

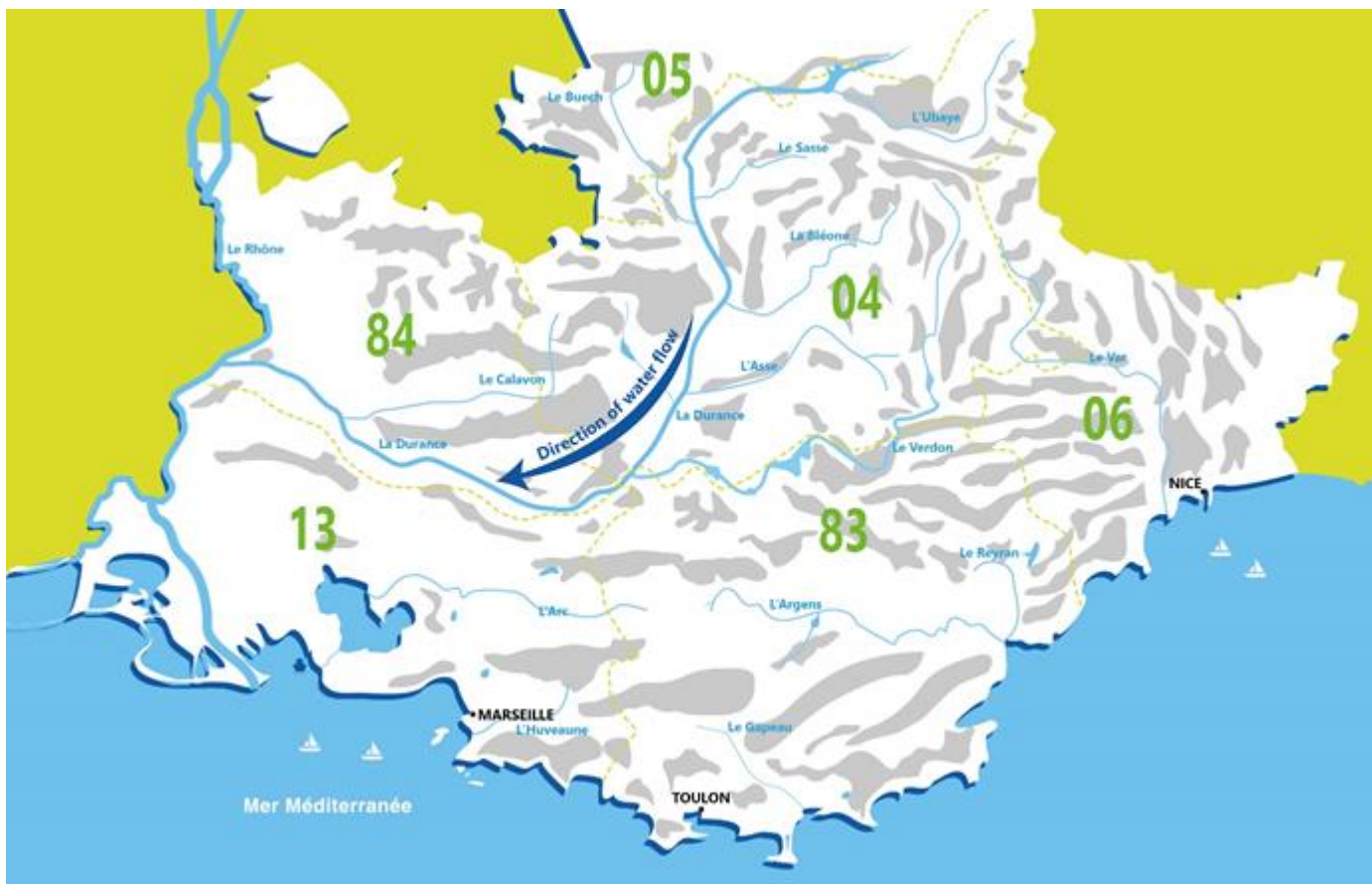
# *An outlook to the role of multipurpose reservoirs in Provence*

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## Provence, contrasting land



The relief constituted by mountain ranges pushes the waters of the Durance and Verdon to the west and keeps resources away from coastal areas.

The region is penalized by the irregular and sudden character of the rains which flow torrentially or infiltrate the limestone massifs downstream.



The Mediterranean coastal zone does not have durable resource and is subject to droughts.

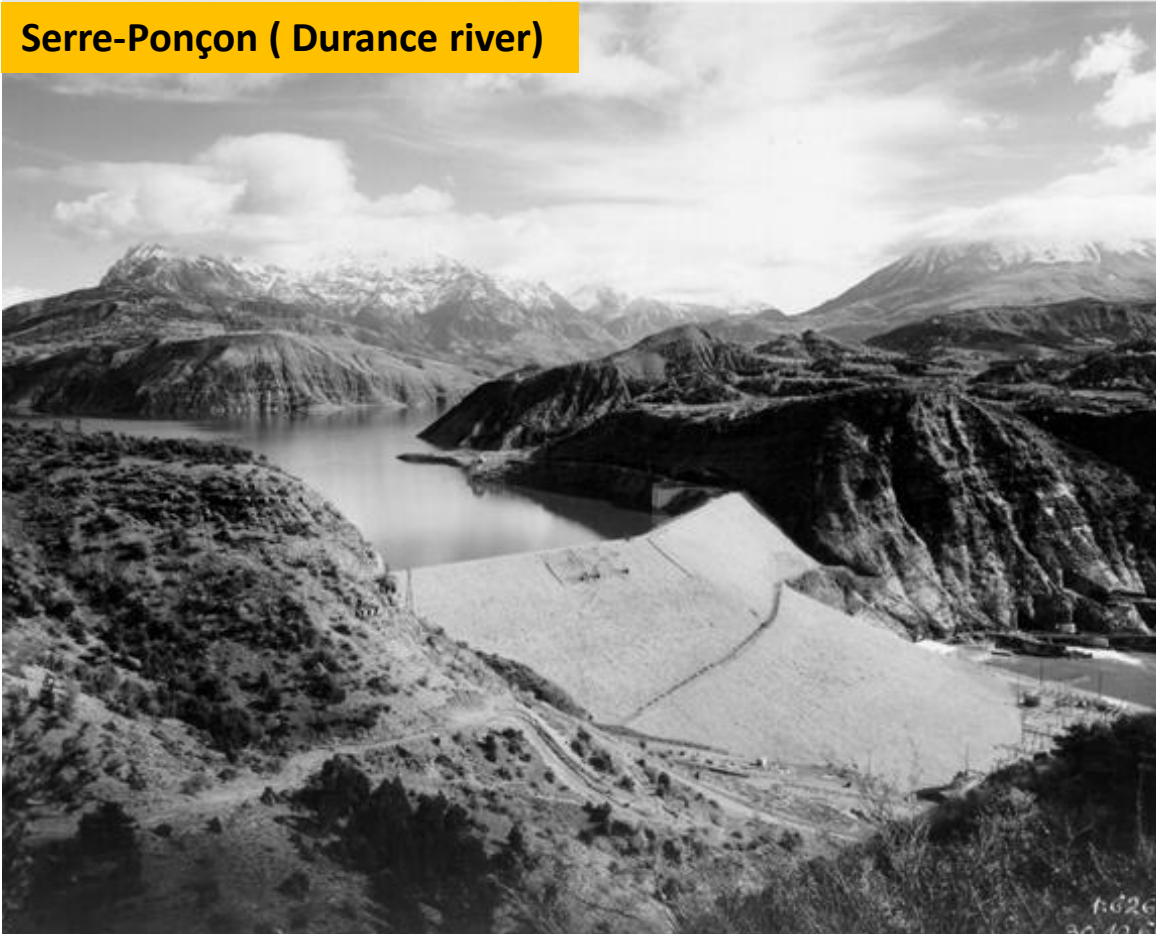






## Main hydraulic infrastructure : upstream dams

Serre-Ponçon ( Durance river)



Built and operated since 1955 by EDF, the Serre-Ponçon dam (water reservoir of 1.2 billion m<sup>3</sup> of water) and all the reserves on the Durance and Verdon rivers are the main resources for the Provence region :

- they secure water for irrigation, industries and domestic use,
- they produced renewable energy

Sainte-Croix (Verdon river)





## Downstream dams in Provence

**Bimont**



**Carcès**



**Verne**



**Dardennes**



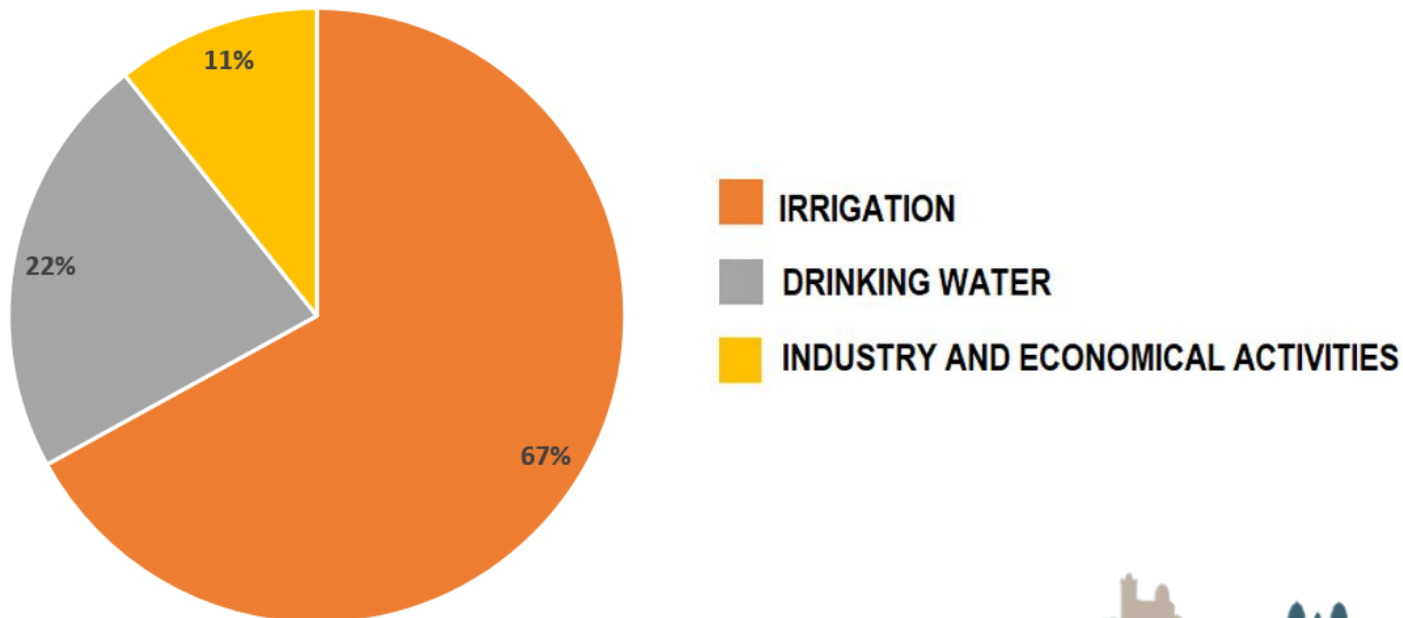
	Serre-Ponçon	Sainte-Croix	Bimont	Verne	Carcès	Dardennes
<b>Operator</b>	EDF	EDF	SCP	SCP	City of Toulon	City of Toulon
<b>Height</b>	123,5 m	85 m	81, 5 m	42 m	14 m	31 m
<b>Volume</b>	1 272 Millions m <sup>3</sup>	767 Millions m <sup>3</sup>	25 Millions m <sup>3</sup>	8 Millions m <sup>3</sup>	7 Millions m <sup>3</sup>	1 Millions m <sup>3</sup>
<b>Length</b>	630 m	138 m	180 m	235 m	160 m	154 m
<b>River</b>	DURANCE	VERDON	INFERNET	VERNE	CARAMY	LAS
<b>Year</b>	1960	1974	1962	1991	1934	1913
<b>Purpose</b>	hydroelectricity irrigation flood leisure	hydroelectricity irrigation drinking water leisure	hydroelectricity irrigation drinking water flood	drinking water	drinking water	drinking water



## Ressources and water demands in Provence

- More than 47 dams with a total storage of **2.4 billion m<sup>3</sup>** in Provence
- 98 % of the various needs are supplied by surface water resources
- ~ **2.2 billion m<sup>3</sup>** are withdrawn for other purpose than hydroelectricity

### Water purpose excluding hydroelectricity in Provence





## Recent dams : mainly prevention of flash floods

Peyron, Fréjus (2008)



Saint-Claude, Antibes (2014)





# Climate change damages

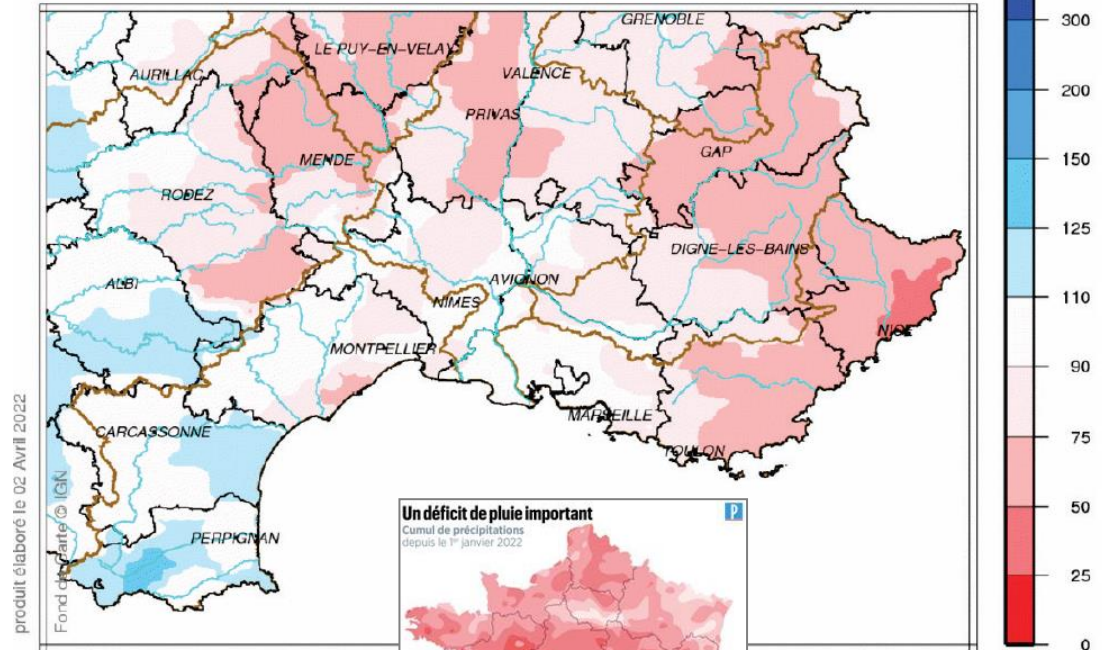
**Roya flood (Oct 2020)**



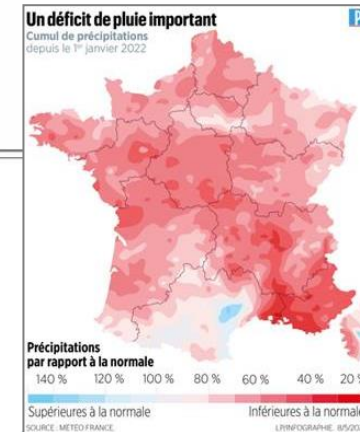
**Frost episode (April 2021)**



**Rapport aux normales 1981/2021 des précipitations**  
**Septembre 2021 à mars 2022**



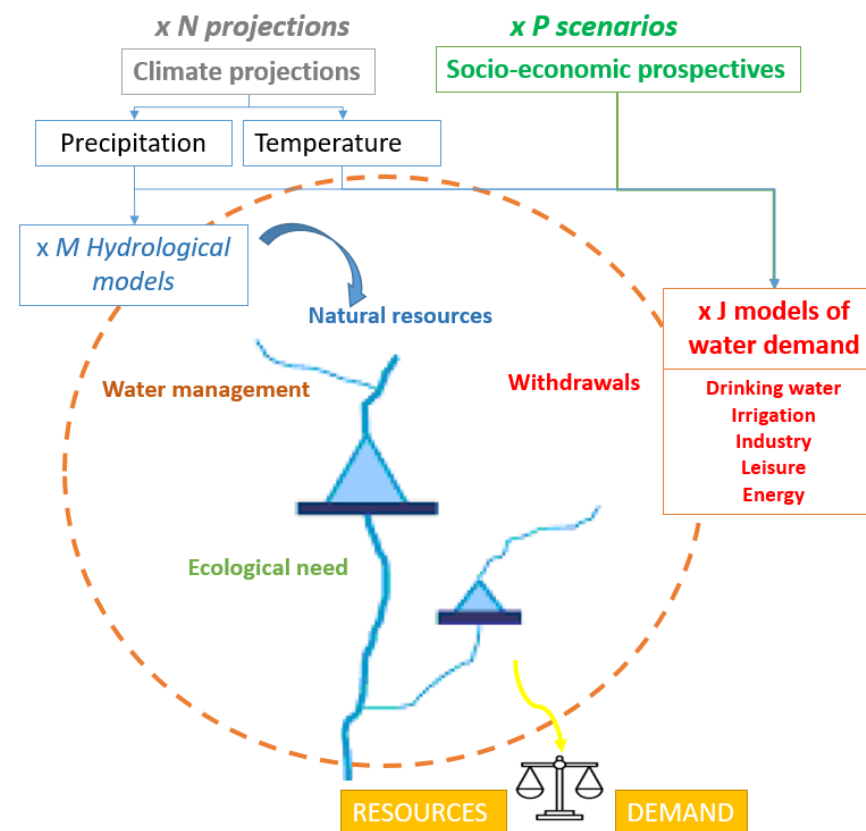
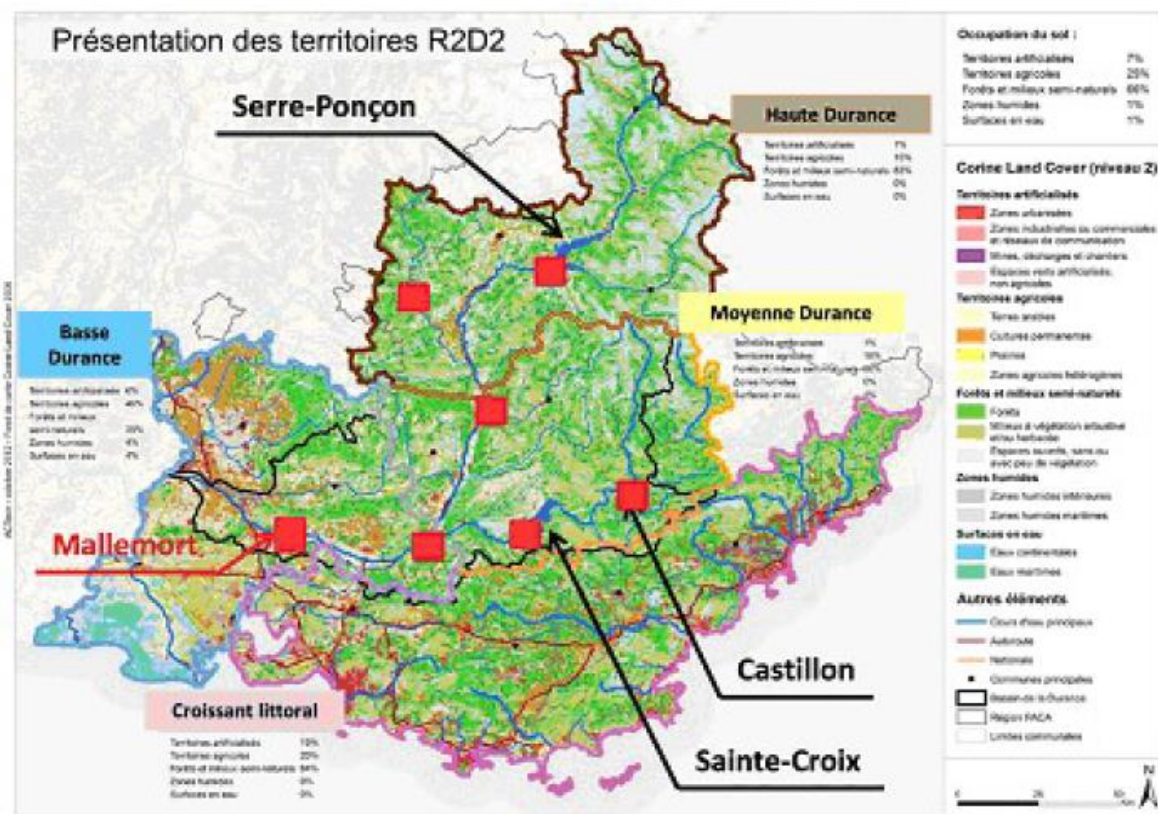
**Significant rainfall deficit (March 2022)**





# Perspectives and initiatives for adaptation to climate change

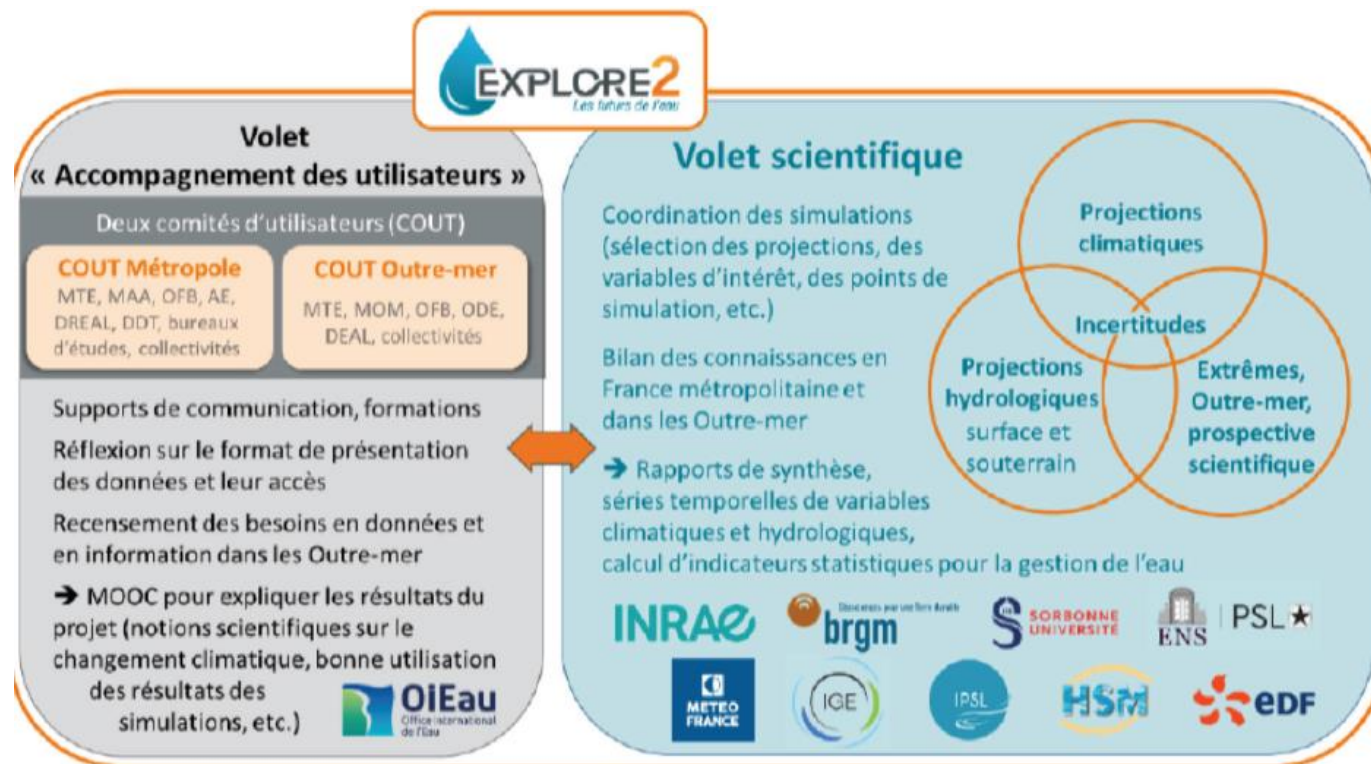
French national research project **R2D2-2050** to assess both future water availability and risk of unsatisfied water demands : combines water management models and future-oriented scenarios involving local experts and stakeholders





## Perspectives and initiatives for adaptation to climate change

A French national new prospective study "Explore 2" will update by 2023, the assessment of the hydrological consequences of the latest IPCC climate scenarios



**Component 1 :**  
Support for actors  
and end users

**Component 2 :**  
Scientific committee



## Perspectives and initiatives for adaptation to climate change

French government initiative to guarantee sustainability of agriculture and anticipating the effects of climate change  
Cooperation framework with working group/stakeholders

VARENNE AGRICOLE  
EAU CHANGEMENT CLIMATIQUE



1.

**Acquire tools for anticipation and protection as part of the overall climate hazard management policy**



2.

**Strengthen the resilience of agriculture by acting in particular on soils, varieties, farming practices and the efficiency of irrigation water**



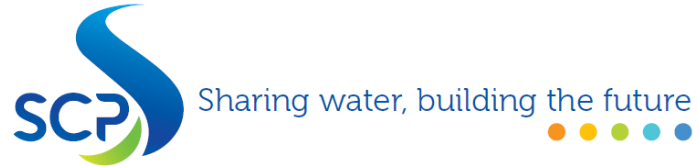
3.

**Sharing a reasoned vision of the needs and access to water resources that can be mobilized for agriculture in the long term**



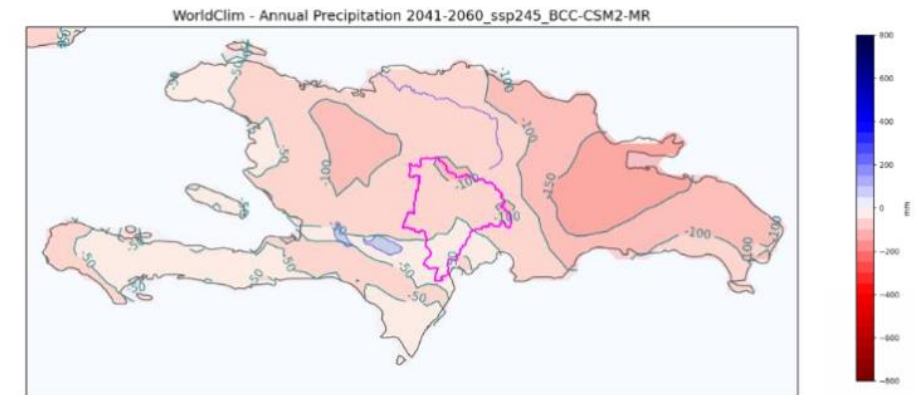
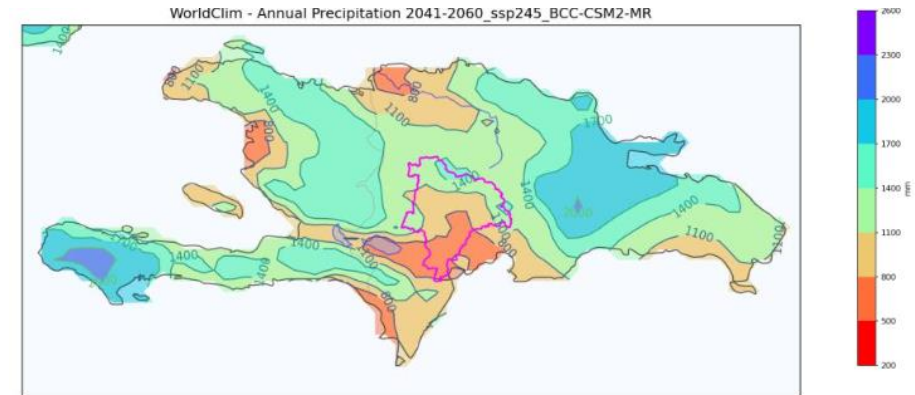
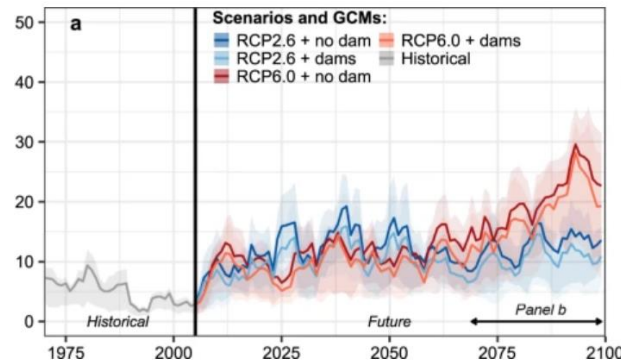
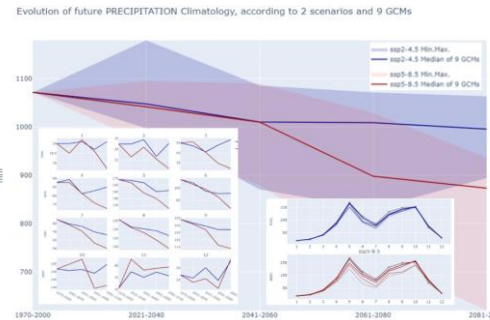


## Innovations in SCP

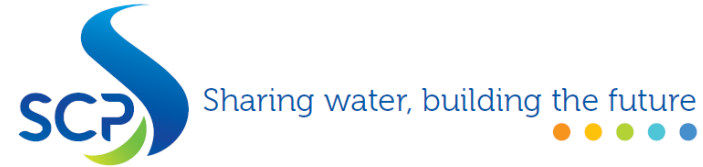


**Hydroclim** aim at a better consideration of climate change in the estimation of hydrological resources and therefore in more precised management of dams/resources.

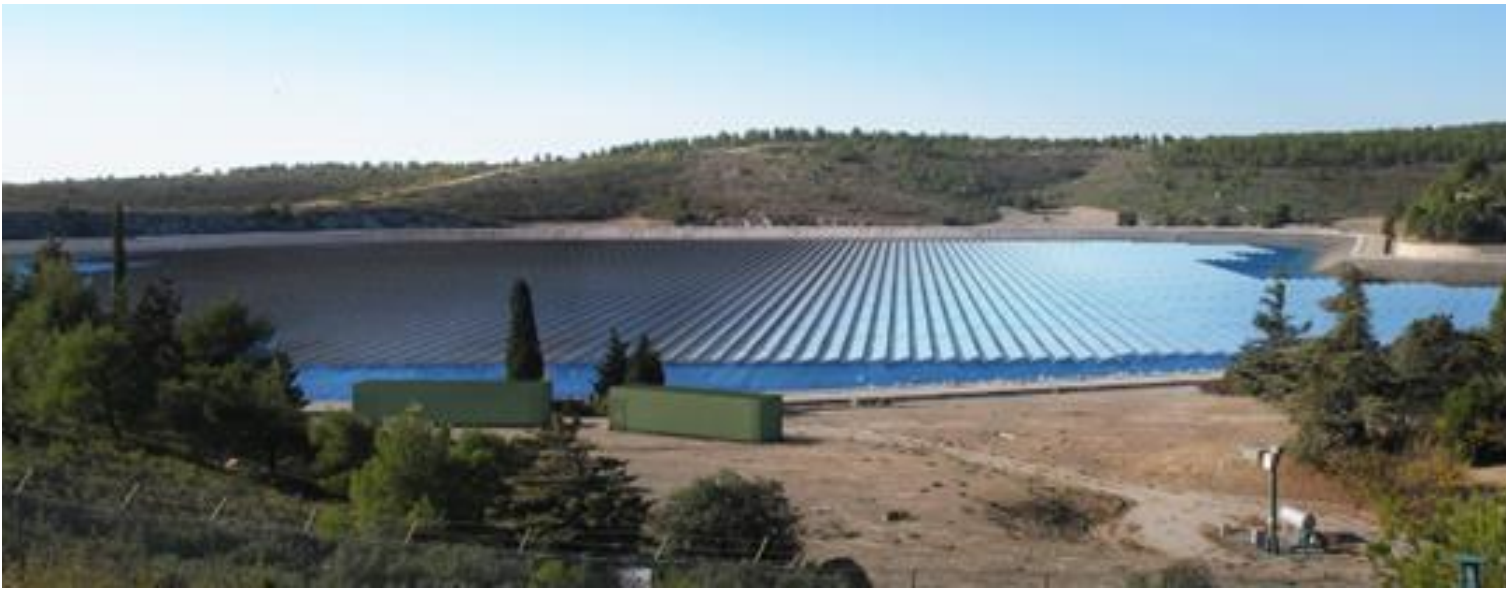
It provides worldwide projections



## Innovations in SCP

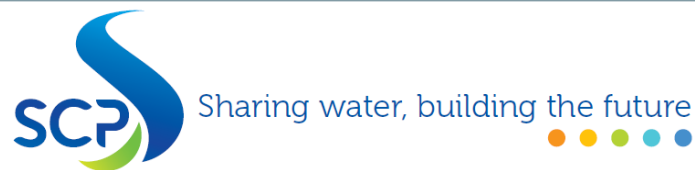


### Multi-purpose of the Vallon Dol reservoir with the installation of floating photovoltaic panels



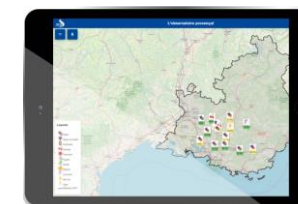


## Innovations in SCP



A web-service, provided by SCP, which allows irrigation management and programming

- Science and technology for agriculture in Provence,
- Decision-making tools,
- Specificities for the current climatic year,
- An application for all Mediterranean crops



## Conclusions

- Provence has been able to cope with the lack of water in coastal areas, thanks to the major developments that were made after the Second World War, and to a 'tradition' of multi-purpose reservoirs,
- Climate change is changing this situation and probably requires more accurate management and more multi-use of reservoirs.

