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The Ecosystem station network of ICOS is based on a number of observation sites for monitoring and understanding the functioning of ecosystems and the exchange of energy and greenhouse gases between the ecosystems and the atmosphere in relationship with climate and management. It is using standardised instruments to perform continuous and intensive measurements of greenhouse gases concentration, meteorological and micrometeorological variables according to common protocols.

ICOS France is co-operated by INRA and CNRS. The network includes eight observation sites (4 class-1, 5 class-2) and seven associated sites. The network samples a range of ecosystems (forest, crop and grassland), management and climate (from cold mountain climate, to tropical humid in Guyana, and including wet oceanic and dry Mediterranean climate).

The French ICOS ecosystem branch involves the following:

- **Heading committee** led by CNRS INSU and including INRA, CNRS INEE, CNES, Météo-France, UVSQ, French Research Ministry.
- **Annual General Assembly** gathering all the sites PIs (last held in July 2014 in Paris)
- **Instrumentation database** documenting the life cycle each sensor and data logger (calibration, maintenance and repair operations...).



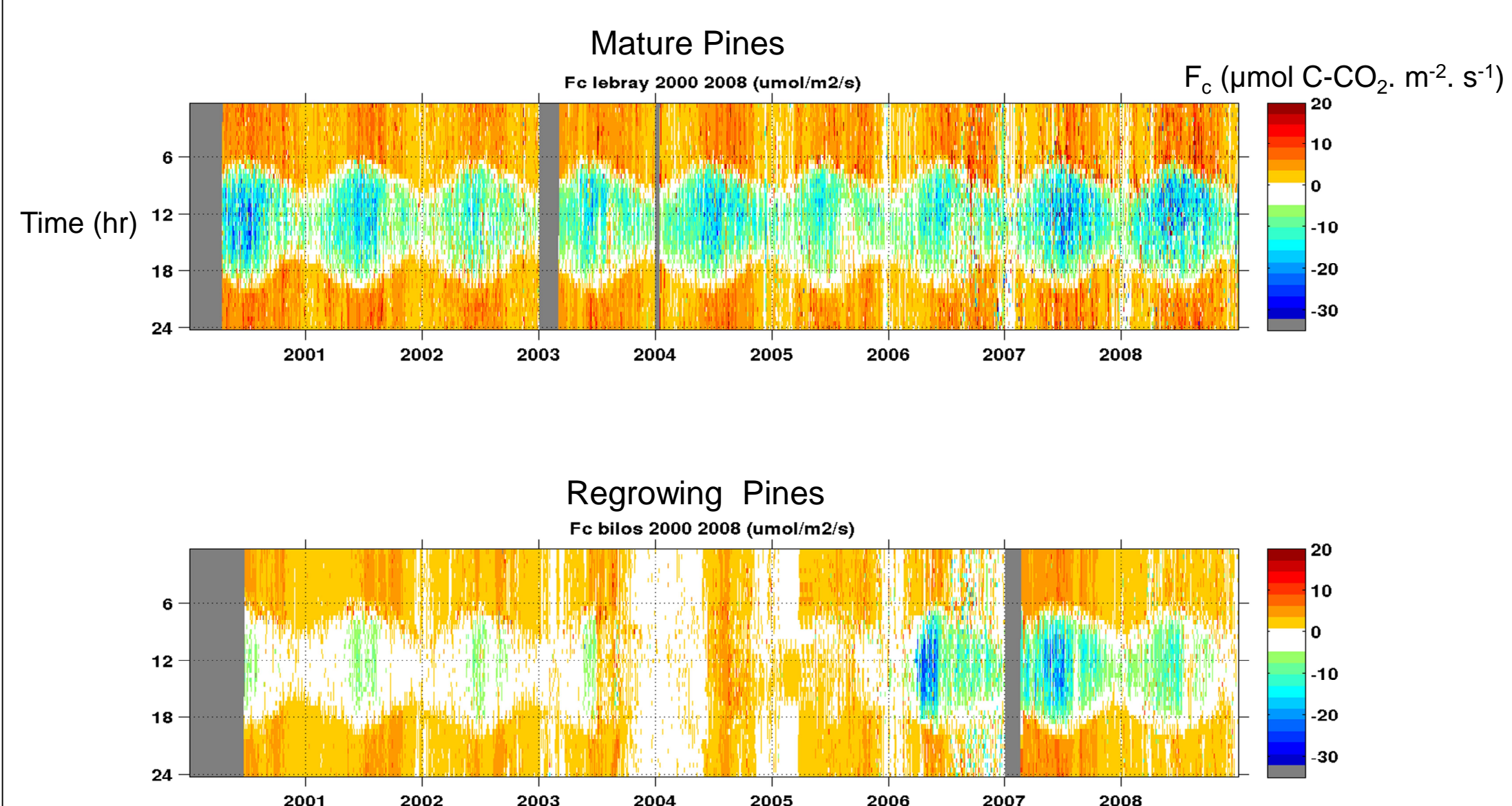
- **Website** (<https://icos-eco.fr/>) in construction that will centralise information about the sites.
- **Forum and mailing lists**, with frequent exchange of technical information (sensors set-up, maintenance, news, job offers).

Typical tower setup :

Type of measurement	Provider	Model	Variable
Sonic anemometer	Gill	HS-50	3D Wind speed components
Infra red gas analyser	LiCor	Li7200	CO ₂ , H ₂ O concentration (fast)
Infra red gas analyser	LiCor	Li840	CO ₂ , H ₂ O concentration (slow)
Sonic anemometer	Gill	WindSonic	2D anemometer
Capacitive sensor	Vaisala	HMP155A	Air humidity
Thermocouples network on plates	HukseFlux	HFP01SC	Soil heat flux
Thermopile sensor	Kipp & Zonen	CMP22	Global radiation
Thermopile sensor	Kipp & Zonen	CNR4	Net radiation
Sensible photodiodes	Kipp & Zonen	PQS1	Incoming and reflected PAR
Sensible photodiodes	Delta T	BF5	Diffuse and direct PAR, Sun duration
Sensible photodiodes	Proprietary	NDVI sensor	NDVI
Sensible photodiodes	Skye	PRI	Incoming and reflected
Self-calibrated dew-point ventilated hygrometer	Thygan	VTP37	Air dew point temperature

Results expected: Long time series of fluxes over ecosystems for determining effect of climate change and agricultural management.

Diagram below exemplifies a 9-year time series of CO₂ fluxes measured using past technologies over a mature and a juvenile pine stands. The uptake of carbon by the vegetation is represented by cold colours. Warm colours means that the vegetation is a source of carbon. Data obtained during the European projects Euroflux, Carboeuroflux, Carboeurope, Carbo Age, GHG-Europe)



Sites localisation :

