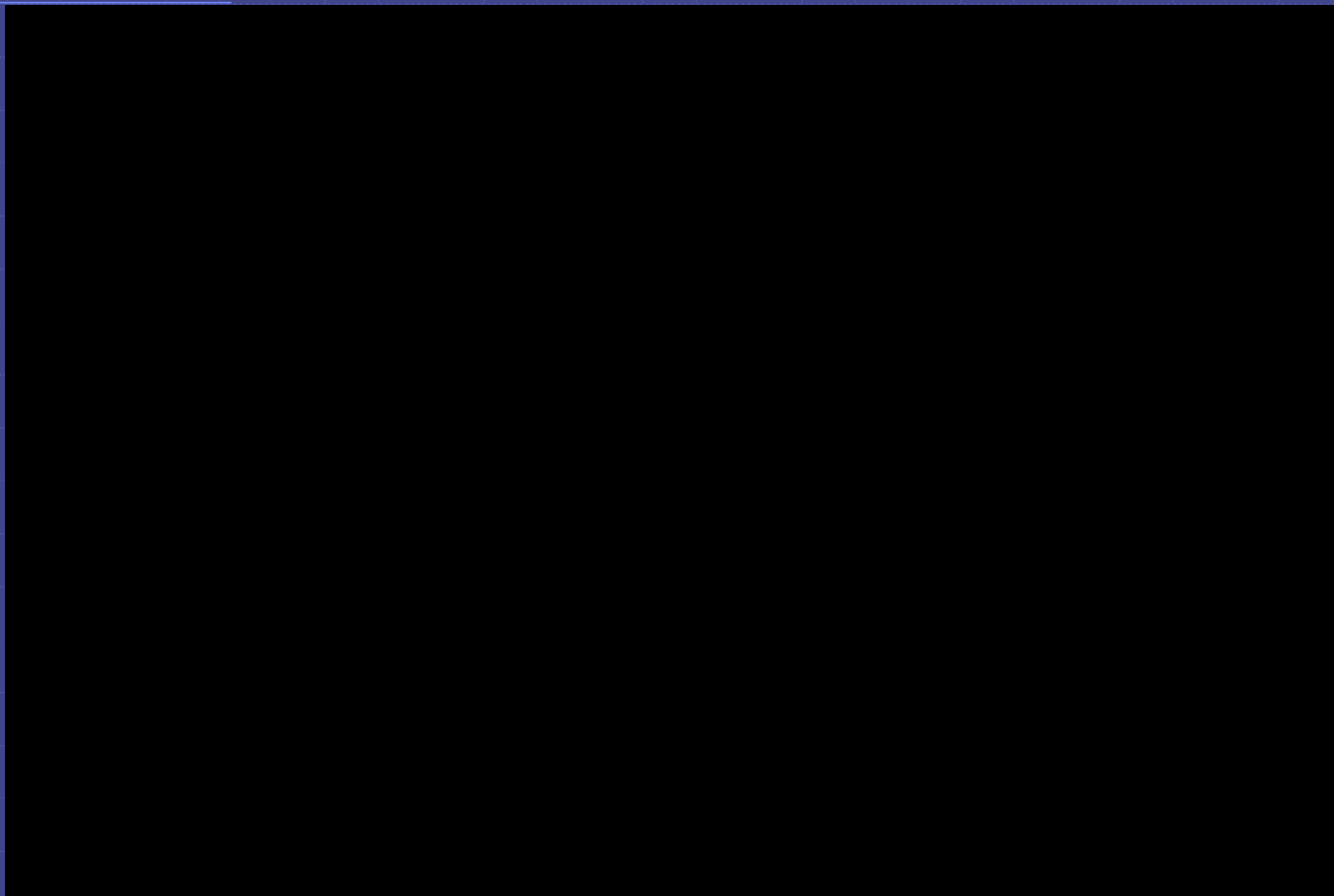




***Desastres Naturales
asociados a Glaciares***

***Mariajosé Herrera Ossandón
Geógrafa, Universidad de Chile***

Criósfera



Del Griego Kryos = HIELO

Constituida por todo sector que esté a menos 0° C, donde el agua se encuentre en forma sólida:

Nieve

Plataformas de hielo

Glaciares

Icebergs

Hielo Marino

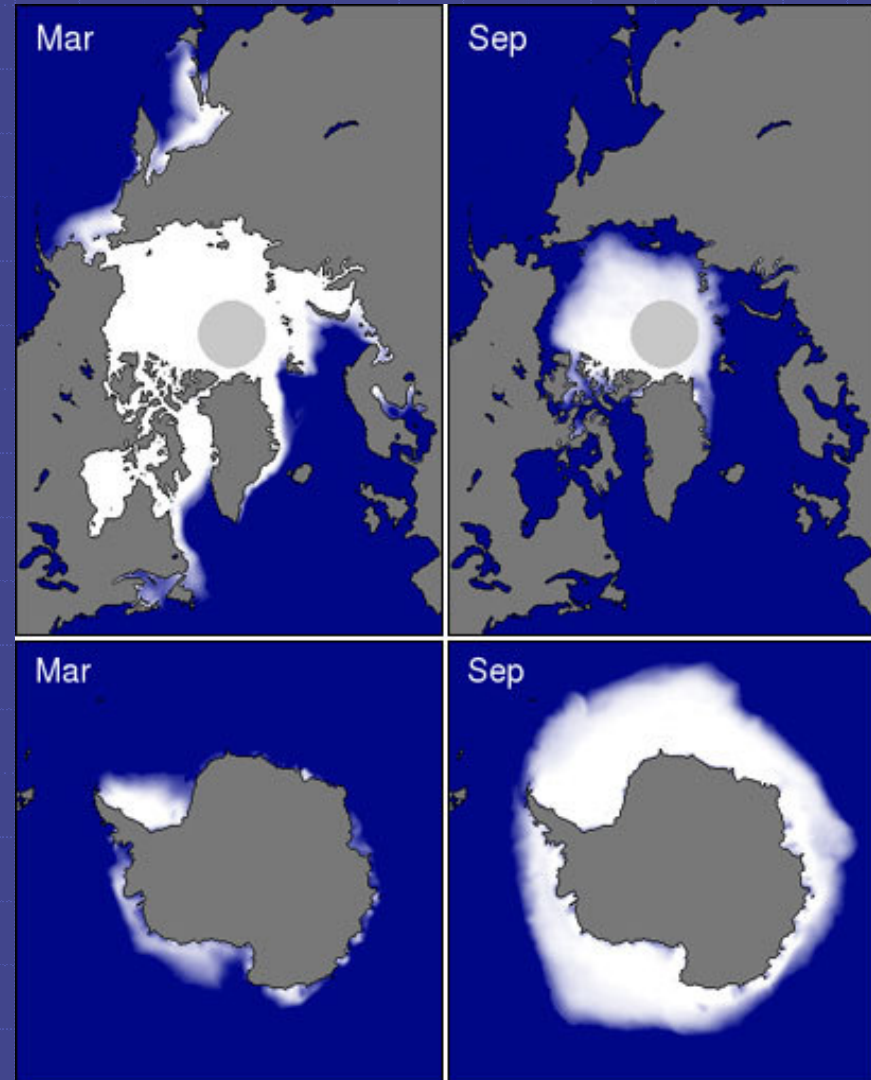
Permafrost

Pueden ser estacionales

Vínculos con la atmósfera, hidrósfera, biósfera y geósfera

El derretimiento del hielo genera más calentamiento

El permafrost que se derrite libera gases de invernadero

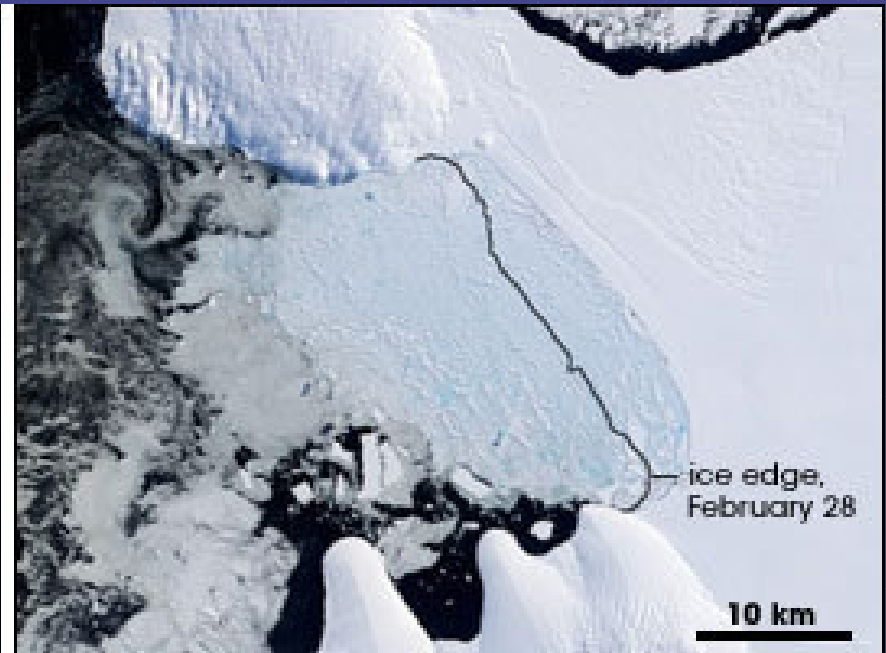


Una menor cantidad de hielo en tierra hace que ascienda el nivel del mar

1 – 2 Milímetros año aproximadamente

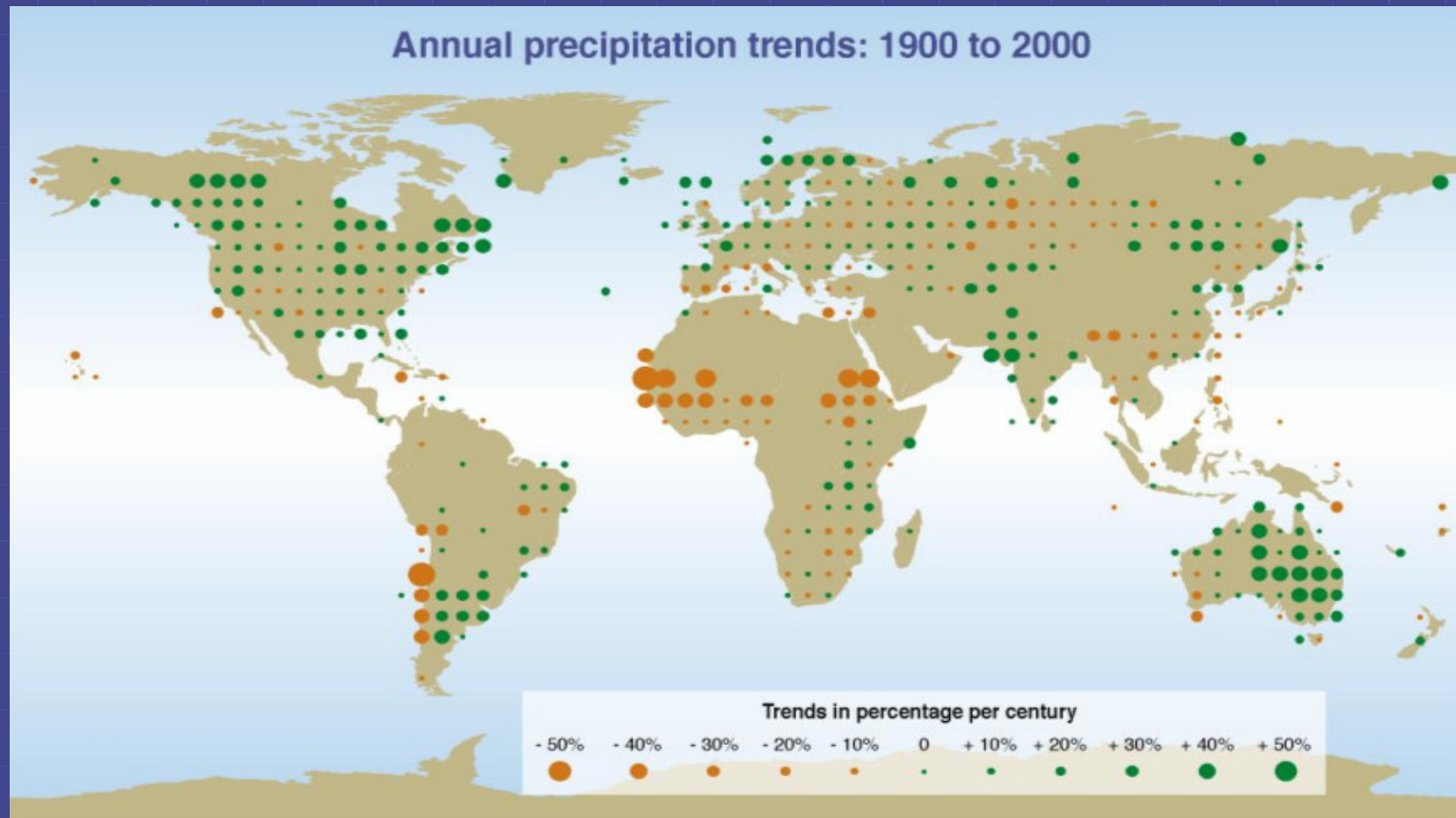


February 28, 2008

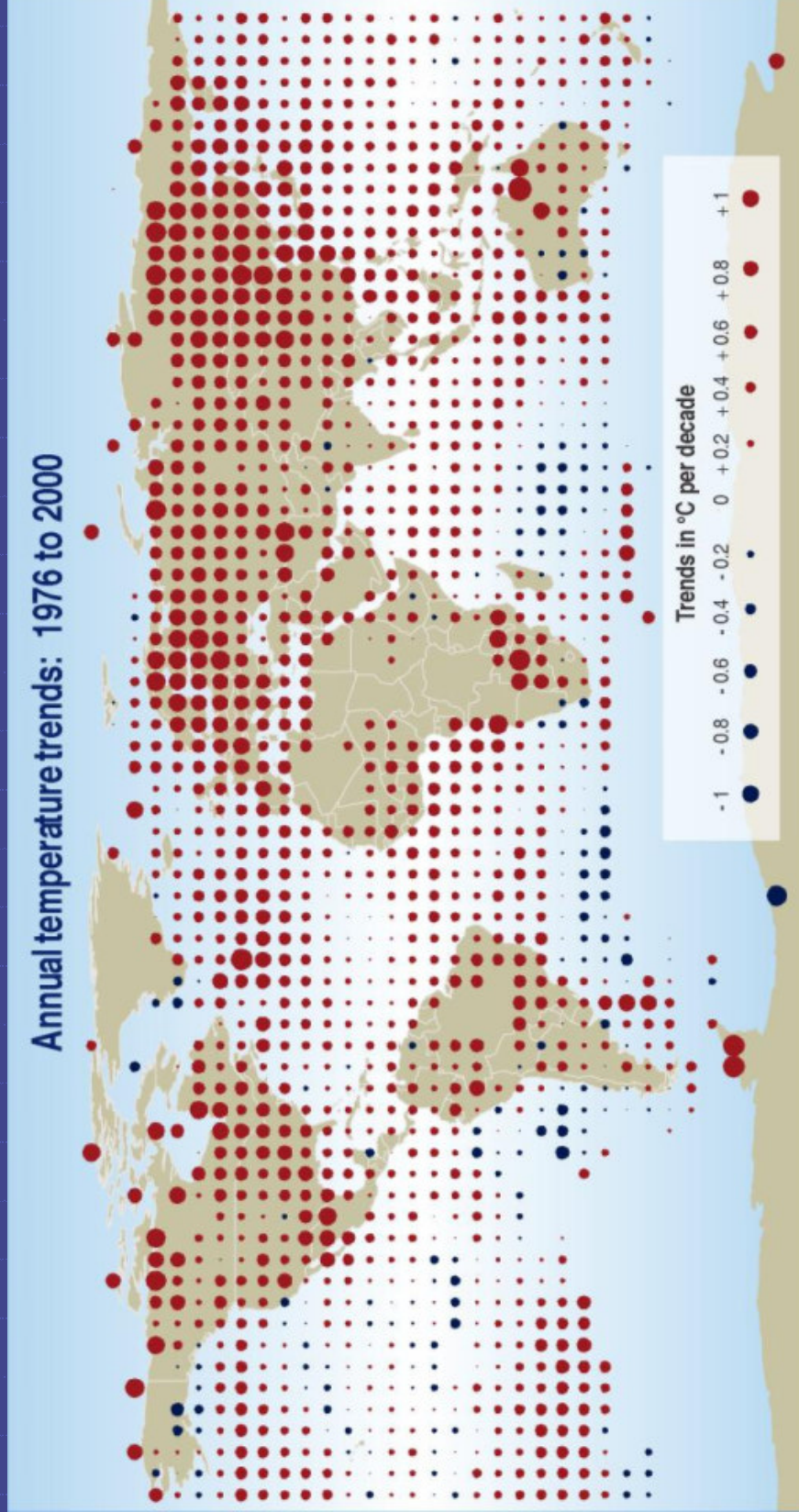


March 17, 2008

Factores climáticos



Annual temperature trends: 1976 to 2000



LIA

Pequeña Edad de Hielo

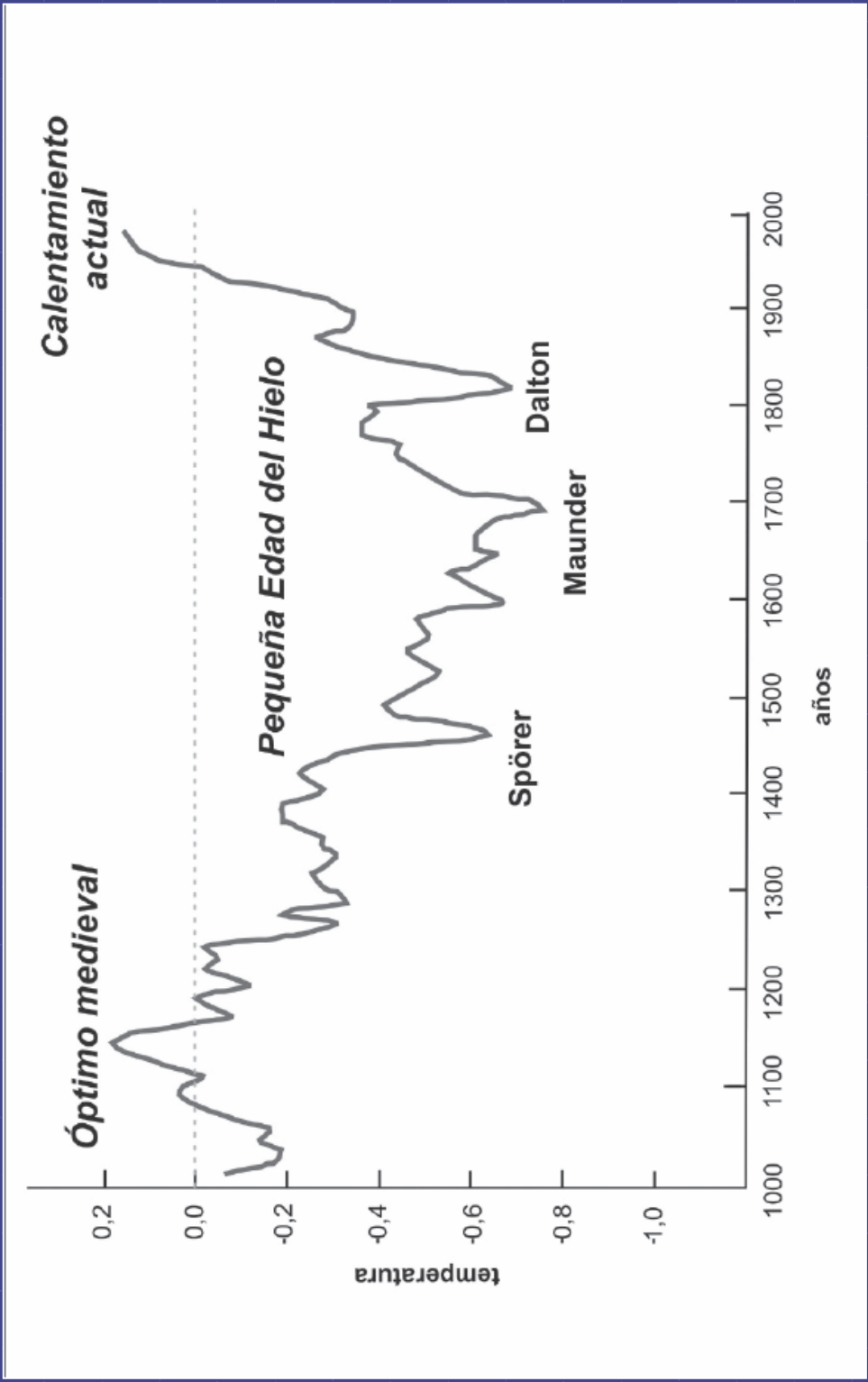
Siglos XIV – XV hasta primera mitad del Siglo XIX aproximadamente.

Causas Asociadas:

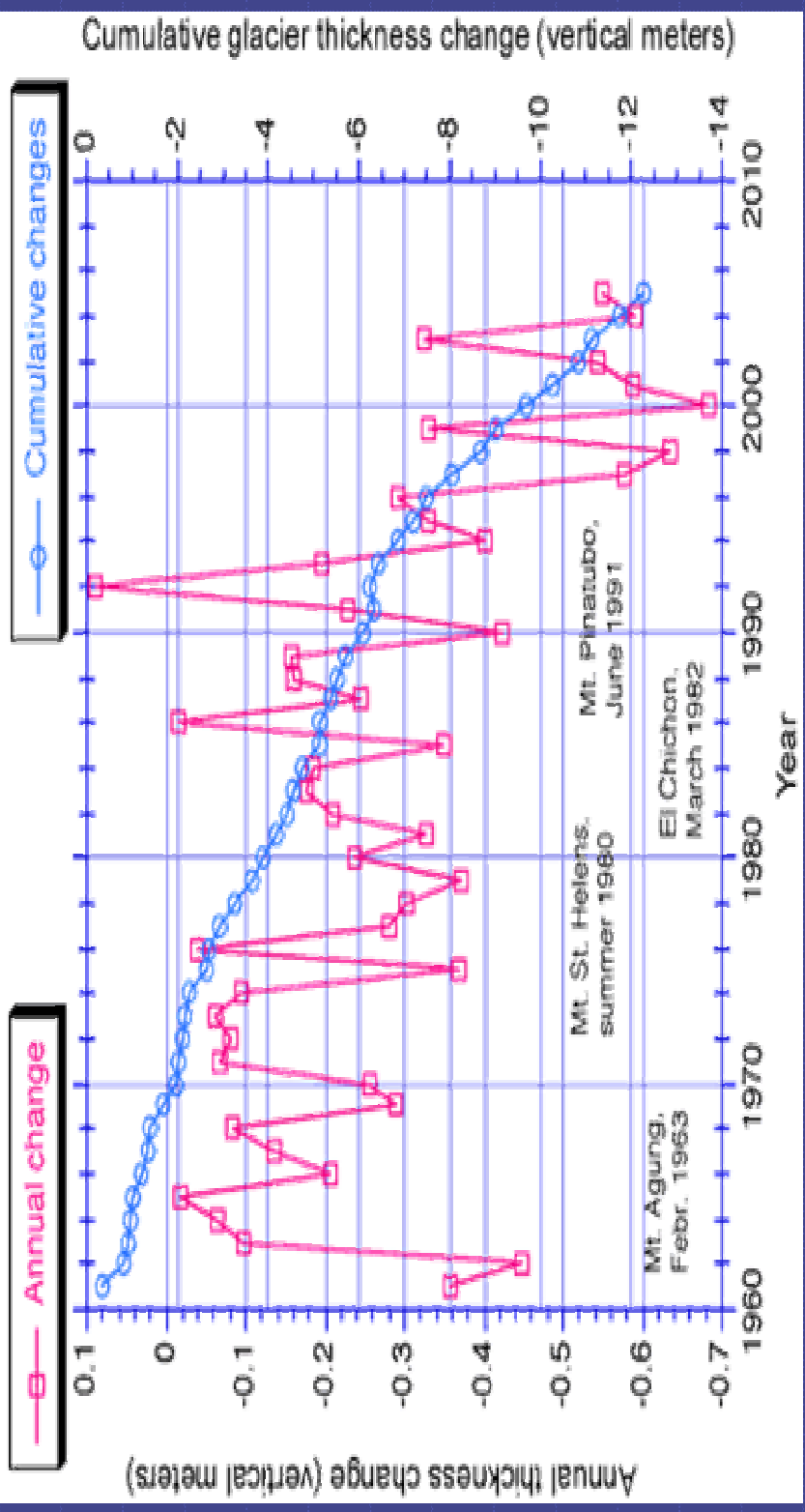
- *Baja actividad solar*
- *Super Erupciones (aumento de gases y aerosoles de proveniencia volcánica)*

Se estima que la temperatura disminuyó entre 1 – 1,5 °C

Relatos históricos



Global Glacier Thickness Change



Pre-erupcion



Post-erupcion



*“Escudo” de aerosoles
en la estratósfera,
producido por
erupciones explosivas
con alto contenido de
azufre*

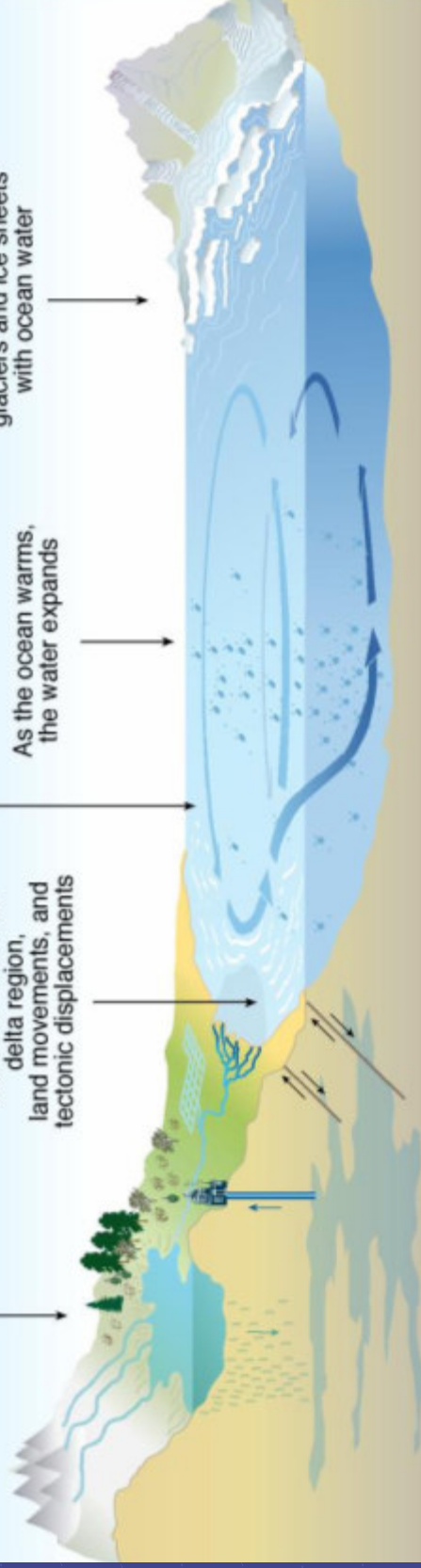
What causes the sea level to change?

Terrestrial water storage, extraction of groundwater, building of reservoirs, changes in runoff, and seepage into aquifers

Surface and deep ocean circulation changes, storm surges

Subsidence in river delta region, land movements, and tectonic displacements

Exchange of the water stored on land by glaciers and ice sheets with ocean water



Peligros y Riesgos asociados a Glaciares

Fenómenos de *calving front*

Drops Stones



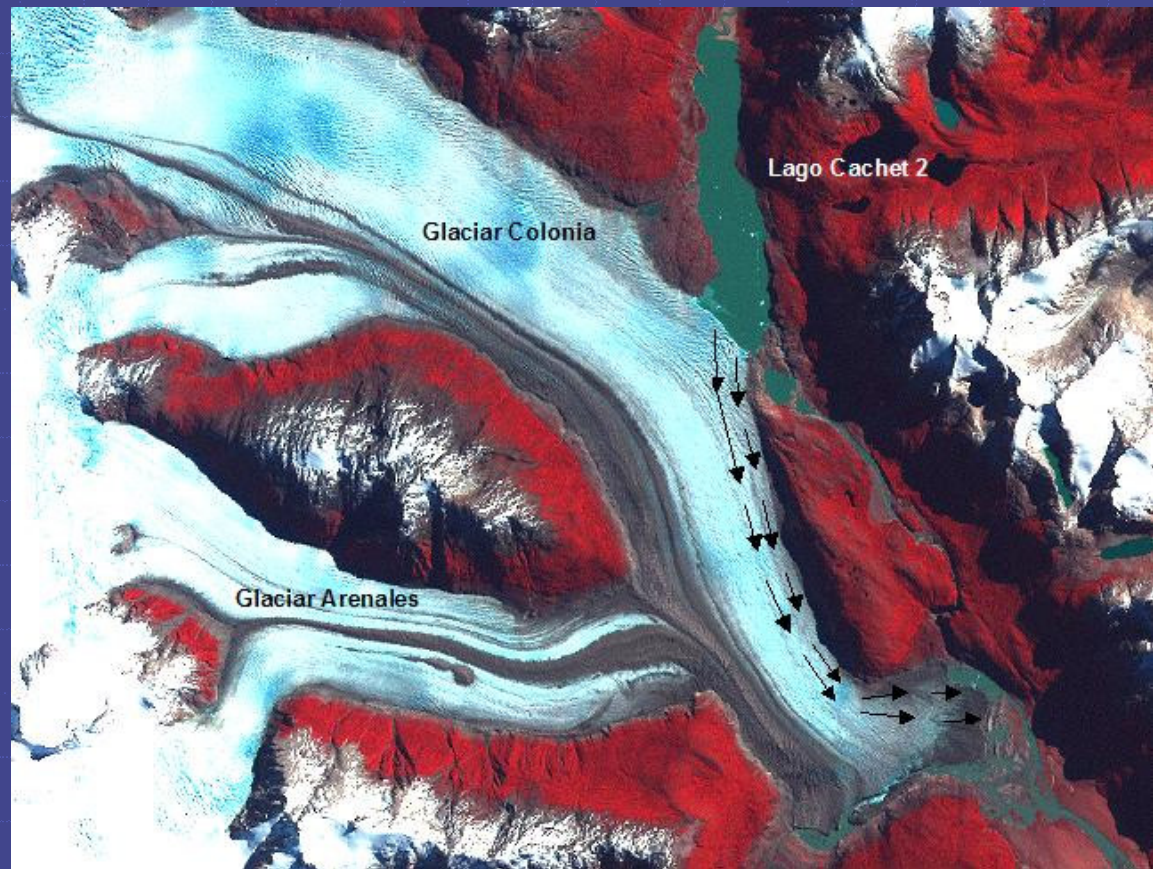
Fenómeno de *melt water*

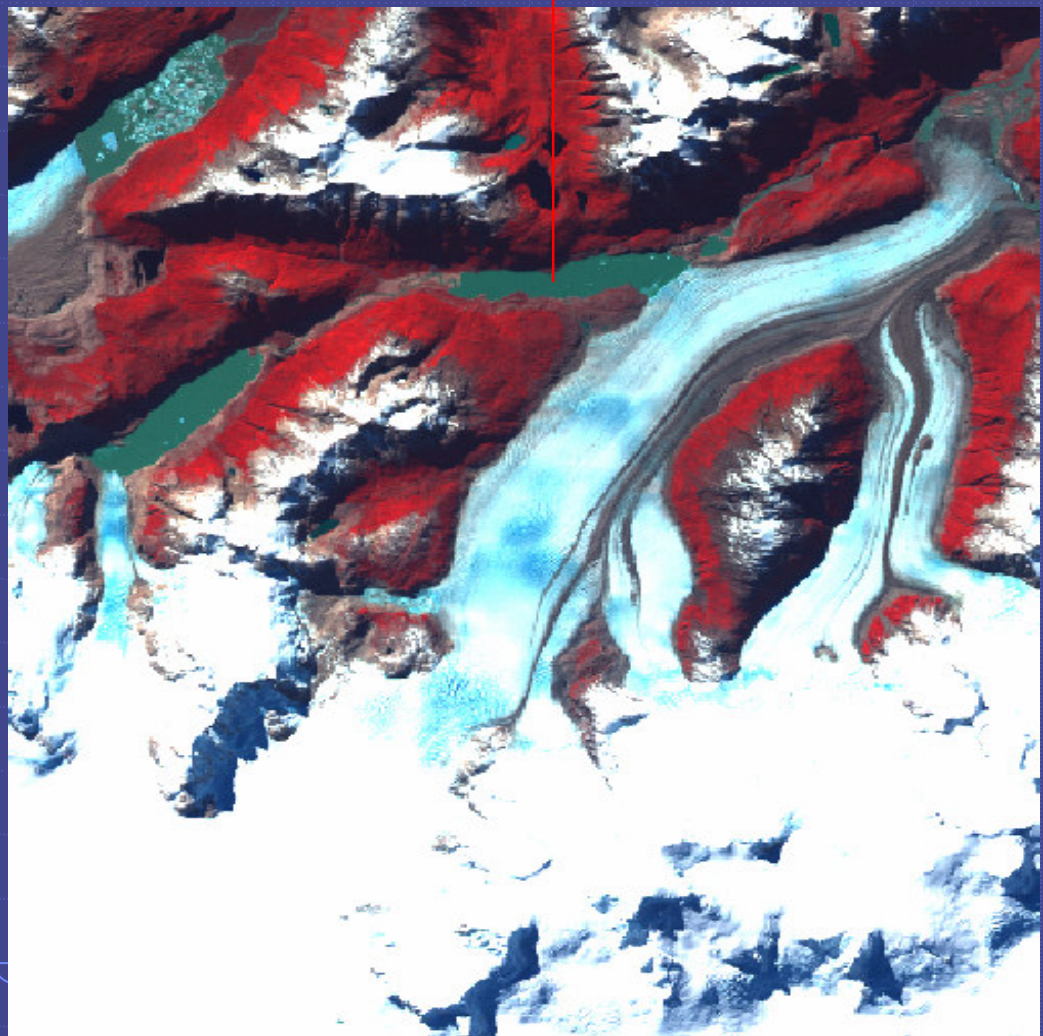


Vaciamiento de Lagos

Lago Cachet 2

CHN

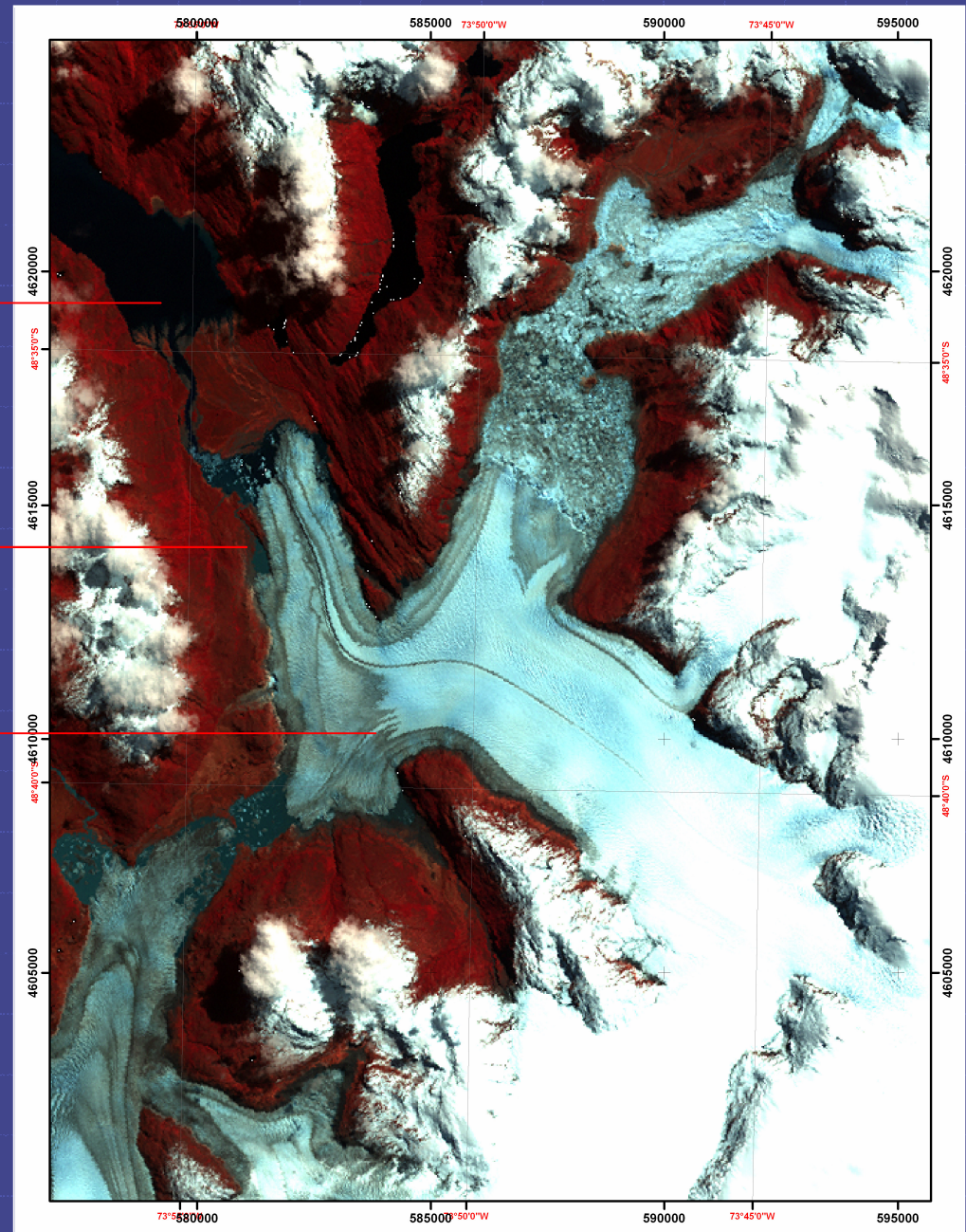


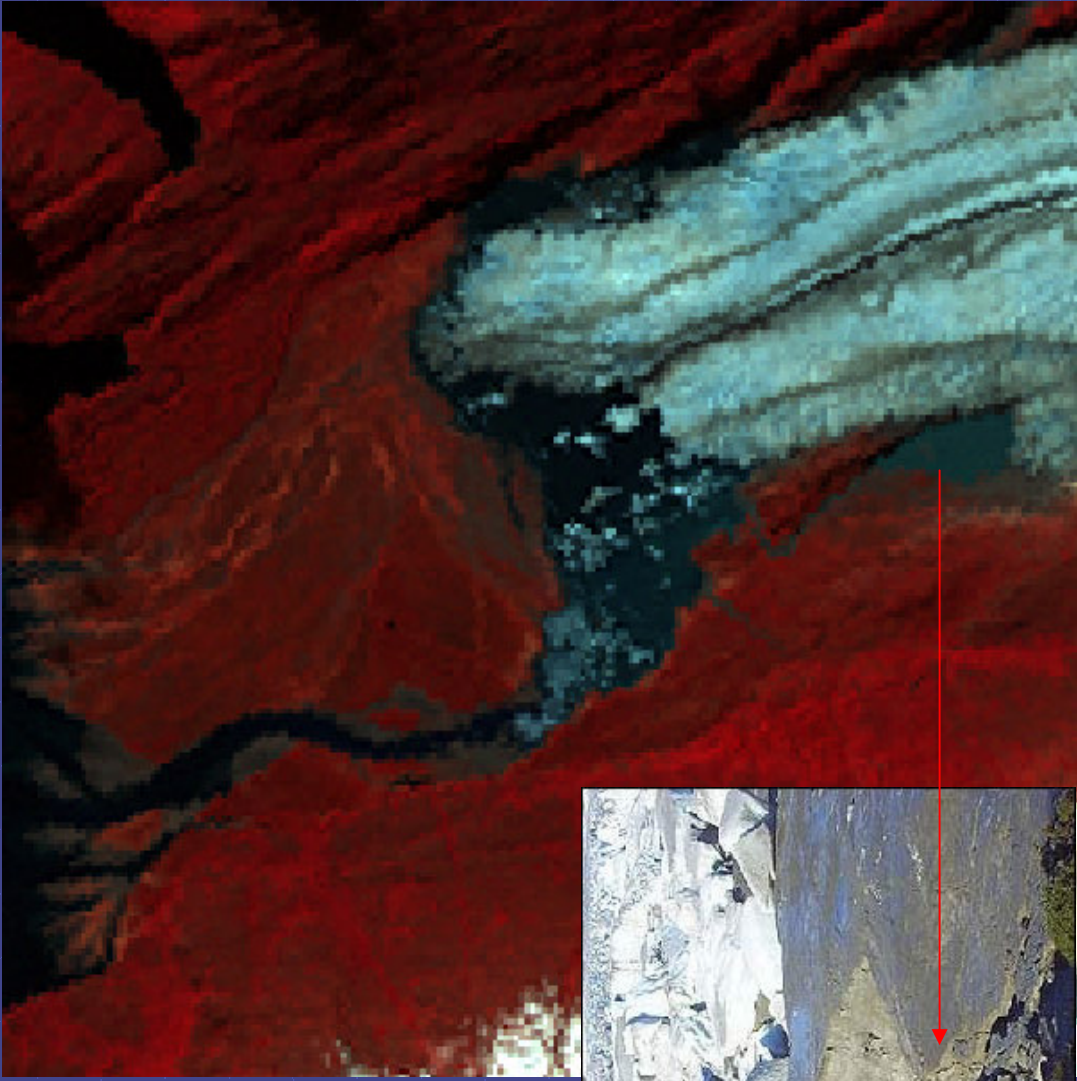


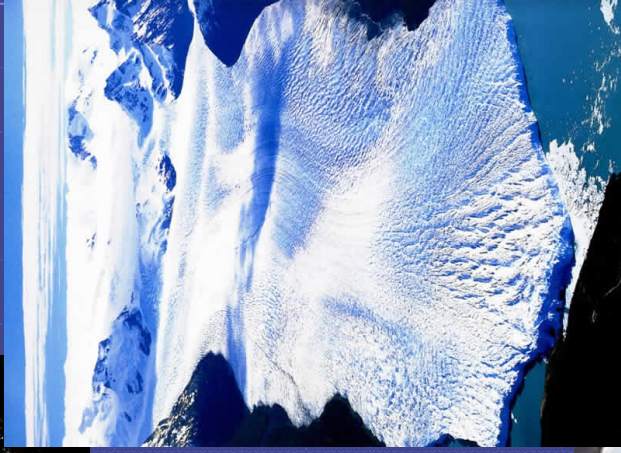
Fiordo Témpanos

Lago Témpanos

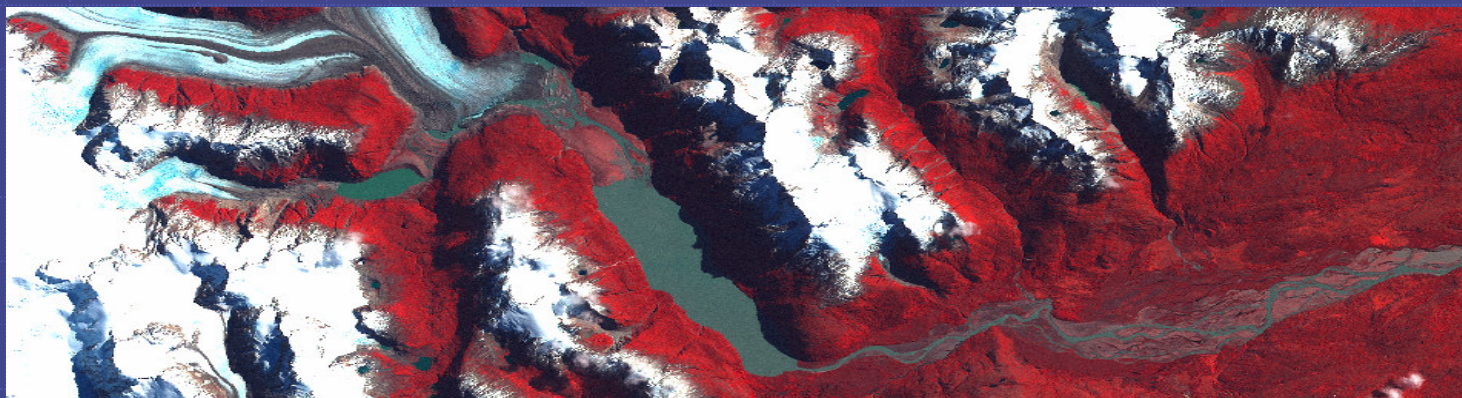
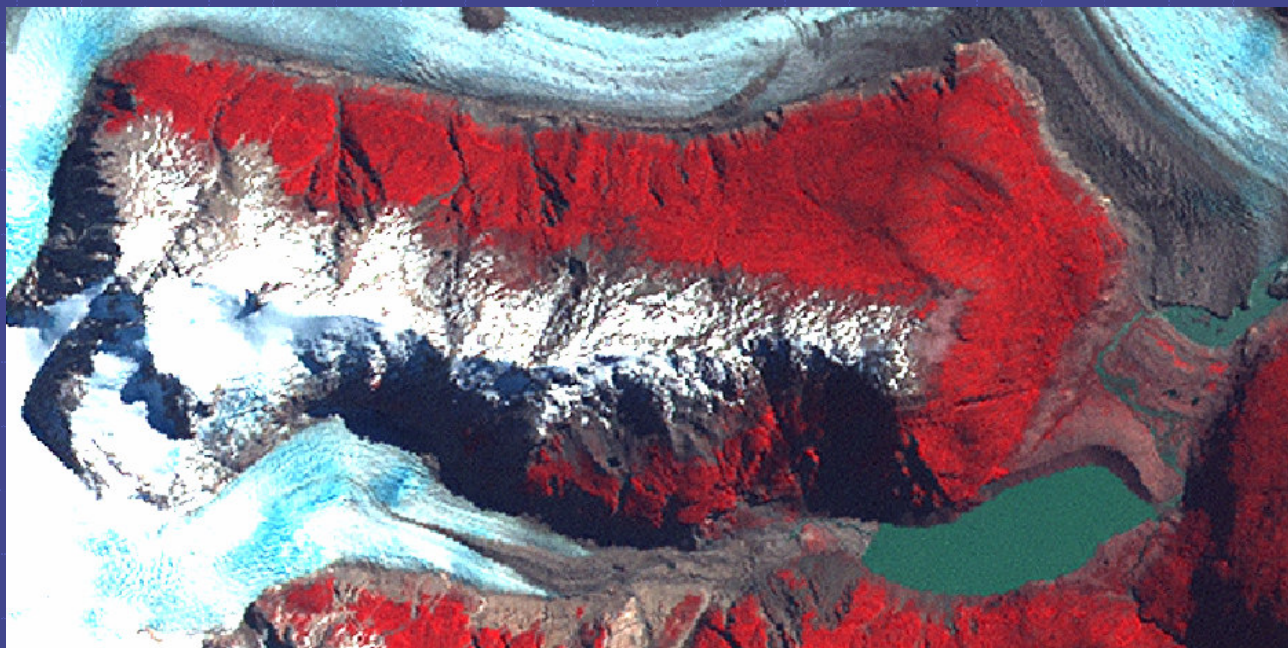
Glaciar Bernardo







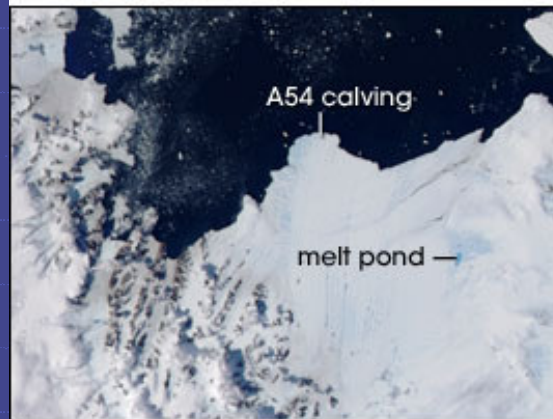
Ruptura de morrenas



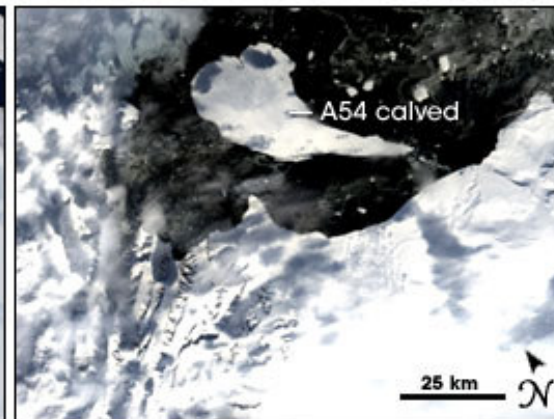
Colapso en plataforma Antárticas



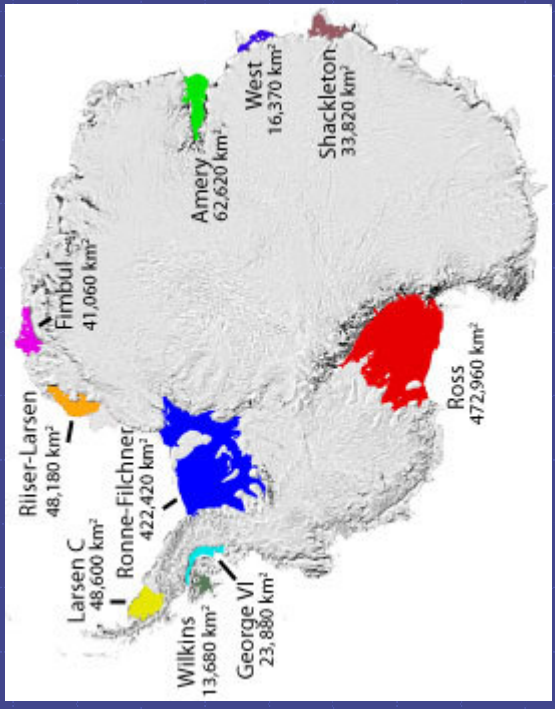
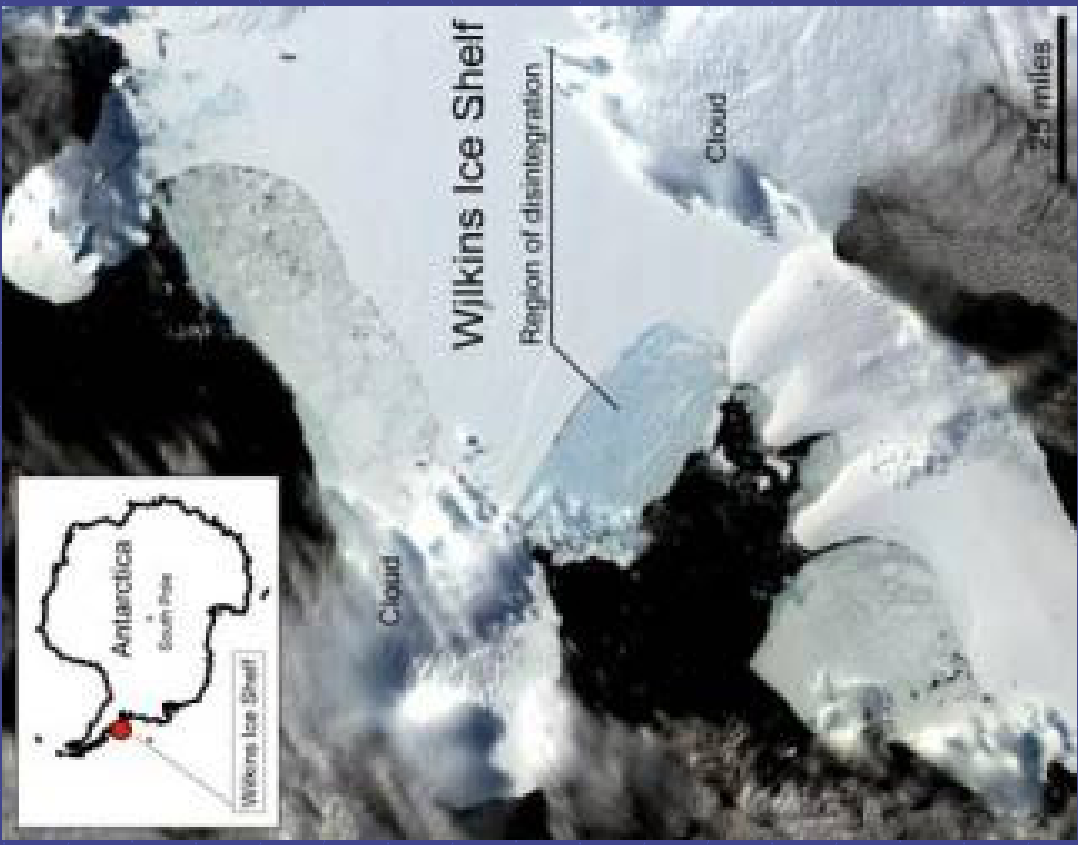
Aerial photo: February 11, 2006



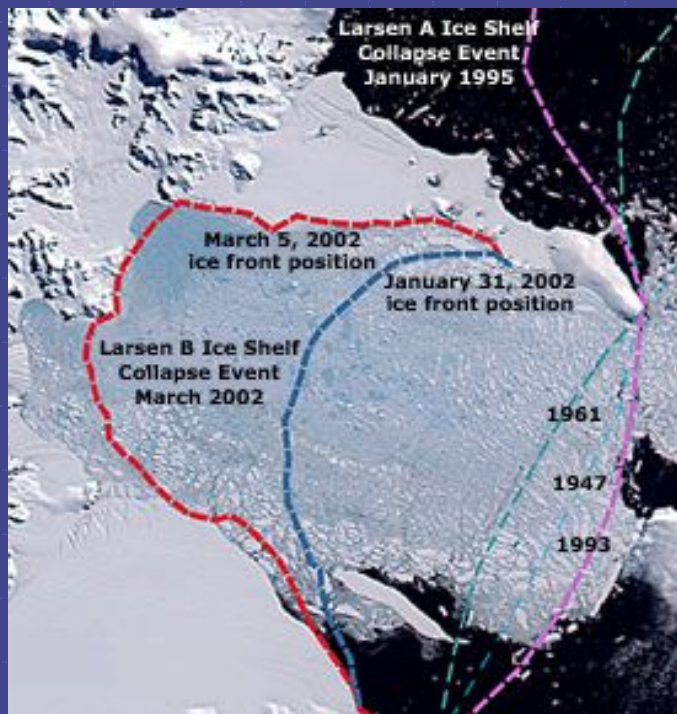
MODIS: February 7, 2006



March 5, 2006



En los últimos 5 años, ha perdido un área de 5.700 km², y su colapso se considera el fenómeno más importante de este tipo registrado en los últimos 30 años en la región antártica.



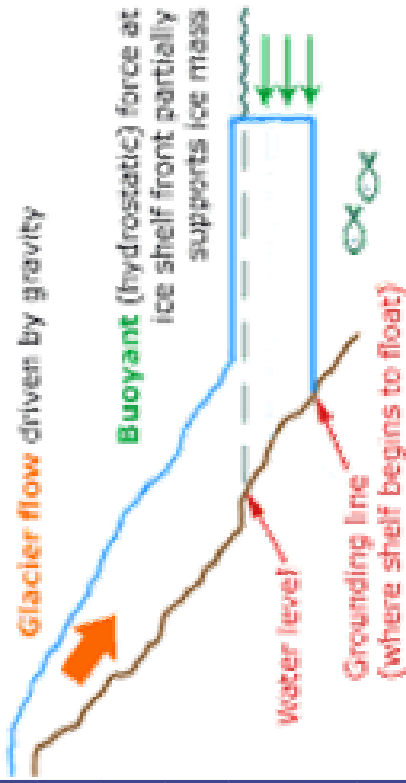
Además, ha sido uno de los colapsos más rápidos: entre febrero y marzo del 2002, en un margen de 35 días, la gran barrera de hielo se fragmentaba en miles de icebergs que se hundían a la deriva en el mar de Weddell.

1. Stable glacier and ice shelf

Glacier flow driven by gravity

Buoyant (hydrostatic) force at ice shelf front partially supports ice mass

Water level
Grounding line (where shelf begins to float)

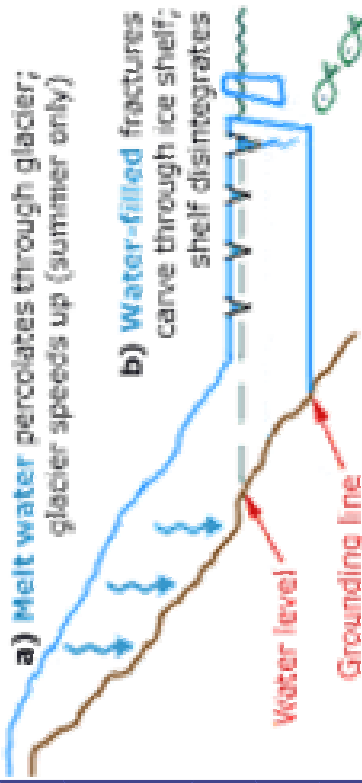


2. Two effects of warmer temperatures

a) Melt water percolates through glacier; glacier speeds up (summer only)

b) Water-filled fractures carve through ice shelf; shelf disintegrates

Water level
Grounding line



3. Unstable glacier front after ice shelf collapse

As shelf retreats past grounding line buoyant support decreases at front but glacier flow continues and glacier front calves rapidly

Water level
Grounding line

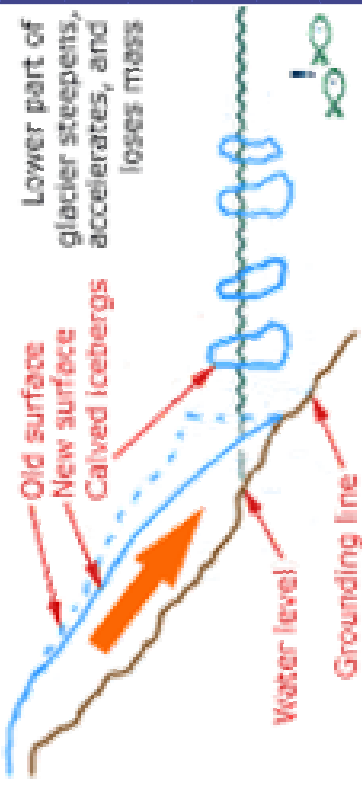


4. Glacier acceleration

Lower part of glacier steepens, accelerates, and loses mass

Old surface
New surface
Calved icebergs

Water level
Grounding line



Crecimiento de lagos Árticos

Permafrost

*Melt Water se acumula
en regiones frías*

Aumento de lagos

