



# Climate Change and Glaciers vulnerability:

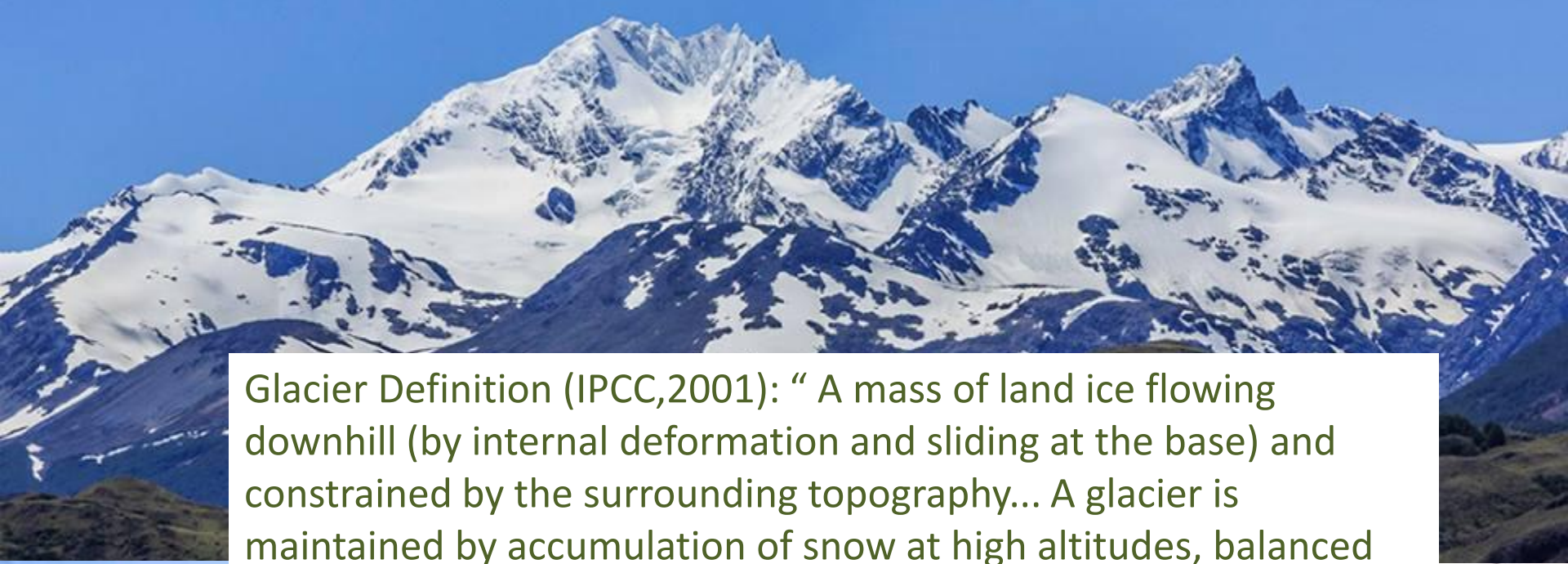
## An outstanding agenda for Latin América

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Glacier Definition (IPCC,2001): “ A mass of land ice flowing downhill (by internal deformation and sliding at the base) and constrained by the surrounding topography... A glacier is maintained by accumulation of snow at high altitudes, balanced by melting at low altitudes or discharge into the sea”.



# Glaciers: Latin American Context



- ✓ IPCC indicates that Latin America is among the regions most vulnerable to climate change. Alerts about the seriousness of global warming that is causing the warming of permafrost and the melting of glaciers (IPCC 2014).
- ✓ Glaciers are considered strategic reserves of freshwater that are being affected by climate change due to their obvious retreat (IPCC 2014).
- ✓ Studies indicate loss of between 20 to 50 % of their size in tropical glaciers and 20% in glaciers of the southern Andes since the end of the decade of 1970 (World Bank 2014).

# Glaciers: The importance of protecting them

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- ✓ It is estimated that tropical glaciers will lose between 78%-97% of their volume; southern glaciers between 22% and 59% of their volume if temperature increases +2 °C (World Bank 2014)
  
- ✓ The Andes mountain range concentrates close to 99% of tropical glaciers, with 71% of them in Perú, 20% in Bolivia, 4% in Ecuador and 4% on the border between Colombia and Venezuela (Kaser, G. 1999).

# Glaciers: The importance of protecting them

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- ✓ They supply water to watersheds in countries such as Venezuela, Colombia, Ecuador, Perú, Bolivia, Chile and Argentina (specially in dry season).
  
  - ✓ They supply river systems, groundwater and aquifers, making water available for valleys, ecosystems and activities such as human and animal consumption, agriculture, industry, etc.
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# Glaciers: Regional public policy



- ✓ Scarce awareness and knowledge of the consequences of the retreat of glaciers.
- ✓ We believe governments of the region should implement proactive, precautionary actions, as part of a collective effort of implementation of adaptation measures.
- ✓ Threatened by global warming, is the added fact that there are presently mining projects in Chile, Perú and Argentina that promote their displacement or even their destruction.
- ✓ Only one of seven countries (Argentina) has a glacier protection policy in force. Glacier Law.





# Glaciers: The case of Chile



- ✓ Chile is classified as a vulnerable country according to the Climate Change Convention, (fits with 7 of 9 UNFCCC criteria).
- ✓ Surface of glaciers in South America: approx. 29.333 km<sup>2</sup>. 80,5% of that surface is in Chile.
- ✓ It is estimated that Chile has 21,114 glaciers with a surface of 23,641 km<sup>2</sup> (DGA 2014) country with the largest percentage in Latin America (Segovia 2014).
- ✓ National studies projections for 2040 and 2100 indicate intensification of dryness in the northern area, advance of desertification towards the south, decrease in rainfall in the central and southern regions, and an increase in the extreme south.





# Glaciers: The case of Chile



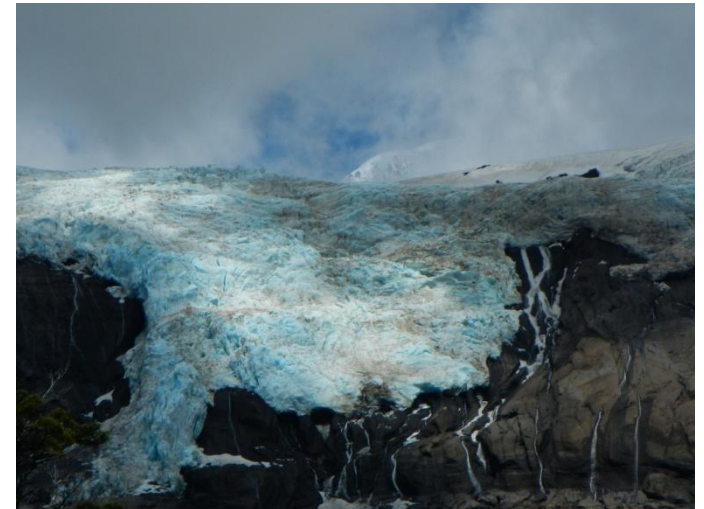
- ✓ Chile does not recognize glaciers in national legislation, which means that they are unprotected.
- ✓ We celebrate that President Bachelet, in her 2014 public account, announced a law to protect glaciers.
- ✓ This announcement adds to her efforts during her previous administration, as well as those of congress members committed with legislating and that formed the “glacier legislative group”.



# Glaciers: The case of Chile



- ✓ The most recent legal initiative from parliament defines glaciers as dynamic ecosystems in a climate change scenario and seeks to protect glaciers and permafrost.
- ✓ Access to drinking water should be considered as a Human Right. The protection of glaciers is vital due to them being strategic reserves that today provide, and will continue tomorrow, providing water resources.
- ✓ Glaciers should be declared a strategic resource and be under Constitutional protection.







# Conclusions

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- ✓ Glaciers are strategic freshwater reserves in a climate change scenario. Precautionary measures are needed from governments through the development and implementation of public policies that deal with strategies of land use planning, adaptation and mitigation to control retreat and loss of glaciers and to respond to the imminent conflicts related to access, use and distribution of water.
- ✓ Projections of glacier retreats, decrease in rainfall and population growth increase the pressure on local water systems and should be dealt with on time.



# Conclusions



- ✓ Consider the adaptation to climate change as a built-in component of development. It is necessary to invest in adaptation now, in order to avoid climate change impacts from becoming a burden difficult to manage for the development agendas of the region. Protecting glaciers is one of them.
- ✓ To safeguard the food production, health and sustenance of communities also involves assuring their water supply over industrial activities such as mining and other extractive activities that generate irreversible impacts.
- ✓ Protecting glaciers implies safeguarding water for human consumption, ecosystems and biodiversity.



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