

**EUROPE-INBO 2012 10th International Conference** Istanbul - Turkey, 17-19 October 2012



Tool for Regional scale assessment of gro**U**ndwater **S**torage improvement in adaptation to clima**T**e change

Project funded by:

MINISTERO DELL'AMB

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Tool for Regional – scale gro**U**ndw ater assessment of improvement **S**torage in adaptation to climaTe change





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# COORDINATING BENEFICIARY : - High Adriatic River Basin Authority

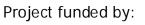
# ASSOCIATED BENEFICIARY :

- European-Mediterranean Centre for Climate Change (CMCC);
- SGI Studio Galli Ingegneria S.p.A. (SGI)

 Tool for Regional – scale assessment of groUndwater
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 Storage improvement in adaptation to climaTe change
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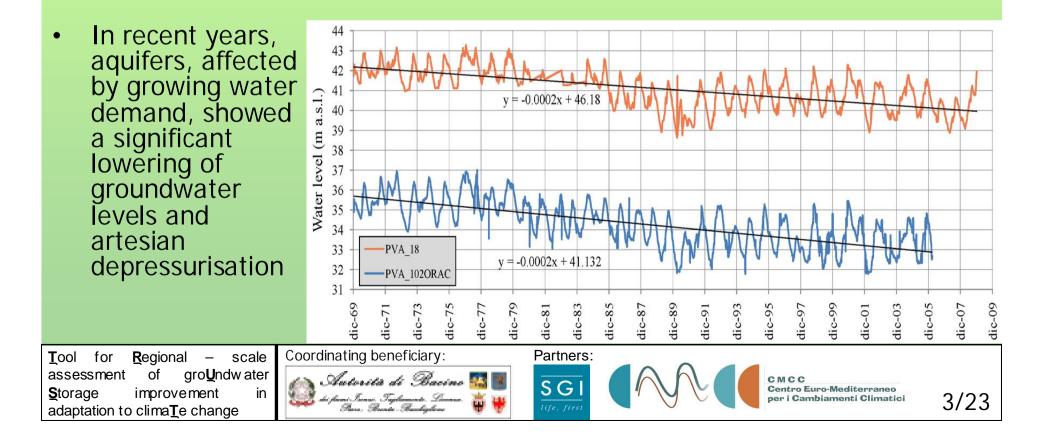






# ISSUES

Groundwater in the Upper Plain of these regions have been exploited for decades for agricultural and industrial uses

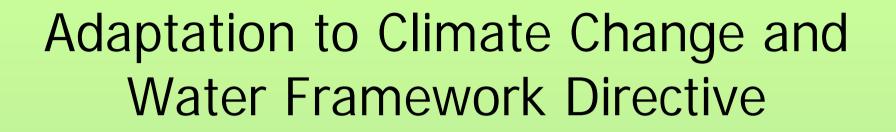






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# Art.4 WFD 2000/60/CE:

"Member States shall protect, enhance and restore all bodies of groundwater, ensure a balance between abstraction and recharge of groundwater, with the aim of achieving good groundwater status"









# General OBJECTIVES

- Incorporate climate change scenarios in the river basin management in accordance with WFD 2000/60/CE
- Examine issues related to the development of water management strategies at river basin scale (WFD) in relation to the CC scenarios









# Specific OBJECTIVES

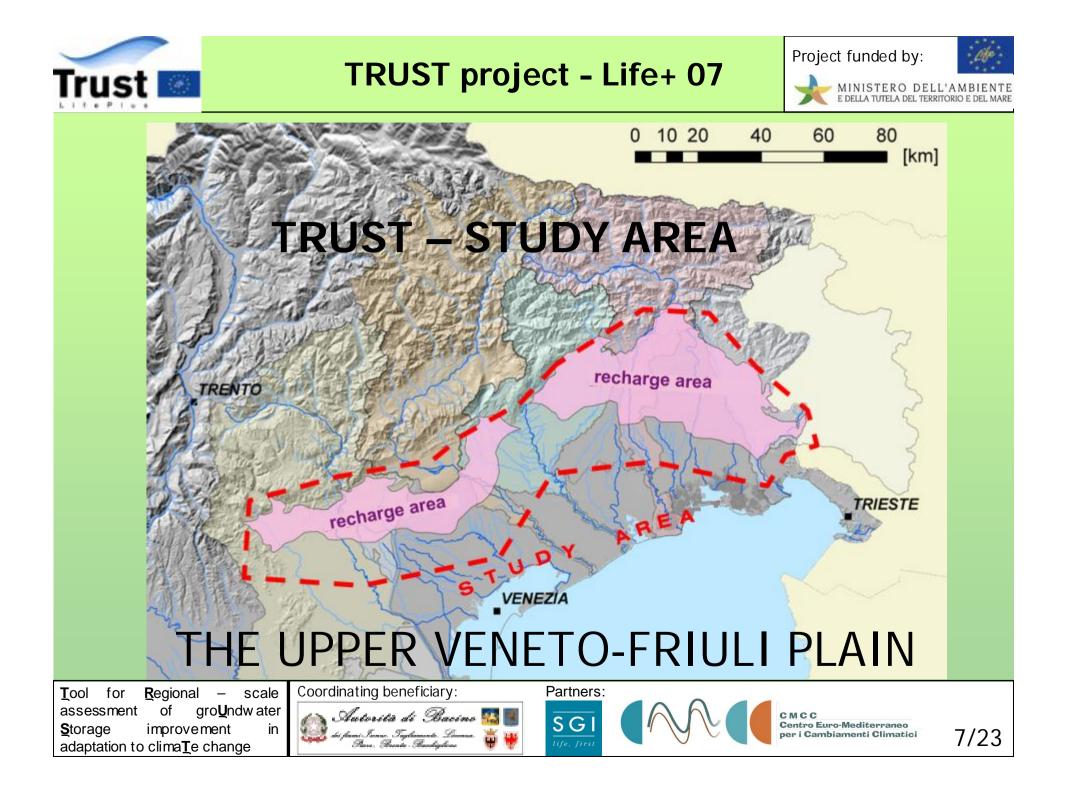
 Develop a database that may characterize the groundwater (and the related water balance terms) to regional scale

 Assessing the possible negative impacts on aquifers of the Veneto-Friuli plain, associated with the climate change scenarios

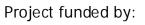
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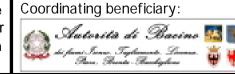




## TRUST PROJECT ACTIVITIES

ACTIONS	ACTION TITLE
1	Set up of the stakeholders
2	Acquisition / evaluation of available data
3	Remote sensing and GIS
4	Climate change scenarios
5	Impact of climate change
6	Tools for large scale groundwater balance
7	Objectives and measures definition
8	Capacity building
9	Project dissemination
11	Project monitoring

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### ACTION 1: Set up of the stakeholders and conceptual framework

## OUTCOMES:

-TECHNICAL ADVISORY COMMITTEE

## -AGREEMENT FOR EXCHANGE DATA

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dinating beneficiary: P Autorită di Bacino 🚾 🔳





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#### AIR-SOIL INTERFACE DATA

Pedology mapLand usEIrrigation system

### ACTION 2: Acquisition and evaluation of data and studies available

#### METEOROLOGICAL DATA

Rainfall
Temperature aria
humidity
Solar radiation
Wind speed
Snow
EVT

**T**ool for **R**egional – scale assessment of gro**U**ndwater **S**torage improvement in adaptation to clima<u>T</u>e change



#### HYDROGEOLOGICAL DATA Superficial water...

Hydrometric levelsDischarges

... and groundwater

- Piezometric levels
- Withdrawals
- Withdrawal' depth



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adaptation to climaTe change

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**ACTION 3: Remote sensing and Gis** Fonte di energia (to quantify the irrigation water deficit) Spectral signature Emissione atmosferica **Spectral Profile** 250 Energia incidente (diretta e diffusa) 200 Radiazione riflessa 150 Emissione termica 100 50 0 2 3 4 Fonte di energia **Band Number** Coordinating beneficiary: Tool for Regional – scale Partners: gro**U**ndw ater assessment of Autorità di Bacine 🌇 🛽 CMCC SGI Centro Euro-Mediterraneo **S**torage improvement in per i Cambiamenti Climatici

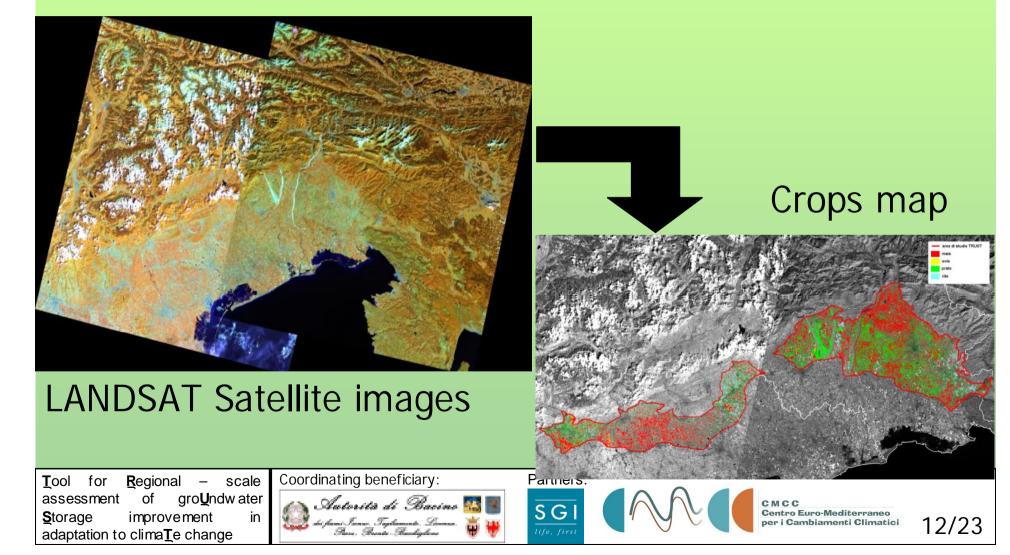


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ACTION 3: Remote sensing and Gis (to quantify the irrigation water deficit)

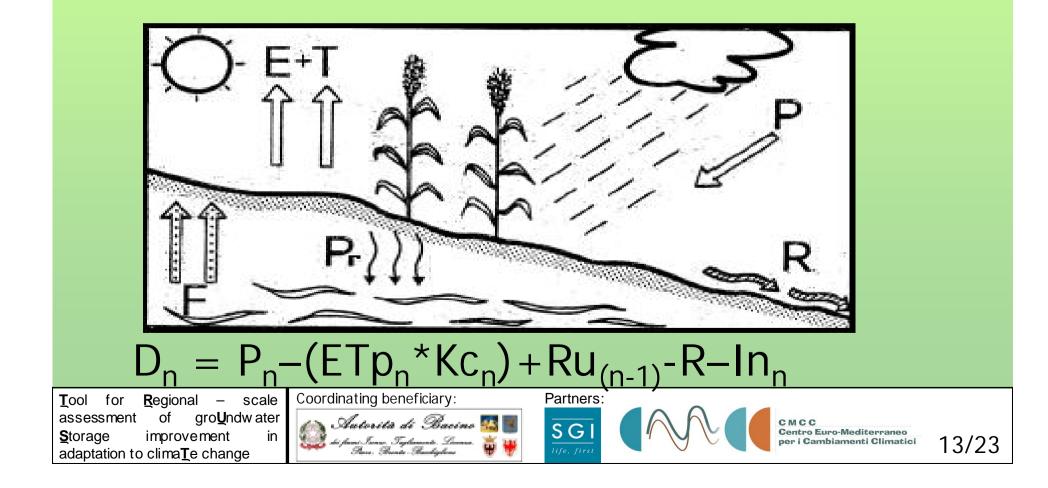






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Crop water balance ACTION 3: Remote sensing and GIS (to quantify the irrigation water deficit)

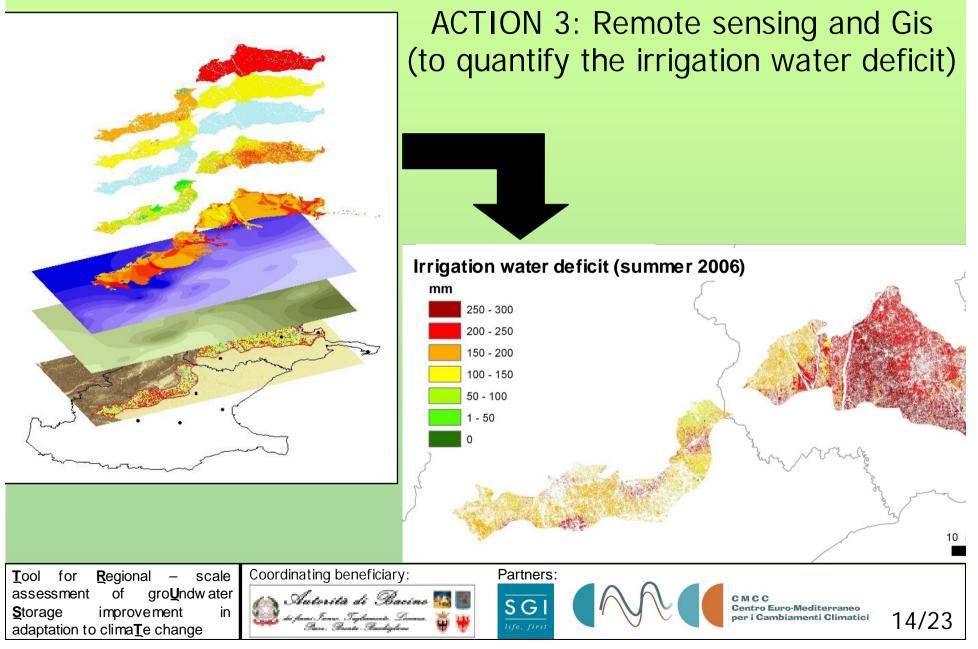




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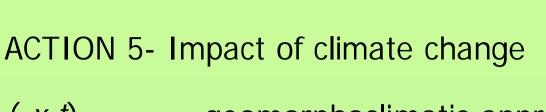




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geomorphoclimatic approach for determining hydrological response of river basins

TRUST STUDY AREA

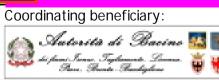
 $j(x,t) \rightarrow Q(t)$ 

Possible effects of future climate on the hydrological balance of the studied river basins

Tool for Regional – scale assessment of groUndwater Storage improvement in adaptation to climaTe change

**MODEL** 

**GEOMORPHOLOGIC** 



j ( x,t)

Partners:



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