

SF2

CLIMATE CHANGE AND GLACIERS - ACTIVITY A

Comparison of multitemporal orthophotos (years 1989, 1994, 1999, 2007, 2010, 2012) for understanding changes in the glacial environment of the Ban Glacier (Lepontine Alps, Arbola Group, Formazza Valley, Piemonte Region)

1. Observe and analyze each photo.
2. What are the two main geomorphological elements of this alpine environment?
3. Compare similarities and differences of the environment in different years.
4. Track the changes of the two main geomorphological elements through time by using different colors on the millimeter transparent paper.
5. Estimate the areal variations of Ban Glacier and lake through time.
6. Estimate the total length of the glacier through time by comparing the position of the glacier front.
7. Interpret what are the ongoing phenomena and write a short statement for describing them.

CLIMATE CHANGE AND GLACIERS - ACTIVITY B

Identification of glacial lakes through space and time (Valaisan Glacier, Graian Alps, Rutor-Valaisan Group, Aosta Valley; Google Earth satellite image, 2009)

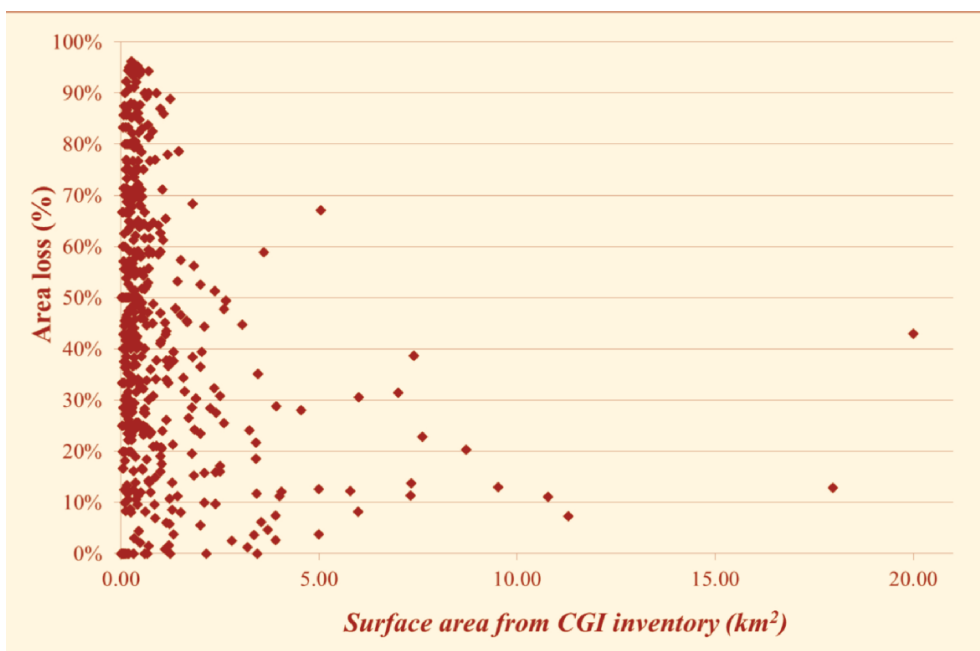
1. Observe the satellite image and identify glacial lakes.
2. Indicate and interpret the possible sequence of formation of glacial lakes (Which are the oldest and which the most recent? Why did they formed through different times?).
3. What is the reason for different colors of the water into the lakes?
4. Write a short statement for describing the above-mentioned phenomena.

CLIMATE CHANGE AND GLACIERS - ACTIVITY C

Identification of changes through time of the Albaron di Sea Glacier (Graian Alps, Ciamarella Group, Grande di Lanzo Valley, Piemonte Region) and inventories of glaciers in Italy.

1. Observe and compare the photographs of the Albaron di Sea Glacier taken in years 1904 and 2007, as well as the ortophoto taken in years 1988 and 2012.
2. Look at the following table and at the graph.
3. What is the relationship between the number of glaciers, the percentage area loss and the glacier size?
4. What is the ongoing phenomenon? What are the effects of this phenomenon on a glacier over the next few years?

Data from inventories of glaciers in Italy		
year of the inventory	number of glaciers	total glacierized area
1927	774	n.d.
1960	838	500 km ²
1989	787	470 km ²
2015	903	370 km ²



Non-linear relationship between percentage area loss from CGI Inventory (1960) to the New Inventory (2015; y axis) and glacier size (x axis). (From: Il Nuovo Catasto dei Ghiacciai Italiani, 2015).

These activities were realized in cooperation with Cristina Viani PhD, Department of Earth Sciences, University of Torino, and the Italian Glaciological Committee

CLIMATE CHANGE AND GLACIERS - ACTIVITY D

Identification of changes through time of the Lys Glacier (Pennine Alps, Monte Rosa Group, Lys Valley, Aosta Valley).

1. Observe and compare the photographs taken in years 1868 and 2011 of the Lys Glacier.
2. Find recognizable landforms and other features to be used as equivalent points to be used as references for photographic comparisons.
3. Use the map on ortophoto for identifying the glacial extents related to the photographs taken in years 1868 and 2011. Complete related labels and legend on the map, avoiding those not related to the presented data.
4. What is the ongoing phenomenon? Indicate some relevant geomorphic processes and factors related to the environmental changes.

year 1868



year 2011



