

CHERNOBYL CESIUM DEPOSITION IN THE SEDIMENT OF A NORWEGIAN LAKE
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After the Chernobyl accident in April 1986 when the first radioactive plume moved in the direction of central Scandinavia, some areas have been severely affected by high concentrations of ^{134}Cs and ^{137}Cs , especially in game and freshwater fish. Here we analyze the distribution of radiocesium in the bottom sediment of a lake 18 months after the deposition took place. Our results indicate that transport from the drainage area to the lake sediment has been quite negligible. A heterogeneous distribution in the sediment is explained by different pathways of water during the first snowmelt after the deposition. The pattern of distribution shows that the deposition of radiocesium from the drainage area has been associated with particles with a high sedimentation rate and that it must be firmly bound to these sediment particles. The main source of radiocesium to fish is probably prey organisms ingesting sediment particles.

ZOOPLANKTON UNDER STRESS CAUSED BY SEDIMENT RESUSPENSION
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The aim of the field research and laboratory investigations carried out on the Włocławek dam reservoir was to determine the influence of resuspension of bottom sediments on zooplankton. It was found that the main factor affecting the zooplankton was the low oxygen content. Field research confirmed great oxygen deficits in the shallow areas of the reservoirs. There were also found remarkable horizontal and vertical diversities of oxygen content in the water and a broad range of temporal diversification. The main cause is resuspension of bottom sediments which is caused by wind mixing and daily cycle of water uptake by the hydropower plant. Moreover, continuing works on deepening the bottom cause immense amounts of the bottom sediments to rise up. Laboratory tests showed that the resuspension process reduced oxygen content even in a few minutes after the sediment rise. Depending on the amount of oxygen dissolved in the water at the time of resuspension, the deficits reached from 60 to 95 per cent daily oxygen deficits. Laboratory experiments showed also that a drastic decline of oxygen content due to sediments resuspension affects the life span of *Daphnia magna* and results in a sudden and great growth of their death rate. This accounts for a remarkable spatial diversification of plankton in this region and great and sudden changes of its concentration observed during the field research.

THE EFFECT OF PREDATION BY SMELT (*OSMERUS EPERLANUS*) ON *DAPHNIA HYALINA* IN A SHALLOW, EUTROPHIC LAKE.

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The population density and length-frequency distribution of *Daphnia hyalina* in Tjeukemeer shows a distinct seasonal variation. Densities usually show a maximum in late spring, and a minimum in mid summer. During the summer decline average size decreases. To investigate the effect of predation on the population dynamics of *D. hyalina* we used a discrete event model, INSTAR, which enabled us to estimate the size-dependent mortality.

The main predator on *D. hyalina* is 0+ smelt (*Osmerus eperlanus*). Consumption was estimated via growth, which was calculated by assessing the length frequency distribution in the field at regular intervals. We assumed a growth efficiency of 20%. The consumption on *D. hyalina* was computed by combining total consumption with the percentage of *D. hyalina* in the diet of smelt.

It was found that smelt feeds selectively: in spring very young smelt feed negative size selectively on daphnids, whereas from July onwards large preys are selected. Absolute mortality due to predation by smelt is highest during the summer decline. We concluded that predation by smelt alone is not sufficient to explain the summer decline, but is also caused by low food levels, resulting in smaller individuals and a reduction in the birth-rate. The effect of smelt predation on the size distribution, however, is considerable.

MICROBIAL POPULATIONS IN AN EUTROPHIC LAKE

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A microbiological monitoring on surface waters was performed on 4 stations located in the Liscia reservoir (northern part of Sardinia Island in Italy) during one and a half year. Fecal indicators of pollution were analyzed as well as other microorganisms (*Aeromonas hydrophila*, *Pseudomonas* sp., yeasts and total bacterial count at 22°C). Microbiological values resulted lower in summer periods, when thermal stratification occurs, than in the other seasons characterized by water circulation. A 5th station located on the Liscia River showed the opposite behaviour: the microorganisms presented the highest values just during the summer because of the increase of the population discharging sewage into the river where, in addition, the water flow decreased. The lake during the sampling period exhibited prolonged and summer blooms of a toxic strain of *Microcystis aeruginosa*. The algal concentrate (obtained gathering algae through a phytoplankton net) injected i.p. in mice had a DL_{50} ranging between 17.49 to 0.9 mL. The decrease of bacterial titres in the lake during the summer (both fecal indicators and *Aeromonas*, *Pseudomonas*) may be correlated to the presence of the toxic alga producing antibiotic substances. In addition to the above cited analyses, genotoxic assays were performed using a raw algal extract. Cyanogynosis contained in this extract demonstrated aneuploidia disjunctions in an eucariotic system (*Aspergillus nidulans*). For this reason with regard of potable use of this reservoir implications on public health have to be considered.