

# Management and control of Albufera wetland

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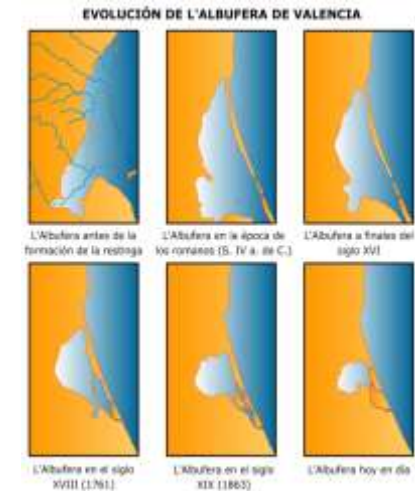


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# L'Albufera, its origin

- A wetland heavily modified by man:
  - Originally an open sea bay.
  - Transformation: from seawater to freshwater.
  - Silting process (XIX-XX), accelerated by man.
- Currently:
  - 19.200 ha of rice fields and 2.800 ha of lake.



Gates on the canals

# Environmental crisis in the 70's



Industrial development



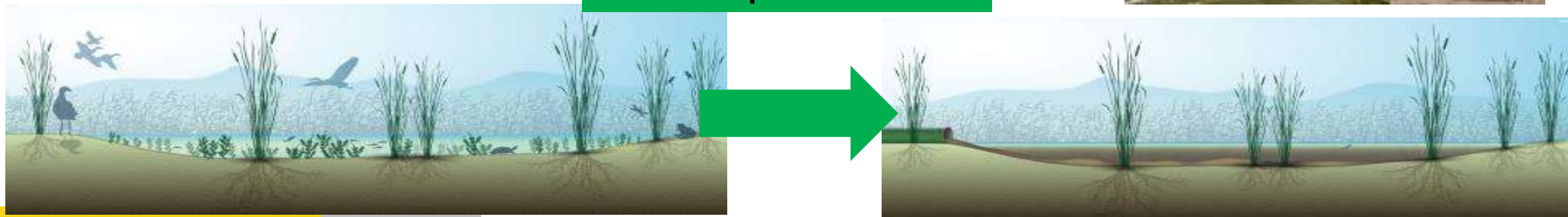
Urban growth



Changing agricultural practices

- Great changes in the quality of the water
- Reduction of habitats
- Loss of biodiversity

Eutrophication



# l'Albufera, protected environment

- Declared Natural Park in 1986.
- Ramsar site since 1989 (wetland of international importance).
- Subject to the regulations of the European Union: Water Framework Directive, Habitat and Birds Directives.
- Natural area included in the Natura 2000 network.

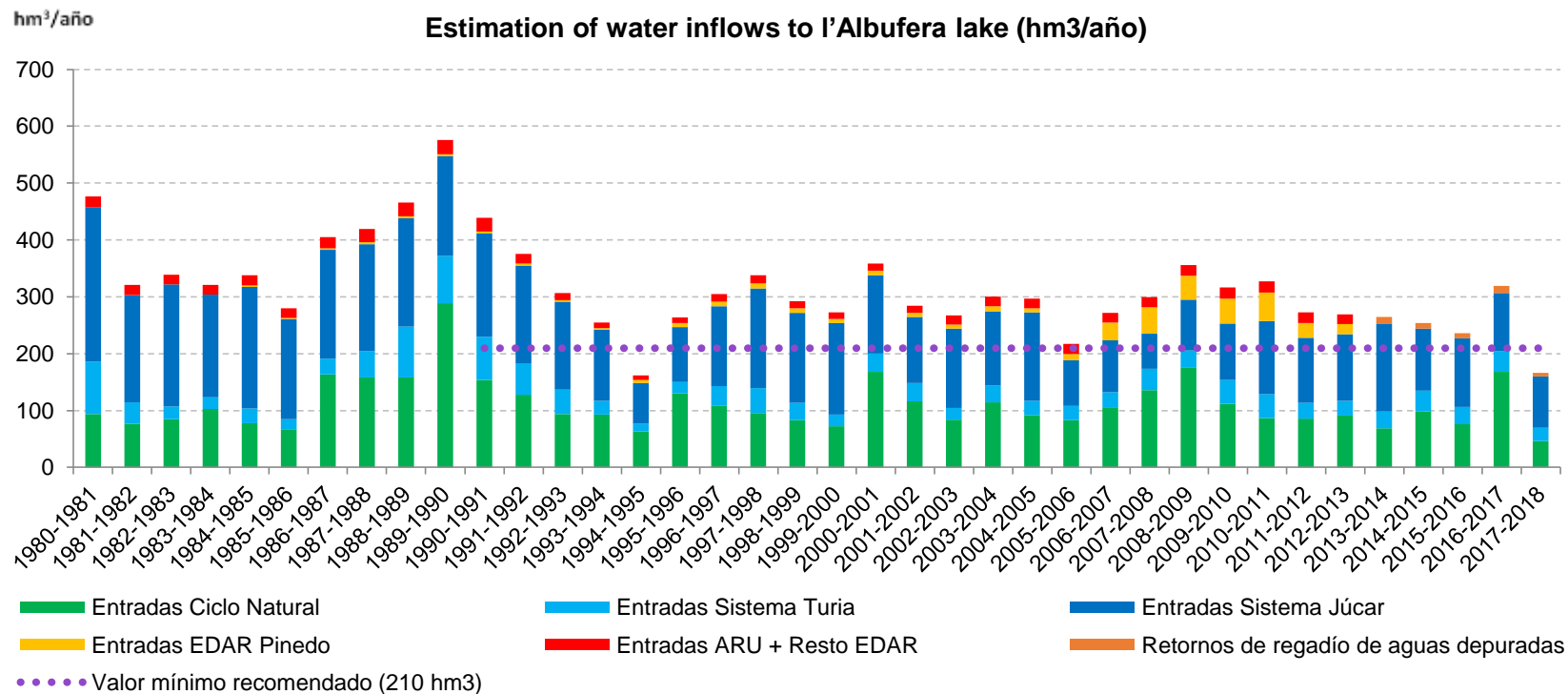
**The current ecological status is far from its optimum**

What is being done?



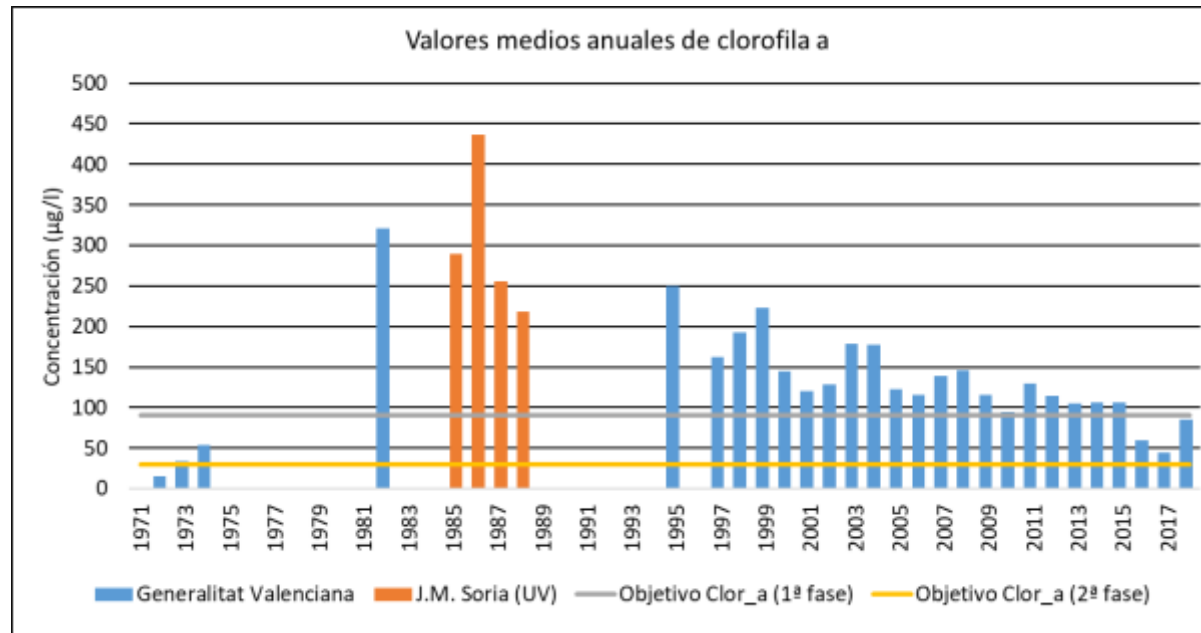
# Minimum water requirements

- The minimum water requirements of the lake are set at 210 hm<sup>3</sup> / year (percentile 90% of the inflows to the lake) in the Júcar River Basin Management Plan (RBMP) approved by RD 1/2016.



# Achieving good ecological potential

- Environmental objectives are established for Chlorophyll a: 90  $\mu\text{g} / \text{l}$  in 2021 and 30  $\mu\text{g} / \text{l}$  in 2027 in the Júcar RBMP.

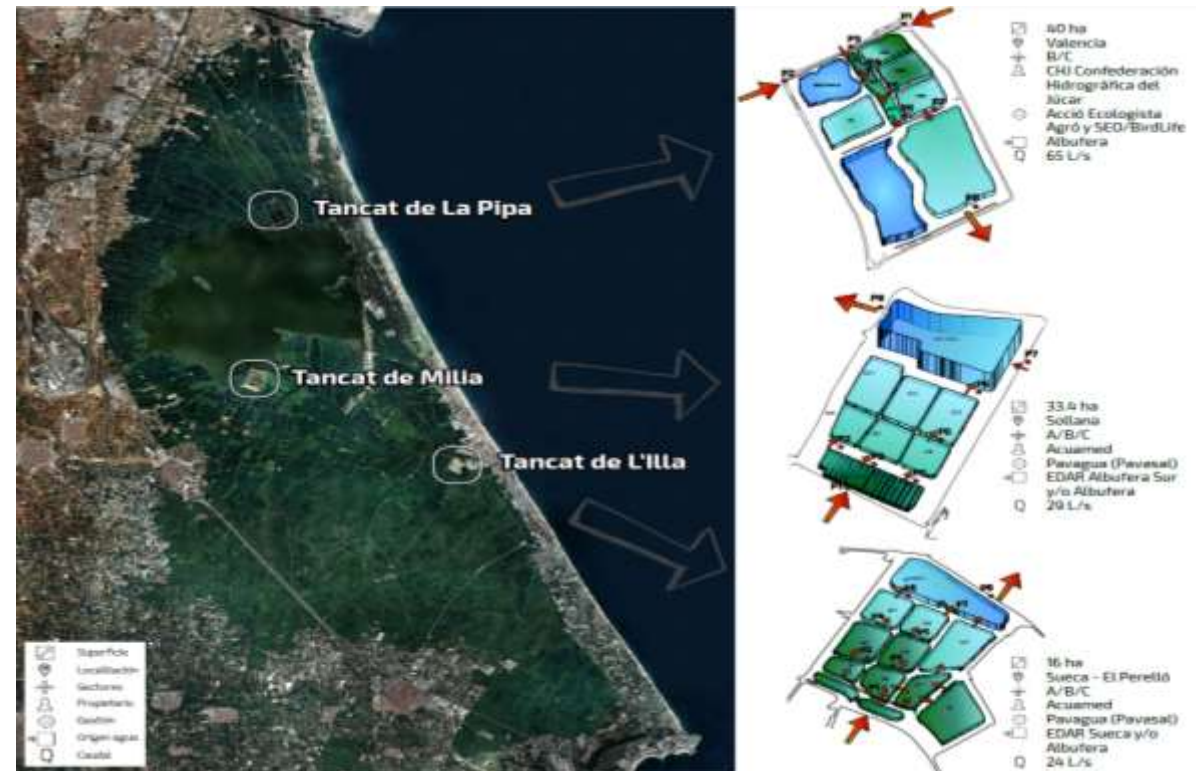


Evolution of annual average of Chlorophyll\_a concentration. Source: G.V & J.M. Soria



# Other Measures

- Control of external loads: improvements in the water sanitation and waste water treatment system.
- Good agriculture practices: reduction of nutrients (mainly P) in irrigation water returns.
- Control of internal loads: water treatment by constructed wetlands.



# Constructed wetlands

- Several functions:
  - improve water quality,
  - restore lost habitats and enhancing biodiversity;
  - provide space for public use.



# Albufera Special Plan

- Júcar River Basin Management Plan (RBMP) approved by RD 1/2016 establishes:
  - *“For the specific case of Albufera lake water body, the public administrations with competences in managing this wetland, will boost the development of a special plan to achieve the environmental objectives established for the wetland”.*
- The Albufera Special Plan has been elaborated with the agreement of the 3 administrations (national, regional and local) with competences in the Albufera wetland.



# Albufera Special Plan: Measures

- Measures to achieve environmental objectives have been divided in six different types:

	Types of Measures
<b>A</b>	Water management: Inflows increase
<b>B</b>	Sanitation and water treatment
<b>C</b>	Improvement in farming practices (diffuse pollution reduction)
<b>D</b>	Improving the environmental status
<b>E</b>	Governance
<b>F</b>	Control and monitoring



# Control and monitoring

## What for?

- To know if the general WFD environmental objectives (good status) are being achieved
- To know if the specific environmental objectives for the lake are being achieved:
  - Eutrophication reduction: (Clor\_a) 90 µg/l in 2021 and 30 µg/l in 2027.
  - Minimum water requirements: 210 Hm<sup>3</sup>/year
- To know about measure effects



# Control and monitoring

## Water quality control in the lake:



## Main control parameters of water quality:

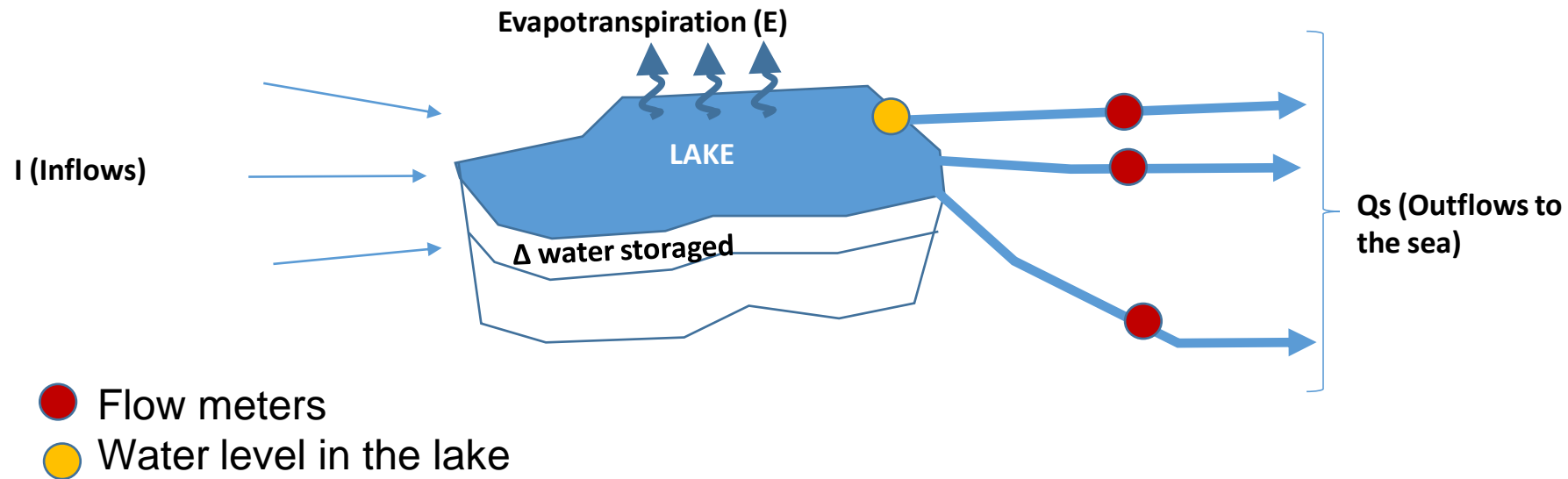
- In situ parameters (Secchi disc, Temp, O<sub>2</sub>, Electric conductivity, pH, Cl<sub>a</sub>)
- Other parameters (TP, TN, NO<sub>3</sub>, PO<sub>4</sub>, Chlorides)
- Chemical parameters (annex IV RD 817/2015)

Code	Water quality control point	Coefficient
JU07220026	(A) Punta de Llebeig	0,24
JU07220027	(B) Mata del Fang	0,40
JU07220028	(C) Mata de Sant Roc	0,20
JU07470030	(D) Tancat de Sacarés	0,16



# Control and monitoring

- **Water quantity control:** The inflows to the lake have been estimated using a water balance model developed by Júcar RBA and Universitat Politècnica de València with data from the control monitoring network.



$$\text{Water balance equation: } I = Qs + E + \Delta\text{water}$$



# Conclusions

- L'Albufera de Valencia stands out for its uniqueness in terms of environmental importance, great links with the cultivation of rice and existence of different administrations with competence in management.
- It requires:
  - Coordination between administrations: Albufera Special Plan (AEP)
  - Control and adequate monitoring.
  - A program of measures to recover the wetland. The AEP will be included in the RBMP update (year 2021).



Thank you for your attention



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