

Limnological research on Lake Maggiore as a contribution to transboundary cooperation between Italy and Switzerland

Rosario Mosello, R. Bertoni & P. Guilizzoni

*C.N.R. - Institute of Ecosystem Study
Verbania Pallanza*

The Institute of Ecosystem Study

Main research activities

Structure and functioning of aquatic and terrestrial ecosystems

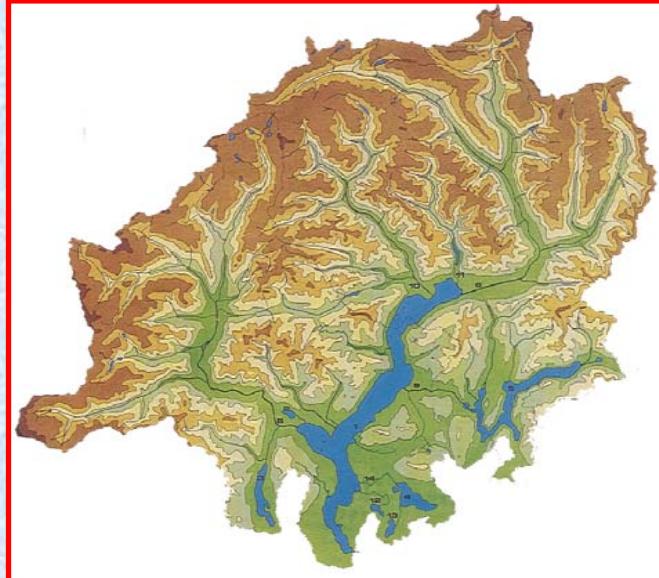
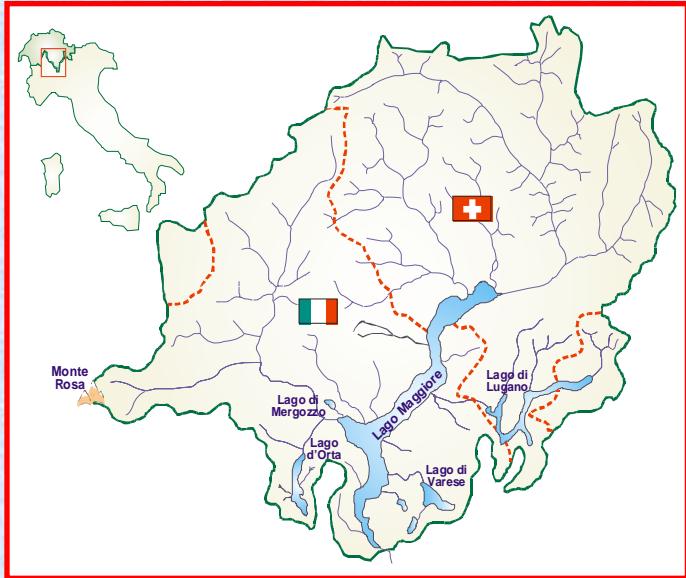
Aquatic and terrestrial ecosystems and global change

Soil quality and ecology

River Po watershed



Characteristics of the watershed



- Well developed hydrography, with 32 natural and artificial lakes and 14 main tributaries
- Mild climate (heat-regulating effect of the lake and sheltering effect of the Alps), but damp, with high atmospheric precipitation (1700 mm/y)
- Just over 50% of the drainage basin is in Switzerland, while 80% of the lake is in Italy
- 670,000 residents (200,000 near the shore line) + 30,000 temporary residents (visitors)

Lago Maggiore morphometric and hydrological features

drainage basin area	6599 km ²
lake area	212 km ²
lake volume	37 km ³
mean level	194 m a.s.l.
max depth	370 m
mean depth	177 m
drainage basin / lake area ratio	31.1
theoretical renewal time	4.0 years



Lake Maggiore resources and uses of the waters

Environmental value	high
Hydraulic regulation	present
Tourism recreation	15 Million y ⁻¹
Bathing	high
Drinking	present
Public navigation	high
Private/recreational navigation	high
Water for agriculture	high
Sport fishery	high
Professional fishery	high
Hydroelectric production	Artificial lakes, outlet,

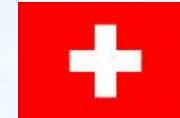


Management of the lake and its watershed

1882



International Commission for
the Fisheries in Italian Swiss
waters



1946



International Commission for
the outflow regulation



1972



International Commission for
the protection of Italian Swiss
waters (CIPAIS)



Total catch (2004-2006) :

120 tons whitefish + shad

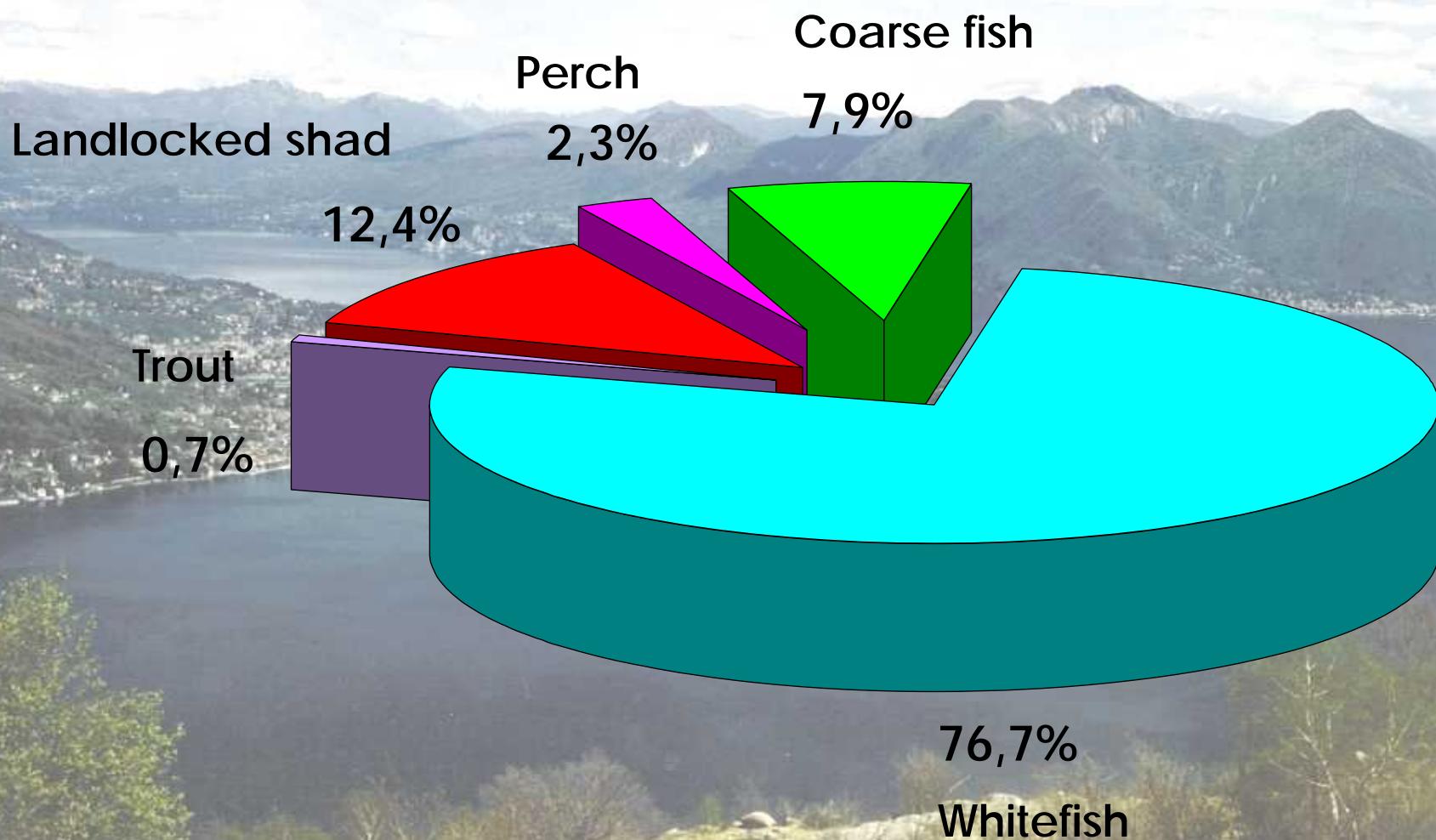
15 tons coarse fish + perch + trout



1882



International Commission for
the Fisheries in Italian Swiss
waters



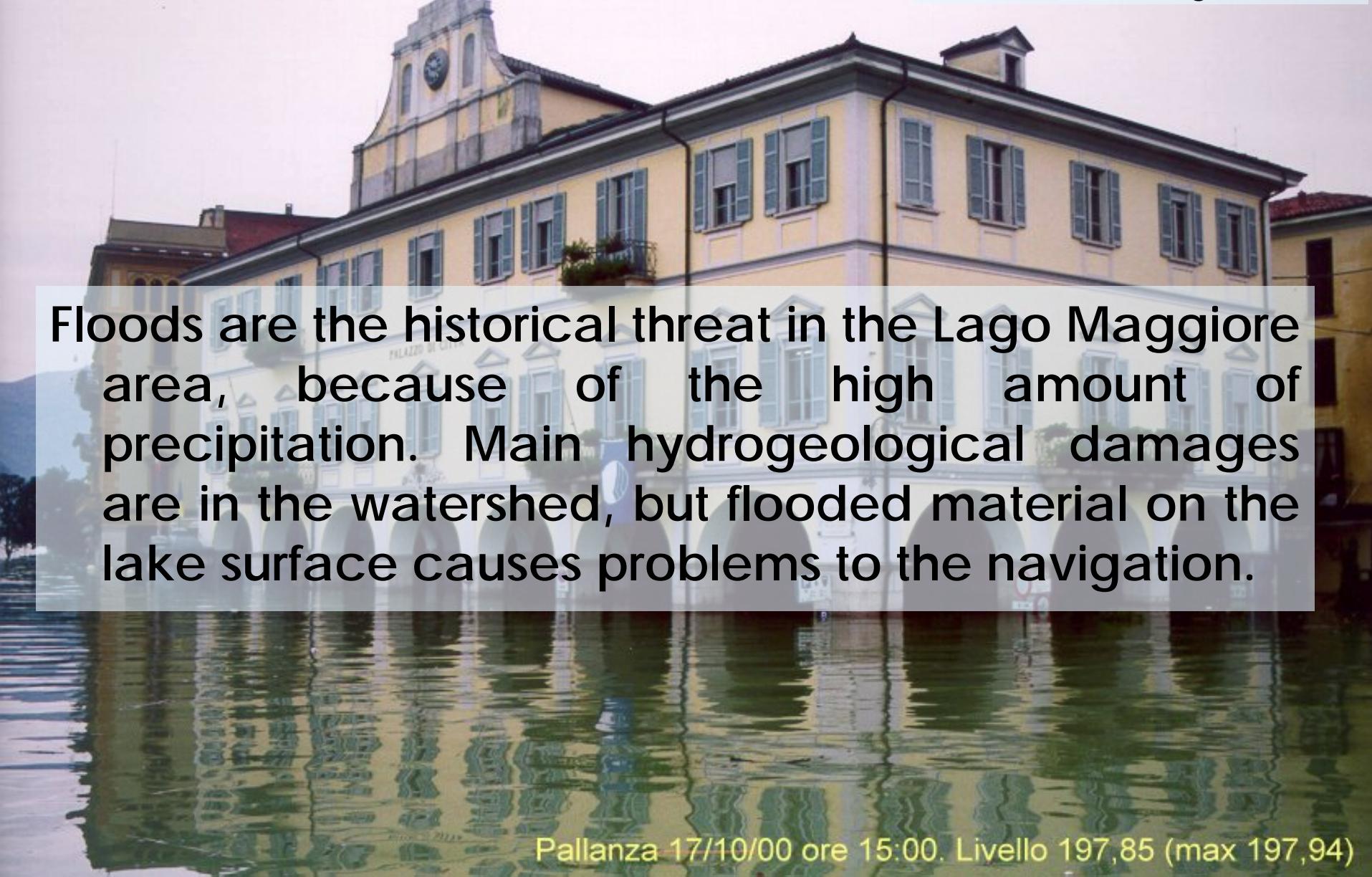


1946

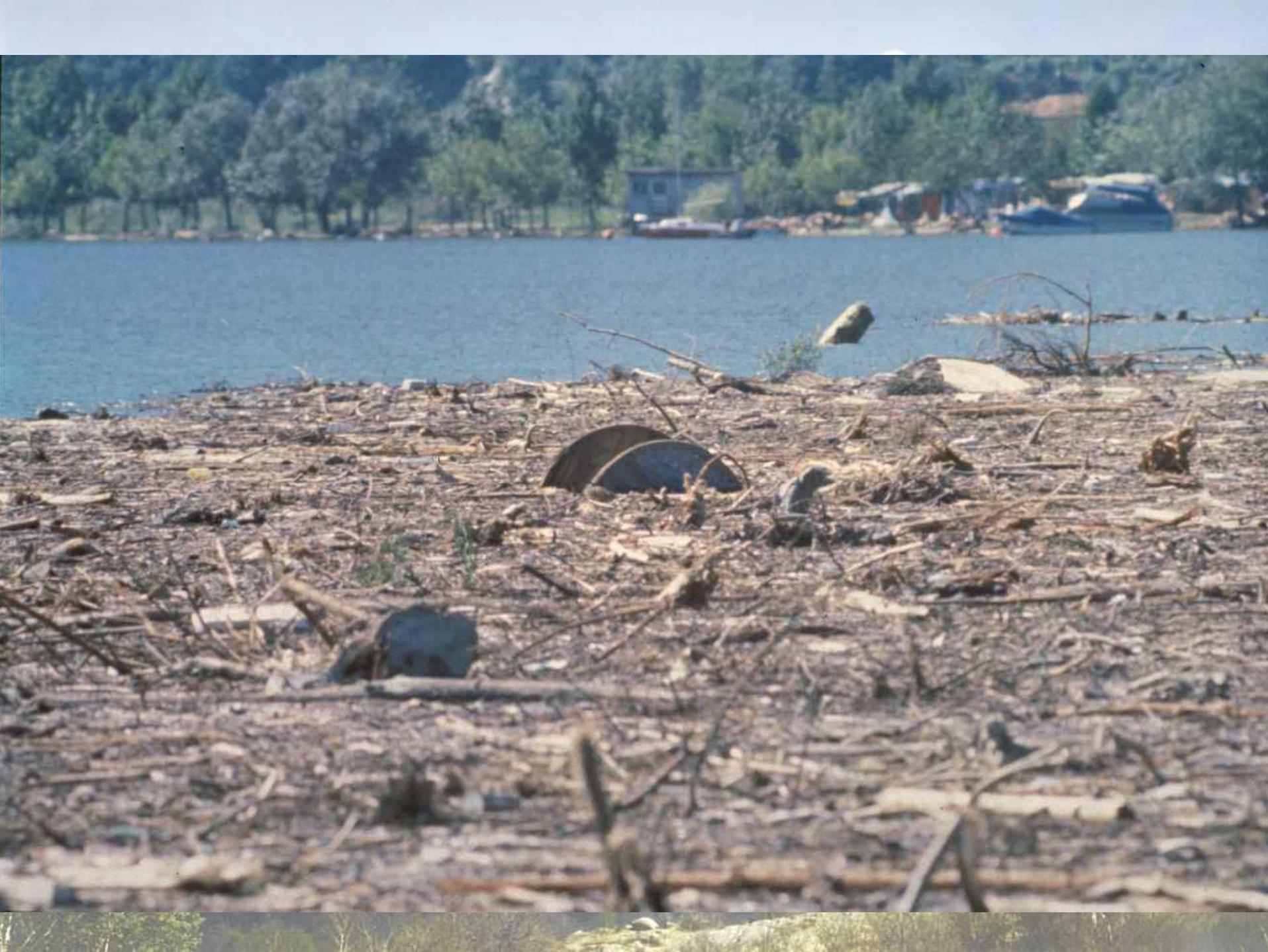


International Commission for
the outflow regulation

Water level fluctuations: flood



Floods are the historical threat in the Lago Maggiore area, because of the high amount of precipitation. Main hydrogeological damages are in the watershed, but flooded material on the lake surface causes problems to the navigation.





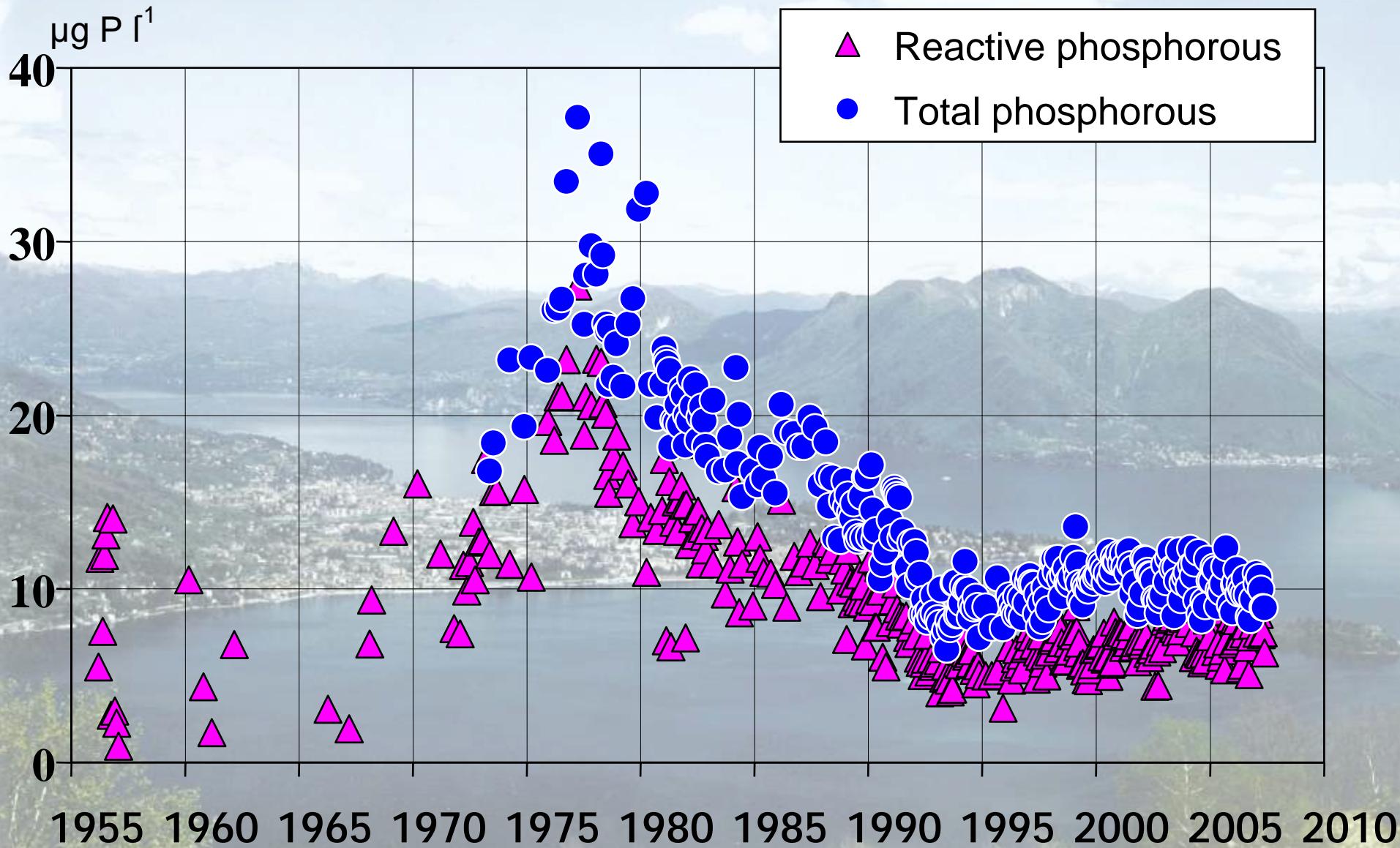
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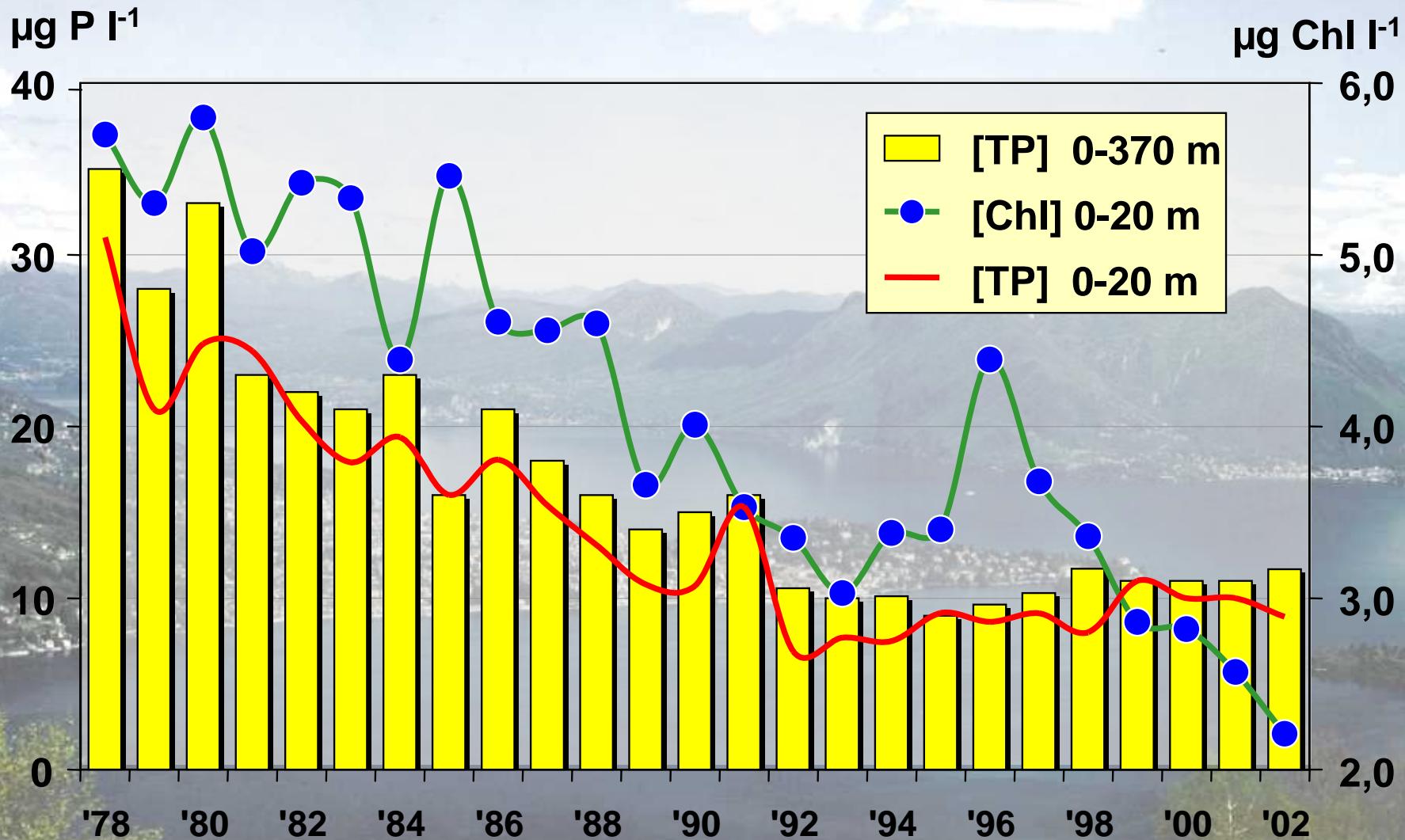


International Commission for the
Fisheries in Italian Swiss waters

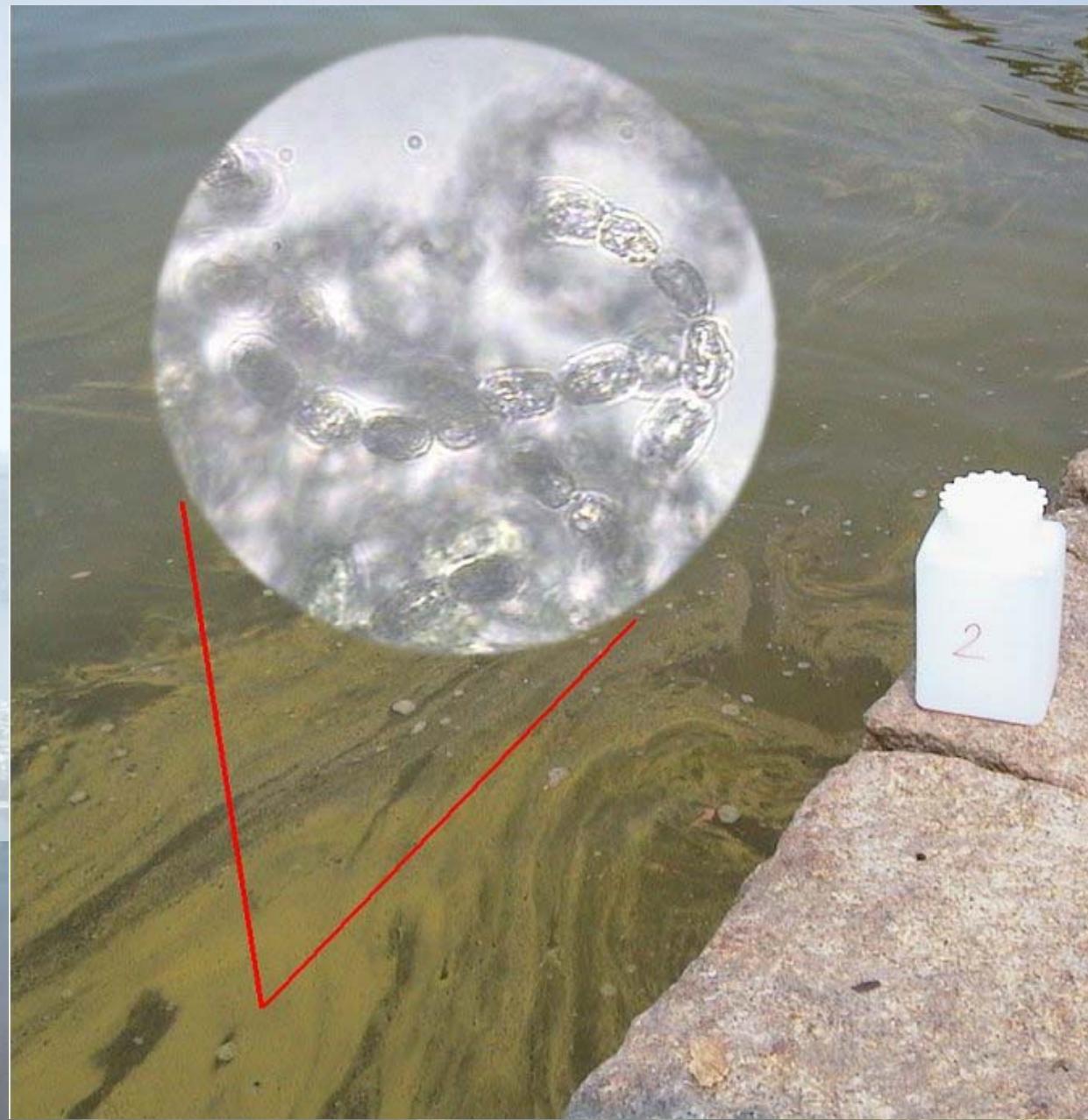
Lake trophic evolution

Up to Fifties	Low algal productivity	OLIGOTROPHIC
1960 – 1969	Increase of algal productivity	MESOTROPHIC
1970 – 1980	Further increase of productivity	MESO-EUTROPHIC
1981 – 1990	Slight decrease of productivity	MESOTROPHIC
1991 – 1997	Strong decrease	MESO-OLIGOTROPHIC
Since 1998	Low biological productivity	OLIGOTROPHIC



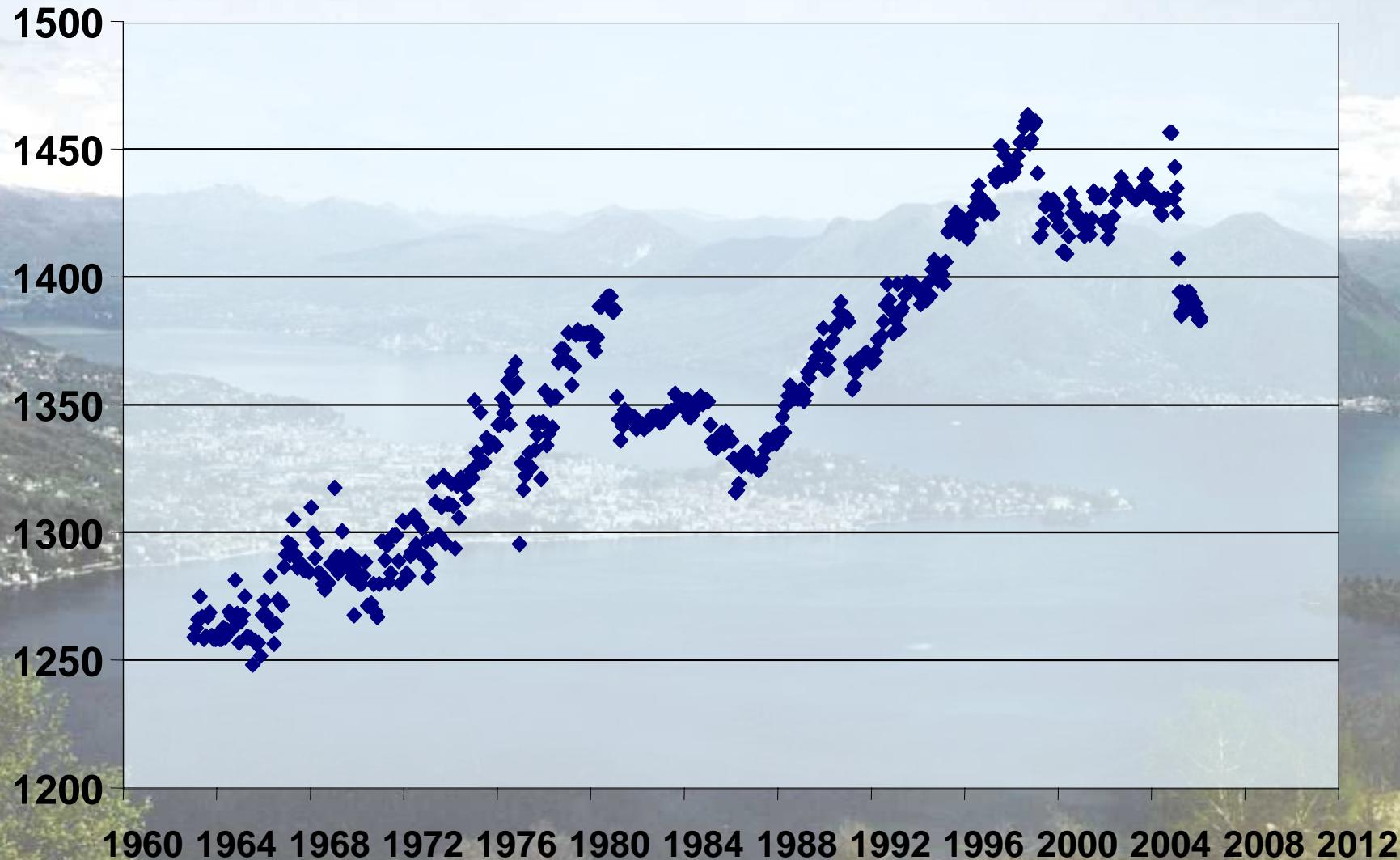


In summer 2005, 2006
and 2007 the presence
of the cyanobacteria
Anabaena
lemmermannii was
observed in Lake
Maggiore



Lake Maggiore

Heat content in the mass of water (MJ m^{-2})





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Commissione Internazionale

per la protezione delle acque italo-svizzere

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per la protezione delle acque italo-svizzere

**Monitoraggio della presenza del DDT e di altri contaminanti
nell'ecosistema Lago Maggiore****RAPPORTO ANNUALE
APRILE 2005-MARZO 2006***A cura di P. Guilizzoni & A. Calderoni***Pallanza 2006**tivity they
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