipitation (mm/year)  
1971 - 2000*

*Predicted % change in precipitation in  
2020's relative to 1971 - 2000*





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## SWICCA: CASE STUDY - GREECE

**Location:** Asopos River Basin, ~ 720 km<sup>2</sup>, Central Greece

**Background:** The metal industry uses water from two reservoirs: Evinos and Mornos.

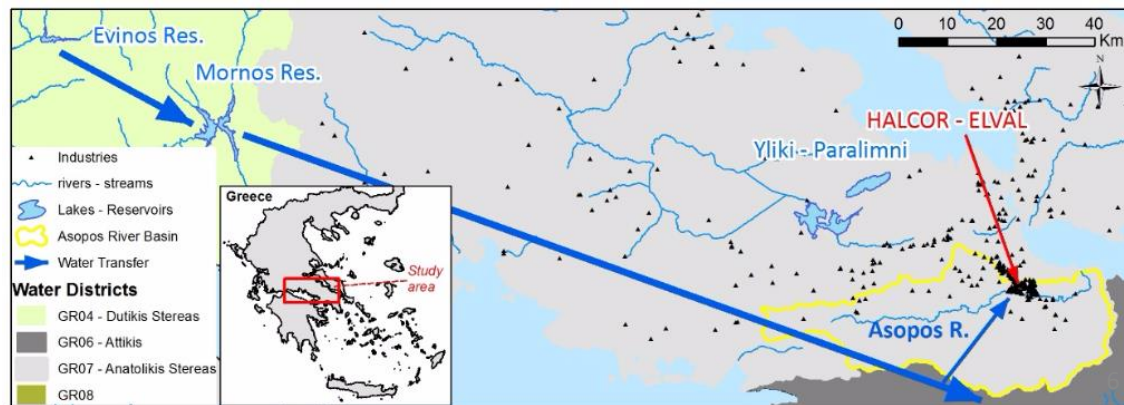
- Water supply is important for:
  - Constituent of production
  - Effluent (waste water) receiver
- These reservoirs also supply water to Athens



*Evinos Reservoir*



*Mornos Reservoir*



*Location of  
study area*



**Problem:** Industrial activity creates significant pressures on:

- **Water demand & availability**
- **Water quality**

Climate change may increase these pressures

**Client needs:**

- **Metal industry** – Needs to assess water-related risks under climate change to ensure business sustainability
  - *Will the current water supply strategy be adequate for the next 10-15 years?*
  - *Will it be necessary to invest in more effective effluent treatment facilities?*
- **Secretariat for Water** – Needs to assess climate change impacts on water quality and protect this important water resource



### Water demand & availability

#### SWICCA datasets used

- Seasonal river flow characteristics
- Precipitation – to assess future discharge
- Temperature – to assess reservoir loss due to evaporation
- Future population – to assess future water needs

#### SWICCA scenario projections:

- SWICCA and local data used to model annual water budgets for Evinos & Mornos reservoirs for different climate scenarios
- Seasonal river flow indicators predict a 5-7% decrease in available water through discharge in next 30 years
- However, preliminary results indicate that the system will safely satisfy future water needs





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## SWICCA: CASE STUDY - GREECE

### Water quality

#### SWICCA datasets used

- Seasonal river flow characteristics
- River discharge – especially ‘low-flow’ when maximum pollutant concentrations appear

#### SWICCA scenario projections:

- SWICCA and local data combined to assess pollution loads from industrial activity in Asopos Basin
- 3 different industrial scenarios, 11 climate scenarios
- Asopos river discharge is not expected to change drastically
- Analysis is ongoing to model future pollutant levels
- Future water quality depends on future industrial growth/decline



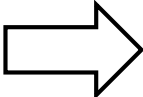
## SWICCA: SUMMARY

- It is important to assess climate change impacts on water resources to ensure business and environmental sustainability in the future
- It is important to balance the interests of the environment and the industrial sector
- Interaction with clients has revealed that they are not entirely aware of potential climate-related risks
- Existing tools are not necessarily sufficient for local scale analysis
- SWICCA provides climate data, climate impact indicators and future climate projections in an easily accessible format
- SWICCA aims to bring climate experts and stakeholders together to discuss how best to tackle the challenges of climate change



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## SWICCA: DEMO

- DEMO of SWICCA Web Portal 

<http://swicca.climate.copernicus.eu>

