

**Comisión de agricultura y Medio Ambiente  
CONGRESO DE LOS DIPUTADOS**

**Adaptación de los derechos del agua para enfrentar los impactos del cambio climático:  
Una comparación entre California y España**

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**Dificultades reales y las soluciones prácticas para alterar el sistema de derechos de agua, con vista a adaptarlo a los retos del cambio climático: mayor escasez y variabilidad.**

**Existen ejemplos en España, en los cuales dentro del marco legal se han producido cambios en la definición de los derechos vigentes, permitiendo una mejor adaptación entre recursos disponibles y demandas?**

**¿Qué condiciones se tienen que dar para que esto sea así, y se logren estos cambios y reformas?**

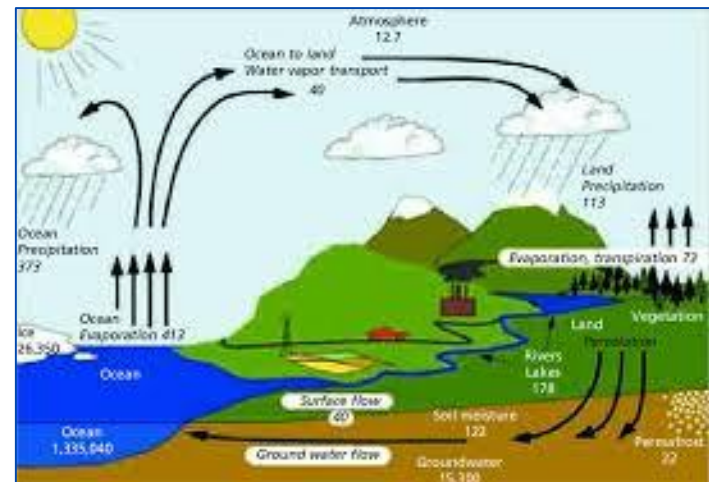
**En el caso de que sea absolutamente necesario, ¿Es viable una reforma de la Ley de Aguas? ¿Cómo debería ser?**

**¿Es imprescindible cambiar la Ley de Aguas para ello?**

# I. Climate change and water resources in Spain

Impacts

Vulnerability



# El cambio climático y el ciclo hidrológico (I)

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- Incremento de las temperaturas
- Impacto incierto en la precipitación aunque previsible disminución en el área mediterránea
- Traslado temporal de los períodos de lluvia (primaveras y otoños más secos, concentración de la pluviometría en invierno)
- Disminución de la escorrentía
  - Por el incremento de las temperaturas y evapotranspiración
  - Por los cambios en los usos del suelo en las cabecera de los ríos
- Disminución de la recarga de los acuíferos

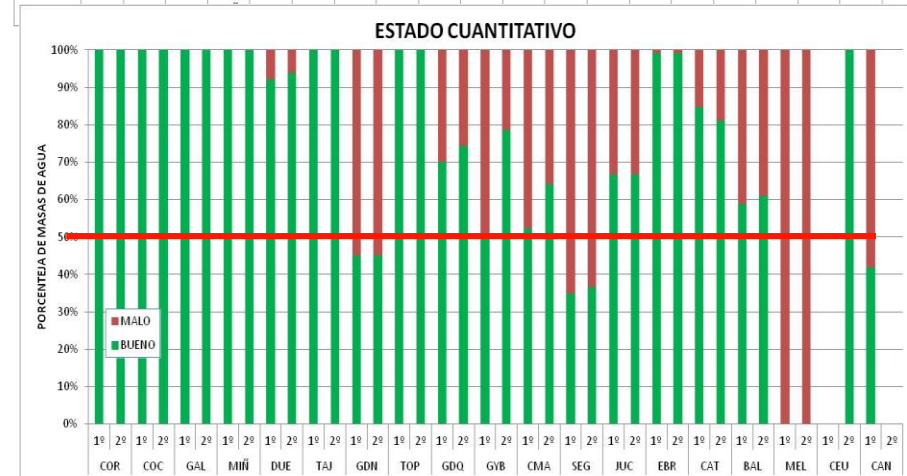
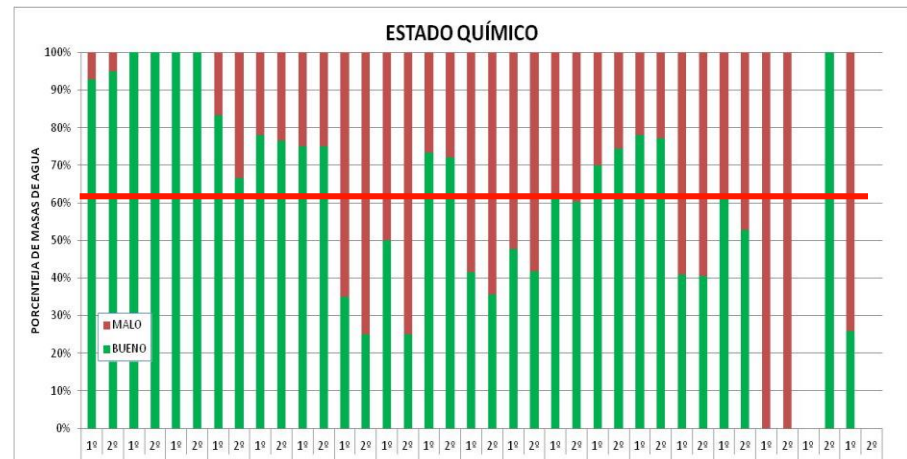
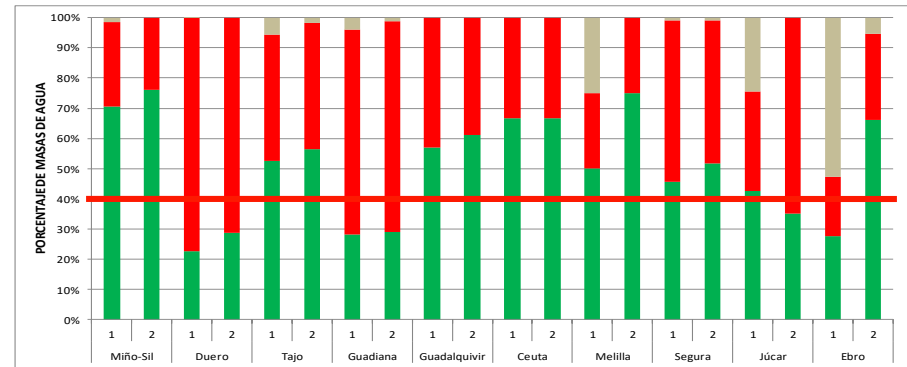
## El cambio climático y el ciclo hidrológico (II)

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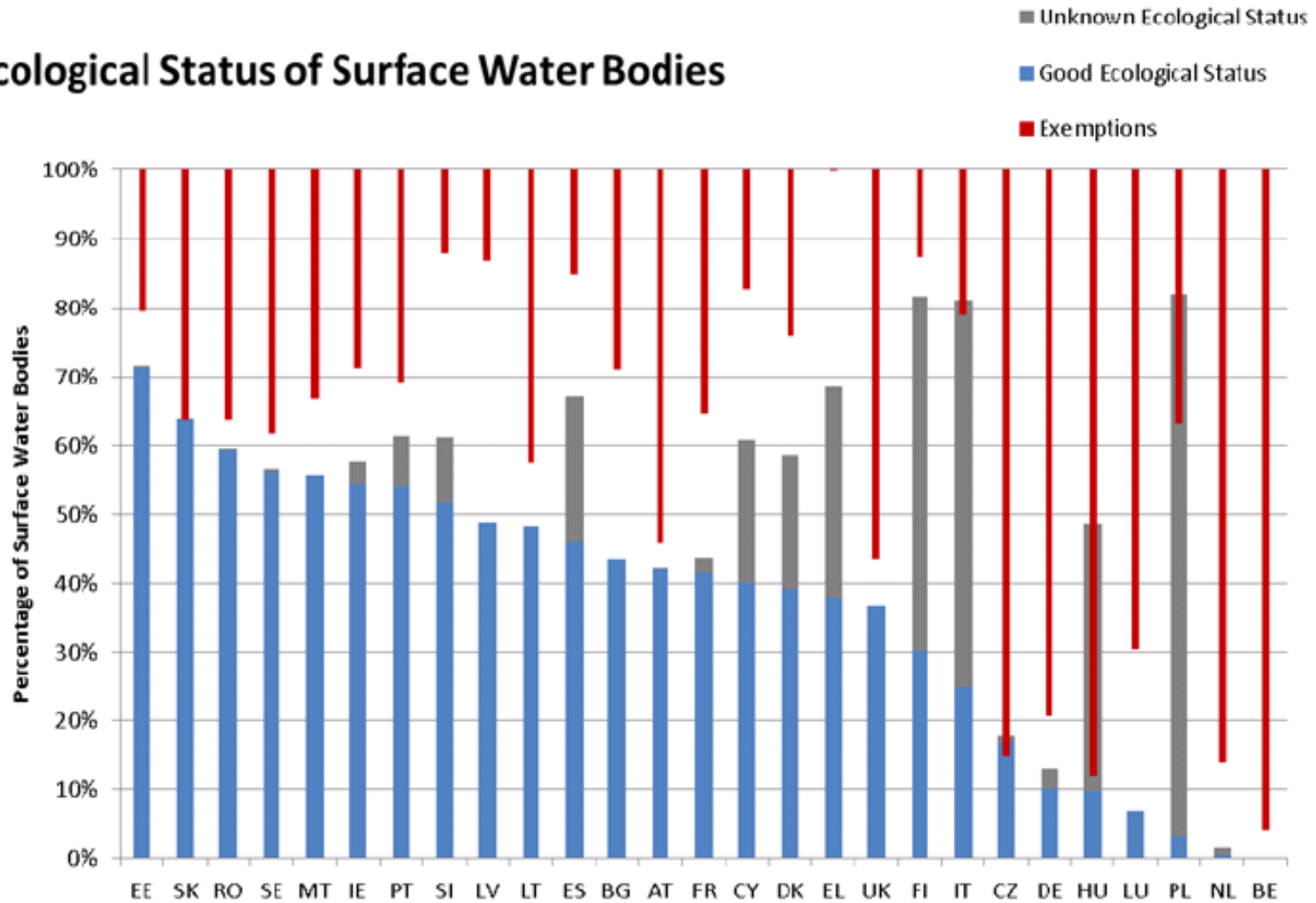
- Polarización de los extremos
  - Sequías más frecuentes, duraderas e intensas
  - Inundaciones más frecuentes e intensas
- Las sequías son fenómenos regionales, no locales
- **Los impactos de los procesos de cambio global ya se han puesto de manifiesto (“efecto 80”):**
  - Reducción de las aportaciones
    - 40% DH Segura                      19% Duero
    - 48% cabecera del Tajo              27% Júcar
    - 22% DH Guadiana                  23% DH Guadalquivir

# Poor status of surface and groundwater

- Quantitative and qualitative pressures
- Surface waters
  - Urban, industrial and non-point source agricultural pollution
  - Hydrogeomorphological alterations
  - Environmental flows
- Groundwater
  - 25% in bad quantitative status, 35% bad qualitative status)
  - Non-point source pollution (nitrates)
  - Overexploitation



# Ecological Status of Surface Water Bodies



Source; RSPB, 2013, from WISE



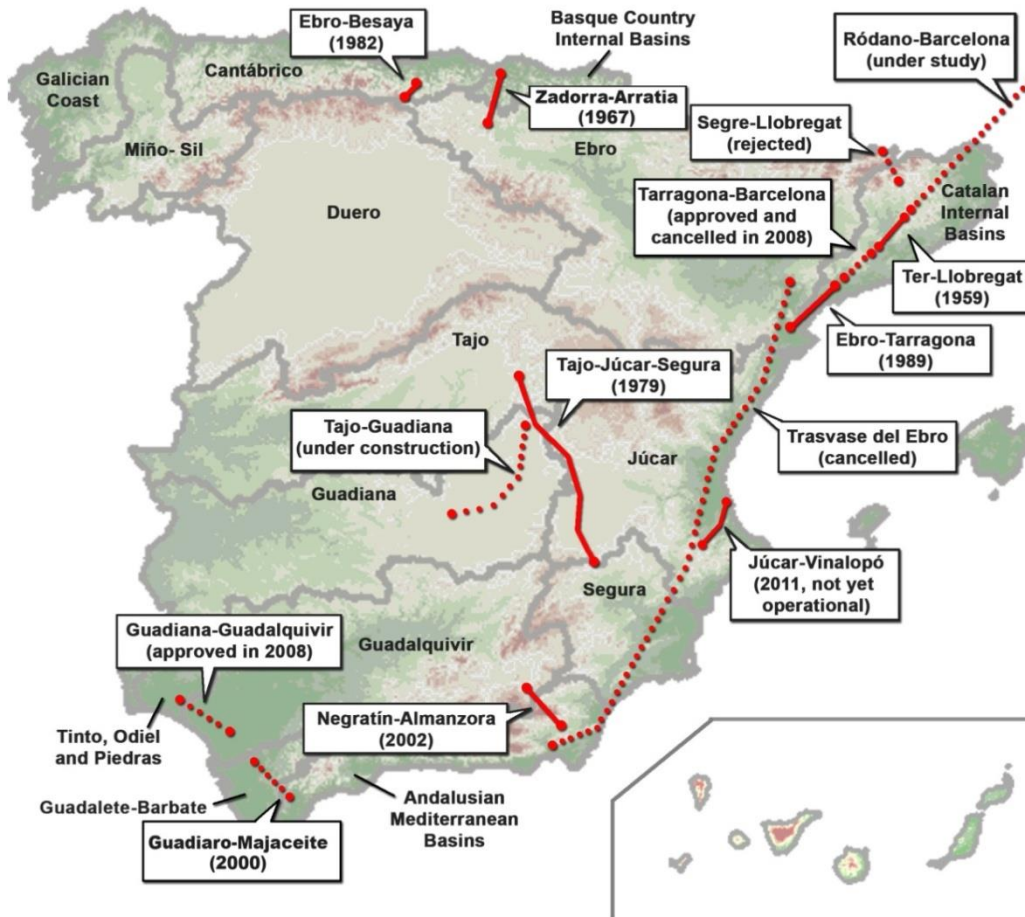
## **II. Water allocation in Spain**



# Mechanisms for water allocation

<b>Spatial scale</b>	<b>Characterization</b>	<b>Legal/administrative instrument</b>	<b>Dominant allocation criteria</b>
<b>International</b>	Spain shares four major river basins with Portugal (46% Iberian Peninsula)	Albufeira Convention	Guarantee hydroelectric production, water supply, flood protection and environmental flows.
<b>Country</b>	Allocation of water resources among river basin districts.	National Hydrologic Plan (approved by national law)	“National hydrological balance” for economic and territorial strategies
<b>River Basin District</b>	Allocation of water between smaller natural river basins within the same river basin district	Basin Hydrologic Plan (approved by regional/national decree)	Regional economic and sectoral development.
<b>Management Areas (<i>Sistemas de explotación</i>)</b>	Territories within a river basin district supplied by a common distribution network (natural, as a common aquifer, or artificial, as an irrigation system)	Management Boards and Water Release Commissions	Adaptation of Basin Hydrologic Plan to specific spatial and/or temporal conditions
<b>User</b>	Holder of water use rights	Water use permits ( <i>concesiones</i> )	Existing rights

# Interbasin water transfers in Spain



## SOME OBSERVATIONS ON IWT

- They must be approved through the National Water Plan
- Volumes transferred are approved by legally established commissions
- They can help solve regional water scarcity problems
- As the geographical scale increases, so do the social, environmental and political implications (& conflicts)
- Often IWT transfer scarcity problems from one basin to another
- The existence of transfer infrastructures can heavily condition water management decisions in both linked river basins

# Water use permits (*concesiones*)

- Allocative mechanism for surface waters since 1879 Water Act
- Permits allocated for 75 year period for a specific use in a specific location
- Groundwater was included in the licensing system with the 1985 Water Act (pre-1985 private groundwater rights remain)
- Water permit revision is a legally feasible but politically complex process that is seldom undertaken (even in cases of improved water use efficiency)

ORDER OF PRIORITY ALLOCATION	
1879 Water Act	1985 Water Act
1. Domestic water supply	1. Domestic water supply
2. Railroads	2. Irrigation & agriculture
3. Agriculture	3. Hydropower generation
4. Navigation canals	4. Other industrial uses
5. Water mills, crossing boats and floating bridges	5. Aquaculture
6. Aquaculture	6. Recreational uses
	7. Navigation
	8. Other uses

- Environmental requirements are (theoretically) a prior restriction to other uses
- Basin management plans or regional laws can change the order of allocation priority among economic uses
- Priority allocation determines the order of water use restrictions in times of drought and possible market exchanges

## Some comments on water allocation

- Surface and groundwater (since 1985) is public domain
  - Permits grant use rights under strict conditions
  - Pre-existing surface water rights (80% of surface water)
  - Pre-existing groundwater rights (80% of groundwater uses)
- Long licensing periods limit management flexibility and create a sense of “private property” over water
  - Relationship between concession volumes – *volumen concesionados* - and allocated volumes - *dotaciones*
- Water resources in many river basins have been over-allocated
- Water use permits often pre-date the introduction of environmental concerns in water management
- Permit review processes (for environmental, socioeconomic, scarcity or efficiency reasons) are politically challenging, potentially expensive, and seldom undertaken



### **III. Mechanisms for water reallocation within the existing legal framework**

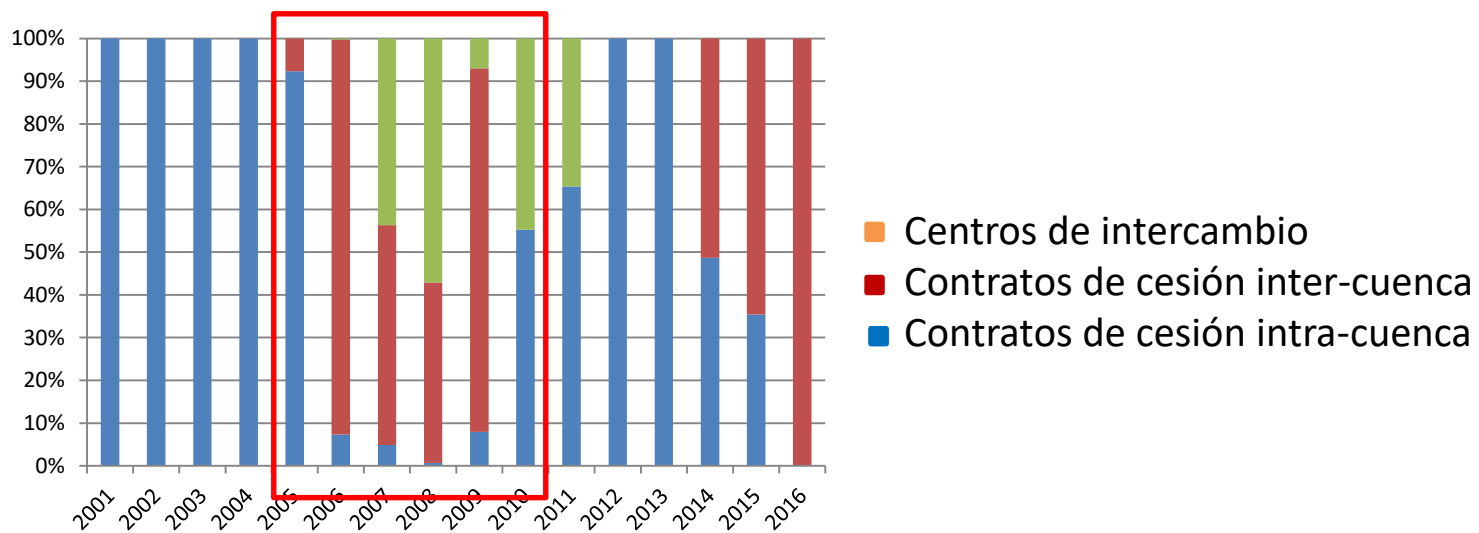
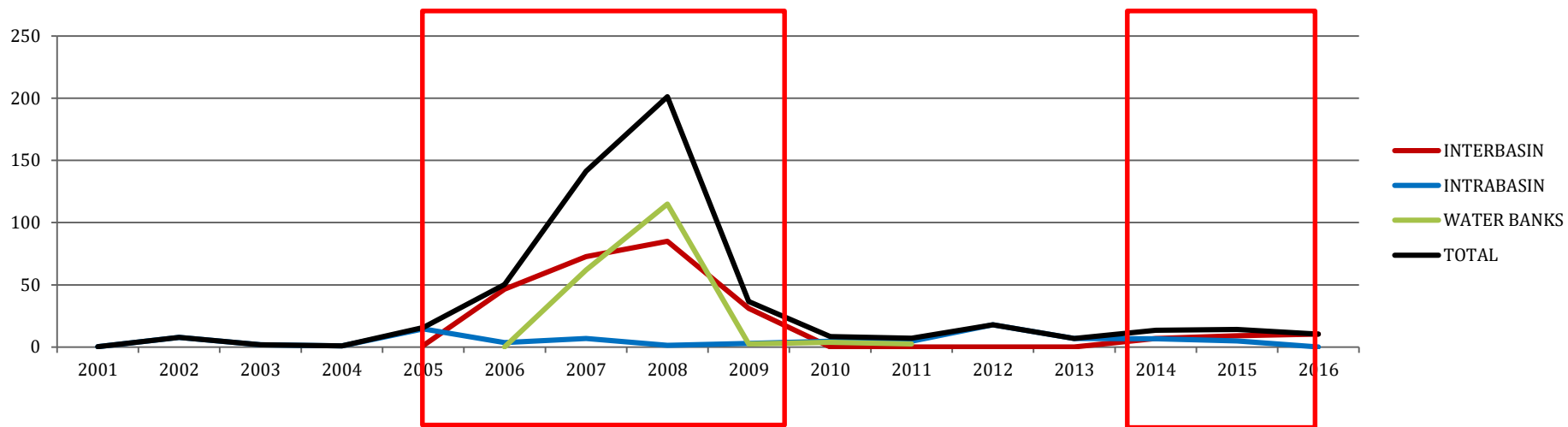
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# Water reallocation mechanisms

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- Water reallocation in times of drought
- Formal (and informal) water “markets”
- Existing mechanisms for revision of existing concessions
  - Restrictions and administrative reallocation take place in times of drought and to guarantee domestic water supply (agreed upon in user-participated Management Boards at the river basin scale)
  - Change in essential characteristics of the right
  - Extinction of concession – hydropower licenses
  - Implementation of environmental flow regimes [Water framework directive implementation]
  - Irrigation modernization programs [increase efficiency in irrigation since 2000]

# Volumen del mercado (2001-2016)

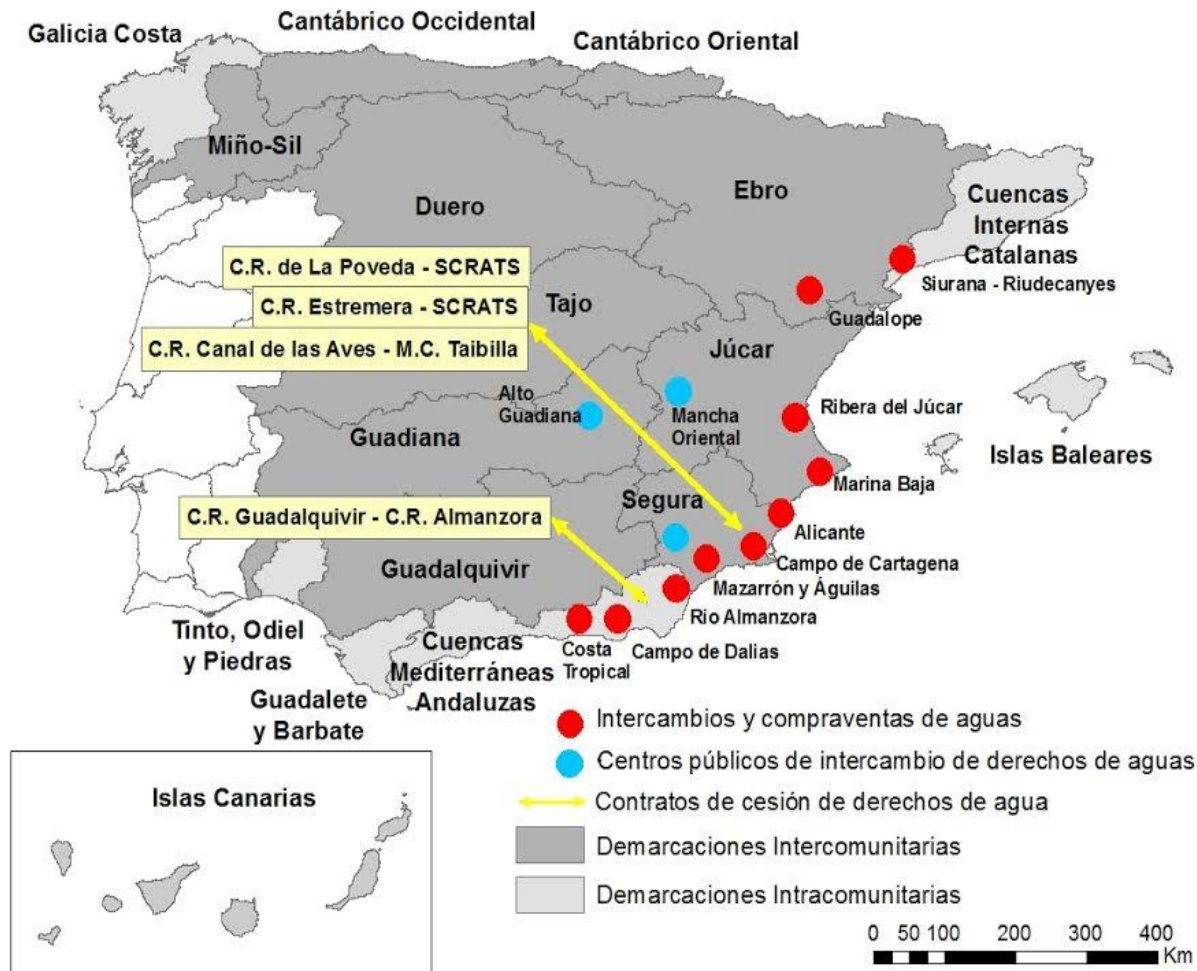


# Volúmenes de agua cedidos entre 2001 y 2016

	<b>Inter autonómico</b> (sólo contratos de cesión)	<b>Intra autonómico</b> (sólo contratos de cesión)
<b>Inter cuenca</b> (sólo contratos de cesión)	<b>37% (200 Mm<sup>3</sup>)</b> 57% (200 Mm <sup>3</sup> )	<b>12% (63 Mm<sup>3</sup>)</b> 18% (63 Mm <sup>3</sup> )
<b>Intra cuenca</b> (sólo contratos de cesión)	<b>6% (30 Mm<sup>3</sup>)</b> 9% (30 Mm <sup>3</sup> )	<b>45% (241 Mm<sup>3</sup>)</b> 16% (55 Mm <sup>3</sup> )



# Distribución geográfica de los mercados de agua en España





**IV. Is a water law reform necessary to adapt to the impacts of climate change?**

# Necessary changes before considering legal reforms

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- Improve knowledge (up-to-date) of existing resources (especially in case of groundwater) and existing uses (*Registro y catálogo*) – invest in information, knowledge and evaluation
- Plan according to CC impact provisions: Limit expansion of new uses and rights in overallocated basins (700.000 new irrigated hectares proposed in RBMP)
- Surface water rights
  - Reduce length of concessions for surface water rights
  - “Conditions” of surface water use rights (*condicionalidad*)
  - What to do with historic water rights and surface water rights under administrative permit (not concession)?
- Groundwater rights
  - Need to regulate wells that pump less than 7000 m<sup>3</sup>/s
  - Need to regulate existing illegal uses

# Adaptación del regadío: Consolidar

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Los planes hidrológicos 2015-2021 prevén un **incremento planificado** de 690.000 nuevas hectáreas de regadío:

- 445.000 ha Ebro
- 93.000 ha Duero
- 70.000 ha Guadiana
- 40.000 ha Tinto-Odiel y Piedras
- 30.000 ha Guadalquivir

No parece razonable en escenarios de cambio climático

El regadío debe servir para disminuir la vulnerabilidad ante períodos de sequía, no incrementarla.

Esto no tiene en cuenta los crecimientos de regadíos ilegales.

En el Guadalquivir:

- la superficie de regadío se ha incrementado en 260.000 ha entre 1998 y 2008 – en gran medida regadíos ilegales con aguas subterráneas.
- Existe un “déficit estructural” (**sobreexplotación**) reconocido de 320 hm<sup>3</sup>



## **V. Possible water law reforms**

## Challenges with existing water law for CC adaptation

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- Changes may be necessary to reduce uncertainty (judicial interpretation) and enhance the ability of RBA to manage flexibly and adaptably.
- Invest in improving information and knowledge on existing resources and uses
- Administrative reinforcement to modify water use rights:
  - Simplify the administrative process for revision of concessions as conditions change
  - Enhance the ability of RBA to “rescue” concessions when these are not used
  - Introduce flexibility in concessions so they can be modified or reallocated without the possibility of takings claims

## Challenges with existing water law for CC adaptation (2)

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- Limit concession time frames adapting them to type of use, amortization period of the investments, uncertainty associated to available resources
- Change the order of priority allocation – eliminate the preponderance of irrigation to flexibilize the system
- Create permanent public water banks to minimize transaction costs in times of drought (or others)
- Condition public financing of modernization programs, water reuse plans, groundwater recharge programs, etc. to a reduction in total volumes used
- Economic-financial regime: Apply the polluter pays principle – loss of water resources because of pollution (plana de Valencia y Júcar)