



**ENI  
CBCMED**  
Cooperating across borders  
in the Mediterranean



Programme funded by the  
**EUROPEAN UNION**



**REGIONE AUTÒNOMA  
DE SARDIGNA  
REGIONE AUTONOMA  
DELLA SARDEGNA**

# **Sinergie per l'efficientamento idrico nell'Area Mediterranea Il Programma ENI CBC MED**

**Webinar – 20 luglio 2021**

## ***I CAMBIAMENTI CLIMATICI e I RISCHI PER LA RISORSA IDRICA***

***Monia Santini – Fondazione CMCC***



**Dipartimento per le Politiche di Coesione  
Presidenza del Consiglio dei Ministri**



**PAC CTE**  
2014 - 2020  
PROGRAMMA COMPLEMENTARE DI AZIONE E COESIONE  
GOVERNANCE NAZIONALE DEI PROGRAMMI DELL'OBIETTIVO  
COOPERAZIONE TERRITORIALE EUROPEA 2014-2020



*Agenzia per la  
Coesione Territoriale*



**REGIONE  
PUGLIA**



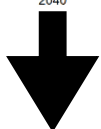
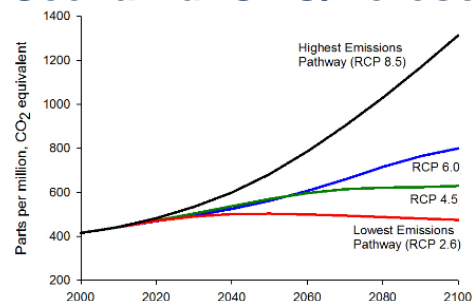
**REGIONE  
LAZIO**



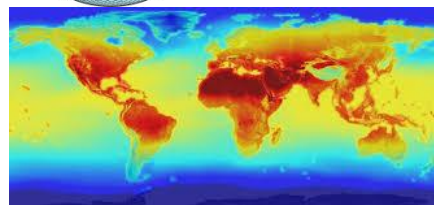
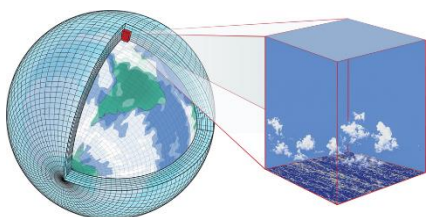
Supercomputer

# Dal clima agli impatti approccio di «ensemble»

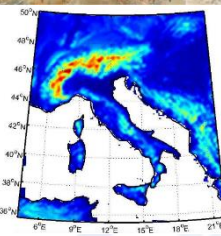
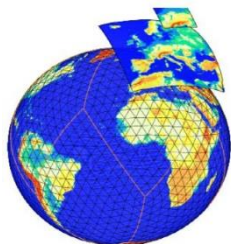
## Scenari di GHG/Aerosol



## Simulazioni Globali



“Downscaling”  
(statistico/dinamico)



**Risorse idriche**

Agricoltura

Suolo & Dissesto

Foreste

Incendi

Coste

Turismo

Energia

Analisi  
Socio-economiche



Trade-off tra  
sostenibilità economica  
e ambientale



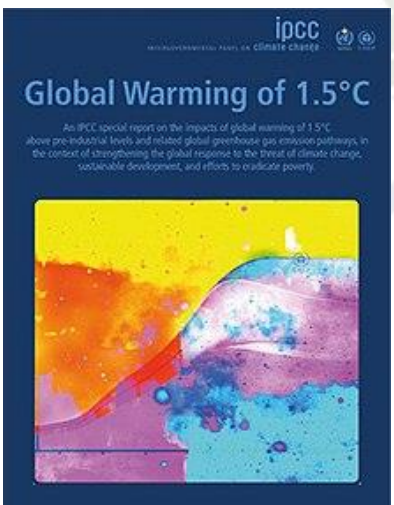


# Rapporti IPCC

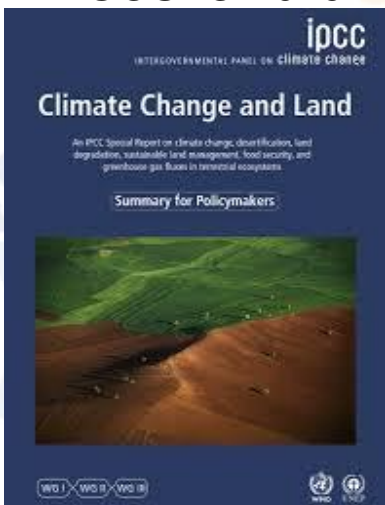


IPCC-AR5 (2013-2014)

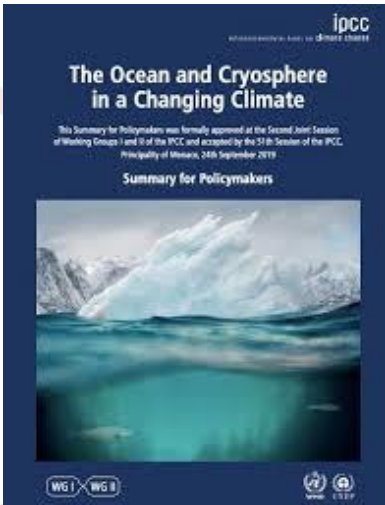
2018



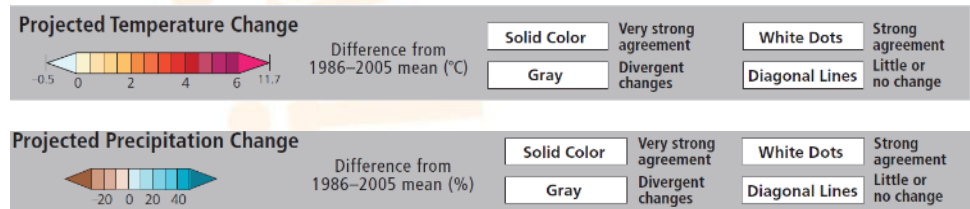
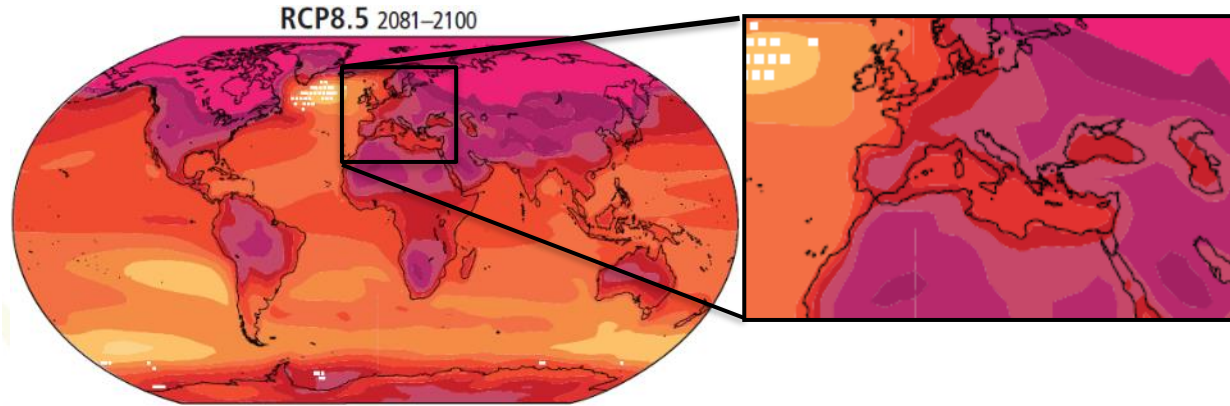
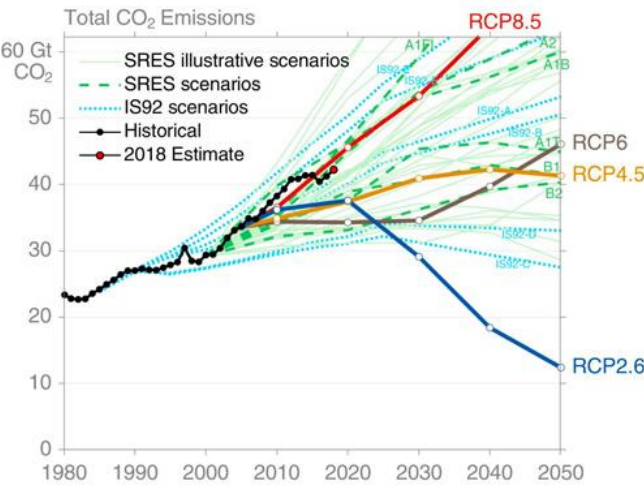
AGOSTO 2019



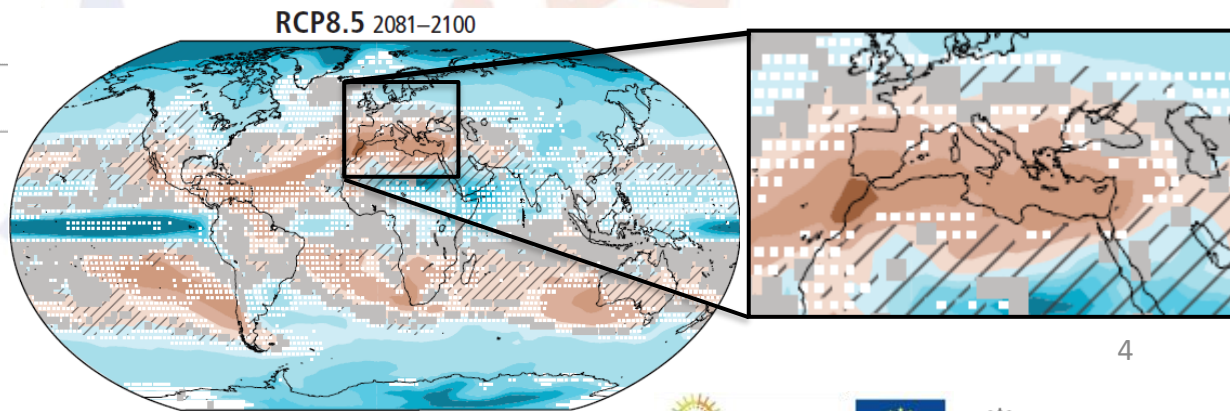
SETTEMBRE 2019



# La regione Mediterranea e i CC: anomalie annuali


















Scenarios	Description	CO <sup>2</sup> Concentration (ppm)	Global Warming until 2100 (Mean and Likely Range)
RCP 2.6	Peak in radiative forcing at ~3 W/m <sup>2</sup> before 2100 year and then decline	490	1.0 (0.3–1.7) °C
RCP 4.5	Stabilization without overshoot pathway to ~4.5 W/m <sup>2</sup> at stabilization after 2100 year	650	1.8 (1.1–2.6) °C
RCP 6.0	Stabilization without overshoot pathway to ~6 W/m <sup>2</sup> at stabilization after 2100 year	850	2.2 (1.4–3.1) °C
RCP 8.5	Rising radiative forcing pathway leading to 8.5 W/m <sup>2</sup> by 2100 year	1370	3.7 (2.6–4.8) °C



IPCC 2014

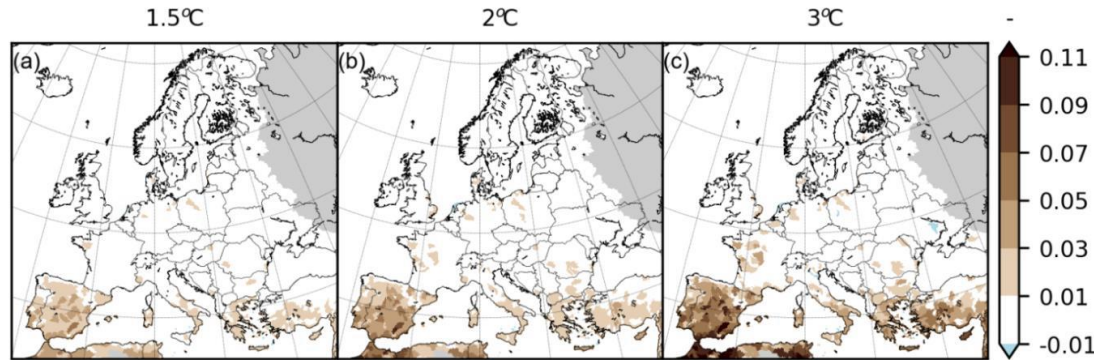
# La regione Mediterranea e i CC: gli eventi estremi

Region/ region code	Trends in daytime temperature extremes (frequency of hot and cool days)		Trends in heavy precipitation (rain, snow)		Trends in dryness and drought	
	Observed	Projected	Observed	Projected	Observed	Projected
Southern Europe and Mediterranean MED, 13	 <i>Likely</i> increase in hot days (decrease in cool days) in most of the region. Some regional and temporal variations in the significance of the trends. <i>Likely</i> strongest and most significant trends in Iberian peninsula and southern France <sup>a</sup>	 <i>Very likely</i> increase in hot days (decrease in cool days) <sup>b</sup>	 Inconsistent trends across the region and across studies <sup>a</sup>	 Inconsistent changes and/or regional variations <sup>b</sup>	 Overall increase in dryness, <i>likely</i> increase in the Mediterranean <sup>a, c</sup>	 Increase in dryness. Consistent increase in area of drought <sup>b, d</sup>
	 Smaller or less significant trends in southeastern Europe and Italy due to change point in trends, strongest increase in hot days since 1976 <sup>a</sup>	<b>Symbols</b> <div>  Increasing trend or signal                              Decreasing trend or signal                              Both increasing and decreasing trend or signal                              Inconsistent trend or signal or insufficient evidence                              No change or only slight change                         </div>				<b>Level of confidence in findings</b> <div>  Low confidence                              Medium confidence                              High confidence                         </div>



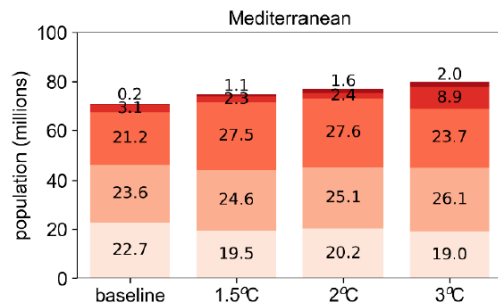
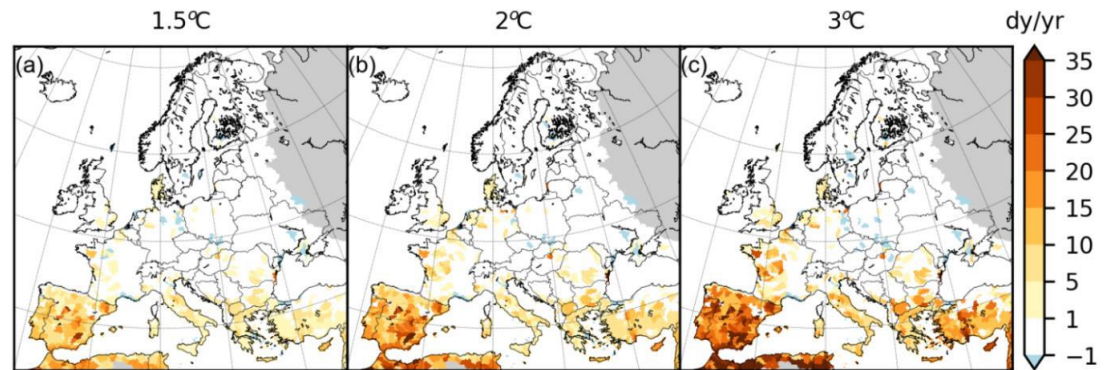
IPCC 2014

# Scarsità Idrica



Variazione  
Water Exploitation Index Plus  
(WEI+)=consumi/disponibilità

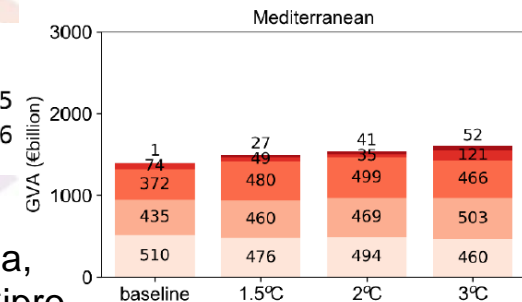
Variazione num. giorni  
WEI+ > 0.2 (scarsità)



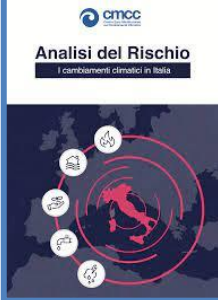
moderate WS WS severe WS

0.1 - 0.2 0.2 - 0.3 0.3 - 0.4 0.4 - 0.5 0.5 - 0.6

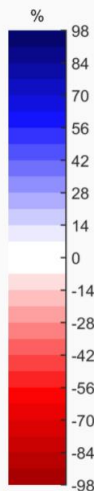
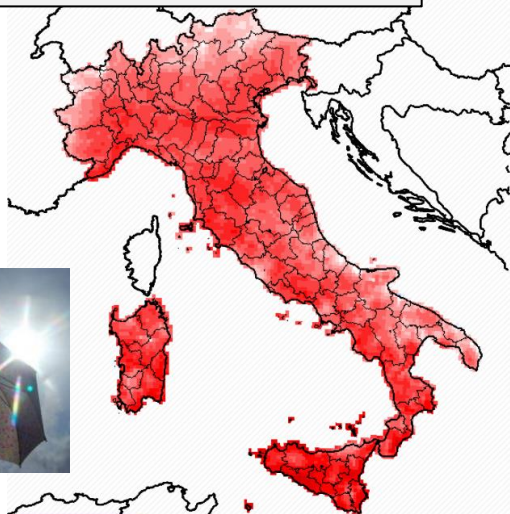
Mediterraneo: Portogallo, Spagna, Italia, Croazia, Grecia, Malta e Cipro



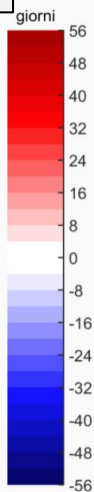
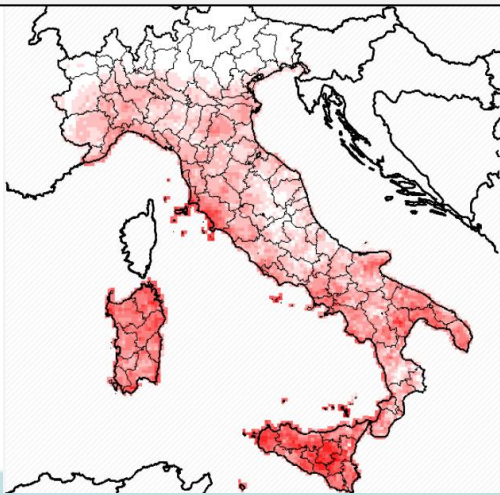
# Gli scenari per l'Italia: le piogge



**Variazioni % Precipitazioni estive 2041-2070 vs. 1981-2010 (RCP4.5)**



**Variazioni giorni consecutivi senza pioggia 2041-2070 vs. 1981-2010 (RCP4.5)**



**Cambiamenti Climatici in Italia. IL RISCHIO PER LE RISORSE IDRICHE**

*Testi tratti dal report: Analisi del rischio. I cambiamenti climatici in Italia*

**CAMBIAMENTI CLIMATICI**

- Temperature medie in aumento
- Precipitazione annua in diminuzione
- Fenomeni di piogge intense più frequenti
- Periodi siccitosi più frequenti e prolungati

**Aumentano rischio climatico per risorsa idrica e per:**

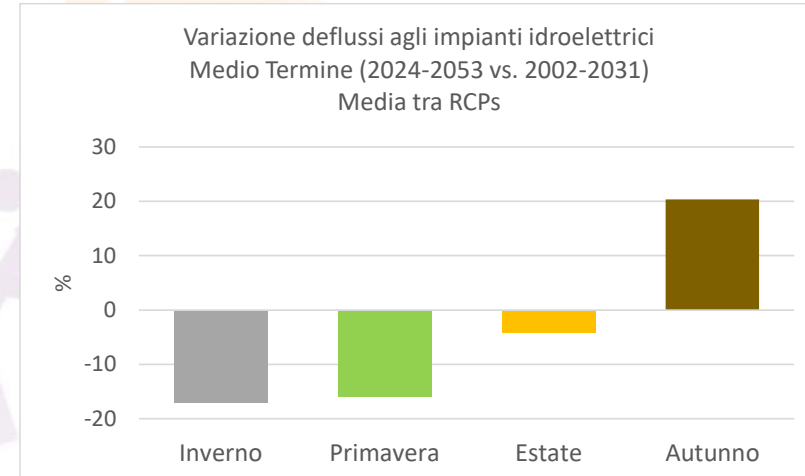
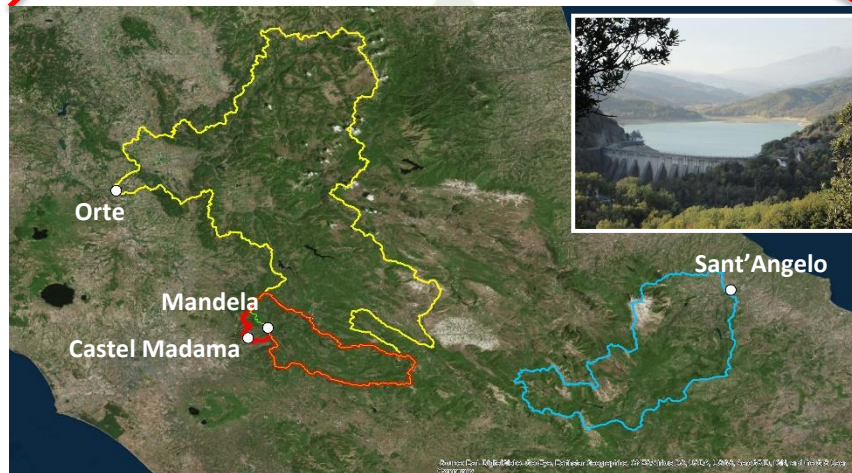
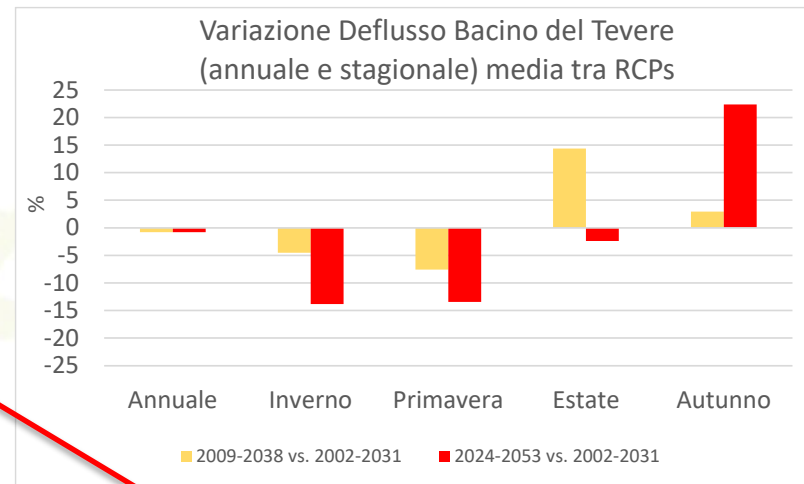
**QUANTITÀ DI ACQUA DISPONIBILE**

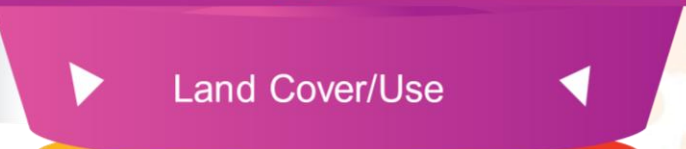
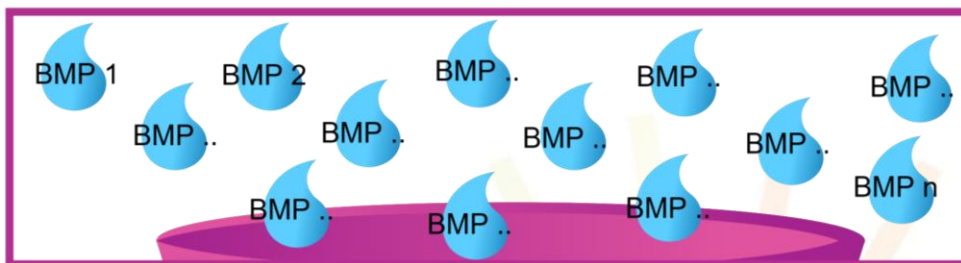
- Fino a **-40%** portata di acqua nei corsi d'acqua/riumi nel 2080
- Ulteriore **-10/15%** per prelievi d'acqua
- Elevata competizione tra settori (usi civili, incluso turismo, industriale, produzione energia elettrica, agricoltura), soprattutto in estate quando la domanda è alta e la risorsa più scarsa

**QUALITÀ DI ACQUA DISPONIBILE**

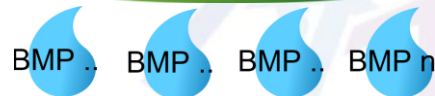
- Riduzione di portata e afflussi contribuiscono all'eutrofizzazione (aumento della biomassa vegetale)
- Alluvioni aumentano apporto di nutrienti e contaminanti nei corpi idrici
- Riserve sotterranee costiere di acqua dolce maggiormente esposte ad aumento di salinità

# Distretto Idrografico Appennino Centrale

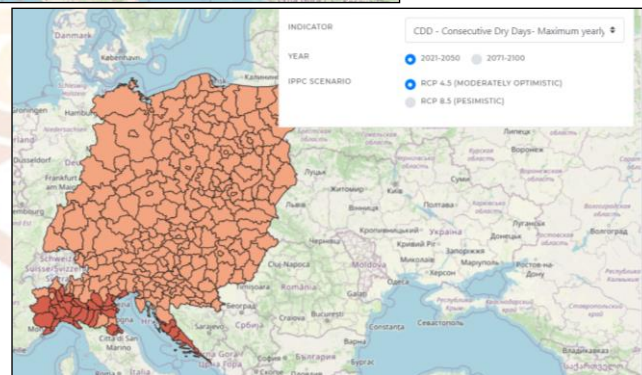




**PRE-SELEZIONE  
DELLE PRATICHE**

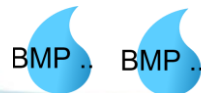


**CRITERI di  
PREFERENZA**



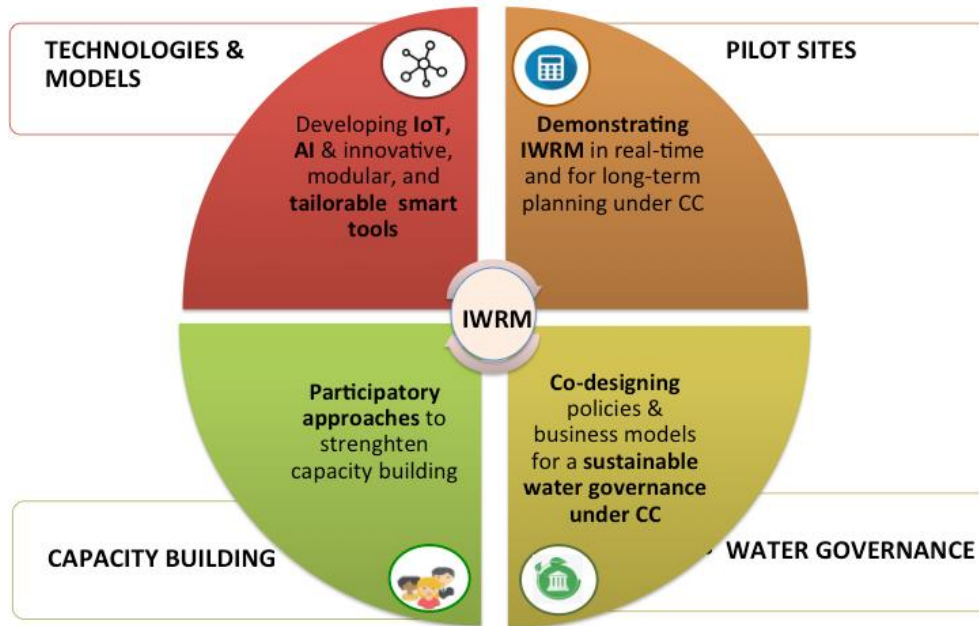
**Misure di adattamento**

**GOWARE**



# Il progetto ACQUAOUNT

Migliorare *IWRM & smart irrigation* attraverso strumenti, servizi e soluzioni innovative, contribuendo alla resilienza climatica



Organisation	Country
<b>FONDAZIONE CMCC</b> Fondazione Centro Euro-Mediterraneo sui Cambiamenti Climatici	Italy
<b>UNISS</b> University of Sassari	Italy
<b>Nature4</b> Nature 4.0 Soc. Benefit Srl	Italy
<b>ABI</b> ABINSULA SRL	Italy
<b>EUT</b> FUNDACIO EURECAT	Spain
<b>GWP-Med</b> MEDITERRANEAN INFORMATION OFFICE FOR ENVIRONMENT CULTURE AND SUSTAINABLE DEVELOPMENT (as host Institute for Global Water Partnership - Mediterranean, GWP-Med)	Greece
<b>NARC</b> National Agricultural Research Center	Jordan
<b>LARI</b> Lebanese Agriculture Research Institute	Lebanon
<b>IRA</b> Institut des Regions Arides	Tunisia

4 casi studio: Italia, Libano, Giordania, Tunisia

# Grazie per l'attenzione!

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