



Integrated management of three constructed wetlands in compliance with Water Framework, Birds and Habitats Directives LIFE12 ENV/ES/000685 ALBUFERA

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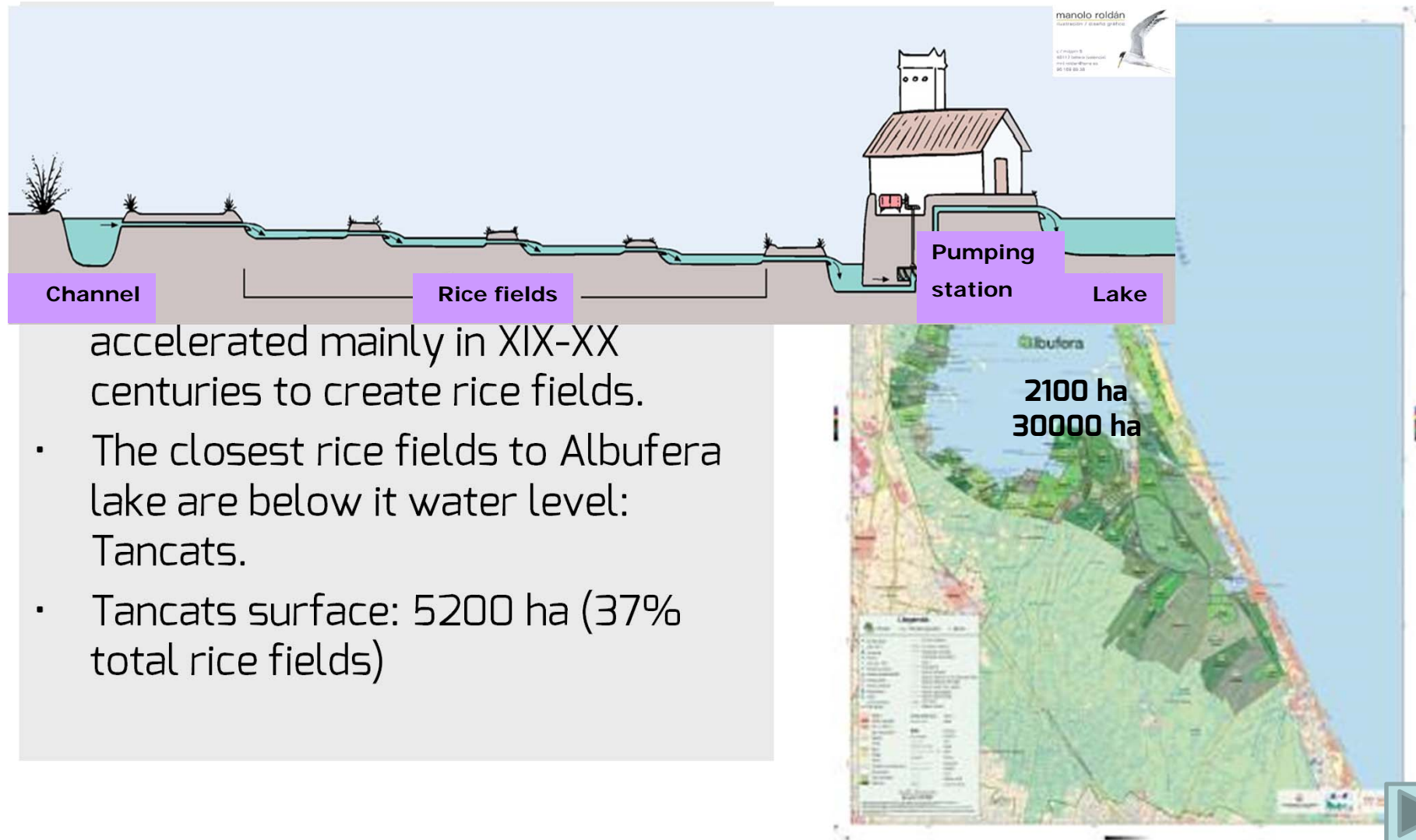


Introduction: L'Albufera de València

- Albufera lake was originally a coastal lagoon of 30000 ha that was isolated and subsequently, naturally (eroded soils) and artificially, filled.
- The natural fiilling processes were accelerated mainly in XIX-XX centuries to create rice fields.
- The closest rice fields to Albufera lake are below it water level: Tancats.
- Tancats surface: 5200 ha (37% total rice fields)



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Background. Previous studies.

- Previous studies in *CW Tancat de la Pipa* 2009-12 (Martin et al., 2013; Rodrigo et al., 2013).
 - Oral presentation of some results by Nuria Oliver next Thursday (Wetland processes and metabolism: from functioning to functions (3) –Auditorium - 10:00 h).
- Key points:
 - Water quality is improved: nitrogen, phosphorus, total suspended solids are reduced.
 - Phytoplankton and zooplankton enhances its biodiversity.
 - Submerged vegetation in shallow lagoons could be recovered.
 - Birds population is increased: the Tancat is a refuge.
- But...Fundamental issue: how affect the water quality to wildlife development and how affect the wildlife over the water quality?



Background

- In other words – translation to Environmental Engineering: How design and operate a CW to maximize simultaneously the water treatment efficiency and the habitats restoration.
- Unfortunately, we had:
 - Three CWs in L'Albufera (but without-little relationship among them).
 - Two public authorities interested in that CWs work.
 - Social and environmental organizations also interested.
 - Research centers (universities) interested in increase the knowledge.



LIFE12 ALBUFERA: Basic data

- Proposal presented in september 2012.
- Environment Policy and Governance
- Total Budget: 1 446 234.00 €
- EU cofinance: 50%
- Starting date: 01/10/2013
- Ending date: 30/09/2016
- Sites: Constructed Wetlands in L'Albufera Natural Park



Participants

Beneficiaries:

- Coordinating: Universitat Politècnica de València (IIAMA).
- Associated (1): Acció Ecologista-Agró.
- Associated (2): Fundación Global Nature.
- Associated (3): Sociedad Española de Ornitología, SEO/BirdLife.

Cofinancers:

- Confederación Hidrográfica del Júcar (CHJ).
- Aguas de las Cuencas Mediterráneas (ACUAMED).

Subcontractors:

- Universitat de València.



UNIVERSITAT
POLITÀCNICA
DE VALÈNCIA



Instituto de Ingeniería del
Agua y Medio Ambiente (IIAMA)

- Technical University in Valencia Region (1971): Civil , Agricultural, Industrial, Chemical... Engineering, Architecture, Business Administration and Fine Arts.
- 36.800 students; 2.600 teachers and researchers; 1.700 administration personnel.
- Research Institutes: Instituto de Ingeniería del Agua y del Medioambiente (IIAMA, 2001).





Acció Ecologista-Agró

- Environmental Non Profit Organization (1983).
- Regional scope of activity.
- Public participation in environmental problems.
- Environmental education.
- Management of Natura 2000 sites.
- Environmental volunteers.
- Development of land stewardship agreements. **TANCAT DE LA PIPA**
- Collaboration in environmental projects: LIFE Trachemys, LIFE Seducción Ambiental.





Fundación Global Nature

- Environmental Non Profit Organization (1993).
- National and International activity.
- Environmental education.
- Development of land stewardship agreements.
- Wetlands restoration and management.
- Constructed Wetlands: *TANCAT DE MILIA* and *TANCAT DE L'ILLA*.
- Management of Natura 2000 sites.
- Partner of Living Lakes international Network.
- National and European Environment, Nature, Information LIFE projects.



Laguna de Boada (Palencia)



Humedal artificial del Tancat de Milia (Valencia)

- Environmental Non Profit Organization (1954).
- National and International scope of activity.
- Bird protection and study.
- Biodiversity conservation.
- Environmental education.
- Environmental volunteers.
- Development of land stewardship agreements (around 25.000 ha in Spain). **TANCAT DE LA PIPA**
- Partner of BirdLife International.
- National, international and LIFE projects.





Confederación Hidrográfica del Júcar



- Competent authority in River Júcar basin district.
- Responsible of application of WFD (2000) rules.
- Water quality control.
- Water resources management.
- Distribution of resources amongst water users.
- Support to water projects and studies.
- The Tancat de la Pipa belong to CHJ.





ACUAMED



GOBIERNO
DE ESPAÑA

MINISTERIO
DE AGRICULTURA, ALIMENTACIÓN
Y MEDIO AMBIENTE

- Public entity to develop water projects and hydraulic works in spanish mediterranean area.
- Increasing water resources (desalination).
- Improvement water management.
- Environmental restoration.
- The *Tancat de Milia* and *Tancat de L'Illa* belong to ACUAMED.

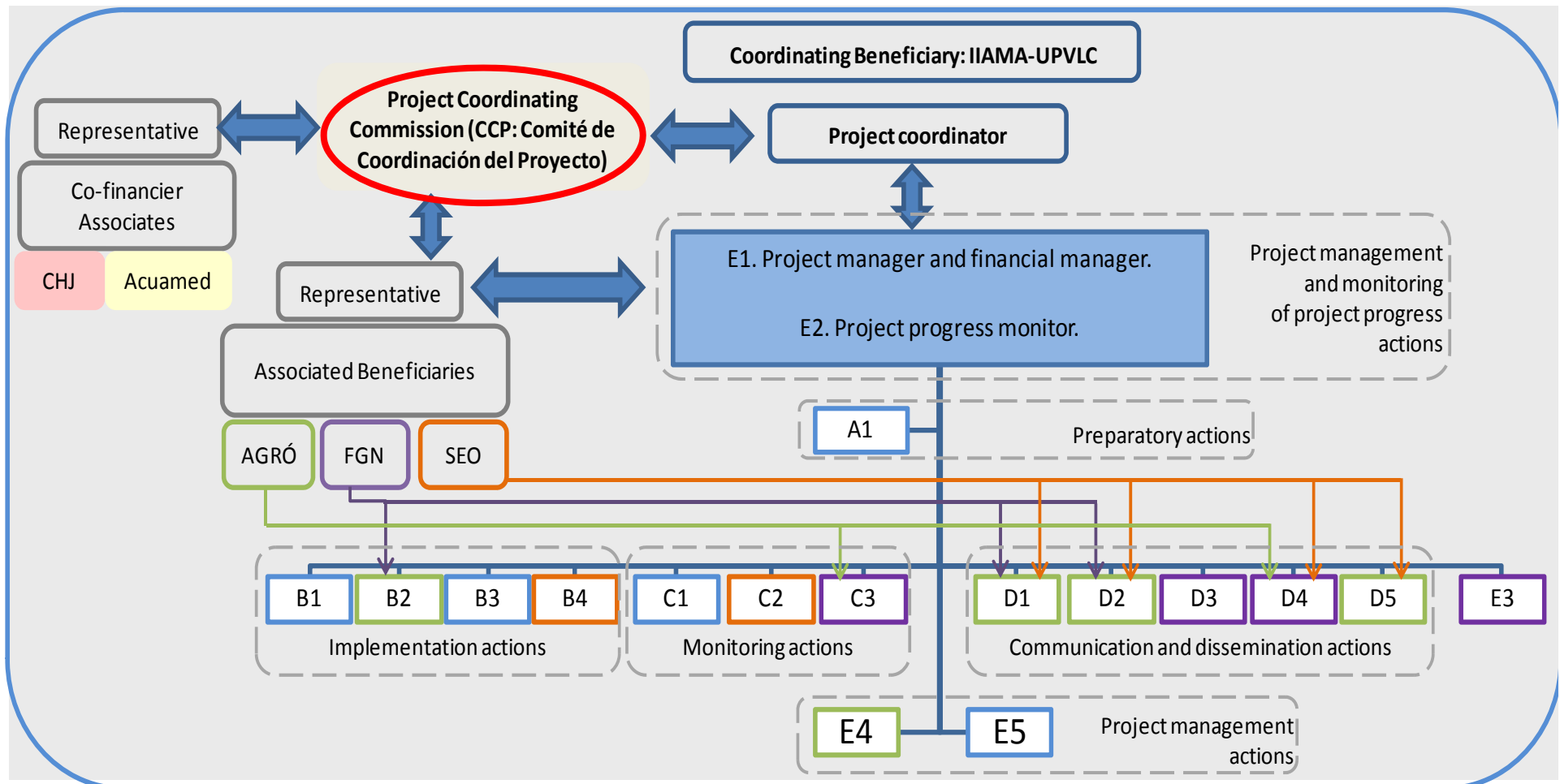


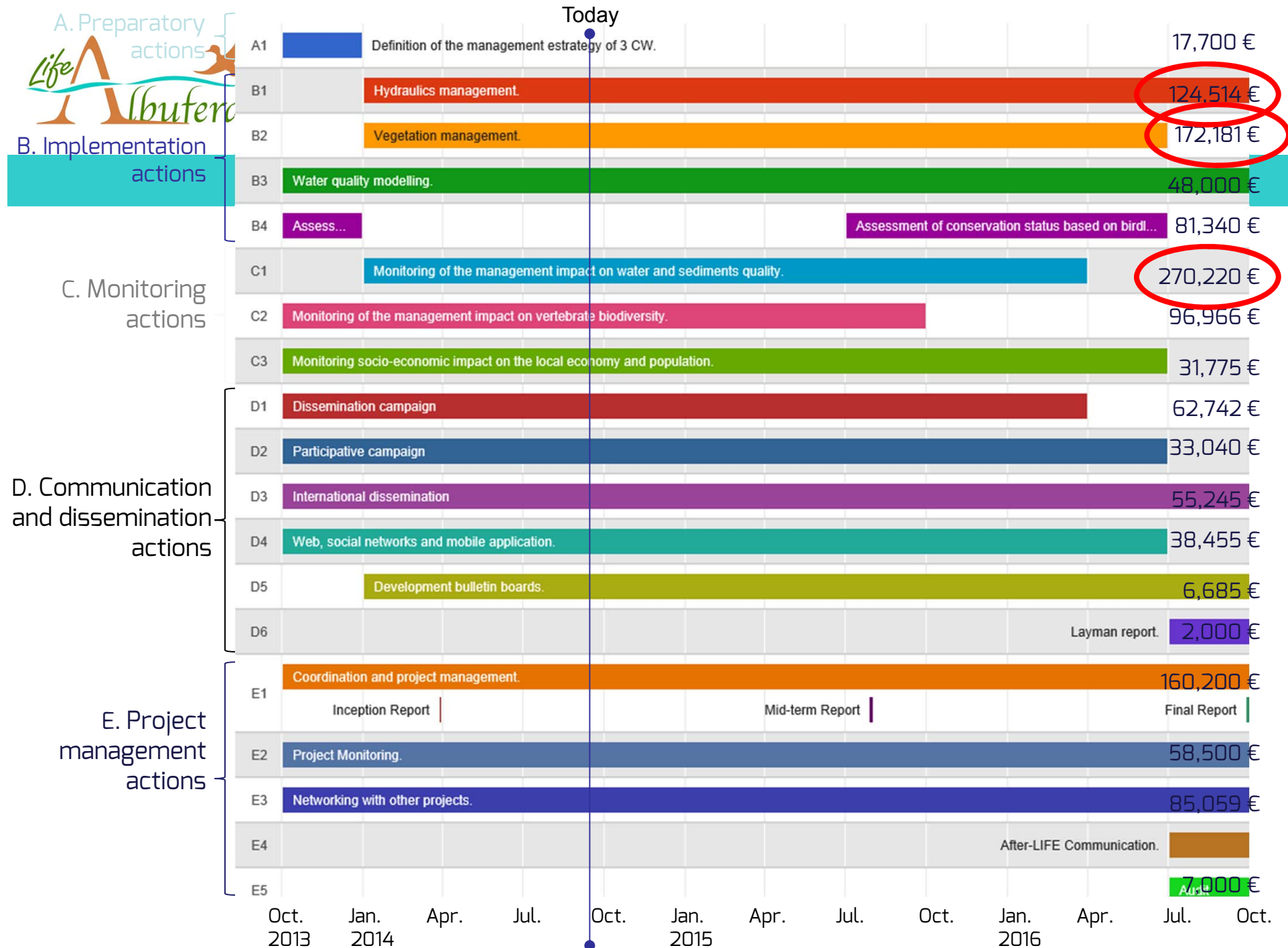


LIFE12 ALBUFERA Project Objectives

- Establishing the most adequate management rules in constructed wetlands in order to jointly optimise water quality and habitat and biodiversity improvement.
- Establishing a methodology to determine good status indicators for bird conservation to apply in other RN 2000 wetlands.
- Providing recommendations addressed to the administrations to set a basis in the development of management plans for RN 2000 areas and hydrological management plans.

Actions and responsables







A1 Action. Preparatory Action

- It is not mandatory but in our case it was a fundamental action:
 - The sites are working since 2009 (Pipa) or 2011 (L'Illa and Milia).
 - We need to know the results obtained (or not) to now.
- Objective: to define a management and monitoring strategy for two years: 2014-15.
- Three months: October 13 - December 13.
- Responsible: UPV. The project coordinator was involved in initial design (2006-2007) and management of the Tancats with their owners (ACUAMED and CHJ).



A1 Action. Preparatory Action

- Results- CWs Management strategy:
 - To establish the same Hydraulic Loading Rate for the three Tancats: $0.06 \text{ m}^3/\text{m}^2 \text{ d}$.
 - To establish different Hydraulic Retention Time (nominal):
 - Tancat de la Pipa: 3.3 days.
 - Tancat de Milia: 5.0 days.
 - Tancat de l'Illa: 6.7 days.
 - To establish the pumping frequency.
 - To establish the water quality sampling points.
 - The vegetation management (planting, harvesting, etc.)
 - The birdlife survey.
 - The ictioph fauna management.



Expected Results

- Improving water quality and biodiversity simultaneously.
 - Biodiversity includes: plankton, aquatic macroinvertebrates, amphibians, non-invasive fishes, birds.
- To define common indicators WQ-biodiversity related with hidraulic and vegetation management in CWs.
- Technical manuals: hidraulics, vegetation, water quality, wildlife...

How to do?

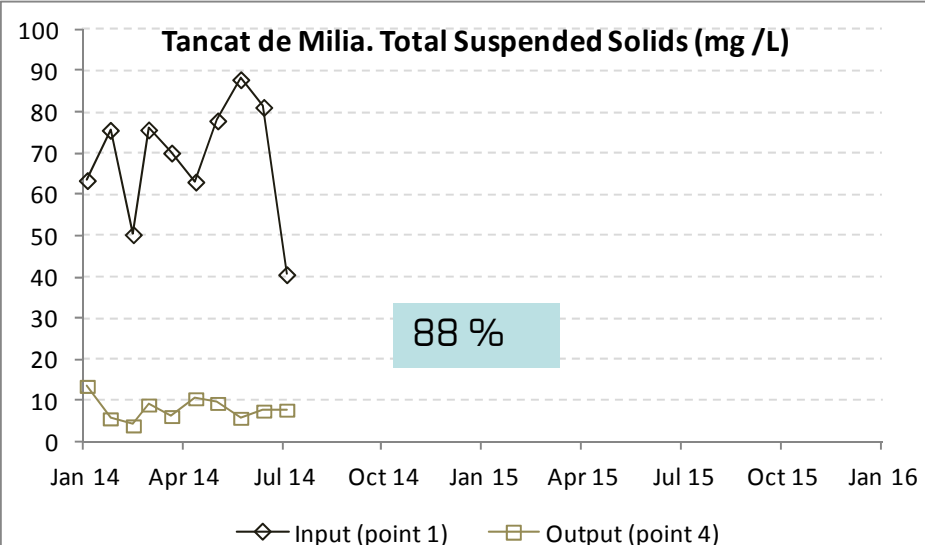
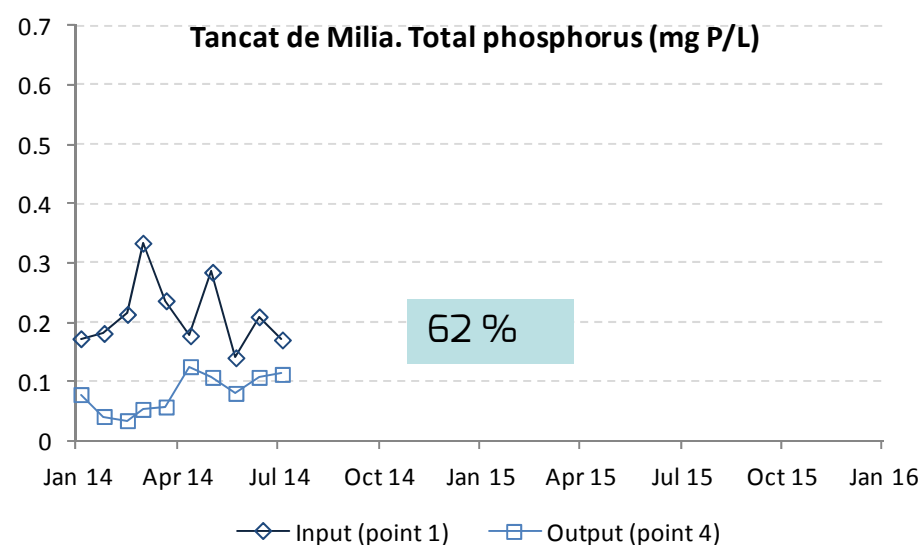
- Water Quality. Subsurface system in CWTancat de Milia



Total Inflow Jan-May 14:
370477 m³
74095 m³/month

HLR: 0.06 m³/m² d
HRT (nom): 4 days

- Water Quality. Subsurface system in CWTancat de Milia



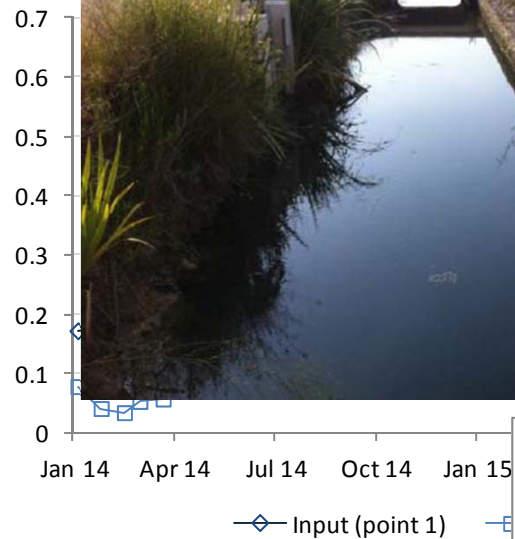
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First results

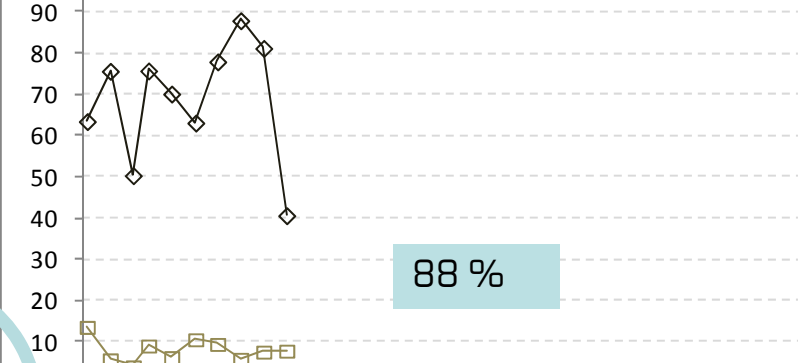
Output channel Sector A (points 2-3-4)



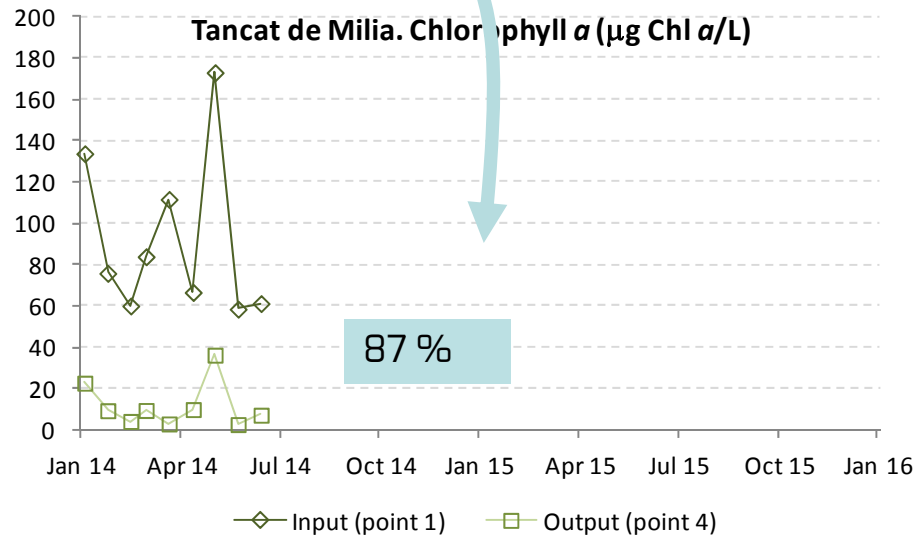
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Face system in CWTancat de Milia

Tancat de Milia. Total Suspended Solids (mg /L)



Tancat de Milia. Chlorophyll *a* (µg Chl *a*/L)



15 Apr 15 Jul 15 Oct 15 Jan 16

—□— Output (point 4)

HLR: 0.06 m³/m² d
HRT (nom): 4 days



EU LIFE development

We are going to finish the first year of our first LIFE.
It is early to make a deep analysis of EU LIFE program.

- Adequate assessment from external monitoring team.
- EU LIFE bring the opportunity to deep in technical aspects of wetlands but 50% cofinancing is low (in our case without the cofinancers the project would not have been possible)
- The burocracy is high (both LIFE and our institution).

After evaluation of Inception Report:

- Problems with timesheets: UPV has their own timesheets for CE projects but not accepted by LIFE.
- Recomendations to include more experimental data in web page.



Project development

- Administrative ¿Problems? ¿Difficulties?
 - Delays in some deliverables: mistakes in project proposal stage.
 - High personnel costs in the first two years: financial difficulties. The main actions are from October 2013 to December 2015.
 - Complexity in coordinating Tancats owners (ACUAMED and CHJ), Tanctas managers and LIFE participants.
 - Delays in payments from cofinancers.
- Technical problems:
 - Three different control flows and hydraulic operation.
 - Interactions revegetation and flows (need to dry one sector maintaining the flow in others).
 - Estimation of water leakage from sectors (they are unlined).

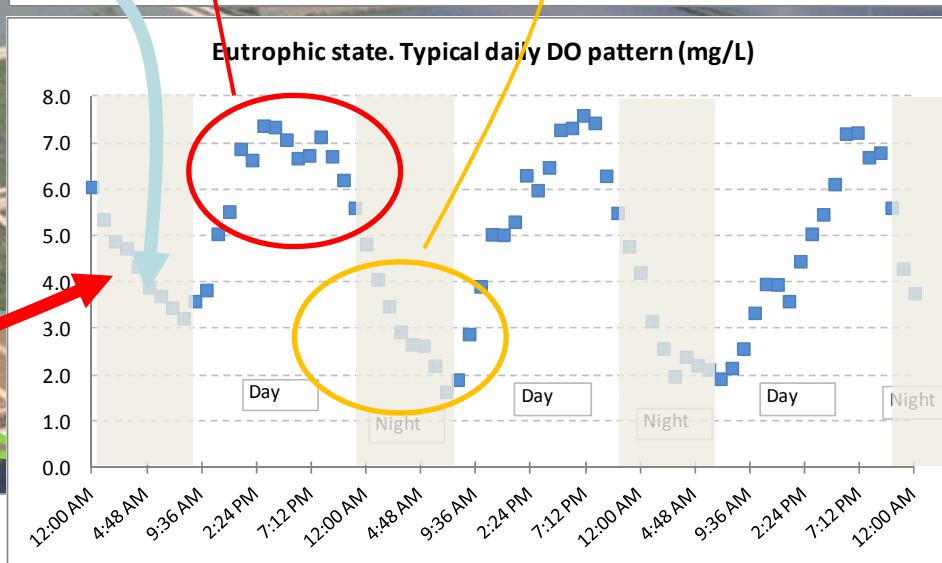
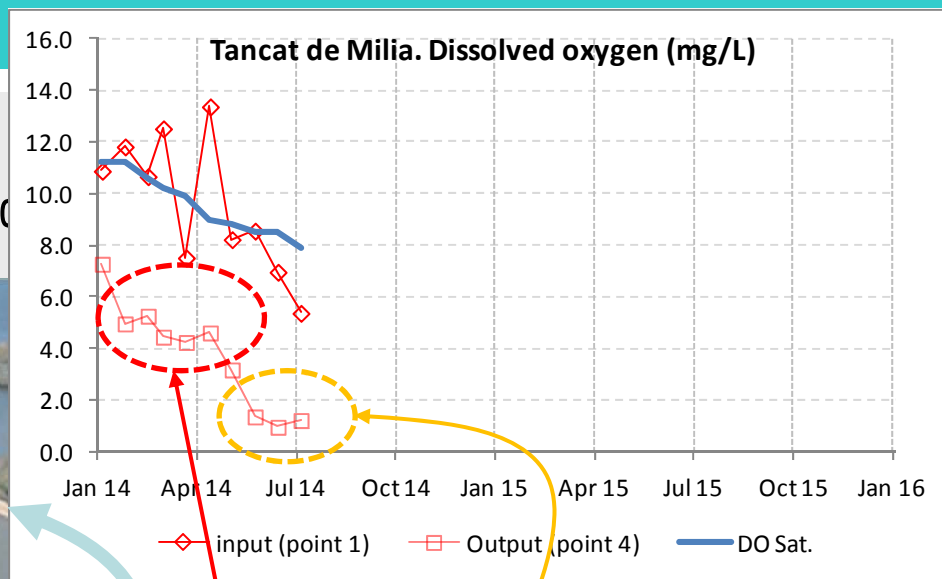


Water Management vs Enhancement Biodiversity

Changes in dissolved oxygen
concentration in Ouput channel Sector A



Water Management vs Enhancement Biodiversity



LIFE Albufera - L'Albufera x

www.lifealbufera.org/index.php/es/

HUMEDALES ARTIFICIALES EN L'ALBUFERA DE VALENCIA
RESERVAS NATURALES AL SERVICIO DE LA BIODIVERSIDAD Y LA CALIDAD DE LAS AGUAS

THANK YOU SO MUCH FOR YOUR ATTENTION!

SEE YOU SOON IN CW's OF L'ALBUFERA DE VALÈNCIA

CAMBIAR IDIOMA

ES EN CA

SÍGUENOS

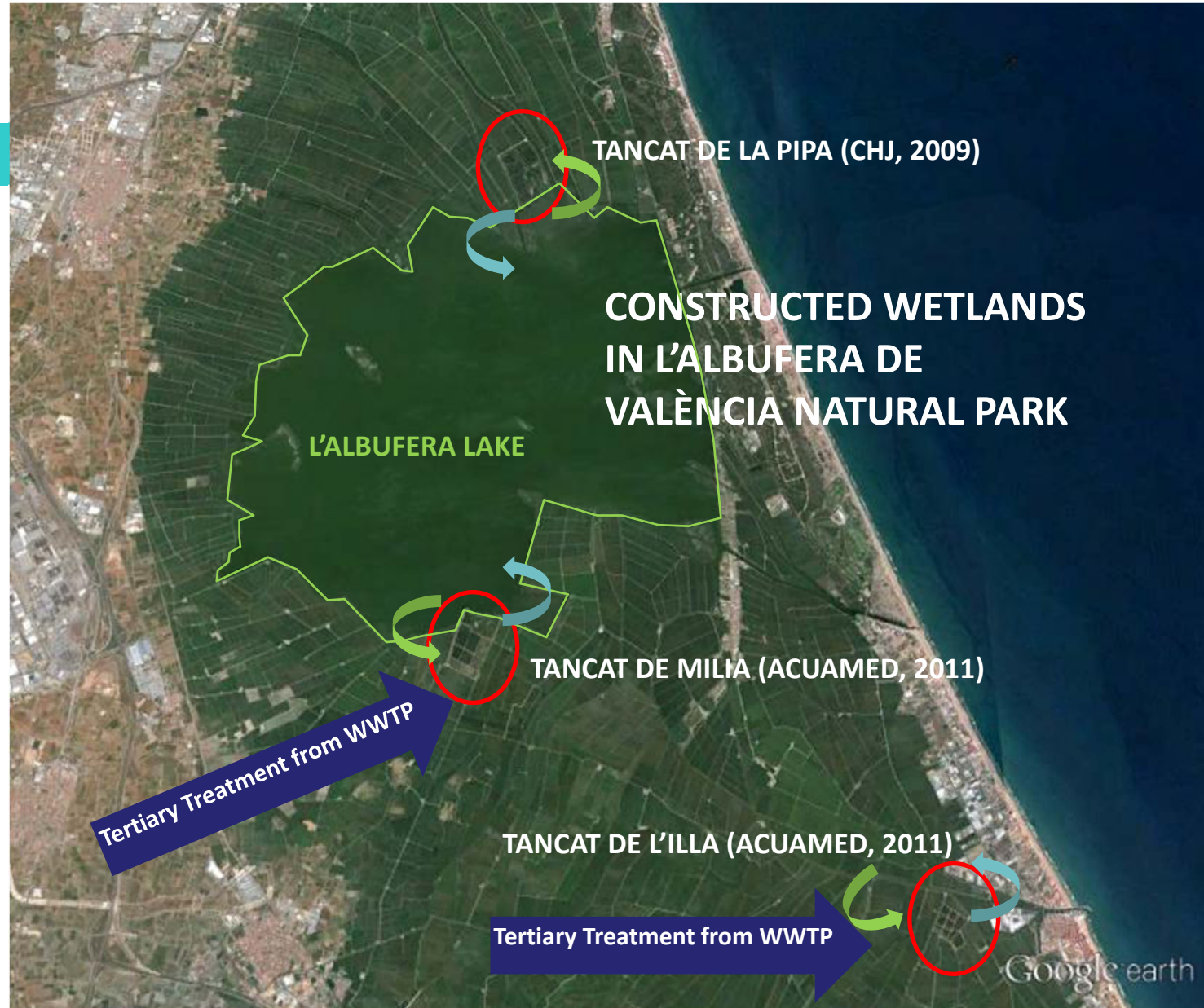
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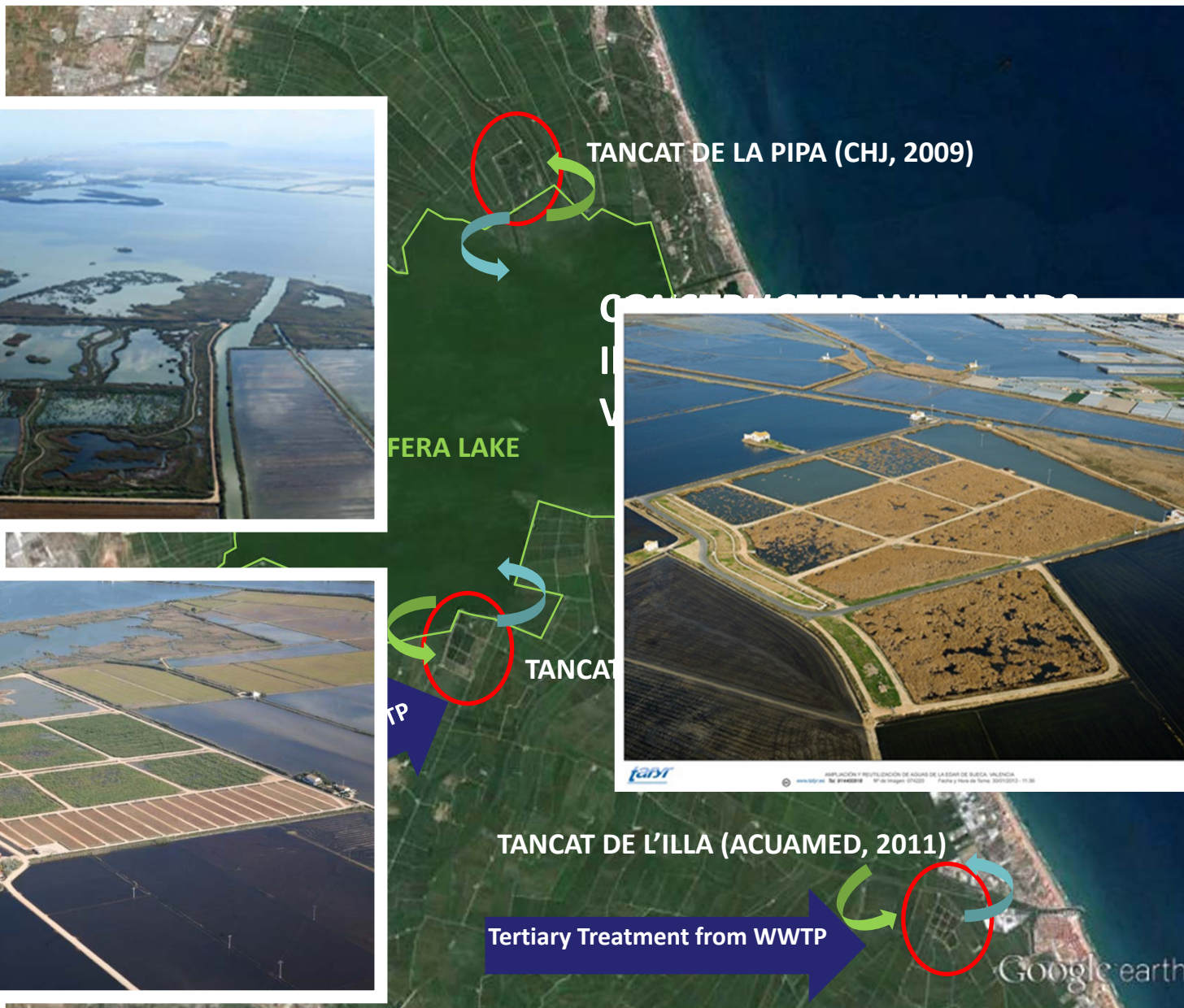
INFORMACIÓN

- » DATOS
- » NOTICIAS
- » AGENDA
- » FOTOS
- » PUBLICACIONES
- » DOCUMENTOS

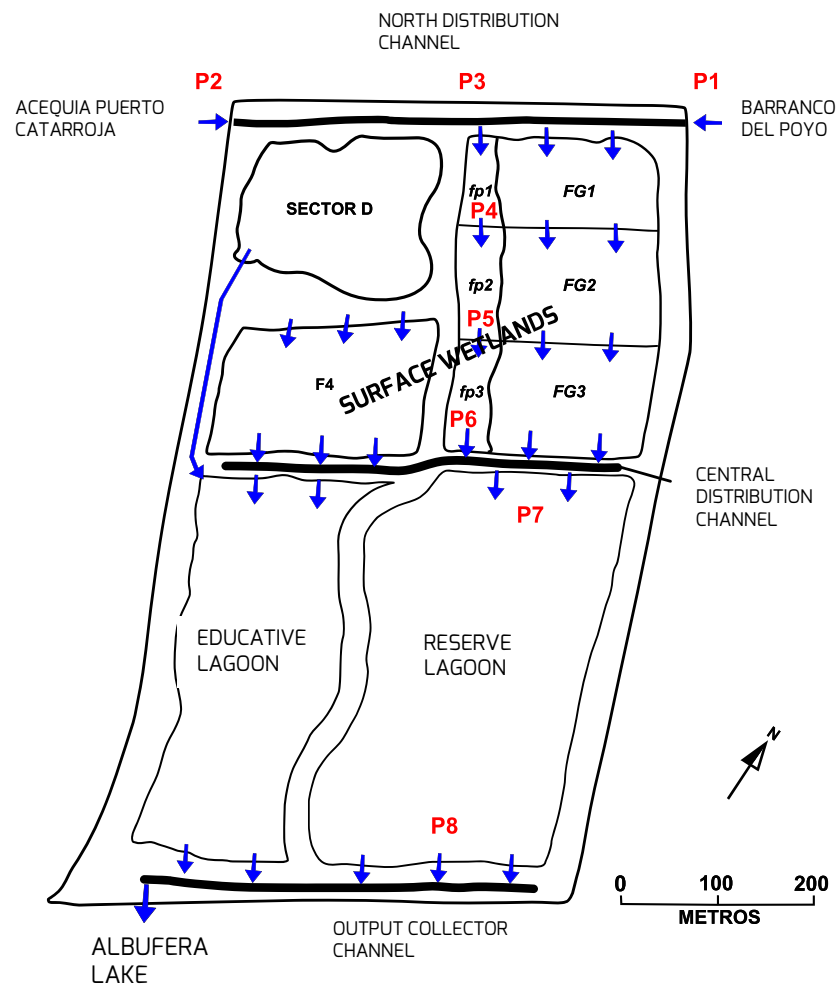
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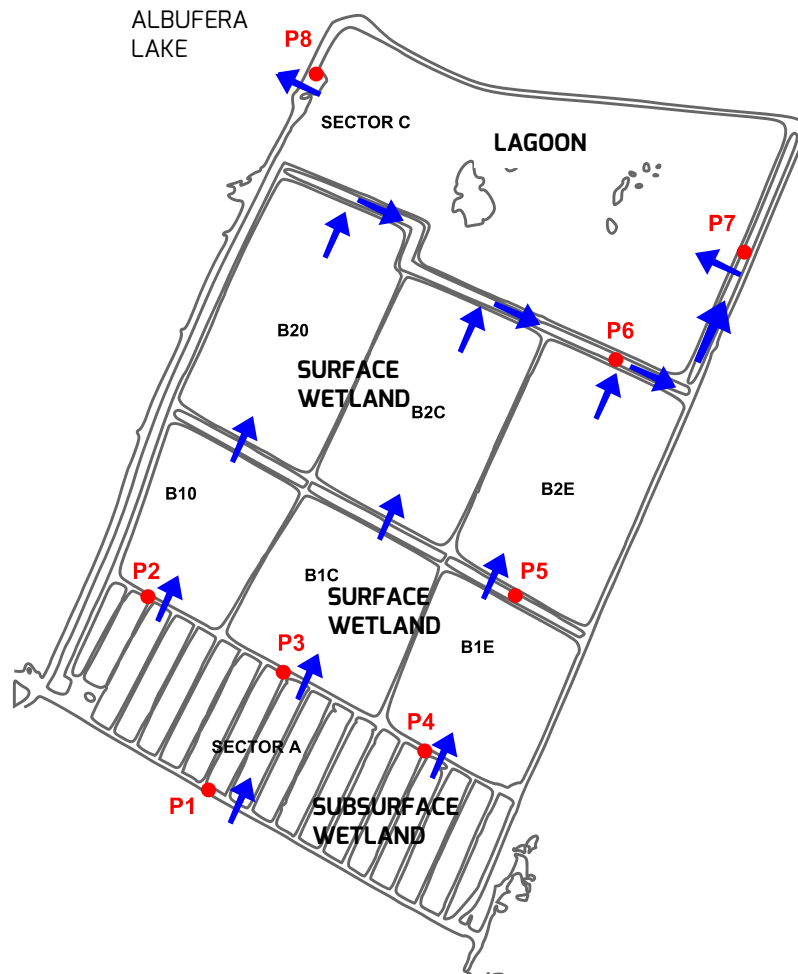
TANCAT DE LA PIPA



- 40 Ha surface.
- Continuous input flow by gravity from:
 - l'Albufera lake. Eutrophic waters.
- Intermitent output flow by pumping.
- P1 – P8 water sampling points.



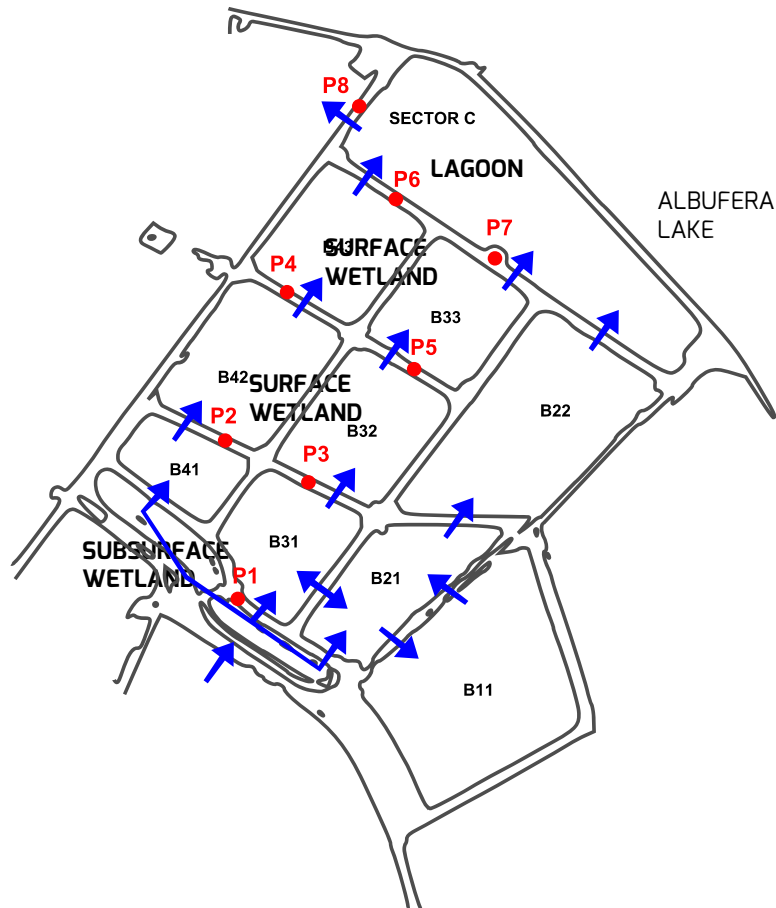
TANCAT DE MILIA



- 33.4 Ha surface.
- Intermittent (daily basis) input flow by pumping from:
 - l'Albufera lake. Eutrophic waters.
 - Albufera-Sur WWTP. Tertiary treatment.
- Intermittent (weekly basis) output flow by pumping.
- P1 – P8 water sampling points.



TANCAT ILLA



- 16 Ha surface.
- Intermittent (daily basis) inflow by pumping from:
 - l'Albufera lake. Eutrophic waters.
 - Sueca WWTP. Tertiary treatment.
- Intermittent (daily basis) output flow by gravity.
- P1 – P8 water sampling points.

