

^{14}C , ^{13}C and ^{18}O isotopes in the recent plants of Wigry Lake

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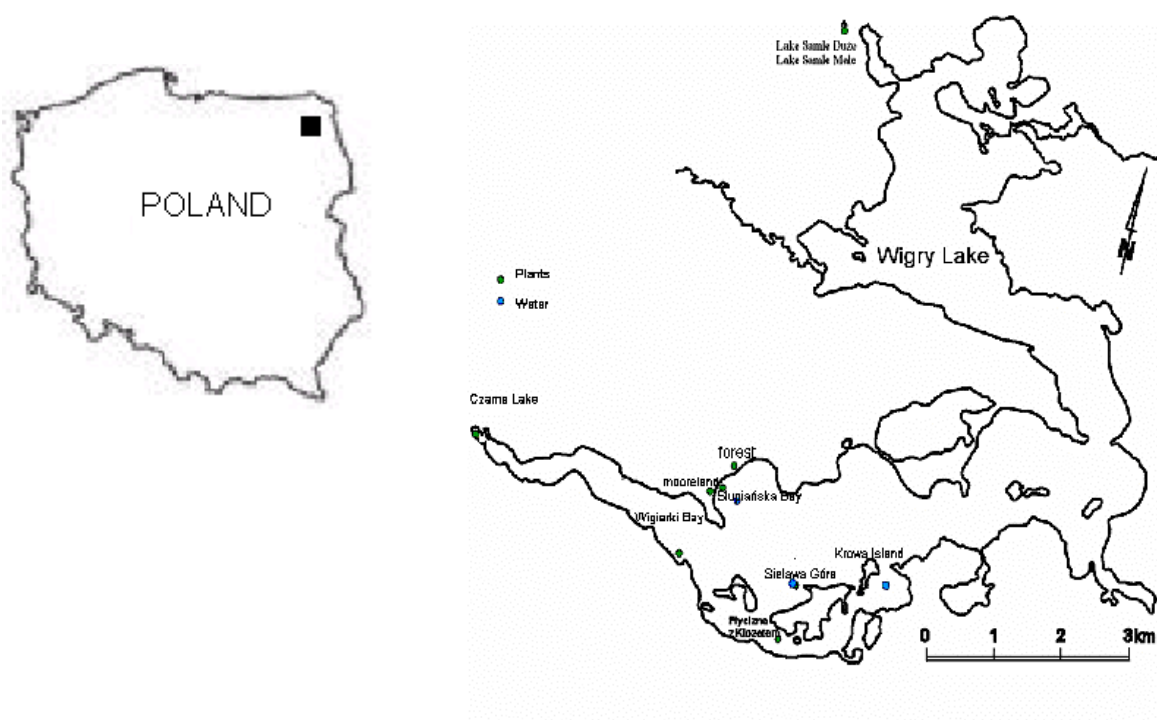
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Lake Wigry is located in the north-eastern Poland close to the Polish-Lithuanian border. It belongs to Wigry National Park together with 41 surrounding lakes. The area of Wigry National Park was shaped during Baltic phase of last glaciation and lakes were formed by retreated glacier. Lake Wigry is elongated ribbon lake type, while in the area there are also marginal lakes and thaw lakes.

The Park is dominated by forest communities (16 groups) mainly spruces and pines, alder swamps, swamp forests, as well as marshy meadow and fests growing on dry ground. The most common forest complexes in Wigry National Park are: red grass dry-ground forest, similar to mixed coniferous forests, sub-boreal coniferous pine forest, typical dry-ground forest, covering approximately, different clusters of alder carr and riverside carr.

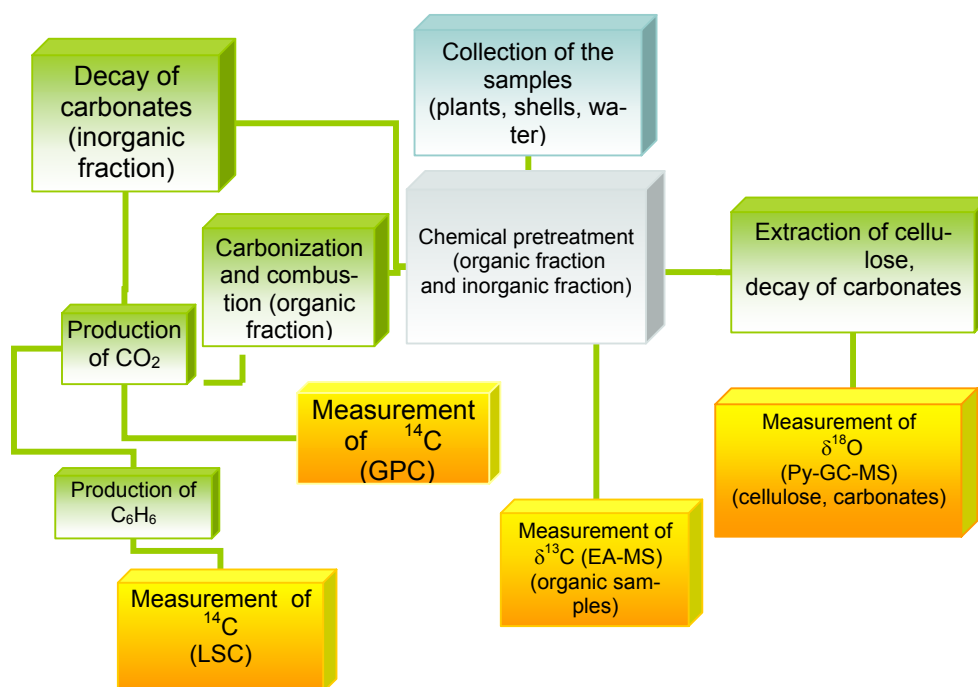
A significant number of vascular plant species present in the Wigry National Park is associated with the aquatic environment and wetlands. Their existence depends on the diversity and quality of lakes, rivers, water-heads, wet meadows, moors and wet forests. The natural plant communities are concentrated on lowmoors, transient moors and high moors located throughout the area of the Park.

The natural carbon mainly consist of three isotopes: ^{12}C , ^{13}C and ^{14}C . The radio-carbon oxidized to carbon dioxide, mixed with the inactive atmospheric carbon dioxide enters the bio- and hydrosphere. To know more about the carbon cycle in contemporary sedimentation environment of Wigry Lake, the samples of plants (Scots pine, Sorediate Tube Lichen, Peat moss, Common Reed, Yellow Pond, Bulrush, Lesser Pond-sedge, Water soldier, Hornwort, Perfoliate Pondweed and Muskgrass- make up, Perfoliate Pondweed, Muskgrass, Eurasian water-milfoil, Sedge, Moss, Willow Moss, Unidentified make up), shells and water were collected from lake and its environment (aquatic, wetland and woodland areas) on July 2002 and on July 2003.



^{14}C , $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ were measured by different methods:

- ^{14}C by using the gas proportional counters and the liquid scintillation counting technique in Gliwice Radiocarbon Laboratory
- $\delta^{13}\text{C}$ by using the Elemental Analyzer Mass Spectrometer in UFZ Centre for Environmental Research, Leipzig
- $\delta^{18}\text{O}$ by using the Pyrolysis Gas Chromatograph Mass Spectrometer in UFZ Centre for Environmental Research, Halle



In result of studies and measurements of isotopic composition of contemporary environment of Wigry Lake we have received the information about carbon cycle. As far as the isotopic composition of Wigry Lake is concerns, we have analyzed mean values and variations in ^{14}C , $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ among plants, lichens, differences of isotopic composition between investigated places of lake, dependences between content of carbon and $\delta^{13}\text{C}$. As far the carbon and oxygen isotopic compositions of plants, we have found out variations in $\delta^{13}\text{C}$ and $\delta^{18}\text{O}$ within plants, variations in $\delta^{13}\text{C}$ among whole material and cellulose, carbon isotopic composition of photosynthetically fixed carbon and syntaxonomic dependences.

Acknowledgments

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