



**University of
Zurich^{UZH}**

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World Glacier Monitoring Service

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Dr. Alejandro Ceccatto
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Zurich, 8 December 2017

Expression of Concern related to the case CFP 16156/2016

Dear Dr. Alejandro Ceccatto, President of CONICET

The World Glacier Monitoring Service (WGMS), acting under the auspices of ICSU/WDS, IUGG/IACS, UNEP, UNESCO, and WMO, has taken notice of the legal prosecution of Dr. Ricardo Villalba in his function as former Director of the Instituto Argentino de Nivología, Glaciología y Ciencias Ambientales (IANIGLA), Mendoza, and responsible scientist for the National Inventory of Glaciers (ING) in Argentina (case CFP 16156/2016; decision of judge Sebastián Casanello on November 27, 2017).

This letter is to express our concern related to this issue, which has been raised in the high-impact journals "Science" and "Nature" [1], [2]. We are deeply worried that Dr. Villalba and the authoritative governmental research organization IANIGLA, Mendoza, are indicted in this case following an argument that lacks any scientific basis and ignores internationally agreed standards, recommendations, and methodologies with regard to glacier monitoring and mapping. In our letter of August 17, 2017, the WGMS has stated that the minimum size is no criteria for the definition of a glacier but rather a practical choice of those implementing an inventory. In view of available satellite data, the minimum size of glaciers applied in the ING can be considered to be in line with good international practices.

Given the indictment by the Argentine federal judge Sebastián Casanello, the WGMS is deeply concerned if scientists, as persons and individuals, face legal prosecution in relation to scientific work, which has been carried out under fulfillment of internationally agreed scientific standards, and in line with best practice. This case has far-reaching consequences as it puts the integrity of scientists and research institutions in Argentina at stakes. We are observing this case very closely and with great concern.

Sincerely

Michael Zemp, Director WGMS

Enclosure: WGMS letter of August 17, 2017

Copy to:

- Argentinean Embassy in Switzerland
- Ministro de Ciencia, Tecnología e Innovación Productiva de la República Argentina
- WGMS Auspice Organizations: ICSU (WDS), IUGG (IACS), UNEP, UNESCO, WMO
- National Correspondents of WGMS
- IANIGLA, Mendoza

[1] Science, 5 December 2017: "Argentine scientist indicted over design of glacier inventory"
<http://www.sciencemag.org/news/2017/12/argentine-scientist-indicted-over-design-glacier-inventory>

[2] Nature, 6 December 2017: "Argentinian geoscientist faces criminal charges over glacier survey: government researcher Ricardo Villalba stands accused of shaping a study to benefit mining interests" <https://www.nature.com/articles/d41586-017-08236-y>



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Zurich, 17 August 2017

Minimal glacier size for inventories

Dear Ricardo,

The glacier staff at IANIGLA informed me about the ongoing discussion in your country about the application of a minimum area threshold for inclusion of glaciers in the national inventory of Argentina.

From an international perspective, and while taking no stand on any specific legal or political issue, I can contribute the following considerations with respect to the minimal glacier size for inventories.

A glacier is generally defined as "a perennial mass of ice, and possibly firn and snow, originating on the land surface by the recrystallization of snow or other forms of solid precipitation and showing evidence of past or present flow" (Cogley et al. 2011).

The minimum size of a glacier is no criteria for its definition but rather a practical choice of those implementing an inventory. For existing inventories, corresponding thresholds have usually been set in view of (i) the types of glaciers in the region of interest, (ii) the earth observation data available, (iii) the purpose of the glacier inventory, and (iv) the resources available. For example, the inventory of glaciers in Svalbard recorded only ice bodies larger than 1km² (WGMS, 1989). In the Alps, with a different size distribution, 90% of the glaciers would have been left out according to this rule.

According to Paul et al. (2009), a size of 0.01km² could be seen as a practical lower limit, as entities smaller than this can be very numerous and their status as glaciers is likely to be doubtful. This is also the minimum size that can be identified with certainty under good conditions from satellite sensors operating at 15–30m spatial resolution. Higher resolution images - as available from newer space borne as well as from airborne sensors - help to improve the glacier identification but cannot completely solve issues such as debris cover, snow patches, shadow, ice divides, or separation of glaciers and permafrost features. These challenges need to be tackled in addition and, again, in view of points (i) to (iv) mentioned above.



If an inventory fulfills the requirements of its national/sponsoring authority needs to be evaluated in view of the original mandate. Nevertheless, one can certainly state that the selection of a minimal glacier size of 0.01 km² for an inventory developed using a combination of ASTER and Landsat ETM+ scenes – such as the one by Falaschi et al. (2013) – can be considered to be in line with good international practices.

Sincerely

A handwritten signature in dark ink, appearing to read 'M. Zemp'.

Michael Zemp

Director WGMS

Copy to Pierre Pitte & Mariano Masiokas, IANIGLA/CONICET

References

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