

Spanish National Drought Observatory

JRC EDORA

Network of Drought Observatories in the EU: Kick-Off - 16-17 June

Basis

- Spanish National Hydrological Plan (2001) for drought management.
 - Implementation of a global system of indicators: Ministry of Environment.
 - Development of Drought Management Plans (DMP): River Basin Authorities (RBA).
 - Emergency Plans for Urban Supply Systems of > 20.000 inhabitants: Municipalities.
- Criteria in DMP (Dec 2018):
 - Framework: Drought ≠ Water Scarcity.
 - Index definition to monitor the monthly hydrological status:
 - Regionally founded.
 - Defined by means of RBA's experience and knowledge.
 - Weighting technique to synthesize available hydrologic or hydraulic information.
 - Linear normalization for standardization.
 - Phases to progressively activate and implement the measures in order to mitigate negative impacts of droughts.

Drought

- Natural event characterized by the propagation of a temporary rainfall deficit
- Prolonged drought: unpredictable drought identified using rainfall indexes

Water scarcity

- Human influenced event characterized by a low water resources availability to provide environmental needs and water demands.
- Structural water scarcity: permanent situation that makes unachievable to fulfill guarantee criteria tested in the hydrological plan.
- Temporary water scarcity: temporal event with a significant impact on water supply.

PD regions

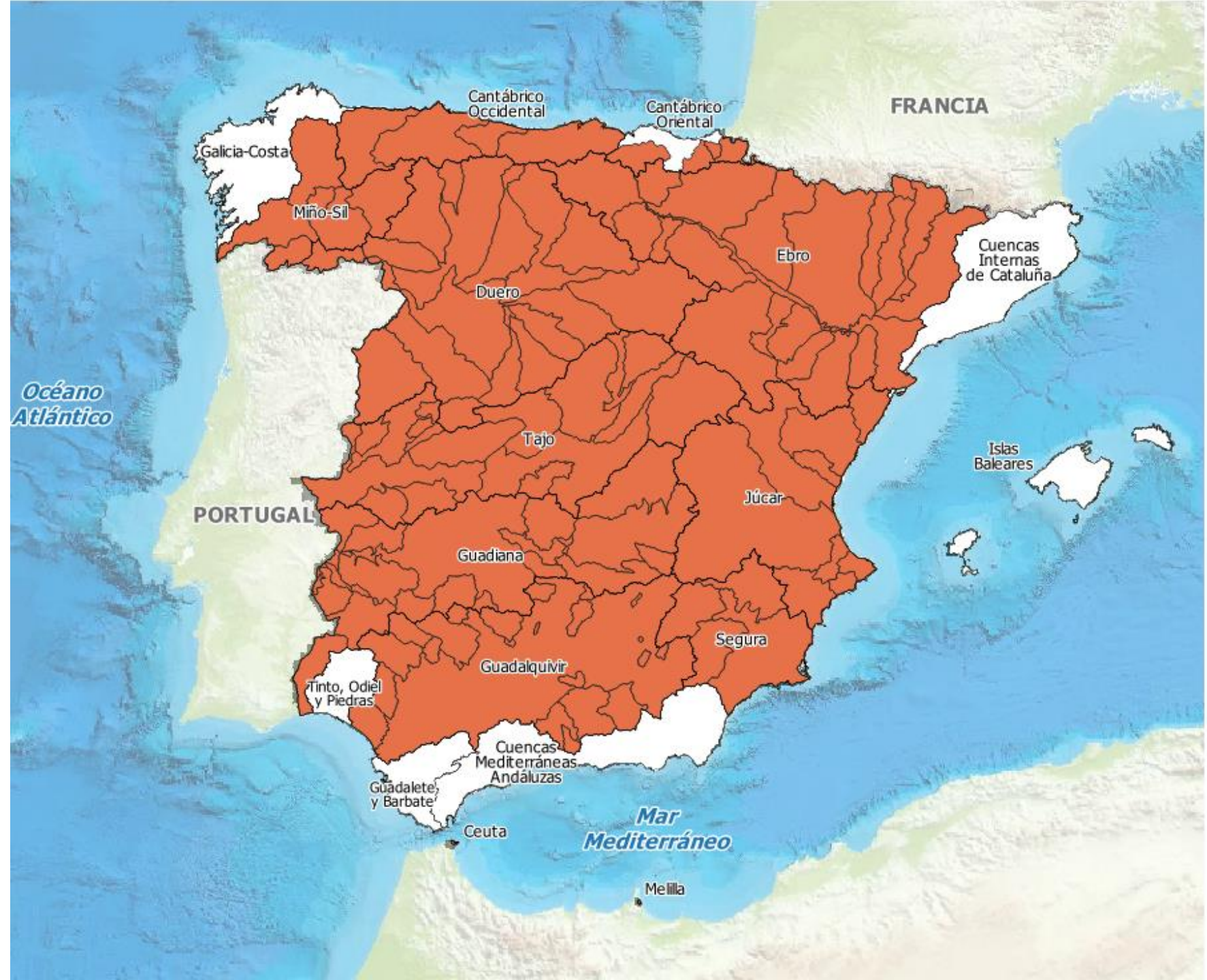
Hydrogeological areas for water resources generation




WS regions





Temporary Water Scarcity region (TWS): water resources management areas (demand, reservoir exploitation and ecological impact).

Not all fitted in a geographical unit:
Water transfer from Tagus to southeastern Iberian Peninsula



Drought indexes, thresholds and mitigation phases

- Based on rainfall + natural runoff
- Indexes as SPI_{xx} , transformed variables, normalization ...
- Linear normalization to [0,1] range
 - $0,0 \leq NDI < 0,3$ Prolonged drought 
 - $0,3 \leq NDI < 1,0$ Normality

- Mainly based on water storage: reservoirs and aquifers
- Indexes as total volume storage
- Linear normalization to [0,1] range
 - $0,50 \leq NWSI < 1,00$ Normality 
 - $0,30 \leq NWSI < 0,50$ Prealert 
 - $0,15 \leq NWSI < 0,30$ Alert 
 - $0,00 \leq NWSI < 0,15$ Emergency 

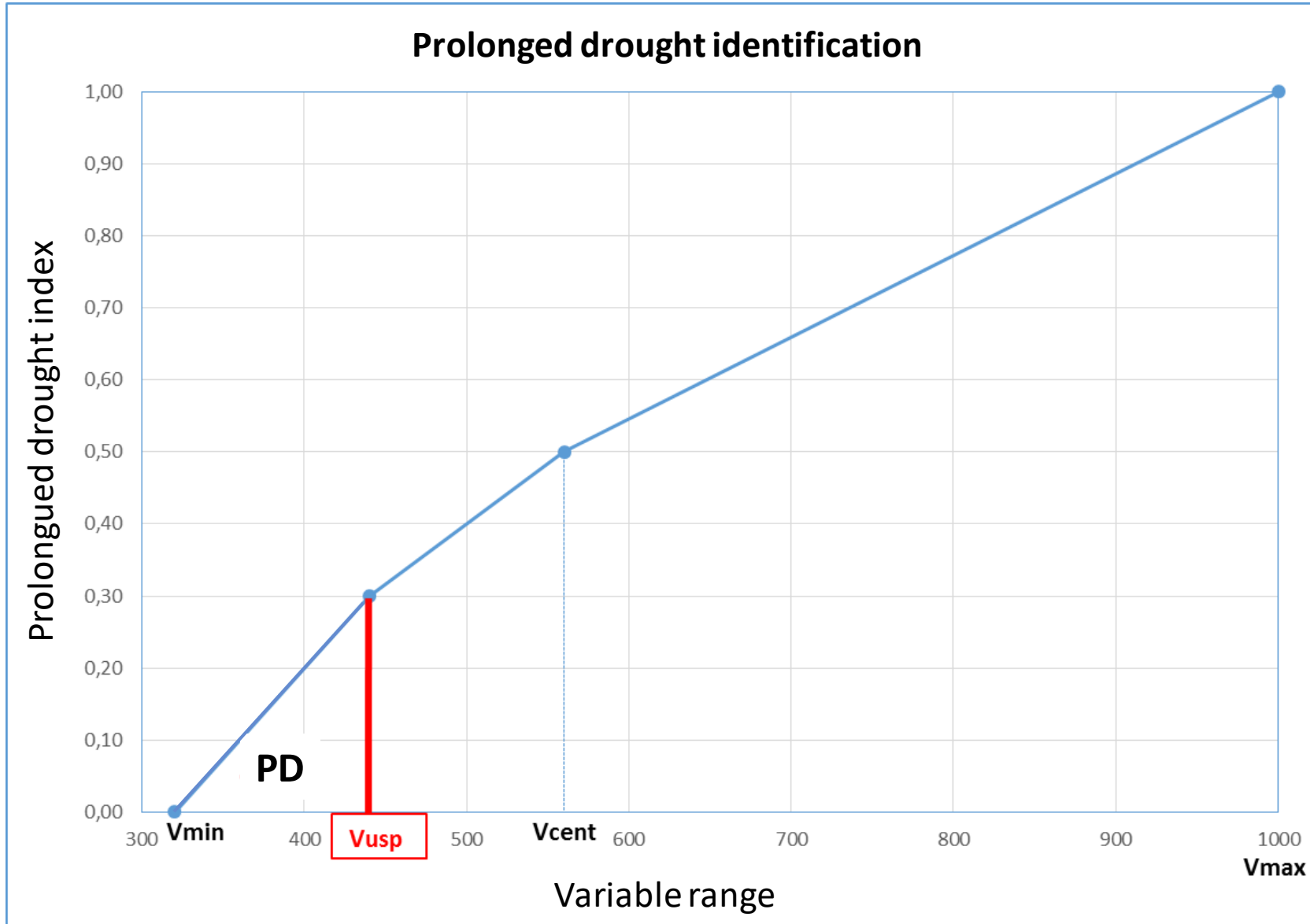
Criteria for threshold identification: ecological flows. Temporary deterioration of water bodies due to exceptional causes. Attenuated compliance with ecological flows is required

Criteria for threshold identification: hyd. system analysis (optimization) to give 3, 2 or 1 years of water supply

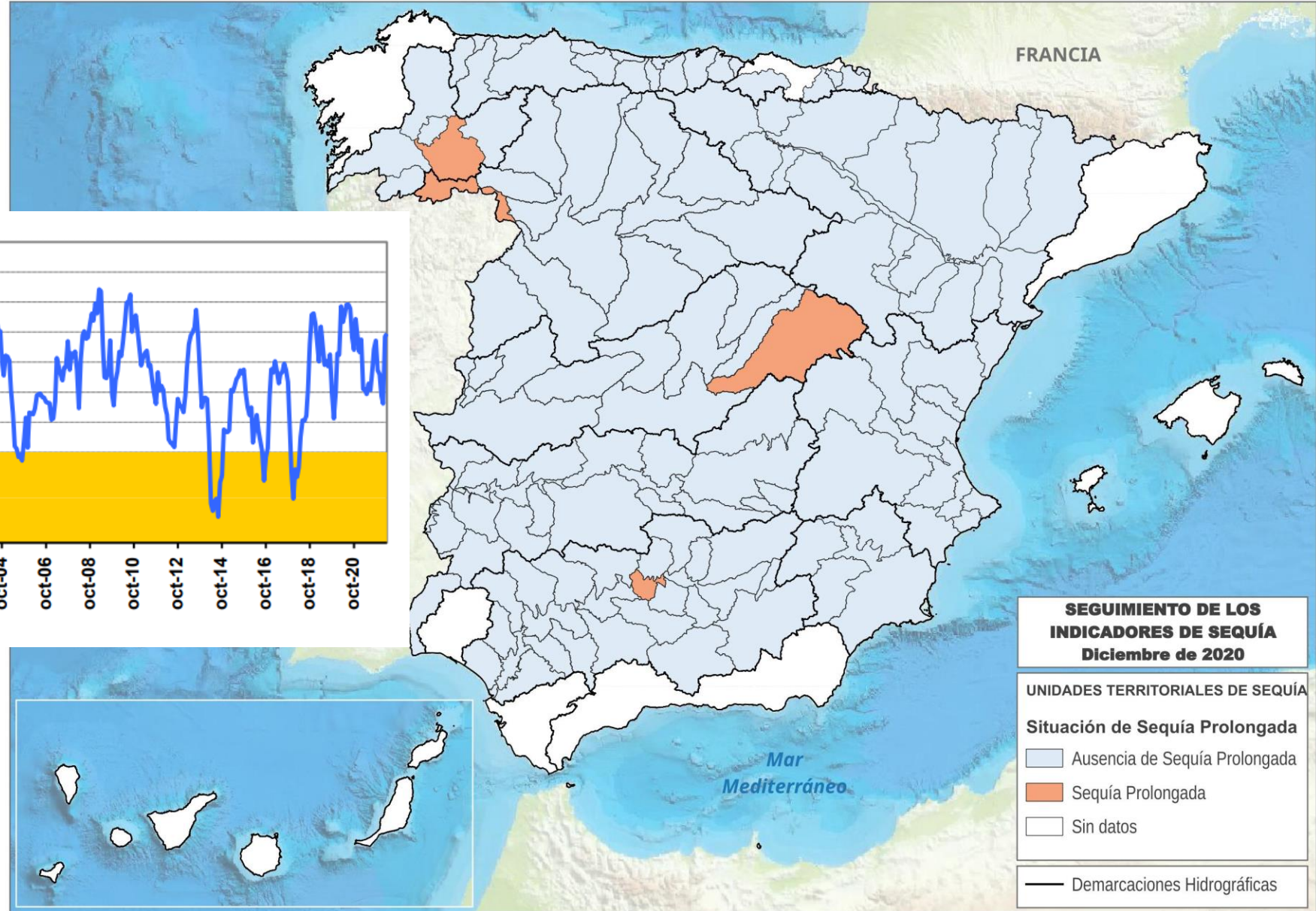
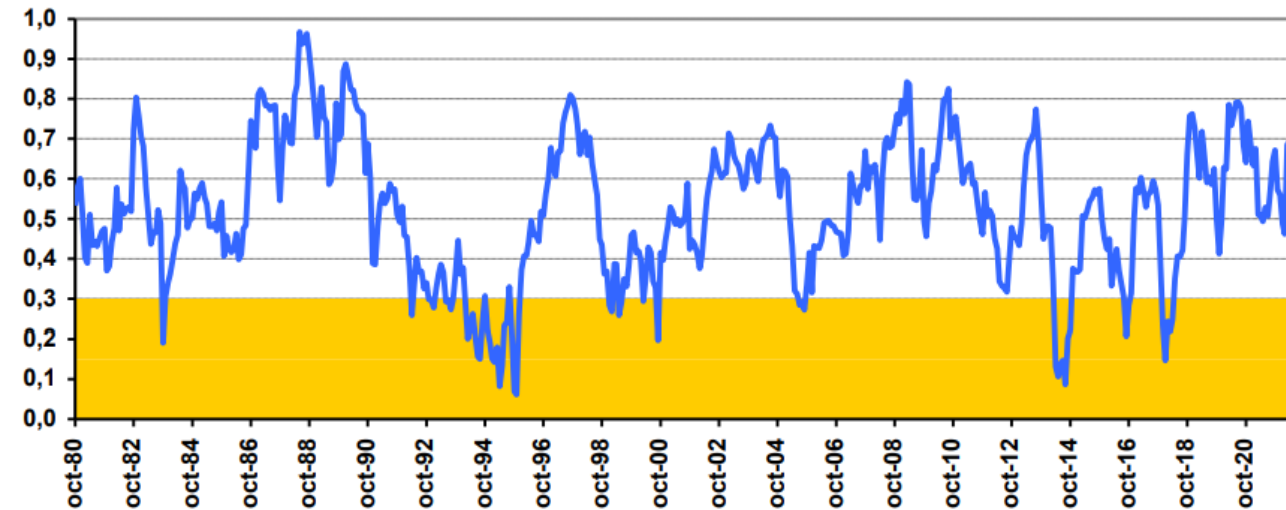
Water scarcity

- Drought Committee
- Mitigation measures based on phases (low to higher complexity and costs):
 - Normality: general management and monitoring
 - Prealert: awareness, savings and follow up
 - Alert: demand & supply practices, including restrictions to the uses of water, control and monitoring
 - Emergency: more intense alert and exceptional actions, decrees and so on

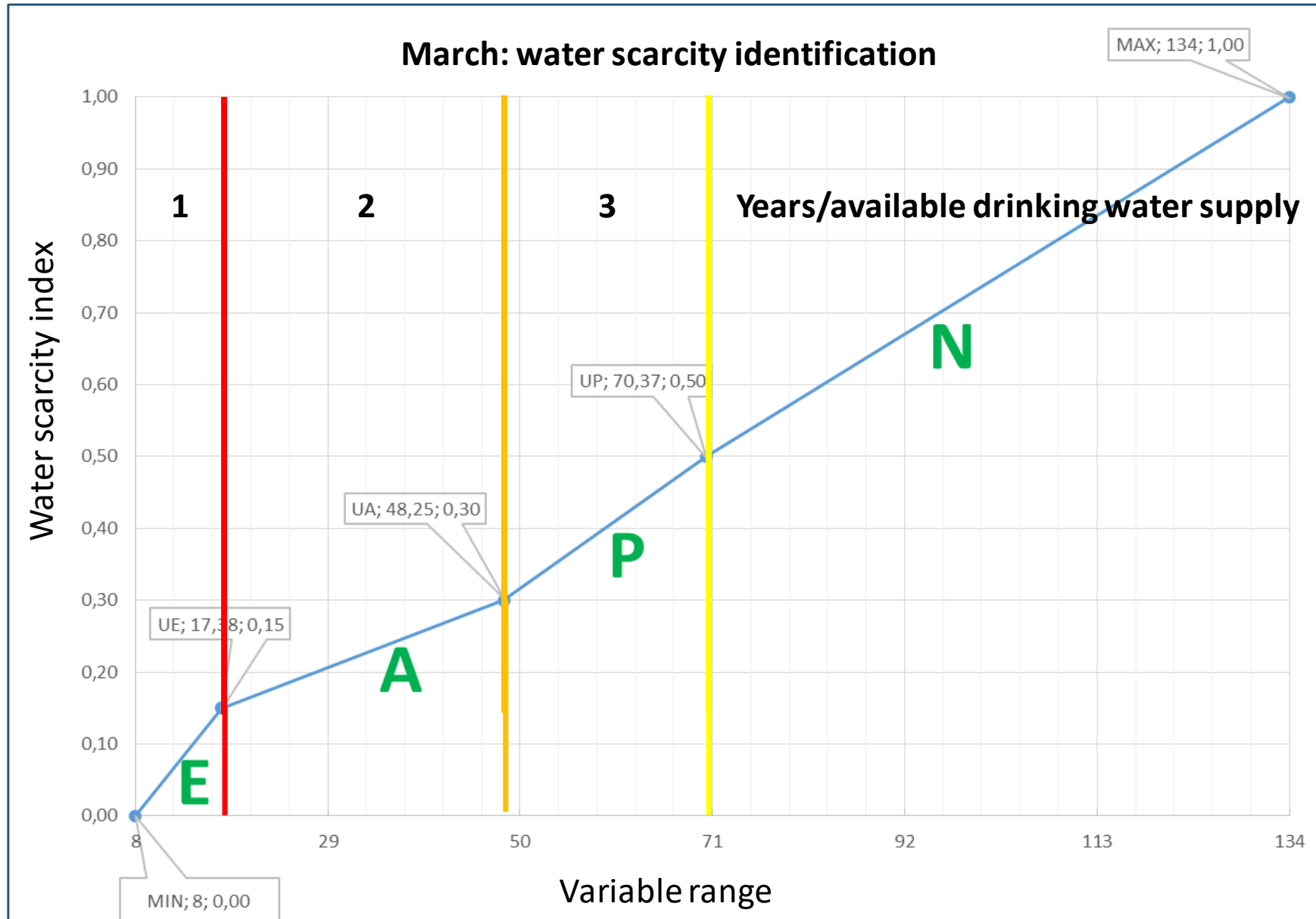
Linear normalization



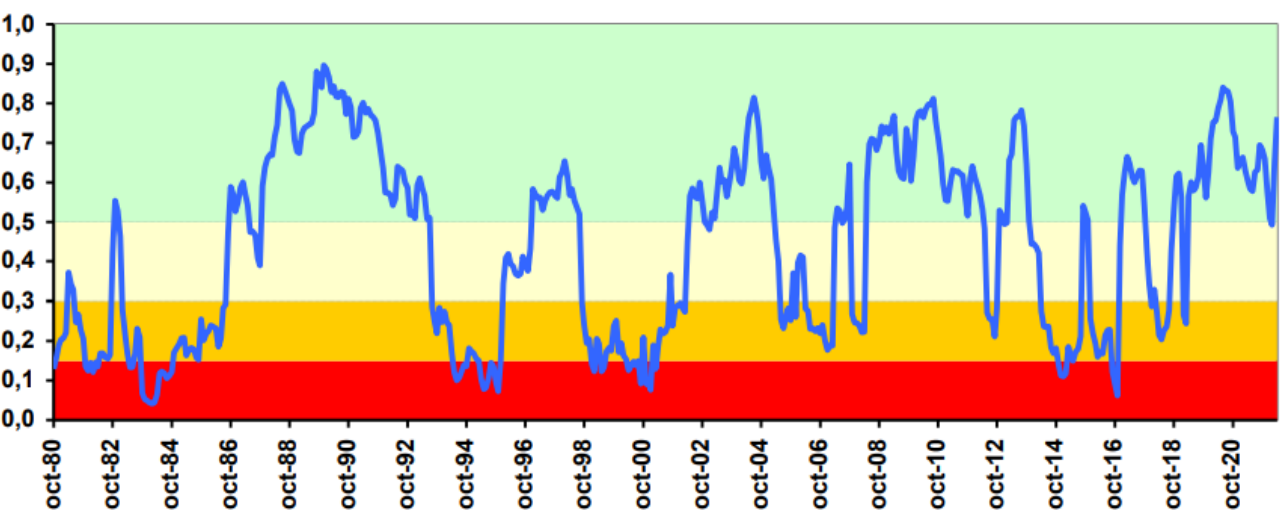
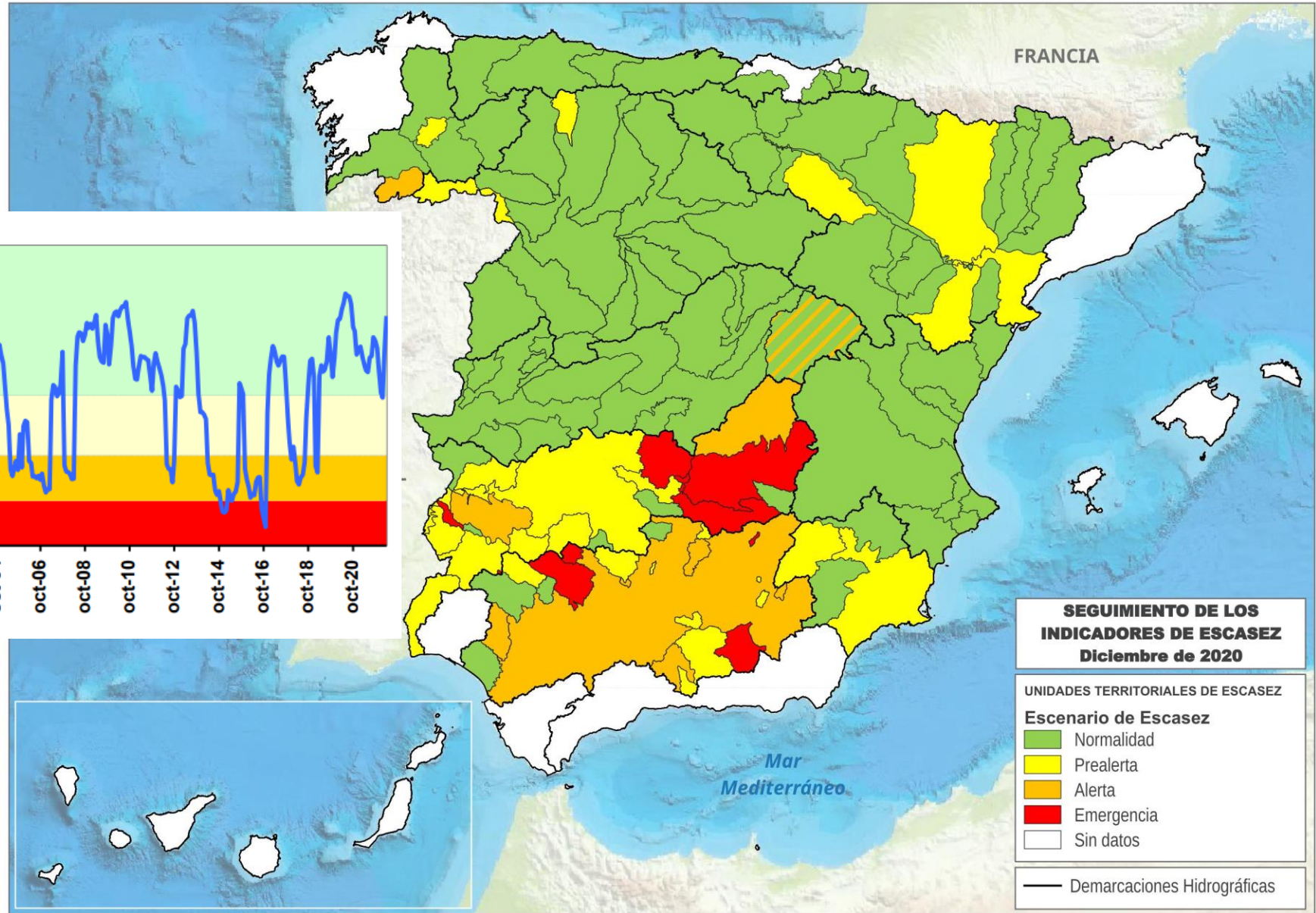
PD series



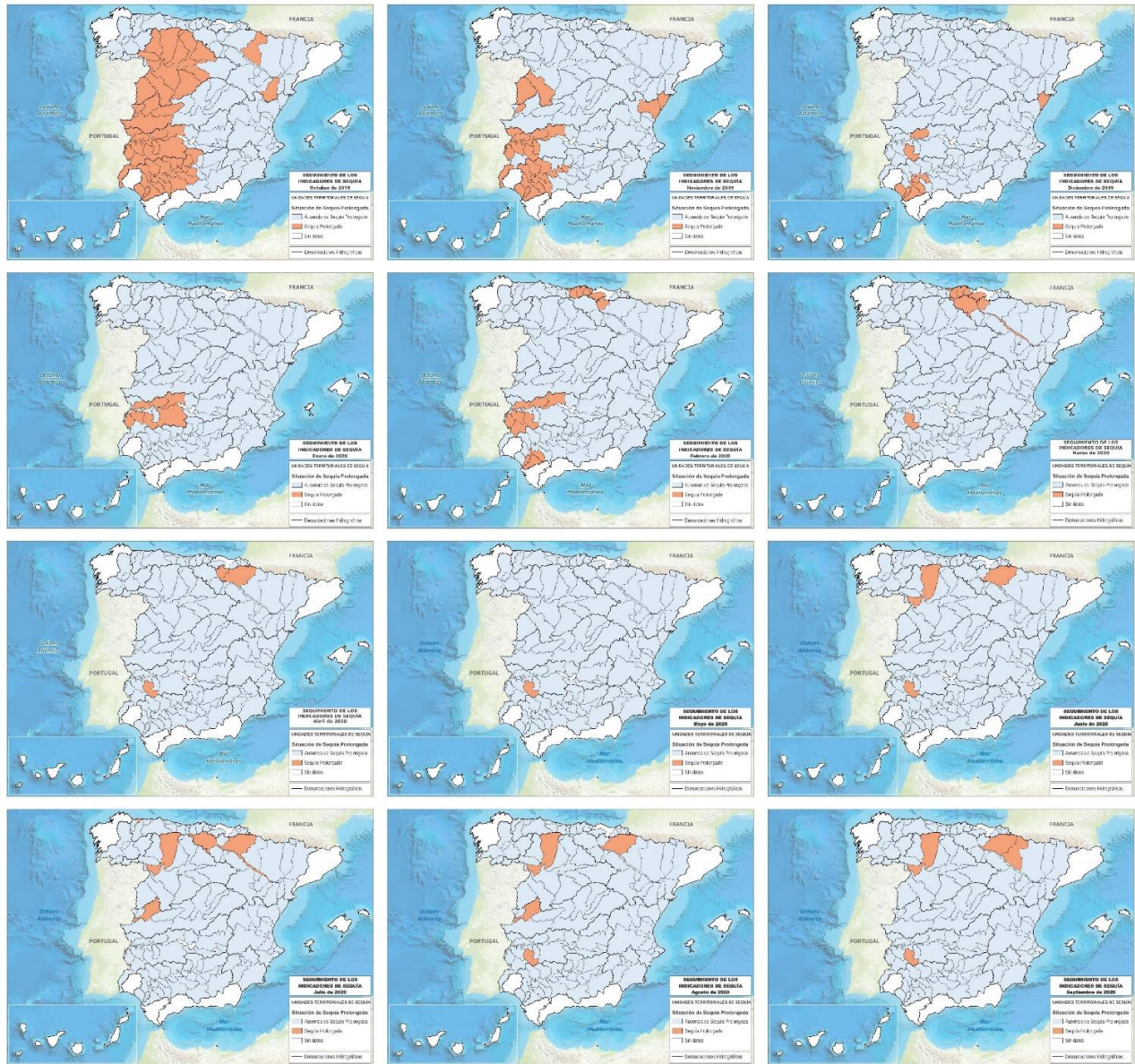
Linear normalization



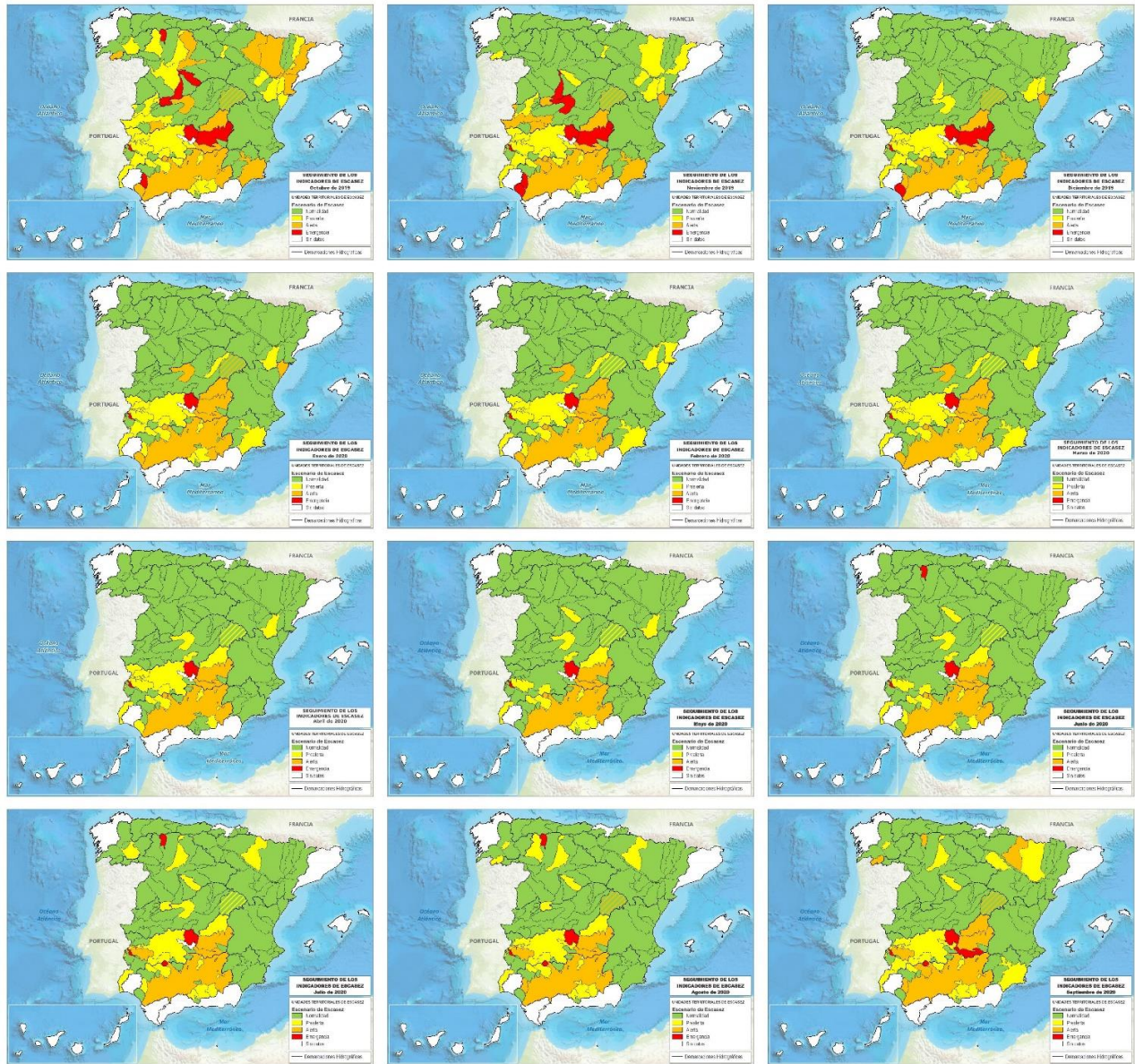
WS series



Año hidrológico 2019-2020 Evolución del índice de Sequía Prolongada



Año hidrológico 2019-2020 Evolución del índice de Escasez Hidrológica



Final comments and characteristics SNDO

- Compilation at a national scale of drought and water scarcity identification
- Monthly assessment of national maps of Drought and Water Scarcity status
- Normalization of criteria developed from units responsible of water management (expertise)
- Cooperation between different units: Ministry and River Basin Authorities

Thanks for your attention