Groundwater intensive use in Spain in the framework of IWRM

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- Overview of GW in Spain
- Evolution of approach to GW management
- Unsolved issues
- Bottlenecks & open questions

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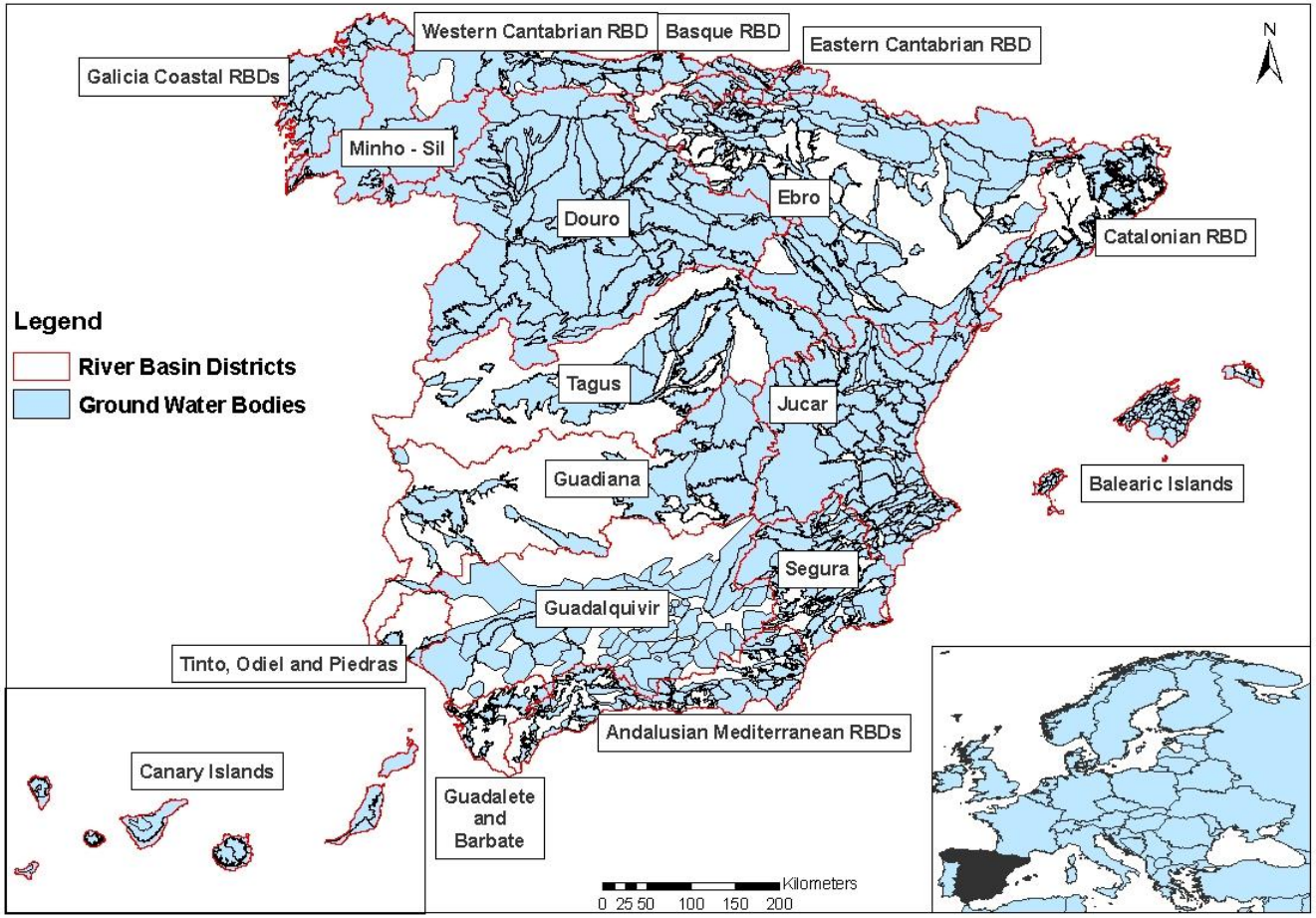
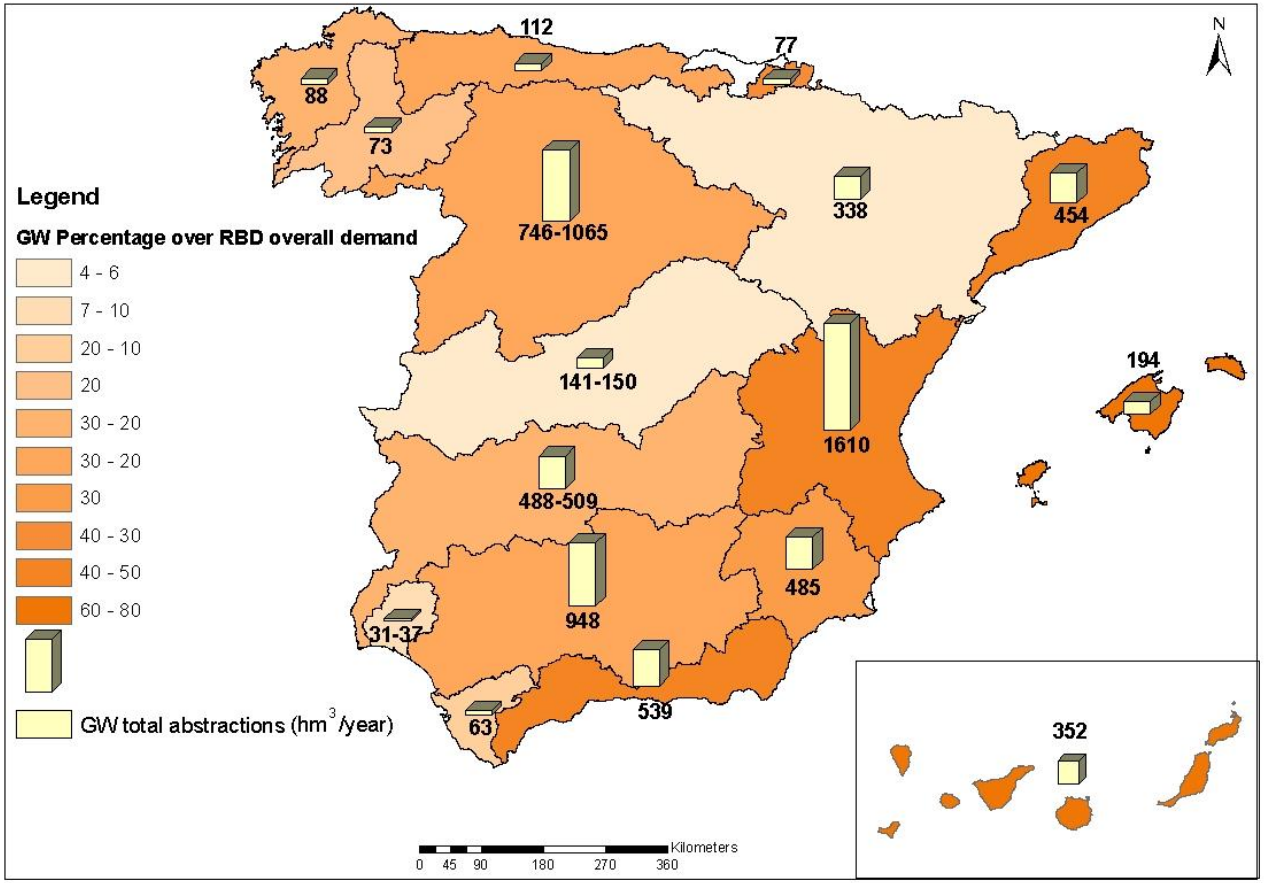
Groundwater in Spain

Over 730 water bodies, 353,300 km^2
Estimated available resources over 22,000 MCM



Groundwater demand

7,000 MCM/yr or 1/3 of the overall water demand



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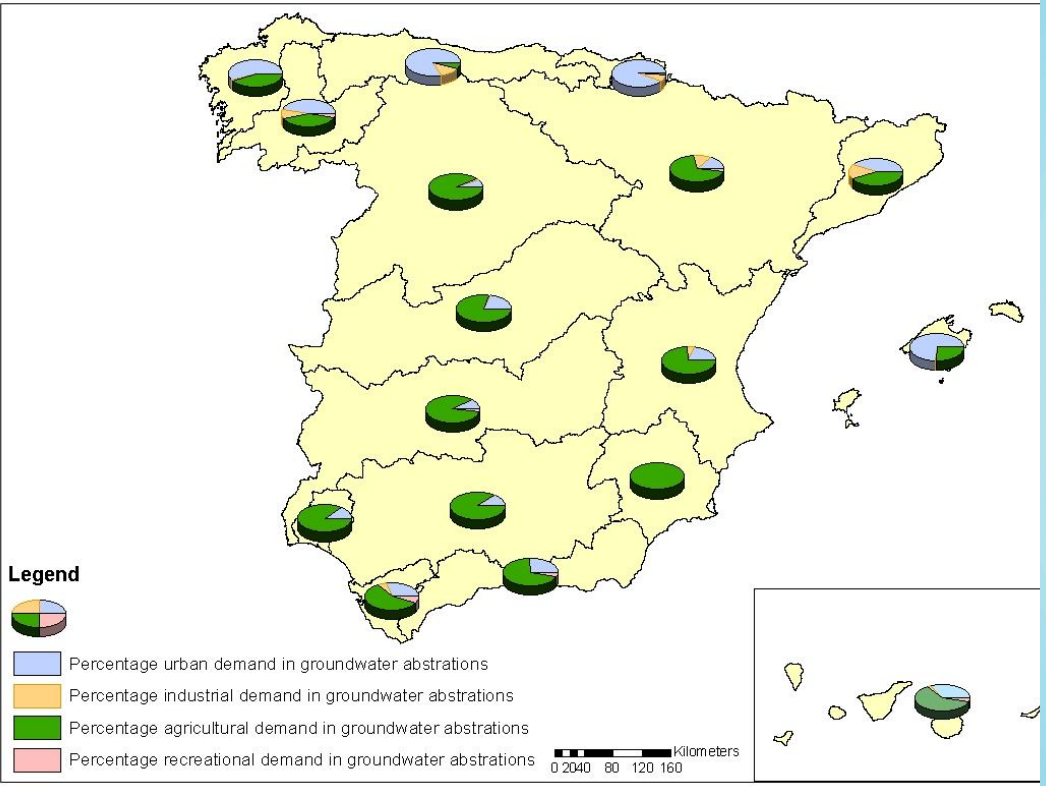
Groundwater uses

73% for irrigation
21% for domestic use

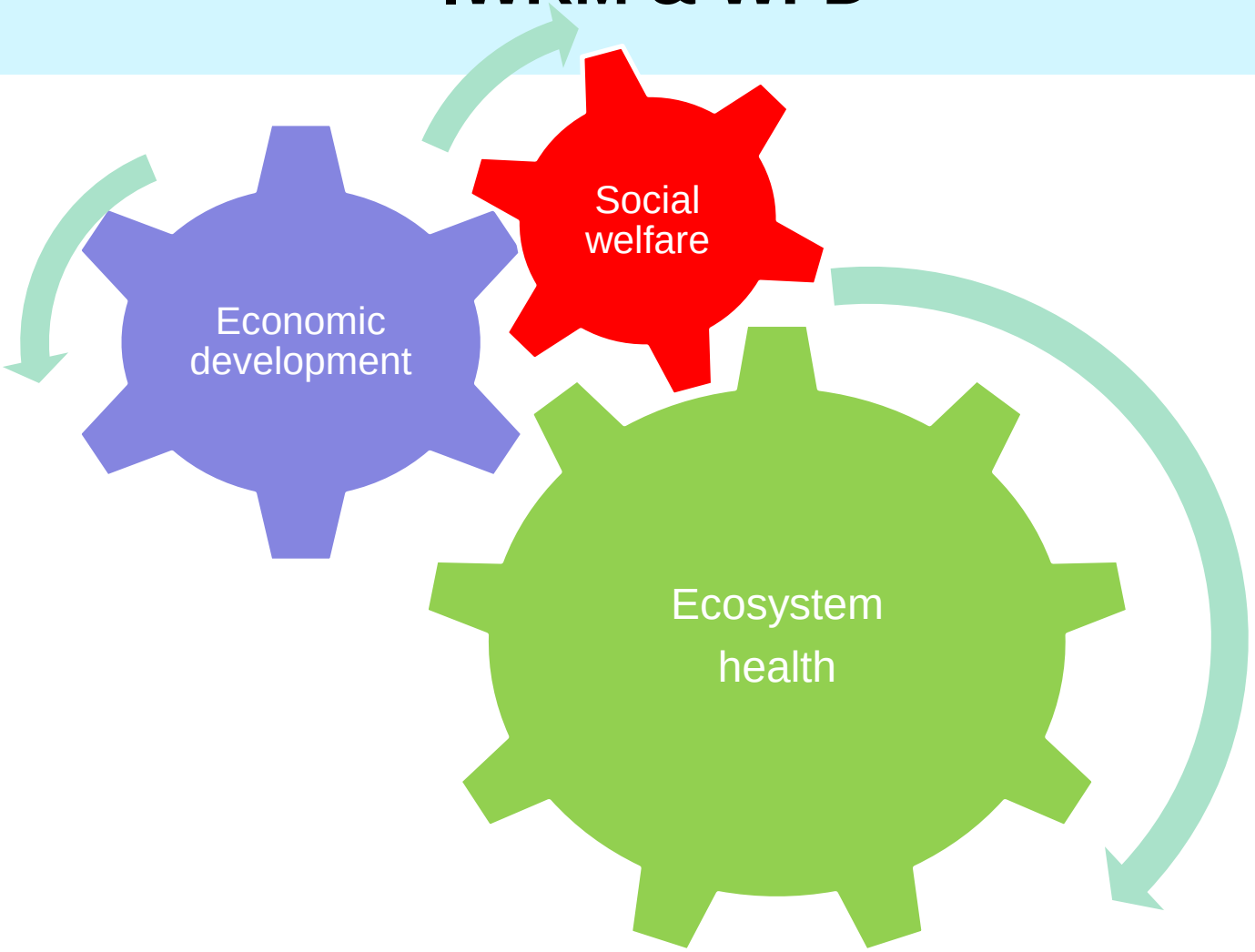
5% for industry
1% recreational



1 Mha. irrigated with GW

Value of GW irrigation production: 4,700 Meur (30% of overall)

IWRM & WFD



Good status of all waters by 2015

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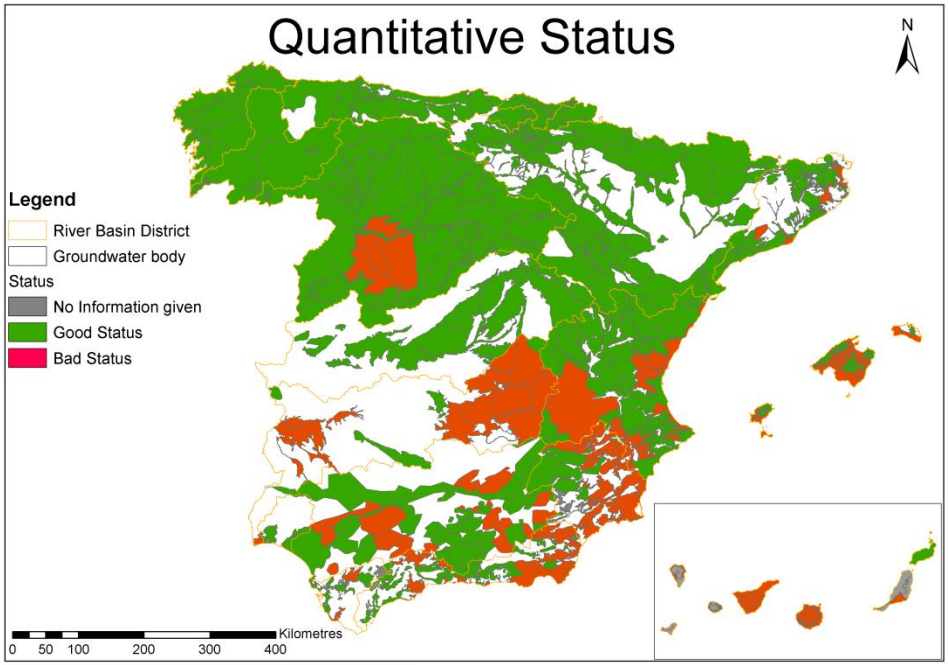
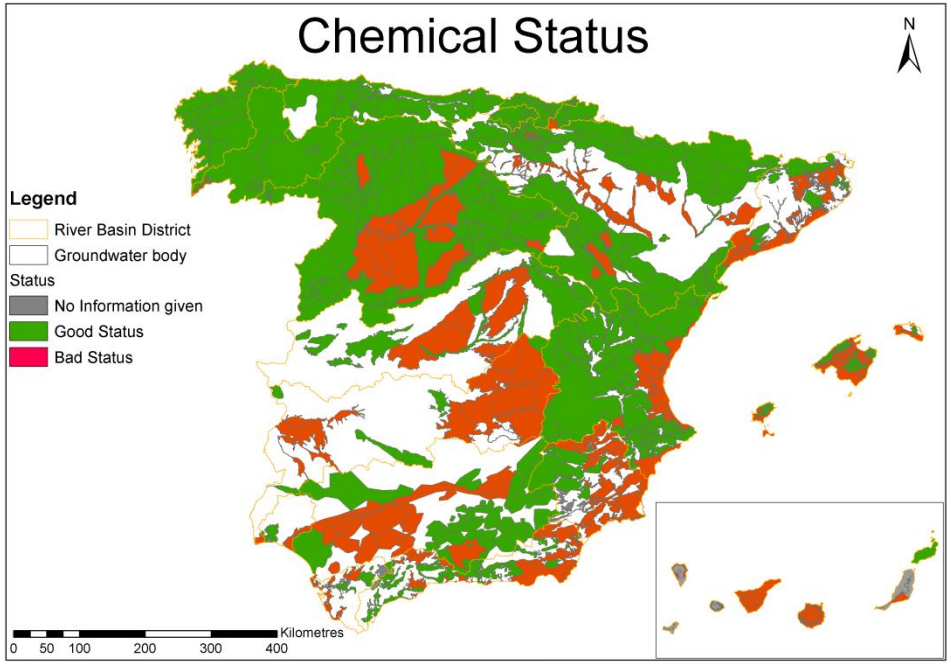
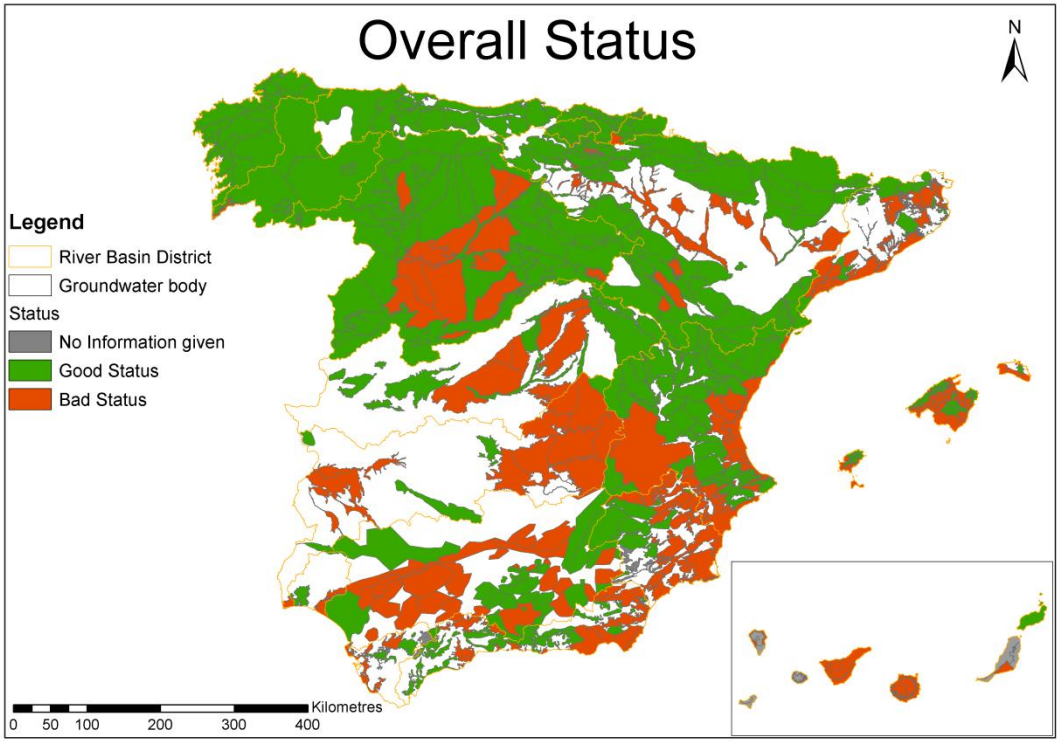
Quantitative Status



Chemical Status



Overall Status



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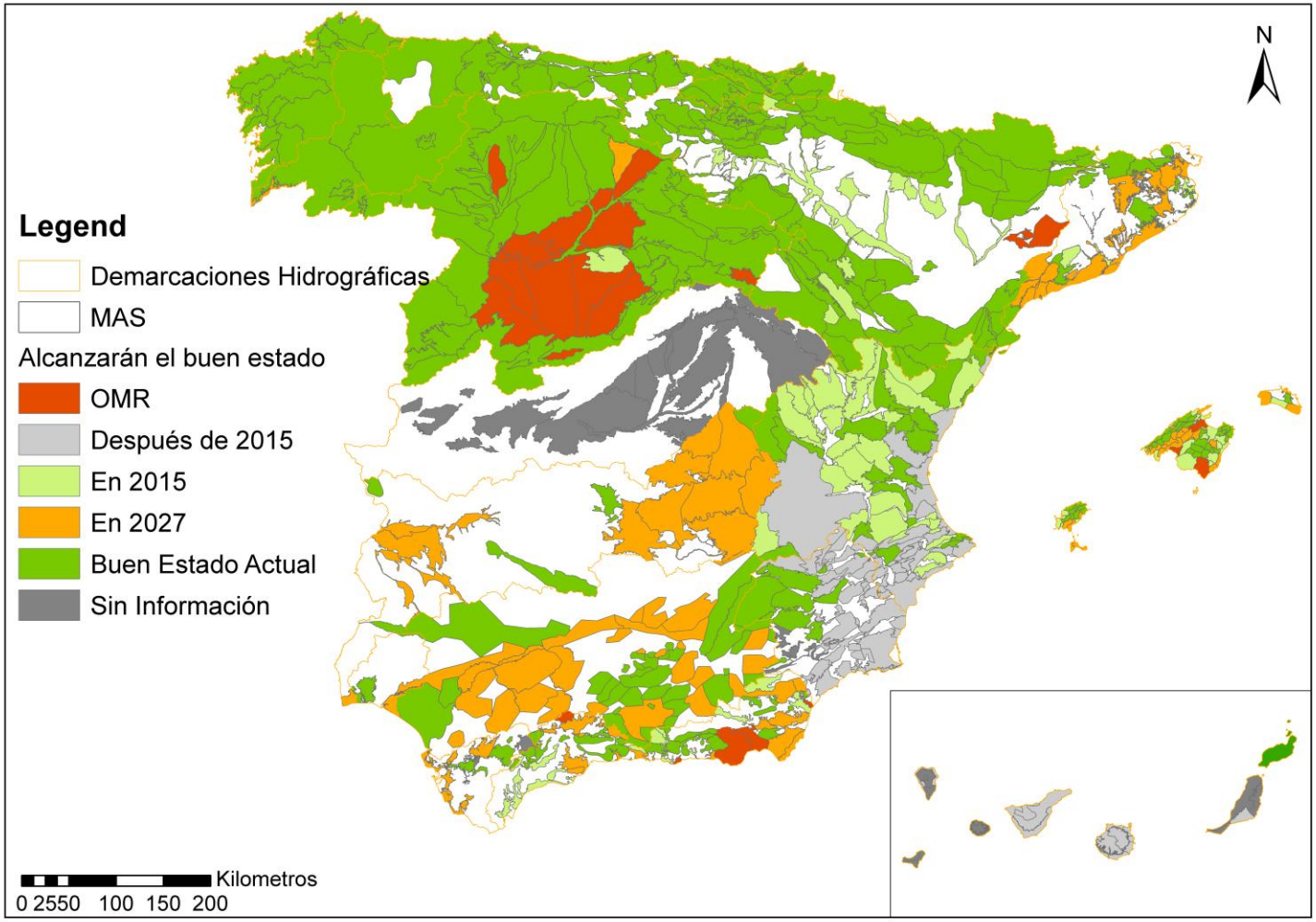
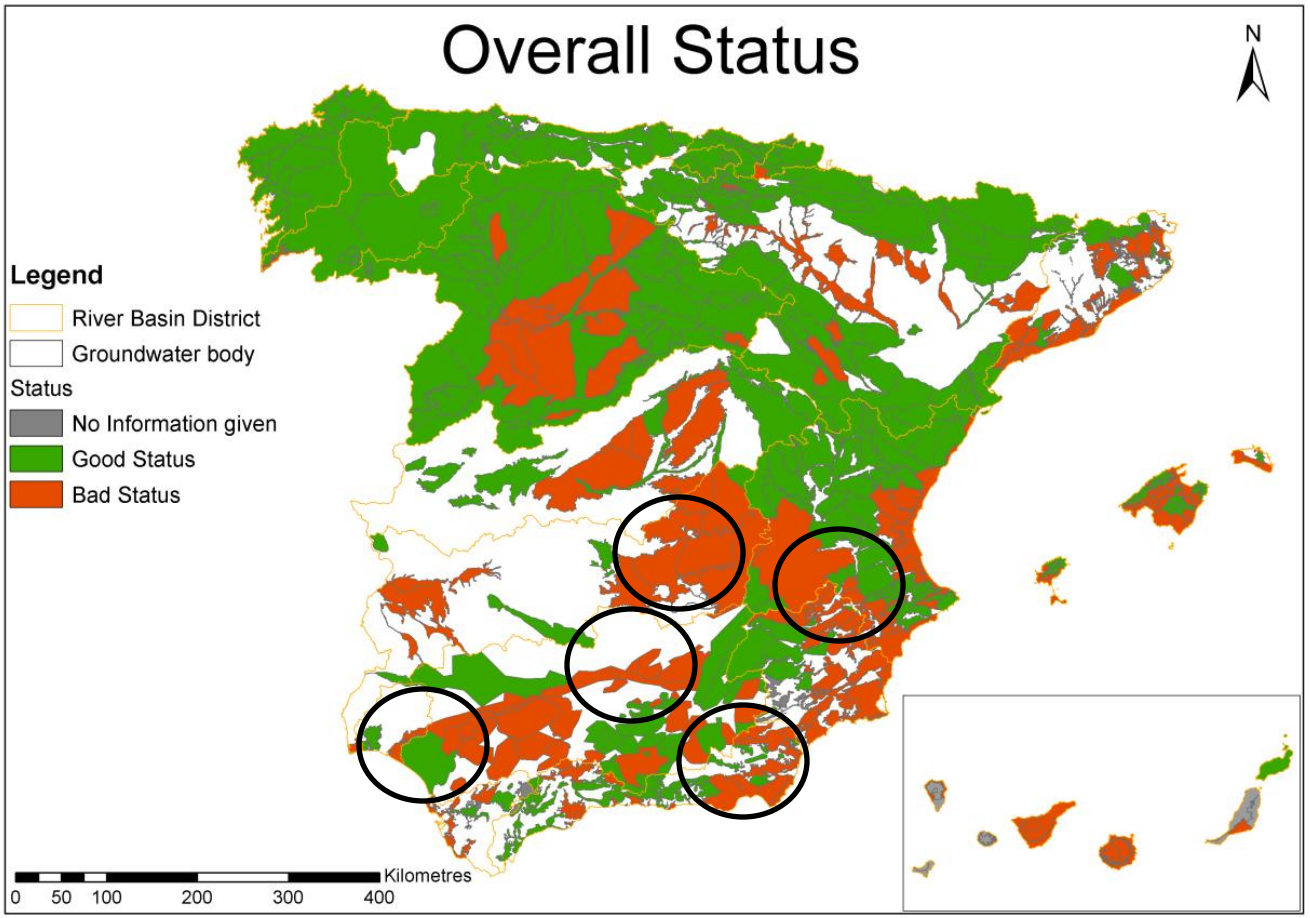
Environmental objectives



Hotspots



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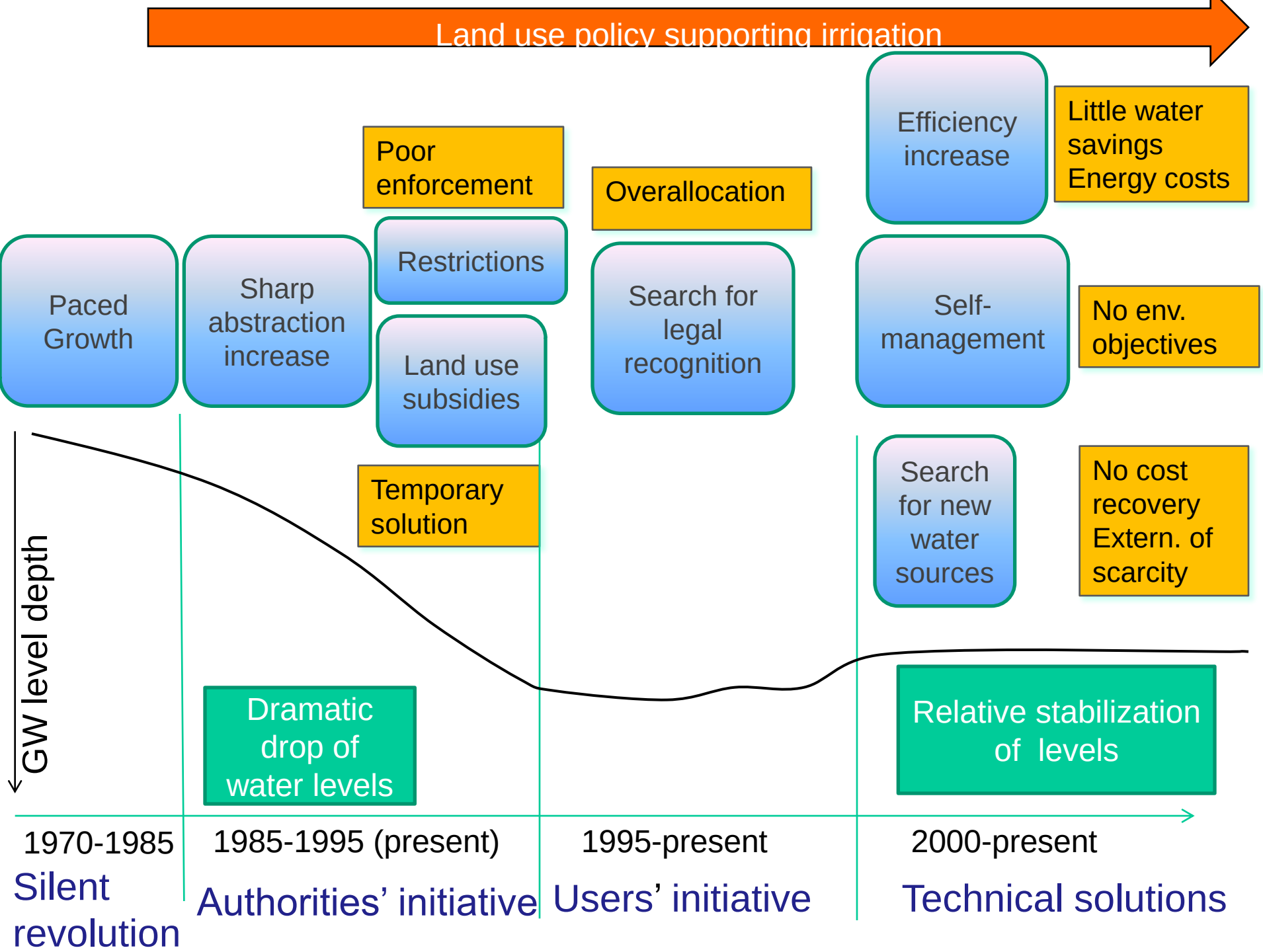
	Sierra de Crevillente	W. La Mancha	Almería	Doñana	Úbeda
Collective action	√	√	√	√	√
Conjunctive use	√	X (no surface water)	√	X (no surface water)	Requested
Water efficiency	√	√	√	√	√
Legal pitfalls	?	Unlicensed wells	Unlicensed wells	Unlicensed wells & land use	Unlicensed wells
External resources	√	√	Requested	Requested	X
Unconventional resources	X	X	√	X	X
Cost-recovery	X	X	X	X	X
Land use policy	Favors irrigation	Favors irrigation	Favors irrigation	Favors irrigation	Favors irrigation


Land use policy supporting irrigation
Paced Growth
Sharp abstraction increase
Poor enforcement
Restrictions
Land use subsidies
Temporary solution
Overallocation
Search for legal recognition
Efficiency increase
Little water savings Energy costs
Self-management
No env. objectives
Search for new water sources
No cost recovery Extern. of scarcity
GW level depth
Dramatic drop of water levels
Relative stabilization of levels
1970-1985
1985-1995 (present)
1995-present
2000-present
Silent revolution
Authorities' initiative
Users' initiative
Technical solutions

Unsolved issues

Mantainance of GW irrigation

BUT

- No durable solutions to environmental impact due to water table drop
- No solutions to quality degradation
- Little, if any, focus on land use policy
- High public spending

"Decision makers will prefer a probabilistic loss to a certain loss"

(Feitelson, 2005)

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Concluding Remarks

EU WFD distant from what is actually happening on the ground

- Socio-economic considerations prevail
- Water users have other priorities and concerns (markets, subsidies…)
- Problems (and solutions) rooted outside the water sphere
- Legal issues complicate the picture
- Technical solutions externalize costs and may put additional pressure on the environment

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Concluding Remarks

- Collective action by users and co-management make water use more rational but not necessarily more environmentally sustainable: what is the incentive for it?

To decrease pressure on GW:

- Market forces, subsidy policies and energy prices are likely to affect the viability of some low-value crops
- For cash crops, complementing GW with other sources BUT with cost recovery from users
- Transparency & accountability about public spending and who pays for what

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Thank you for your attention

Sierra de Crevillente

- 9000 has.
- Max depth GW levels: 400-500m
- Drops of 10m/yr
- High-value crop: 12,000 (€/ha)
- GW quality degradation
- Surface water transfer

Doñana

- 5800 ha.
- WAP: 11 €/m^3
- GW quality degradation
- Public land occupation
- Request for surface water

Úbeda

- 27000 ha.
- Max depth GW levels: 100-300m
- Small production margins

Almería

- 28000 ha
- Max depth GW levels: 100-300m
- Sea water intrustion
- Alternative water sources