United Nations Educational, Scientific and Cultural Organization

Man and the Biosphere programme

Sustainable Development Goals

An Image Worth a Thousand Words: Raising awareness about climate change effects through satellite imagery

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United Nations
Educational, Scientific and
Cultural Organization
MaB
Man and
the Biosphere
Programme
International
Hydrological
Programme

LIMA COP20 | CMP10

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SOBRE CAMBIO CLIMÁTICO 2014

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PARIS2015

CONFÉRENCE DES NATIONS UNIES
SUR LES CHANGEMENTS CLIMATIQUES

COP21·CMP11

Climate change
Awareness raising

United Nations Educational, Scientific and Cultural Organization

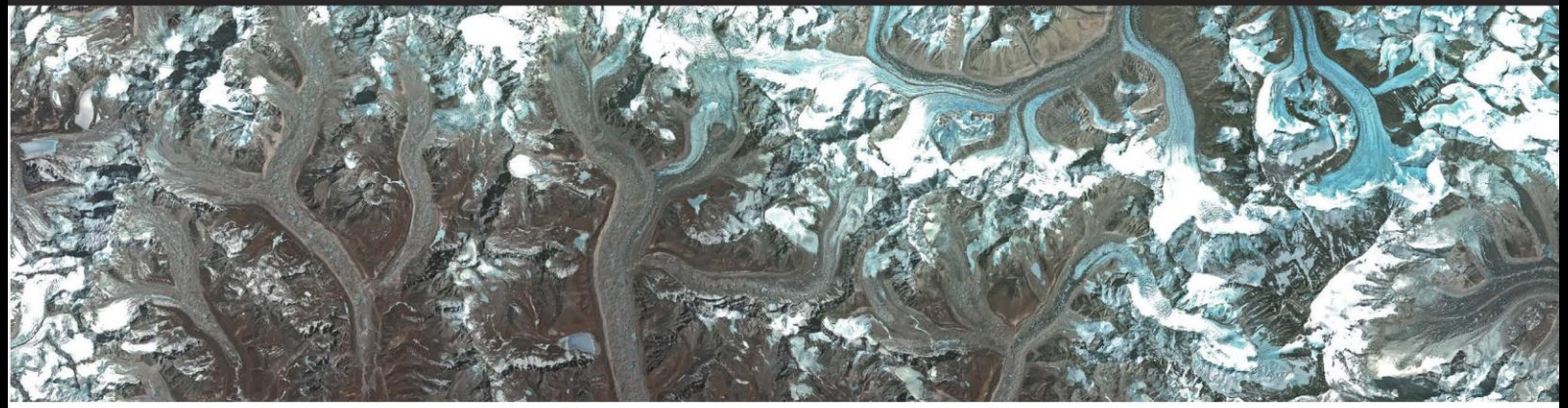
International Hydrological Programme

Man and the Biosphere Programme

With the support of the Government of Flanders

Climate change impacts
on mountain regions of the world

Impacts du changement climatique
sur les régions montagneuses à travers le monde



The UNESCO Climate Change Platform

JAXA Explore to Realize

esa

USGS science for a changing world

planetaction

UN WATER World Water Day 2013 International Year of Water Cooperation

Les montagnes : des systèmes d'alerte précoce pour le changement climatique

Mountains: early warning systems for climate change

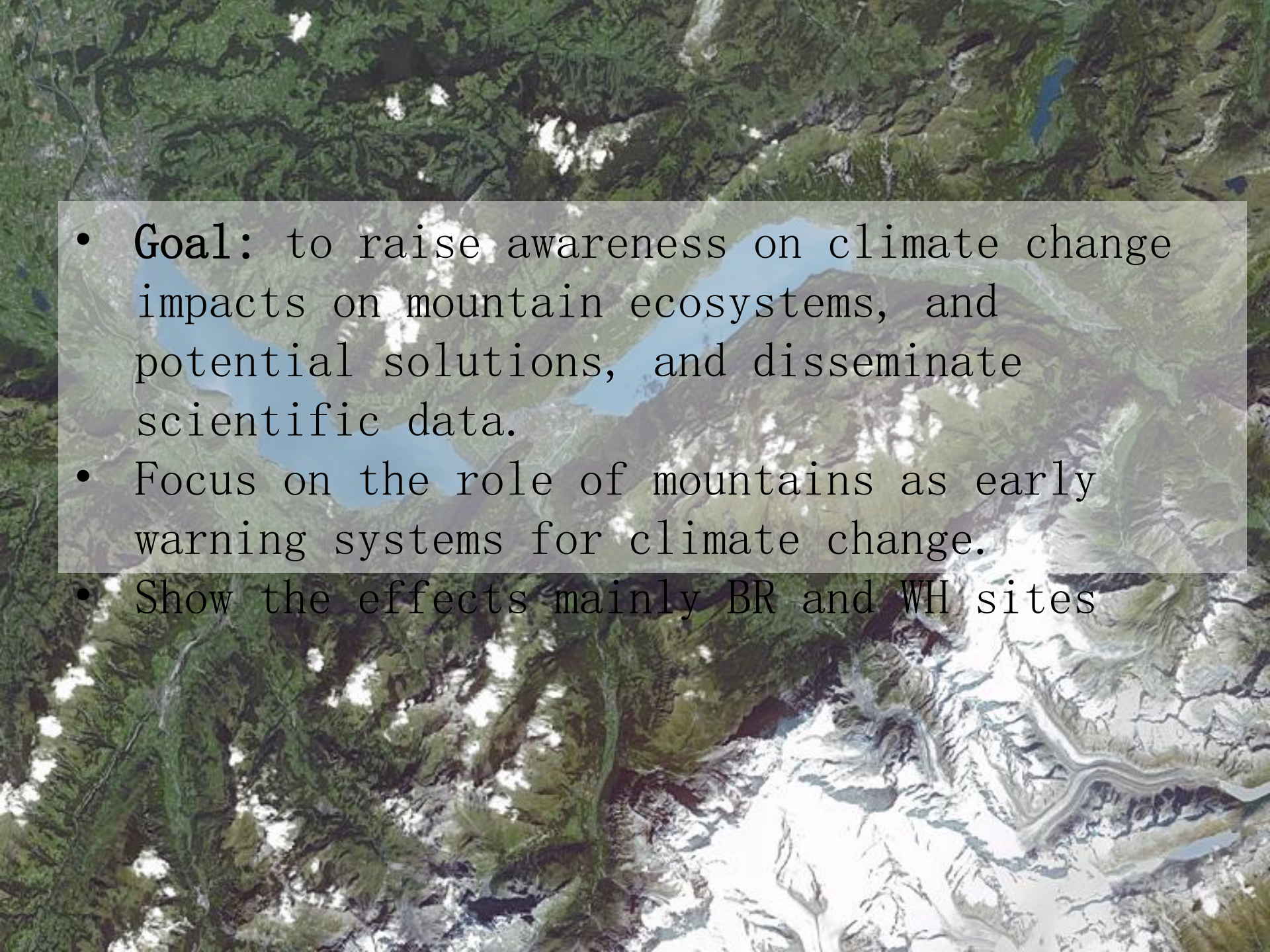
United Nations Educational, Scientific and Cultural Organization

Programme Hydrologique International

50 years

MaB Man and the Biosphere programme

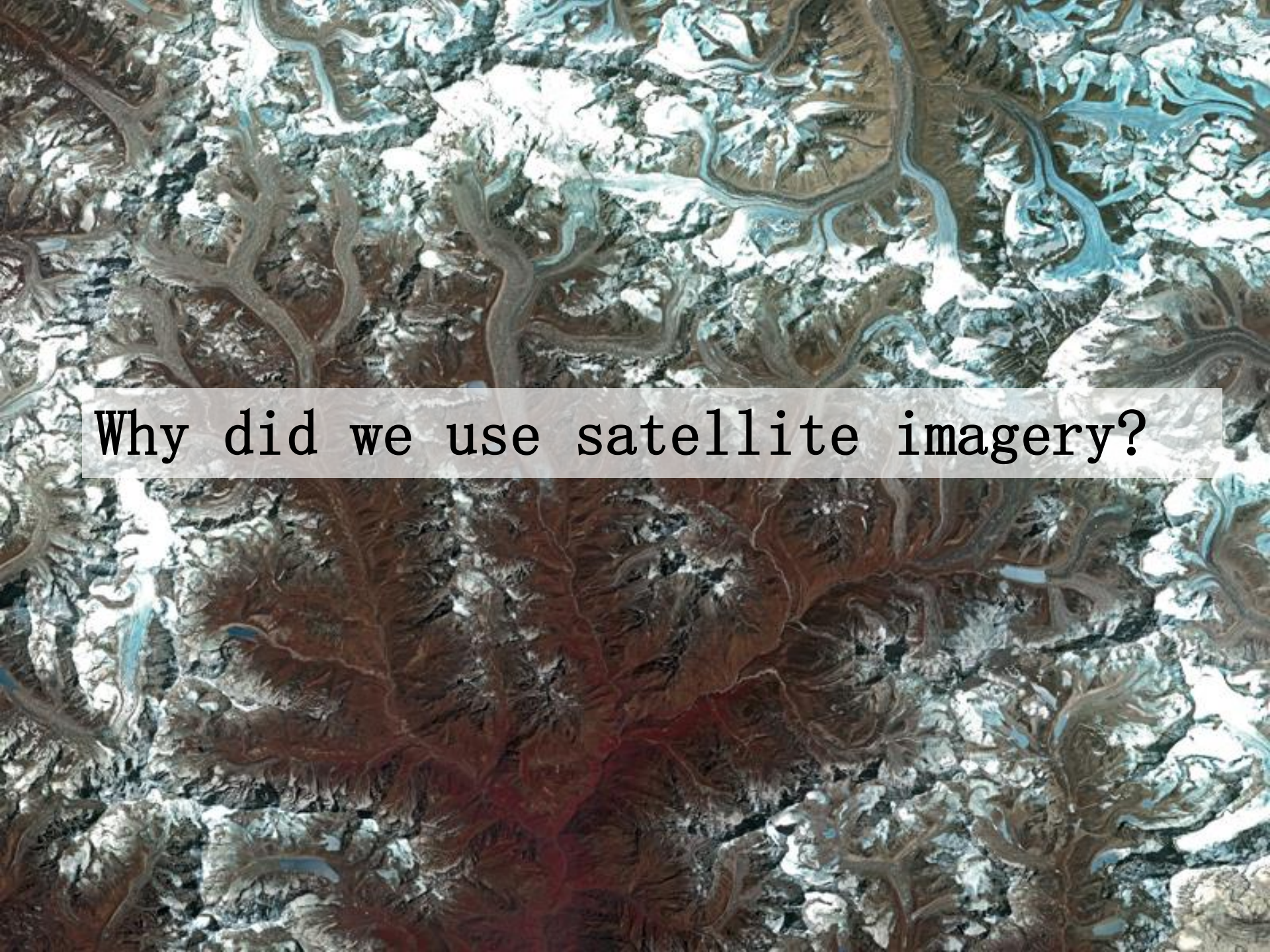
- Government of Flanders, Belgium
- Japan Aerospace Exploration Agency (JAXA)
- European Space Agency (ESA)
- United States Geological Survey (USGS)
- World Glacier Monitoring Service (WGMS)
- GRID-Arendal and Wild Touch.



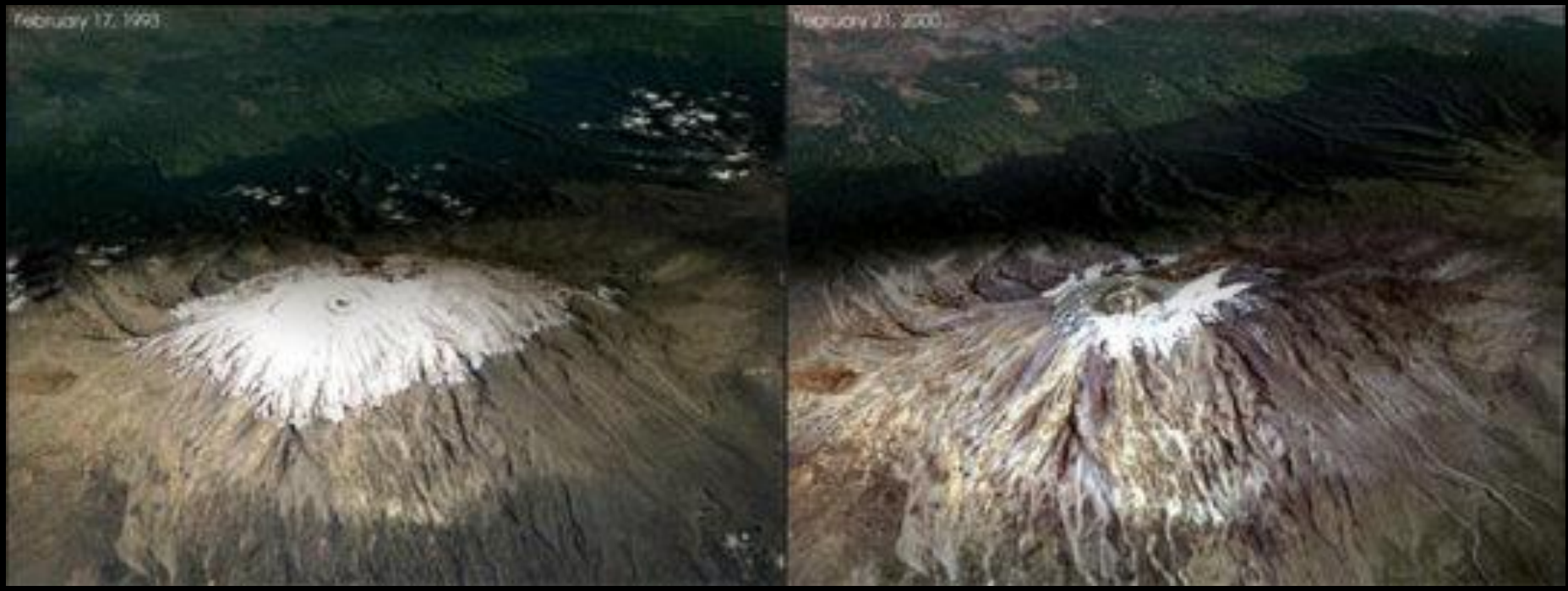
- **Goal:** to raise awareness on climate change impacts on mountain ecosystems, and potential solutions, and disseminate scientific data.
- Focus on the role of mountains as early warning systems for climate change.
- Show the effects mainly BR and WH sites

Why mountains?

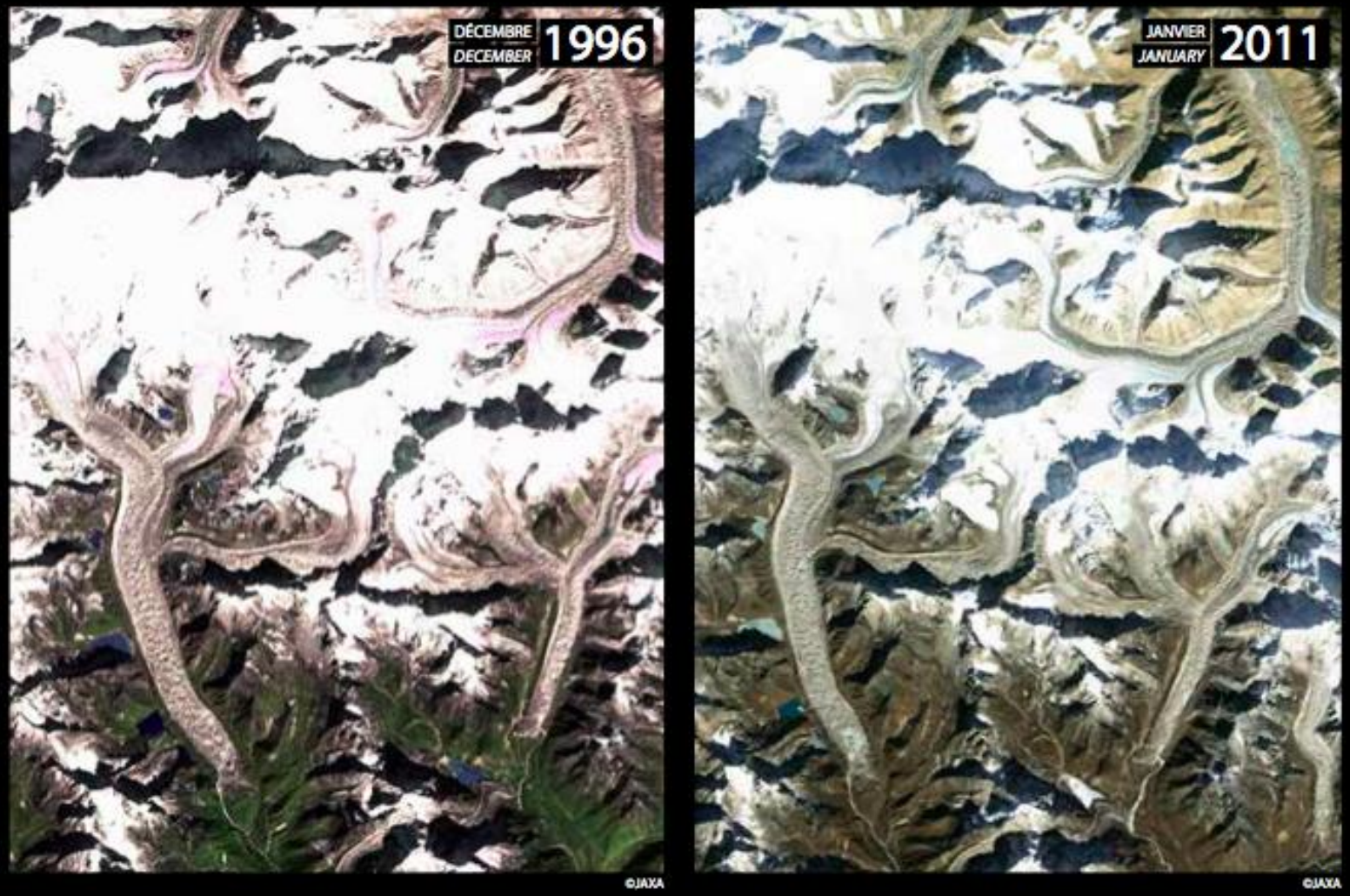
- Occupy 25% of the Earth’s surface.
- Home to about 1.2 billion people.
- Water towers of the world.
- Contain more than half of the world’s biodiversity hotspots, much of which is used by people for food, fiber, timber, and medicine.
- Regulate the climate, purify the air, and store carbon dioxide.
- 59% of the WNBR contain mountain ecosystems.


Why did we use satellite imagery?

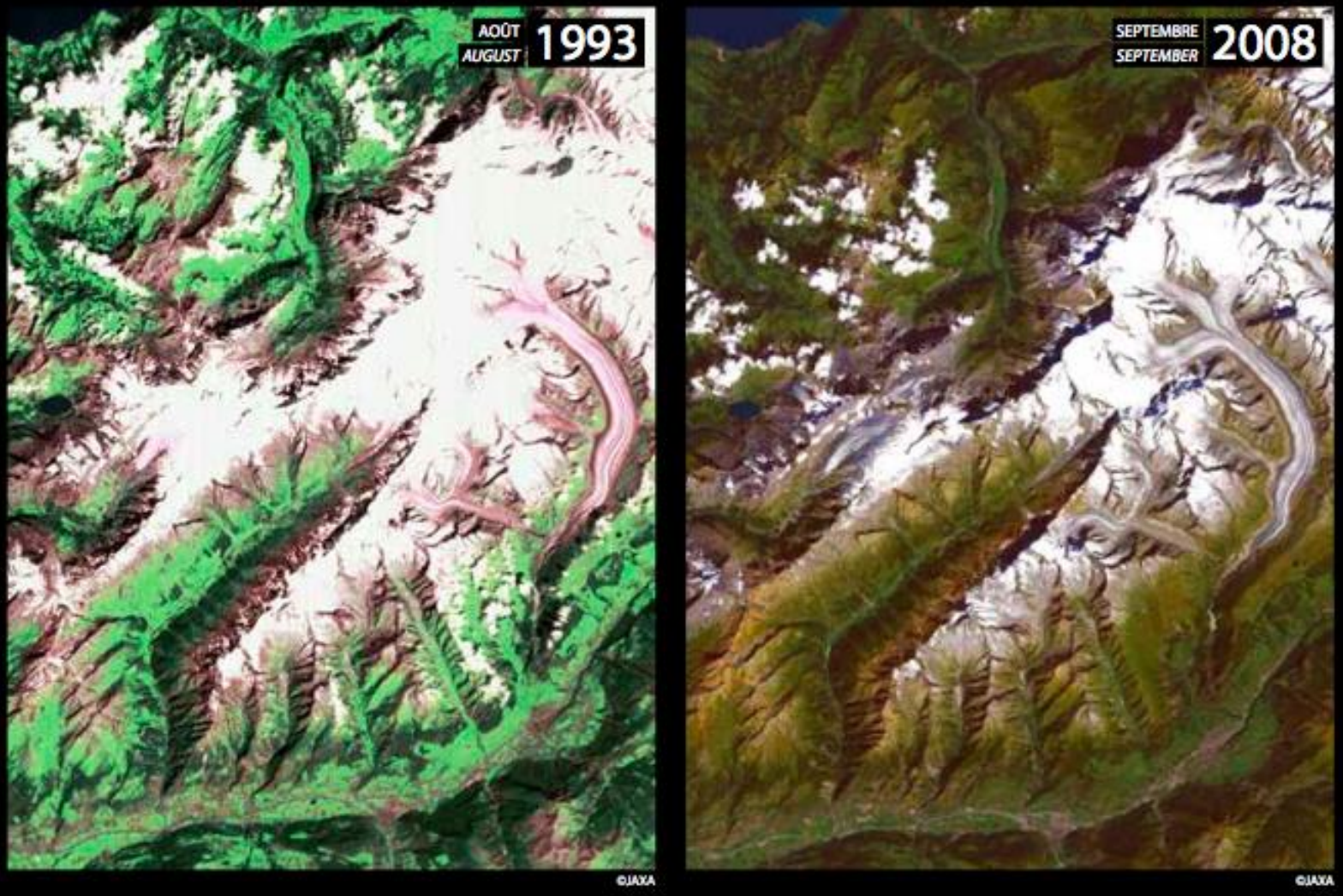
…Because an image
worth a thousand words



Over the last 100 years about 85% of the Kilimanjaro’s ice cover has disappeared. Glaciers shrank from an area of 11.40 km² in 1912 to only 1.76 km² in 2011.



Mount Everest: the total area covered by glaciers in the Dudh Koshi Basin declined by 143 km2, which is equivalent to 27% area loss between 1980



The Great Aletsch Glacier has retreated by about 3.4 km in length since the mid- 19th century, nearly half of which occurred during the past 56

Nigardsbreen : Les fluctuations du glacier émissaire
Nigardsbreen: Fluctuations of the maritime outlet glacier

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Le Nigardsbreen est l'un des nombreux glaciers émissaires du Jostedalsbreen (« breen » signifie glacier en norvégien). Situé dans le Parc National de Jodestal, près des côtes occidentales de la Norvège, le Jostedalsbreen est une grande calotte glaciaire d'Europe continentale (474 km²).

Le Nigardsbreen a une superficie de 48 km². Culminant à 350 m au-dessus du niveau de la mer, il est le glacier émissaire le moins élevé du parc, ainsi qu'un des glaciers les plus accessibles au monde. Au cours des 50 dernières années, le glacier a oscillé entre périodes d'expansion et de recul.

Le Jostedalsbreen, avec de nombreux autres glaciers norvégiens, contribue grandement à la production d'hydroélectricité ; cette énergie compte pour 98 % de l'énergie produite en Norvège pour l'usage domestique et pour l'exportation. Environ 15 % du ruissellement utilisé provient de bassins glaciaires dont les réserves sont principalement disponibles en été. Mais sa faible altitude rend le Nigardsbreen plus sensible aux variations de précipitations et donc plus sujet à la fonte que les glaciers situés à l'intérieur des terres. Le recul du glacier a pour conséquence une importante modification de la végétation dans les zones adjacentes.

Nigardsbreen is one of several icy arms extending out from the Jostedalsbreen ("breen" meaning glacier in Norwegian). Jostedalsbreen lies in the Jostedal National Park near the western coast of Norway and is the largest ice cap on mainland Europe (474 km²).

Nigardsbreen has a surface area of 48 km². At 350 m above sea level, it is also the lowest arm in the park and one of the most accessible glaciers in the world. For the last 50 years, this glacier has experienced alternating periods of growth and loss.

Together with many other Norwegian glaciers, Jostedalsbreen contributes significantly to hydropower, which accounts for 98% of the energy produced for Norway's domestic use and export. Around 15% of the run-off used for power generation comes from glaciated basins with most of the water being available during summer. But because of its low altitude Nigardsbreen is more sensitive to changes in precipitation and thus to melting than glaciers situated further inland. This leads to significant vegetation changes in areas near the glaciers.

COP20, Lima, Peru

UNESCO’s
General Conference

SUSTAINABLE DEVELOPMENT GOALS

Next activities: UNESCO Chair on WH and BR Observation and Education

- Heidelberg University of Education, Germany
- Implement research/education projects
- Establish a capacity building programme for site managers to help monitoring through digital geo-media (remote sensing, GIS)
- Trainings for teachers and students

Thank you!