

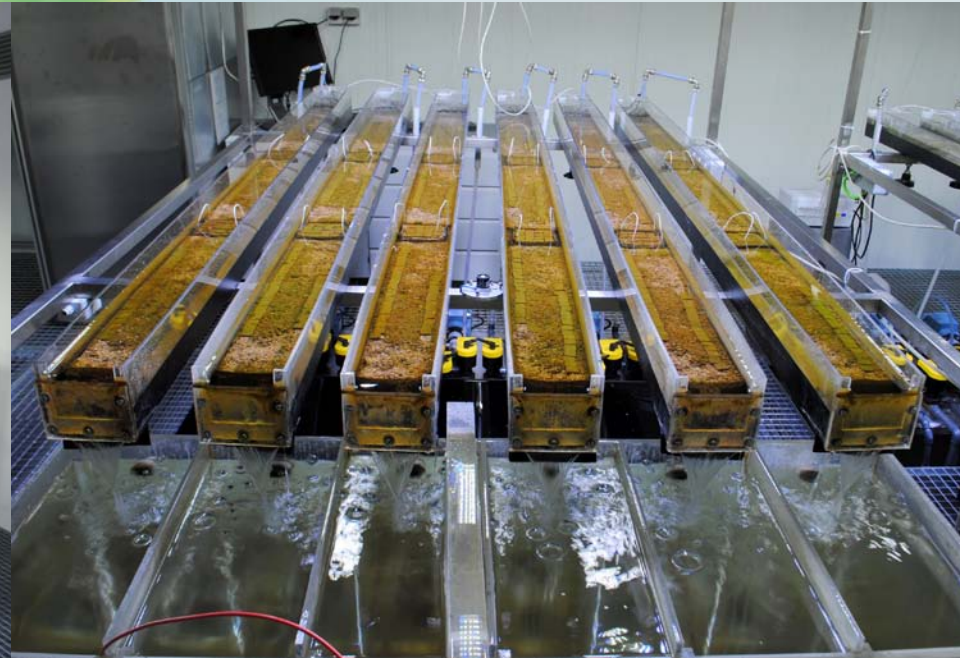
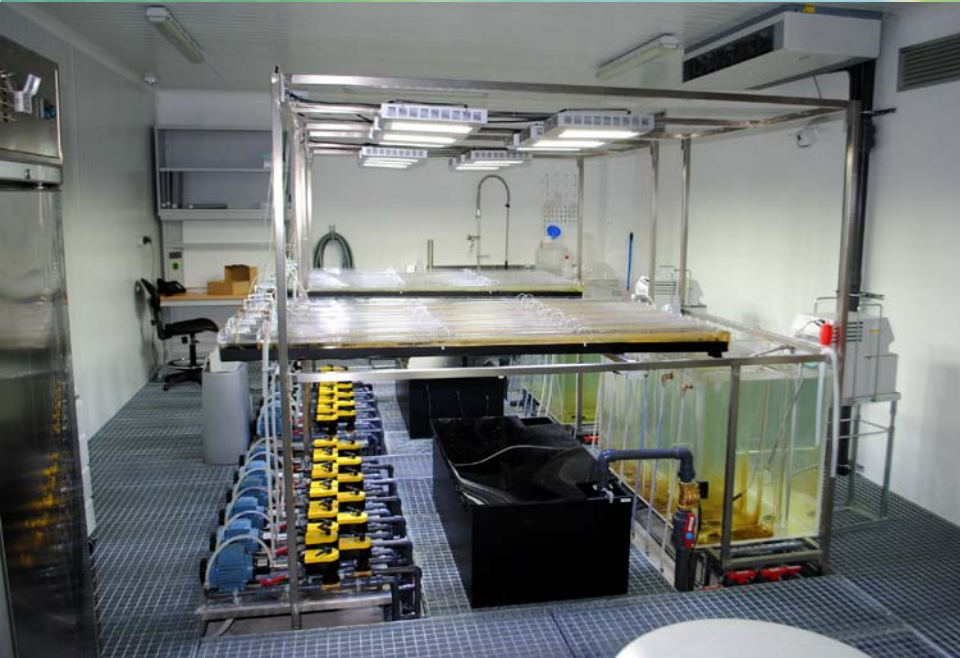


Experimental Streams Facility

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What is it? General description

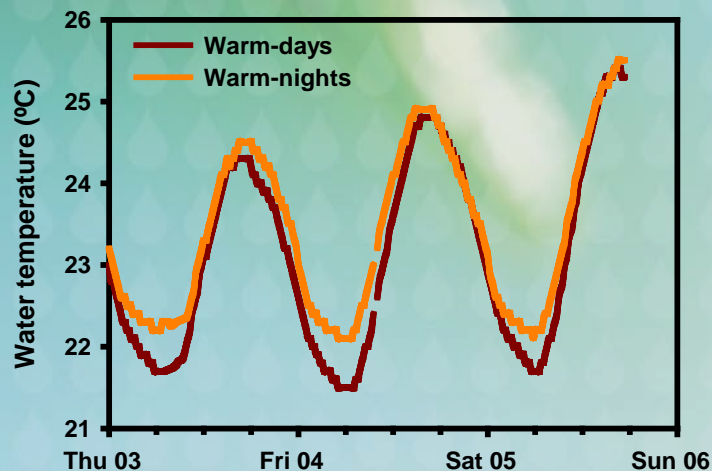
- **Numbers:** 24 experimental streams at the ESF
- **Dimensions:** 2 m long, 10 cm wide, rectangular cross section 50 cm²
- **Substrata:** Sandy streambed and glazed ceramic tiles or rocks
- **Hydraulics:** laminar to turbulent flow, 0.01 to 0.1 L/s, 2 to 50 min travel time
- **Chemistry:** harvested rainwater, nutrients and DOC addition
- **Temperature:** air and water temperature controlled, from 4 to 40°C
- **Operation:** flow-through, recirculation or hybrid operation.



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How does it work?

- **Automatic control system for all variables:** hydraulics, nutrient additions, determination of water source, light cycles, temperature values and cycles, discharge values and cycles.
- **Monitoring variables also connected to automatic control system:** water temperature, chlorine concentration, dissolved oxygen, water in experimental units, light radiation.



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What for? Goals and ongoing research

Ecological research:

- What's the relationship between intermittency temporal extent and stream ecosystem processes?
- Will warmer-nights cause a shift towards heterotrophy?
- How relevant are heatwaves in shaping stream communities?
- Does intermittency influence the length of trophic invertebrate chains?

Ecotoxicological research:

- What's the interaction between physical stressors such as water stress during droughts and chemical stress by pharmaceuticals?
- Does biodegradation of pharmaceuticals depend on temperature?
- Is bioaccumulation of pharmaceuticals in biofilms and invertebrates depend solely on exposure?



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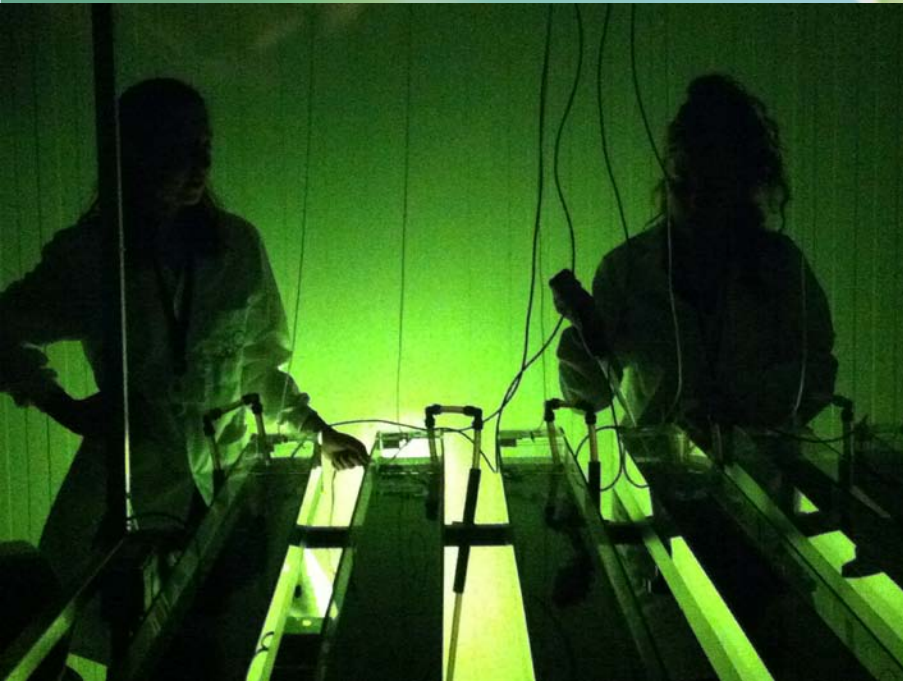
What else? Related facilities and group expertise

In situ measurements:

- Photosynthetic efficiency: maximum and effective phot eff (PAM), and by algal groups (PhytoPAM).
- Metabolism: whole system (channel unit) metabolism by O₂ optodes, CO₂ and CH₄ emissions, etc
- Decomposition: leaf disks, wood decay, etc

Lab measurements:

- Extracellular enzyme activities: functional diversity with eco-plates, alkaline phosphatase, and many others.
- Metabolism: community primary production and respiration with recirculation chambers.
- General parameters: chlorophyll a, AFDM, bacterial abundance (L:D, cell counters, spectrofluorometric estimates), etc
- Microbial community profiling: DGGE, pyrosequencing, etc
- Invertebrate community: taxonomy, determination of grazing rates, estimates of secondary production.



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Research team

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