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Cameroon's Lake Nyos Gas Burst: 30 Years Later

9th Workshop of the IAVCEI-Commission on Volcanic Lakes (CVL9); Cameroon, 14–24 March 2016

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Lake Nyos, Cameroon, shows red coloration from iron oxides stirred up by the artificial degassing of carbon dioxide from the bottom water. To prevent a recurrence of the 1986 disaster, a French team installed tubes that siphon water from the bottom of the lake to the surface, allowing carbon dioxide to escape in safe amounts. Credit: Antonio Costa

On 21 August 1986, a lethal carbon dioxide (CO_2) cloud burst from the bottom waters of Lake Nyos in northwestern Cameroon, killing 1746 people and more than 3000 livestock. Early on, there was disagreement over whether the cause for the gas release was a volcanic or a limnic eruption, the latter a **rare event** in which CO_2 suddenly comes out of solution and erupts from the water. When Lake Nyos's bottom water naturally recharged with CO_2 in the years after 1986, it became clear that the limnic eruption hypothesis was the most likely.

After the tragic Nyos event, volcanic lake research grew worldwide. During the International Conference on the Lake Nyos Gas Disaster in Cameroon's capital, Yaoundé, in March 1987, the International Working Group on Crater Lakes (IWGCL) was born. In 1993, the International Association of Volcanology and Chemistry of the Earth's Interior (IAVCEI) welcomed IWGCL as a commission, renaming it the **Commission on Volcanic Lakes** (CVL). Last March, to commemorate the Nyos Lake tragedy, the IAVCEI-CVL convened in Yaoundé for its 3-yearly workshop.

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Key lectures were presented by Nyos fluid geochemistry and limnology (inland water) pioneers Minoru Kusakabe (Japan), George Kling (United States), and J.-C. Sabroux (on behalf of Michel Halbwachs's team, France). It was apparent from the workshop that the initial controversy over the cause of the Lake Nyos disaster has been replaced by harmony and agreement. After 15 years of risk mitigation actions by the artificial degassing of Lake Nyos, the lake is considered relatively safe.

Also discussed was the decades-long commitment to research, supported mainly by the **Japan International Cooperation Agency**. Workshop attendees agreed that research efforts stand as a laudable example of international collaboration and capacity building. For example, it was noted that several Cameroonian experts have now returned home after getting their Ph.D.'s in Japan, to head up research on their lakes.

As part of the workshop activities, on 19 March, scientists engaged in a multidisciplinary sampling and measurement campaign for Lake Nyos. On 22 March, they undertook an in-depth survey of Lake Barombi Mbo, the largest **maar lake** in Cameroon.

The CVL Steering Committee recognized Minoru Kusakabe for his role as the "CVL founding father," his career-long dedication to Lake Nyos, and, especially, his efforts toward capacity building among

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Cameroonian researchers by honoring him with the first of a series of awards named after him. The CVL will bestow the Kusakabe Award every 3 years. Also at the meeting, Madeleine Tchuente, Cameroon's minister of scientific research and innovation, presented six members of CVL and two others with medals and the title chevalier de la République du Cameroun (knight of the Republic of Cameroon) on behalf of President Paul Biya.

The 2016 workshop confirmed the IAVCEI-CVL as a cohesive, united, and active group of passionate researchers, ensuring creative and socially responsible research on volcanic lakes in the future. Many local students and 65 professional participants from 11 countries attended the workshop, with the Italian team being the largest group present. The workshop was organized by Greg Tanyileke, Wilson Fantong, Aka Festus, and others from Cameroon's Institute of Geological and Mining Research (**IRGM**) and was supported by the International Union of Geodesy and Geophysics.

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