

Zeitschrift: Veröffentlichungen des Geobotanischen Institutes der Eidg. Tech. Hochschule, Stiftung Rübel, in Zürich

Herausgeber: Geobotanisches Institut, Stiftung Rübel (Zürich)

Band: 105 (1991)

Artikel: Pflanzenökologische und limnologische Untersuchungen des Reussdelta-Gebietes (Kanton Uri) : Aufnahme des Ist-Zustandes von 1987/88 = Phytoecological and limnological investigations in the region on the Reuss delta (canton Uri)

Autor: Elber, Fredy / Marti, Karin / Niederberger, Klemens

Register: Liste of figures : limnology

DOI: <https://doi.org/10.5169/seals-308914>

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. [Mehr erfahren](#)

Conditions d'utilisation

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. [En savoir plus](#)

Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. [Find out more](#)

Download PDF: 01.02.2026

ETH-Bibliothek Zürich, E-Periodica, <https://www.e-periodica.ch>

List of figures / Limnology	page
2.1. Map of the sampling area with the sampling stations. Distance between contour lines: 5 m. Mean water level from September 25 to October 27, altitude above sea level: 435.5 m.	80
3.1. Water level at the time of investigations and mean monthly water level during the investigation period from April 1987 to April 1988. Data from the Swiss Hydrological Service (Schweizerische Landeshydrologie und -geologie).	87
3.2. Average vertical attenuation coefficient of photosynthetically available radiation and transparency (Secchi-depth) in the littoral and in the pelagial during the investigation period from April 1987 to April 1988. m.v. = missing value.	88
3.3. Mean temperature in the littoral for the 0-5 m depth interval and in the pelagial for the 0-10 m depth interval during the investigation period from April 1987 to April 1988.	89
3.4. Conductivity in the littoral (mixed water, water column from the 0-4 m depth interval) and in the pelagial (0-10 m depth interval, mean of samples taken at 0, 1, 2.5, 5 and 10 m depths) during the investigation period from April 1987 to April 1988.	91
3.5. pH values in the littoral for the 0-5 m depth interval and in the pelagial for the 0-10 m depth interval during the investigation period from April 1987 to April 1988.	92
3.6. Chloride concentration in the littoral (mixed water, water column from the 0-4 m depth interval) and in the pelagial (0-10 m depth interval, mean of samples taken at 0, 1, 2.5, 5 and 10 m depths) during the investigation period from April 1987 to April 1988.	93
3.7. Oxygen concentration in the littoral for the 0-5 m depth interval and in the pelagial for the 0-10 m depth interval during the investigation period from April 1987 to April 1988.	94
3.8. Oxygen saturation in the littoral for the 0-5 m depth interval and in the pelagial for the 0-10 m depth interval during the investigation period from April 1987 to April 1988.	94
3.9. Nitrate concentration (NO_3^- -N) in the littoral (mixed water, water column from the 0-4 m depth interval) and in the pelagial (0-10 m depth interval, mean of samples taken at 0, 1, 2.5, 5 and 10 m depths) during the investigation period from April 1987 to April 1988.	95
3.10. Ortho-phosphate concentration (PO_4^{3-} -P in the littoral (mixed water, water column from the 0-4 m depth interval) and in the pelagial (0-10 m depth interval, mean of samples taken at 0, 1, 2.5, 5 and 10 m depths) during the investigation period from April 1987 to April 1988.	96
3.11. Total phosphorus concentration in the littoral (mixed water, water column from the 0-4 m depth interval) and in the pelagial (0-10 m depth interval, mean of samples taken at 0, 1, 2.5, 5 and 10 m depths) during the investigation period from April 1987 to April 1988.	97
4.1. Mean density of individuals for phytoplankton at the six sampling stations in the littoral (mixed water, water column from the 0-4 m depth interval) and at the two sampling stations in the pelagial (0-10 m depth interval, mean of samples taken at 0, 1, 2.5, 5 and 10 m depths) during the investigation period from April 1987 to April 1988.	114

4.2.	Wet weight of phytoplankton at the six sampling stations in the littoral (mixed water, water column from the 0-4 m depth interval) and at the two sampling stations in the pelagial (0-10 m depth interval, mean of samples taken at 0, 1, 2.5, 5 and 10 m depths) during the investigation period from April 1987 to April 1988.	114
4.3.	Relative frequency of the phytoplankters at the six sampling stations in the littoral (mixed water, water column from the 0-4 m depth interval) and at the two sampling stations in the pelagial (0-10 m depth interval, mean of samples taken at 0, 1, 2.5, 5 and 10 m depths) during the investigation period from April 1987 to April 1988.	116
4.4.	Relative amounts of several algal groups on the wet weight of the plankton at the six sampling stations in the littoral (mixed water, water column from the 0-4 m depth interval) and at the two sampling stations in the pelagial (0-10 m depth interval, mean of samples taken at 0, 1, 2.5, 5 and 10 m depths) during the investigation period from April 1987 to April 1988.	117
4.5.	Chlorophyll a concentration at the six sampling stations in the littoral (mixed water, water column from the 0-4 m depth interval) and at the two sampling stations in the pelagial (0-10 m depth interval, mean of samples taken at 0, 1, 2.5, 5 and 10 m depths) during the investigation period from April 1987 to April 1988.	119
4.6.	Dry weight at the six sampling stations in the littoral (mixed water, water column from the 0-4 m depth interval) and at the two sampling stations in the pelagial (0-10 m depth interval, mean of samples taken at 0, 1, 2.5, 5 and 10 m depths) during the investigation period from April 1987 to April 1988.	119
4.7.	Ash-free dry weight at the six sampling stations in the littoral (mixed water, water column from the 0-4 m depth interval) and at the two sampling stations in the pelagial (0-10 m depth interval, mean of samples taken at 0, 1, 2.5, 5 and 10 m depths) during the investigation period from April 1987 to April 1988.	121
4.8.	Ratio of ash-free dry weight to total dry weight at the six sampling stations in the littoral (mixed water, water column from the 0-4 m depth interval) and at the two sampling stations in the pelagial (0-10 m depth interval, mean of samples taken at 0, 1, 2.5, 5 and 10 m depths) during the investigation period from April 1987 to April 1988.	121
4.9.	Density of individuals for zooplankton at the six sampling stations in the littoral (mixed water, water column from the 0-4 m depth interval) and at the two sampling stations in the pelagial (0-10 m depth interval, mean of samples taken at 0, 1, 2.5, 5 and 10 m depths) during the investigation period from April 1987 to April 1988.	122
5.1.	Rack of glass slides with bar to fix on the ground. L: 48.5 cm, H: 8.5 cm (without bar).	125
5.2.	Exposure depth of the glass slides at 2.5 m and 5 m depths during the investigation period from May 1987 to April 1988.	126
5.3.	Chlorophyll a content on the glass slides at 2.5 m and 5 m depths during the investigation period from May 1987 to April 1988. m.v. = missing value.	130
5.4.	Ash-free dry weight on the glass slides at 2.5 m and 5 m depths during the investigation period from May 1987 to April 1988. m.v. = missing value.	132
5.5.	Percent of chlorophyll a of the ash-free dry weight on the glass slides at 2.5 m and 5 m depths during the investigation period from May 1987 to April 1988.	136
5.6.	Degree of cover of diatoms, cyanophytes and chlorophytes on the glass slides at 2.5 m and 5 m depths (diatoms only) during the investigation period from May 1987 to April 1988. m.v. = missing value, values for the cyanophytes and	

the chlorophytes at 5 m depth always $\leq 10\%$.	139
5.7. Relative frequency of the main diatom species on the glass slides at 2.5 m depth during the investigation period from May 1987 to April 1988. Hatched = major species (relative frequency at each sampling stations 10% at least once), numbers 1-6 = species with relative frequencies at the corresponding sampling station 10% at least once. m.v. = missing value.	148
5.8. Relative frequency of the main diatom species on the glass slides at 5 m depth during the investigation period from May 1987 to April 1988. Hatched = major species (relative frequency at each sampling stations 10% at least once), numbers 1-6 = species with relative frequencies at the corresponding sampling station 10% at least once. m.v. = missing value.	149
5.9. Relative frequency of the diatom differential groups on the glass slides at 2.5 m and 5 m depth during the investigation period from May 1987 to April 1988. rH 1 = 100% relative frequency, \bar{u} s = very sensitive species, s = sensitive species, wt = less tolerant species, t = tolerant species.	159
6.1. Labyrinth trap (20x14x2.5 cm) for macroinvertebrates. Left: as exposed at the lake bottom, right: opened.	162
6.2. Properties of lake bottom at the six sampling stations at 5 m depth. Average estimates of the investigations from January and from April 1988.	163
6.3. Dry weight (TG) and ash-free dry weight (AFTG) of the sedimented particles and ratio of ash-free dry weight to total dry weight at sampling stations 1, 2 and 3 in the littoral during the investigation period from April 1987 to April 1988.	165
6.4. Dry weight (TG) and ash-free dry weight (AFTG) of the sedimented particles and ratio of ash-free dry weight to total dry weight at sampling stations 4, 5 and 6 in the littoral during the investigation period from April 1987 to April 1988.	166
6.5. Mean number of individuals per labyrinth trap for macroinvertebrates at the six sampling stations during the investigation period from May 1987 to April 1988. N = 4-6. m.v. = missing value.	169
6.6. Relative frequency of the main macroinvertebrate groups at the six sampling stations during the investigation period from May 1987 to April 1988. m.v. = missing value.	172
6.7. Number of individuals per labyrinth trap for <i>Dugesia polychroa/lugubris</i> , <i>Policelis nigra/tenuis</i> and <i>Dendrocoelus lacteum</i> at the six sampling stations during the investigation period from May 1987 to April 1988. Note the different scales. N = 4-6. m.v. = missing value.	173
6.8. Number of individuals per labyrinth trap for <i>Herpobdella octoculata</i> , <i>H. stagnalis</i> and <i>Glossiphonia complanata</i> at the six sampling stations during the investigation period from May 1987 to April 1988. Note the different scales. N = 4-6. m.v. = missing value.	174
6.9. Number of individuals per labyrinth trap for <i>Asellus aquaticus</i> at the six sampling stations during the investigation period from May 1987 to April 1988. N = 4-6. m.v. = missing value.	175
6.10. Number of individuals per labyrinth trap for snails at the six sampling stations during the investigation period from May 1987 to April 1988. N = 4-6. m.v. = missing value.	176
7.1. Area of the theoretical (0-20 m depth interval) and the actual (0-5 m) shallow water area and the vegetation area in the Reuss delta region. Data from 1982/83 by LACHAVANNE et al. (1985).	

Sector 1: on the right of the River Reuss, Allmeini and Schützenrütli
 Sector 2: on the left of the River Reuss, Flüelerschachen and Schanz
 Sector 3: on the left of the River Reuss, Schwäb and Seedorferbucht. 188

7.2.-

7.7. Comparison of the vegetation area (size and flora composition) in the littoral 1982/83 and 1988.

Sector 1 = Allmeini and Schützenrütli

Sector 2 = Flüelerschachen and Schanz

Sector 3 = Schwäb and Seedorferbucht

----- = 5 m isobath (boundary of the actual shallow water zone with regard to the mean water level of many years, altitude above sea level: 433.6 m.

Investigation from 1982/83: x = occurrence of the species without declaration of the relative frequency .

Investigation from 1988: x = occurrence of one or a small number of

191-197

8.1. Density of individuals for *Tabellaria fenestrata*, *Rhodomonas minura* and the group of the diverse flagellates in August (before the flood event) and in September (after the flood event) at the sampling stations in the littoral and in the pelagial. Pel li = pelagial on the left of River Reuss mouth, Pel re = pelagial on the right of River Reuss mouth. 205

9.1. Possible development of the phytoplankton community in the littoral of Lake Uri as a result of the new formation of the River Reuss mouth. 211

9.2. Possible development of the macroinvertebrate communities in the littoral of Lake Uri as a result of the new formation of the River Reuss mouth. 214

List of tables / Limnology

2.1. Latitude and longitude of the sampling stations in the pelagial and the littoral. Latitude and longitude refers to the contour map 1:5000, Reusshochwasser, Canton Uri. 79

2.2. Dates of the chemical, physical and biological investigations and exposition time of the glass slides. 81

3.1. Annual mean and standard deviation of the investigated parameters during the period April 1987 to April 1988. M = mean, S = standard deviation. 86

3.2. Results of the statistical comparisons between the six sampling stations in the littoral and between the two in the pelagial as well as between the littoral and the pelagial. Significance level $p \leq 0.05$, * = $p > 0.1$. 98

3.3. Results of the bacteriological investigation from August 5, 1987 (carried out by the Labor der Urkantone) and February 1, 1988 (our investigation). The investigation were carried out in the Giessen (a channel which acts as a receiving body of water for the water treatment plant of Altdorf), within the bay behind the island for the birds and to the left of the island.
 * = at the mouth of Giessen, ** = about 50 m upstream of the Giessen mouth, *** = on the right to the Giessen mouth, near the shore. 102

3.4. Comparison of the nutrient concentrations of some Swiss lakes. Values of Lake Uri from January to March 1988. * = Mean of the littoral stations