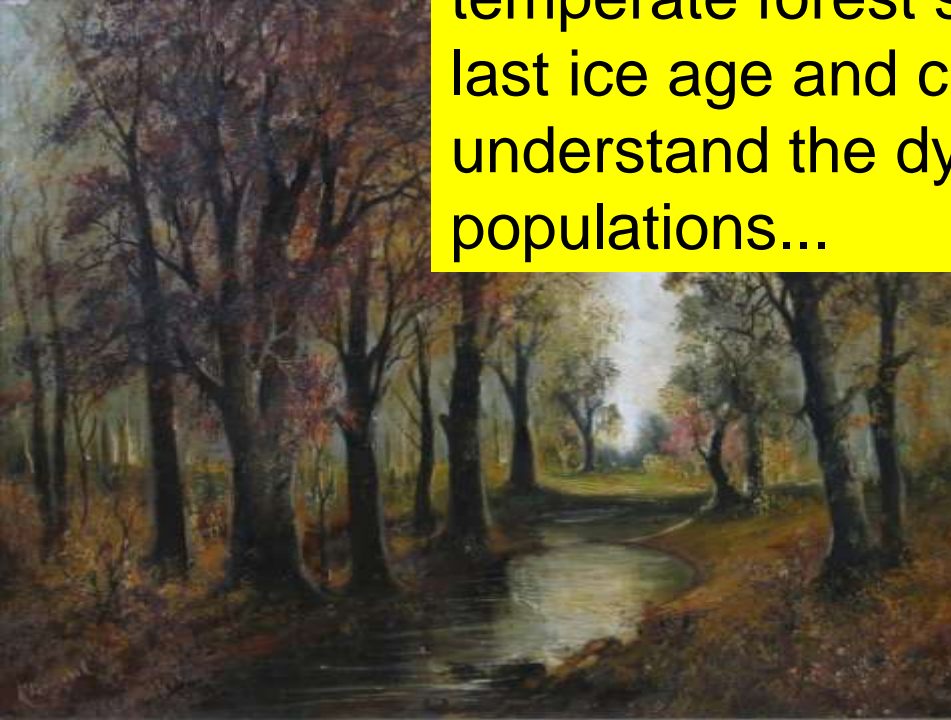




...if the last time you sampled your lake plankton during the summer holiday, this is like monitoring a temperate forest shortly after the last ice age and claiming you understand the dynamics in the tree populations...

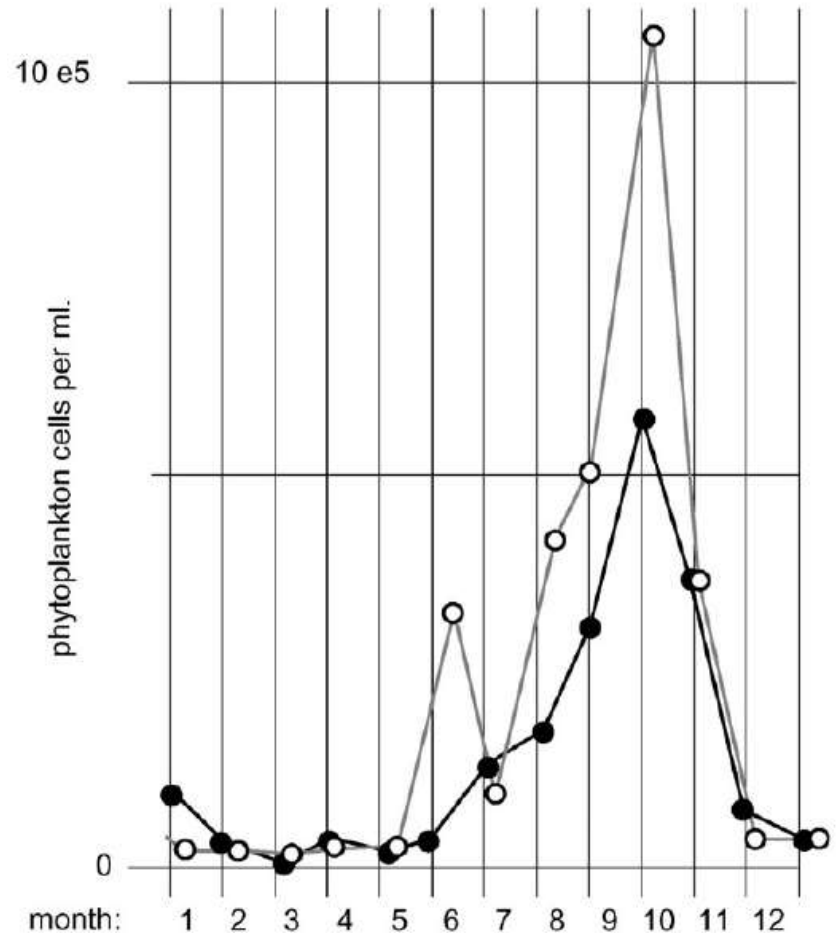


AquaProbe : from *Monitoring* towards *Understanding*, *Predicting* and *Managing* Plankton in Changing Aquatic Ecosystems



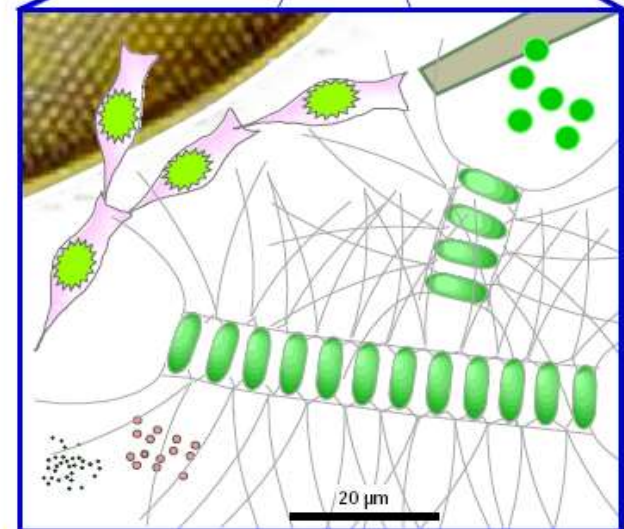
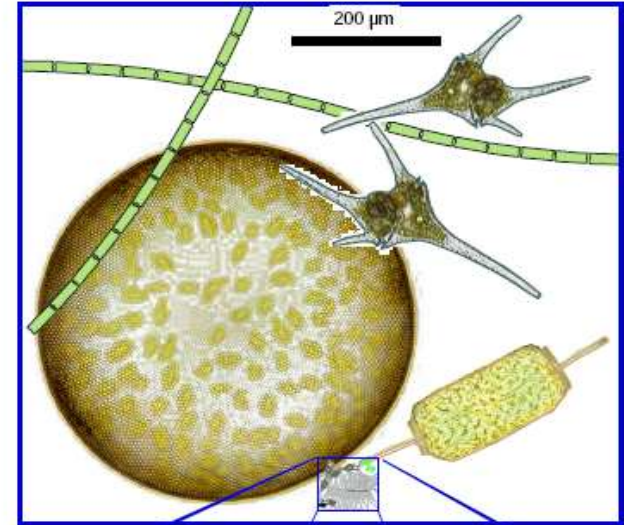
monitoring plankton dynamics

- aquatic ecosystems are under threat
- high quality monitoring data vital, e.g. calibration and validation ecosystem models or DSS
- changes at phytoplankton affect higher trophic levels through trophic cascades
- phytoplankton dynamics incompatible with traditional monitoring
- required automated, stand alone system for sampling, cell counting and classification of phytoplankton
- single instrument; Cytosense / Cytobuoy

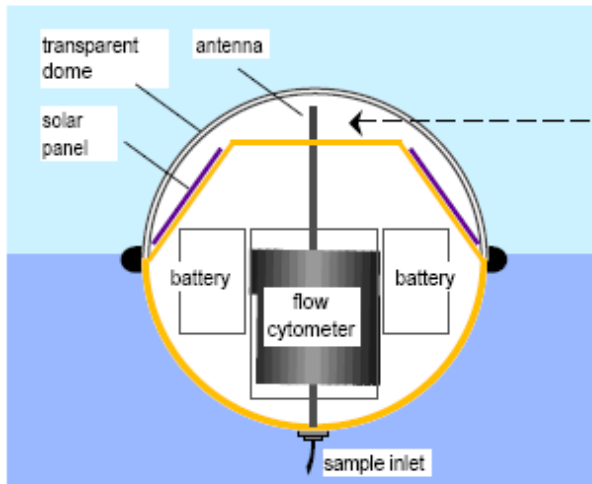
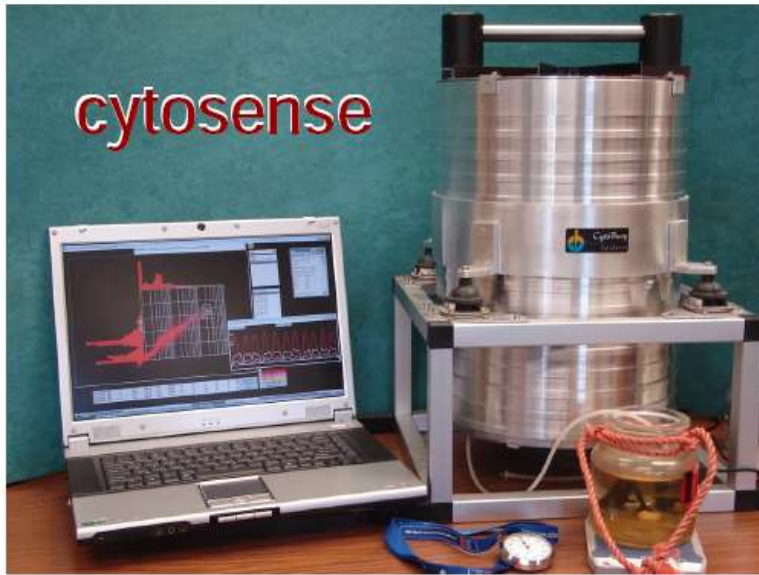


key characteristics CytoSense

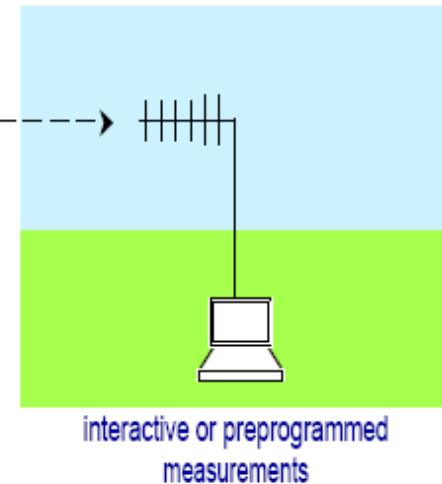
- large size range, even in the > 1 mm scale (see picture);
- can be adapted for sampling and counting zooplankton
- full particle scans enabling plankton recognition at species level
- large numbers of particles in short periods of time - improving the statistical basis of monitoring data;
- operate autonomously (automated time series);
- easy transport to/from locations, easy mounting without optical alignment etc;
- it can be upgraded for submersible use



CytoSense *BENCHTOP* flow cytometer



radio link



interactive or preprogrammed measurements

AquaProbe

Aims:

- 1) **Monitoring**: to develop robust, innovative tools for the monitoring of plankton communities in changing aquatic ecosystems
- 2) **Patterns**: to identify and describe patterns in the detailed time series of plankton dynamics & to test these patterns against models of community assembly & to define phytoplankton community assembly rules
- 3) **Modeling**: to identify the prospects and restrictions for modeling and prediction of plankton dynamics by re-definition of functional groups, using the newly available high frequency monitoring data series
- 4) **Managing**: to strengthen the scientific basis for activities in WFD



French-Swiss school of Plant Sociology



- plant sociology based upon belief that local plant community more informative about environment than individual sp
- the status of the ecosystem can be derived from relationships between plant associations and environmental factors
- community assembly is a non-random process, governed by a set of assembly rules (species coexist because they passed same habitat filters, giving coherent message about status environment)

community assembly

Table 1: Predicted phylogenetic structure of co-occurring species assemblages subject to differences in the dominant ecological processes, and the nature of trait evolution

Dominant ecological process	Trait evolution	
	Conserved	Convergent
Habitat filtering	Phylogenetic clustering	Phylogenetic overdispersion
Competition	Phylogenetic overdispersion	Phylogenetically random

Note: Table adapted from Webb et al. (2002).

