

# ASSESSING KEY PARAMETERS OF PRODUCTIVITY FOR A NON-LAND-DEPENDENT SYSTEM OF BIOMASS PRODUCTION

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**ABSTRACT.**- This study addresses the challenge of producing feedstocks for bioenergy and bio-based products in a non-land-dependent system based on the recently-developed concept of Green Floating Filter (GFF). In this system, cattails are grown as floating plants in eutrophic water bodies in order to form a biomass mat that improves water quality; the produced biomass is fully harvested at the end of the growth cycle. The overall objective of this work was to determine the performance of *Typha domingensis* Pers. grown as GFF at two water nutrient levels –namely two steps of a wastewater treatment plant- in order to provide data for the GFFs proof-of concept undertaken in the Life Biomass C+ project.

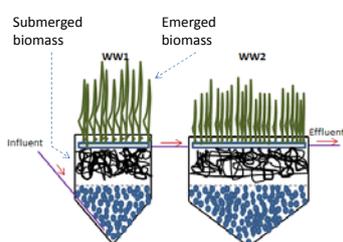
## GFF CONCEPT



- Improvement of water quality
- Production of biomass
- Wide range of applications
- Avoidance of agricultural land use

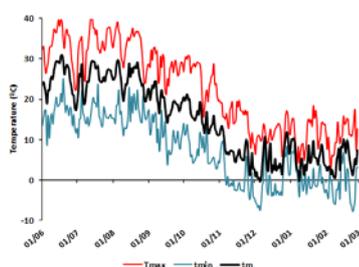
SDG 6-Clean Water  
SDG 7-Affordable and Clean Energy  
SDG13-Climate Action

## EXPERIMENTAL SETUP & GROWING CONDITIONS

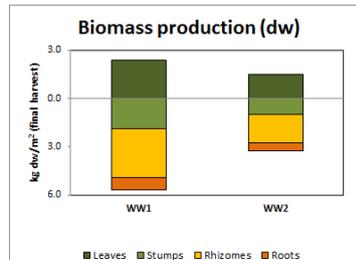
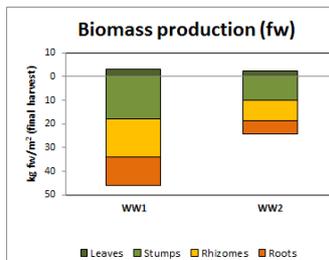
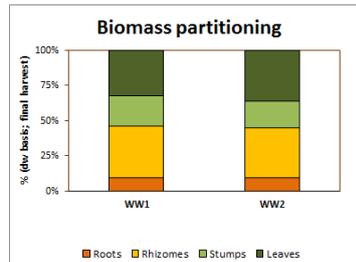
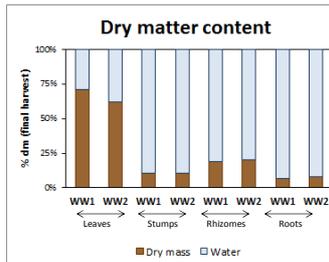


- Location: Madrid (Spain)
- Wastewater treatment plant with GFFs.
- Influent: Pre-treated wastewater from an almond processing agroindustry.
- Chemical Oxygen Demand: 479 and 295 mg O<sub>2</sub>/L, in WW1 and WW2, respectively.

- Temperatures →

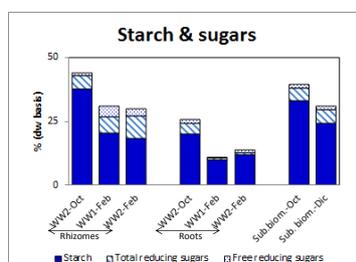
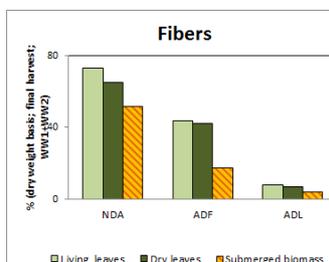


## RESULTS



	Rh/(Rh+rt)	Rh/L	Rh/(L+Sp)	(Rh+rt)/L
<b>Just-harvested biomass:</b>				
WW1	0.58	4.86	0.59	1.31
cv (%)	(4)	(50)	(14)	(10)
WW2	0.62	3.74	0.54	1.18
cv (%)	(7)	(55)	(18)	(14)
<b>Oven-dry biomass:</b>				
WW1	0.80	1.30	0.69	1.64
cv (%)	(2)	(49)	(24)	(49)
WW2	0.80	1.24	0.69	1.58
cv (%)	(4)	(58)	(38)	(61)

Rh=Rhizomes; rt=Roots; L=Leaves (emergent biomass);  
Sp=stumps; cv= coefficient of variation.



**CONCLUSIONS.**- Datasets of key parameters of productivity were built for the proof-of concept. The level of water contamination has a remarkable effect on cattail yield but this effect is not evenly distributed between plant fractions; the response of the submerged biomass is higher than the emergent biomass. The most important factors influencing the starch content of the submerged biomass are the date of biomass collection and the partitioning into rhizomes and roots. It is concluded that the potential of cattail GFFs for bioethanol and biobased products is high, but it relies on the water nutrient level.