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Autor: Guggenbühler, Mireille
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All of a sudden, Lake Brienz was too clean for some

The largest mountain lake in Switzerland has seen some ups and downs. Back in 1980, it was “over fertilised” – too high in phosphates. Then, in the space of a few years, it became so clean and free of nutrients that the fish died of hunger. Since then, the lake's ecosystem has stabilised, and the fish are doing better.

MIREILLE GUGGENBÜHLER

Water plant manager Michael Baumann stands on the roof of the new facility in Brienz, Canton Berne, and allows his gaze to wander. Below are construction vehicles, behind him the clarification tanks and in front of him, three hundred metres away, are Lake Brienz and Hasli beach. Residents of the Hasli valley come here every summer to swim. Today, there is no-one to be found. Small waves break on the shingle beach; the emerald-green water is otherwise calm – high season has long since ended, and the ships are no longer running.

Around a hundred metres from the lake shore, 18 metres deep, purified water from the treatment facility flows into the lake. “The quantity of wastewater that we process here is highest during peak season in the summer,” says Baumann. This is when the neighbouring campsite is occupied, the Ballenberg open-air museum is open and the hotels are fully booked. In winter, on the other hand, it takes longer to clean the waste water. “The microorganisms that purify the water move more slowly in the winter cold – just like people,” explains Baumann.

Worms, insects and crabs thriving like never before

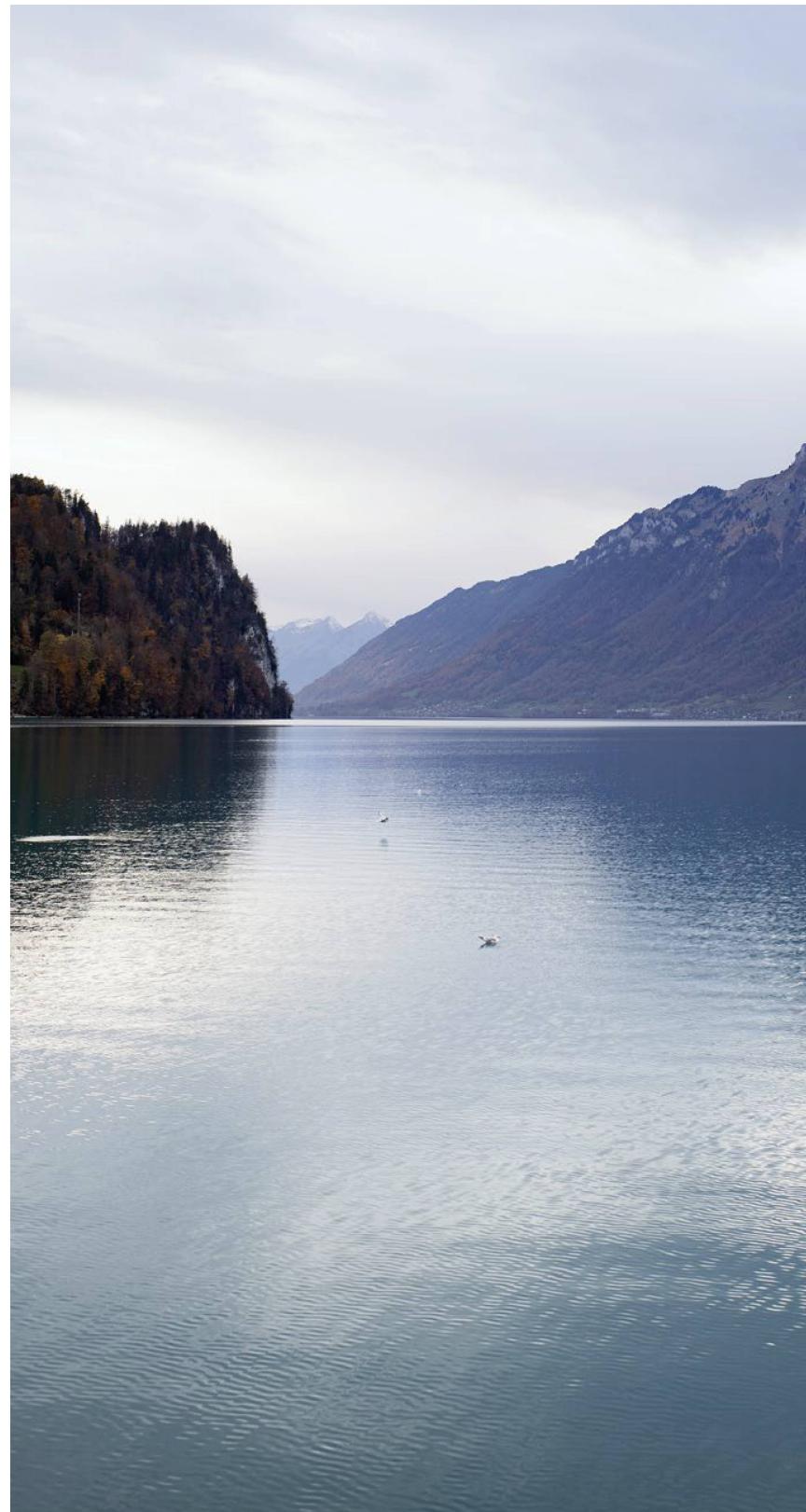
The water treatment facility at the upper end of Lake Brienz is new, and replaces the previous facility, which dates back 50 years. The new facility is computer-controlled and is monitored by Michael Baumann and his colleagues. Its construction is not quite complete, but it is already operational. The previous facility was also able to break down numerous chemical compounds. However: “Thanks

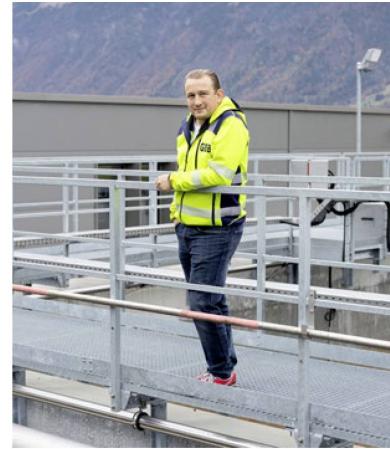


Higher, farther, faster, more beautiful? In search of somewhat unconventional Swiss records

This edition: On the shores of the cleanest lake in Switzerland.

Lake Brienz, flanked by the slopes of the Bernese Alps, is probably the cleanest lake in Switzerland today. For a long time, this was not the case.
Photos: Danielle Liniger





The new Brienz water treatment facility, managed by Michael Baumann, is largely responsible for the good quality of the lake's water.

to the new facility, we can clean wastewater a lot more effectively," says Baumann.

The results are impressive: the water treatment facility is one of the main reasons why Lake Brienz is currently in great health, compared with other Swiss lakes. This large lake on the fringe of the Alps, which was still heavily contaminated with nitrogen during the 1980s, is now the cleanest lake in Switzerland. It has a comparatively intact ecosystem, where animal organisms – crustaceans like water fleas, insect larvae and worms – can thrive particularly well. These organisms then serve as food for the fish. If there are many of them in a body of water, this is a sign that the water is relatively unpolluted. One year ago, the positive biological condition of Lake Brienz was documented in a report commissioned by the Federal Office for the Environment.

Fish and fishermen endured hard times

The lake's current good condition is in stark contrast with the bleak years of its past. One of the people most concerned about it was Beat Abegglen. He is a trained fisherman and lives in Iseltwald, a small former fishing village on the south bank of Lake Brienz.

In the late 1980s, he built up his fishing business there. Shortly thereafter, however, catches collapsed. "In the mid-90s, fish in their fourth year of life weighed between 150 and 200 grammes. At the turn of the millennium, their average weight was 40 grammes," says Abegglen. "This loss in weight and a drastic reduction in catch sizes are always a sign that something is wrong with the water."

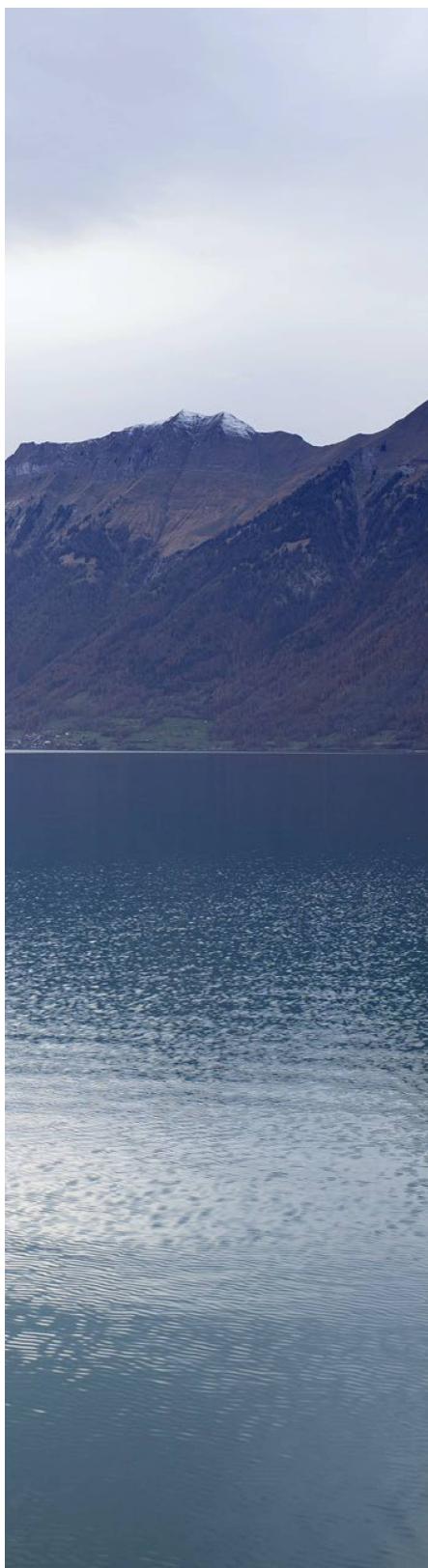


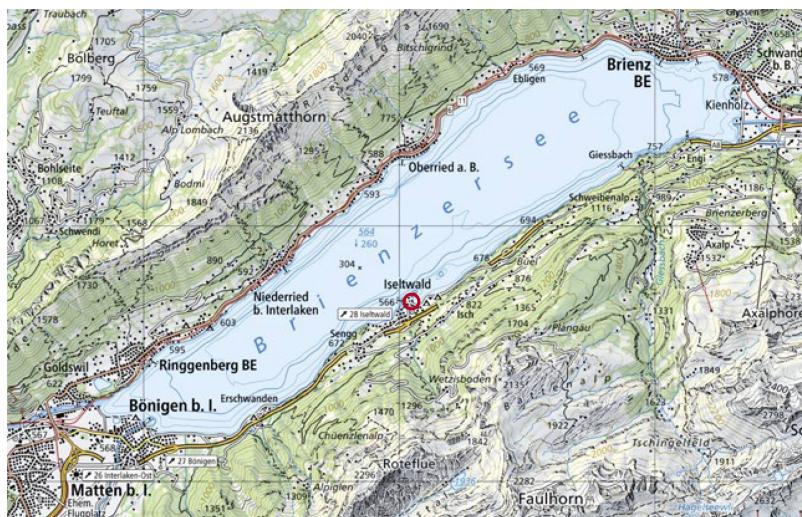
Beat Abegglen takes a look back on his difficult years as a fisherman. First, catches collapsed. Since then, he has been landing more fish from the lake again.

At the same time as Beat Abegglen was making his observations, experts at the water protection office of Canton Berne determined that the water fleas, or daphnia, had disappeared. Water fleas, which form part of plankton, are chiefly eaten by whitefish. These are the most common species of fish in Lake Brienz.

Based on all these observations, Canton Berne commissioned a research project aimed at finding out the reasons behind the fall in catches and the disappearance of the water fleas. The investigations showed that the changes observed were connected with the decrease in nutrients in the lake. The main reason for this decrease in nutrients was the massive reduction in the levels of phosphorous – including from faeces and from detergents and cleaning products – entering the lake. This decrease, according to the research report, is in turn due to the "decades of efforts made in technical water pollution control" – in other words, the good work done by the water treatment facility.

For Lake Brienz, which already has naturally low nutrient levels, this success in preventing water pollution also had a downside: "The tiny quan-





© Swisstopo

ties of nutrients hinder the already meagre growth of algae, and reduce food sources for plankton, leading to less food for the whitefish," the report states.

The drop in catch sizes in Lake Brienz led to discussions in fishing circles, but also in politics. A proposal was made to artificially raise the levels of phosphorous entering the water by making treatment facilities purify the water less thoroughly. The canton, however, refused. Deliberately adding dirty water to the lake was environmentally undesirable.

Rising temperatures favour food production

Because the drop in fish catches was so massive, Beat Abegglen was forced to abandon his job as a fisherman. Today, he runs his fishery as a hobby and works in another industry as his main job. He sells his fish to customers in the region, who can react flexibly to his catches. However, for the past four years, Abegglen's catches have been increasing again. Fish no longer weigh around 40 grammes – they now weigh 170-180 grammes again. "At the same time, the whitefish and perch are back," says Beat Abegglen. Theoretically, Abegglen could now make a living from fishing again. He no longer wants to, though: "I am not giving up the security of a fixed income."

As for why the fish are now doing better, Beat Abegglen has an explanation: the water that flows into Lake Brienz from its tributaries is warmer than it was a few years ago. In Abegglen's view, this is due to global warming. "Glaciers melting used to result in very cold water flowing into Lake Brienz all year round." Now, the



Isektwald is a picturesque peninsula rising up out of Lake Brienz. During the summer, historic paddle steamers churn through the often emerald-green water of the mountain lake.

Photos: Keystone

volume of glaciers has shrunk considerably, and less glacier water is flowing into the Aare and the Lütschine, Lake Brienz's two main tributaries. The rivers are also transporting less debris into the lake. This means that the lake is less cloudy and sunlight can penetrate deeper into the water. The warmth of the water and the fact that sunlight can now reach great depths has an impact on plankton production in the lake. "So, much more food is being produced for the fish," says Beat Abegglen.

An unstable lake for years

Whether Lake Brienz's ecosystem will remain in such good health is hard to predict. "Lake Brienz has always been in an unstable state," says Beat Abegglen. This is also recorded



in Canton Berne's research report. In addition, even the new treatment facility cannot eliminate all substances from wastewater. As for how this micro-contamination will affect the lake's ecosystem in the future, no-one knows. However: "In a couple of years, we will definitely be able to filter these substances out in water treatment facilities," says treatment facility manager Michael Baumann.

This situation has done nothing to dispel the fascination with the largest mountain lake in Switzerland. It continues to be a beloved getaway destination – not least due to its unique colour. This year, commercial shipping on Lake Brienz recorded its highest number of visitors in ten years: 496,000 passengers travelled on the lake by boat. This is around 179,000 more guests than in 2013. In contrast to neighbouring Lake Thun, Lake Brienz is primarily a getaway destination for foreign guests.

Nonetheless, the hype is never as great as for other lakes, says Beat Abegglen, who even after more than 30 years' fishing is still fascinated by Lake Brienz: "In late August, you can always see plenty of shooting stars over the lake. There are so many that it makes you feel awestruck and small."