Cryosphere Training Course 2016

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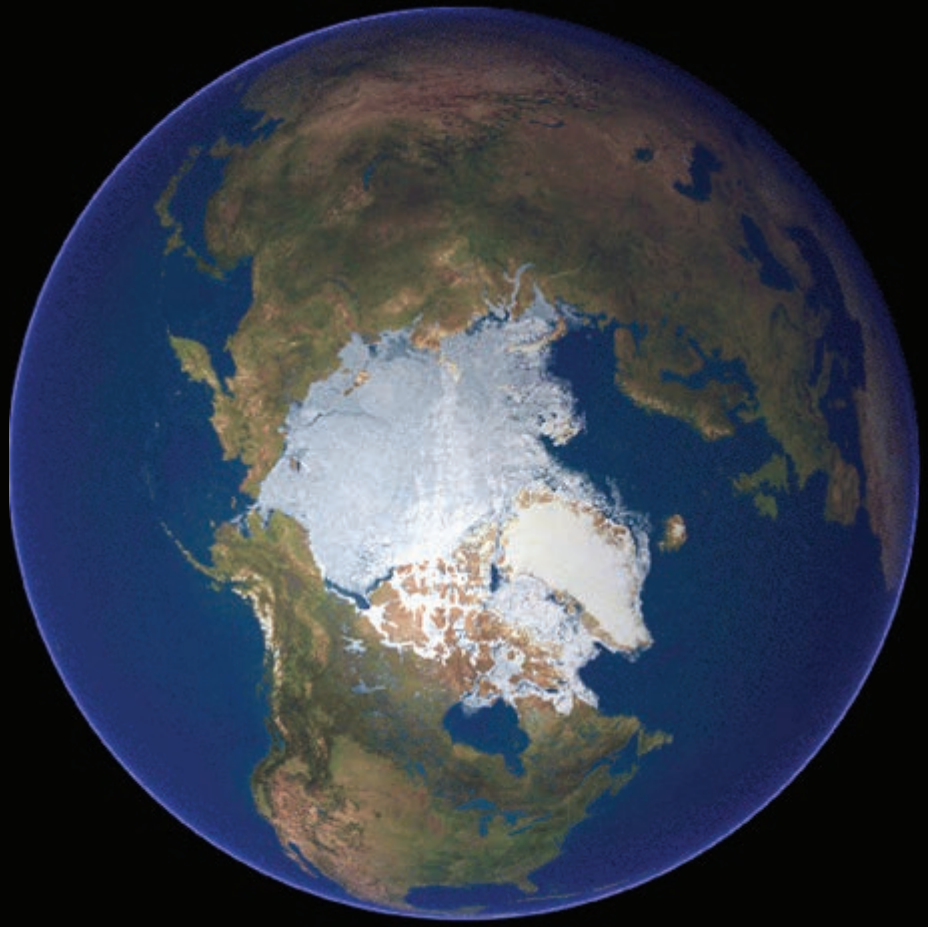
UK SPACE AGENCY

CATAPULT Satellite Applications

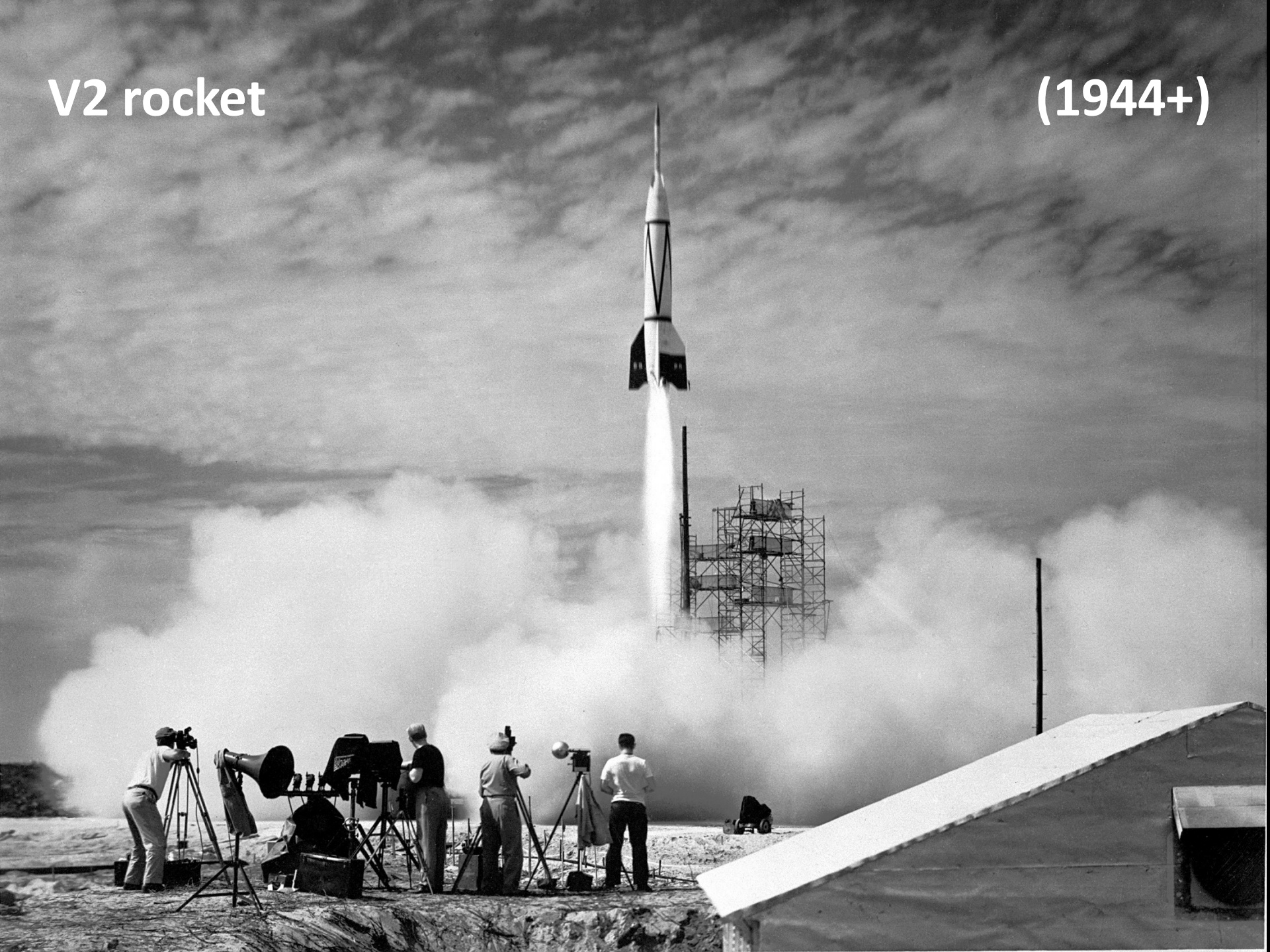


Earth Observation

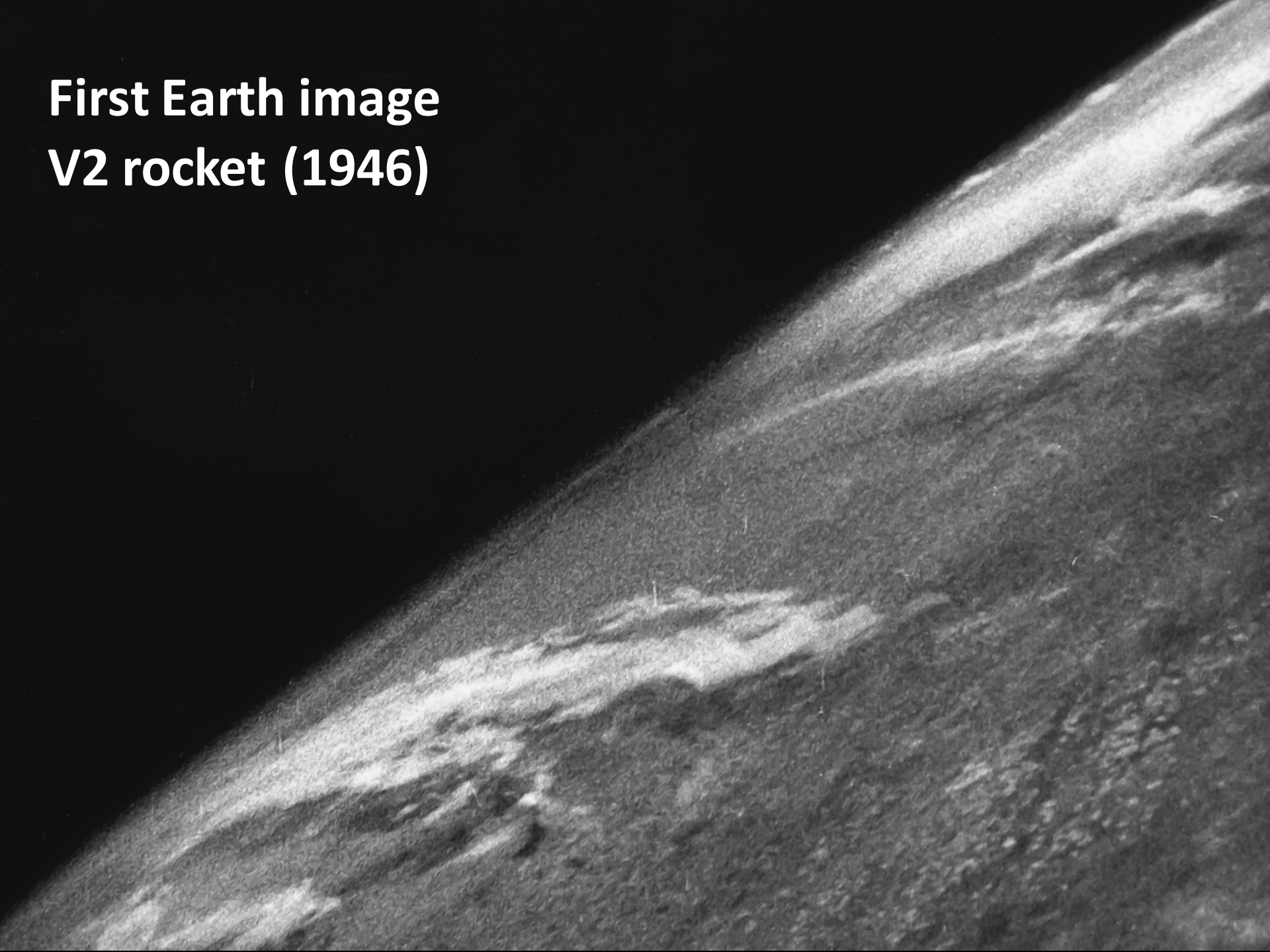
The Cryosphere

Course Overview

V2 rocket (1944+)



First Earth image
V2 rocket (1946)



First telemetry

C119 & DMSP (1959)

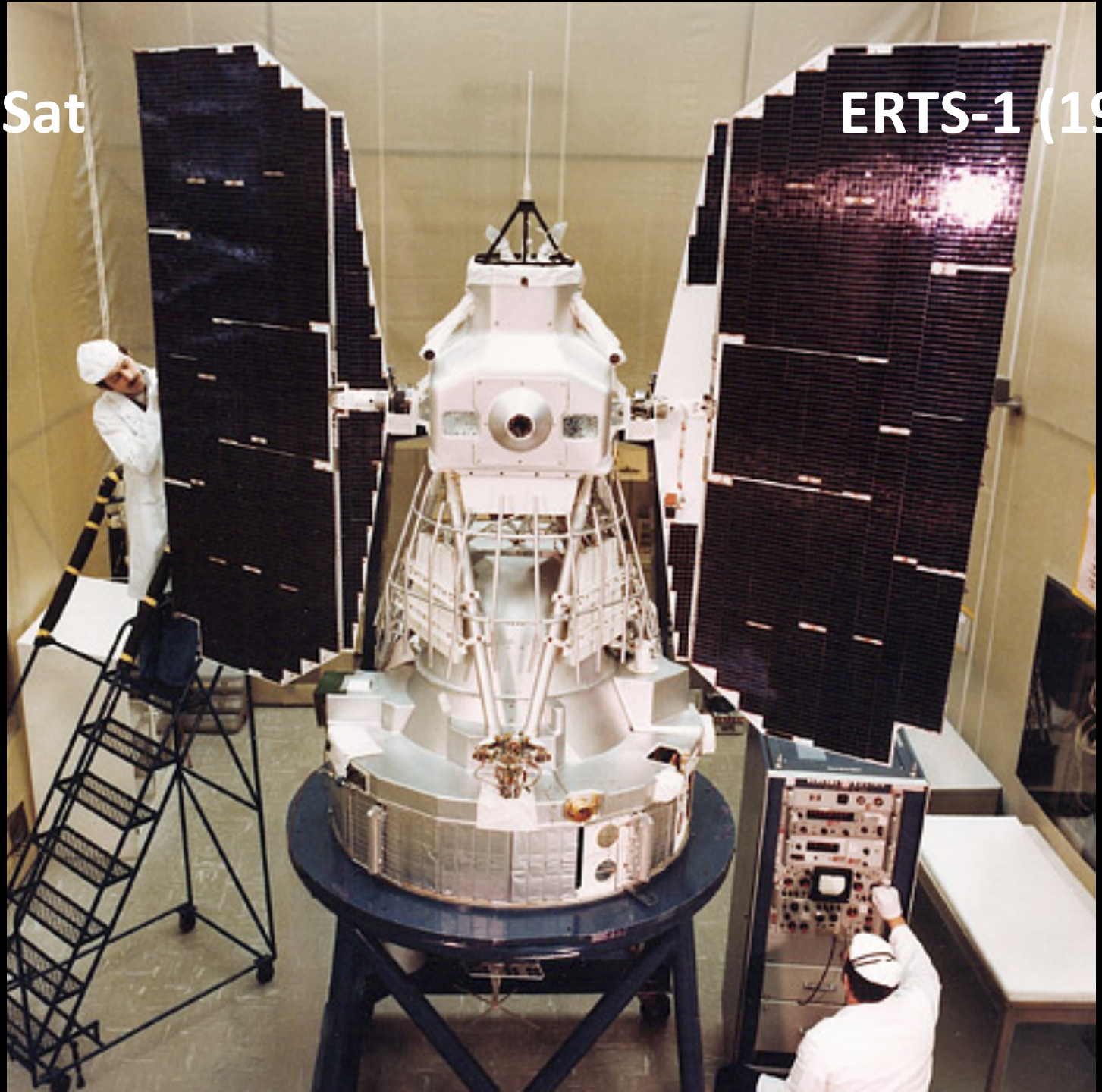
First weather satellite

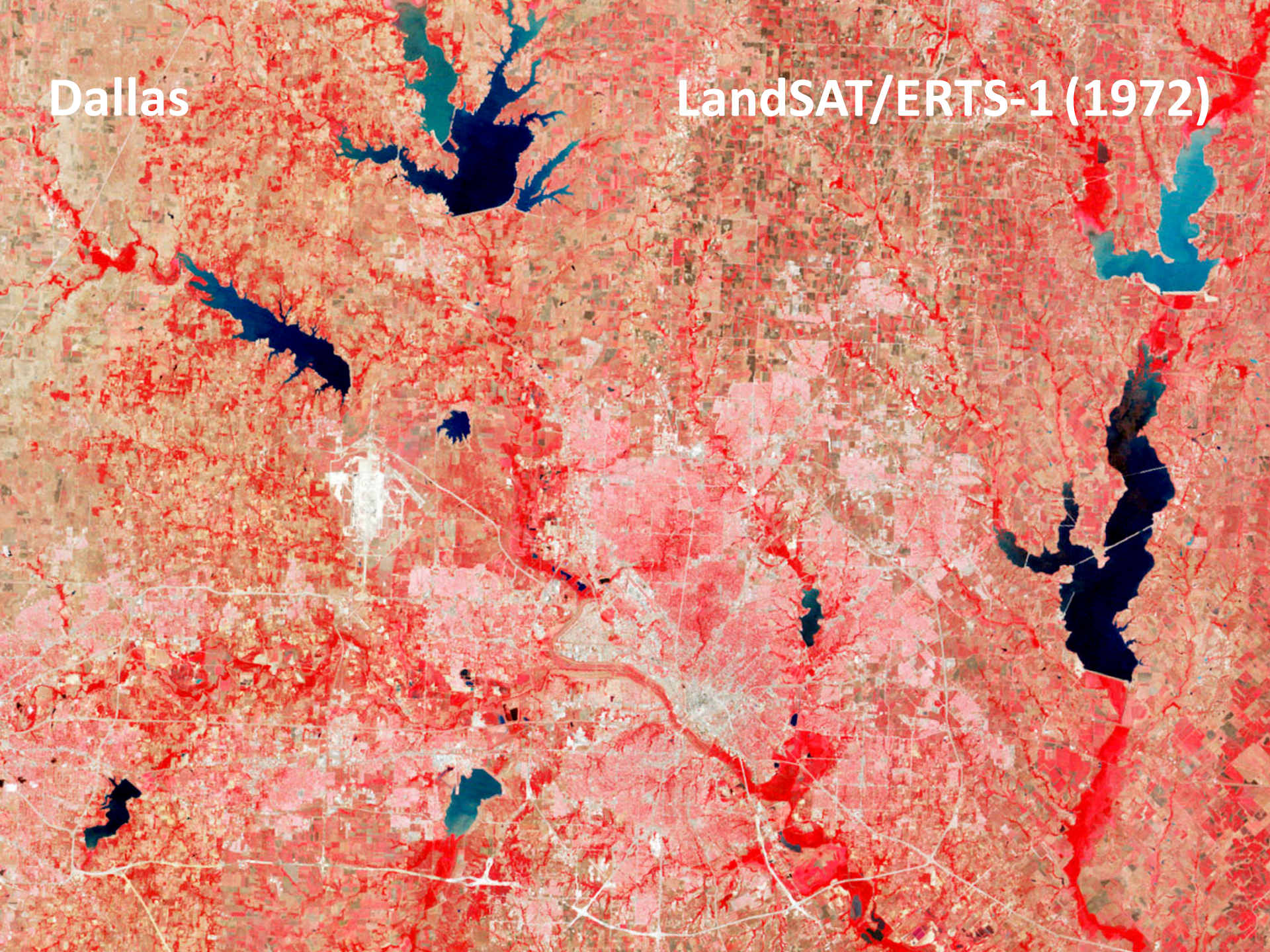
TIROS (1960)

Earthrise

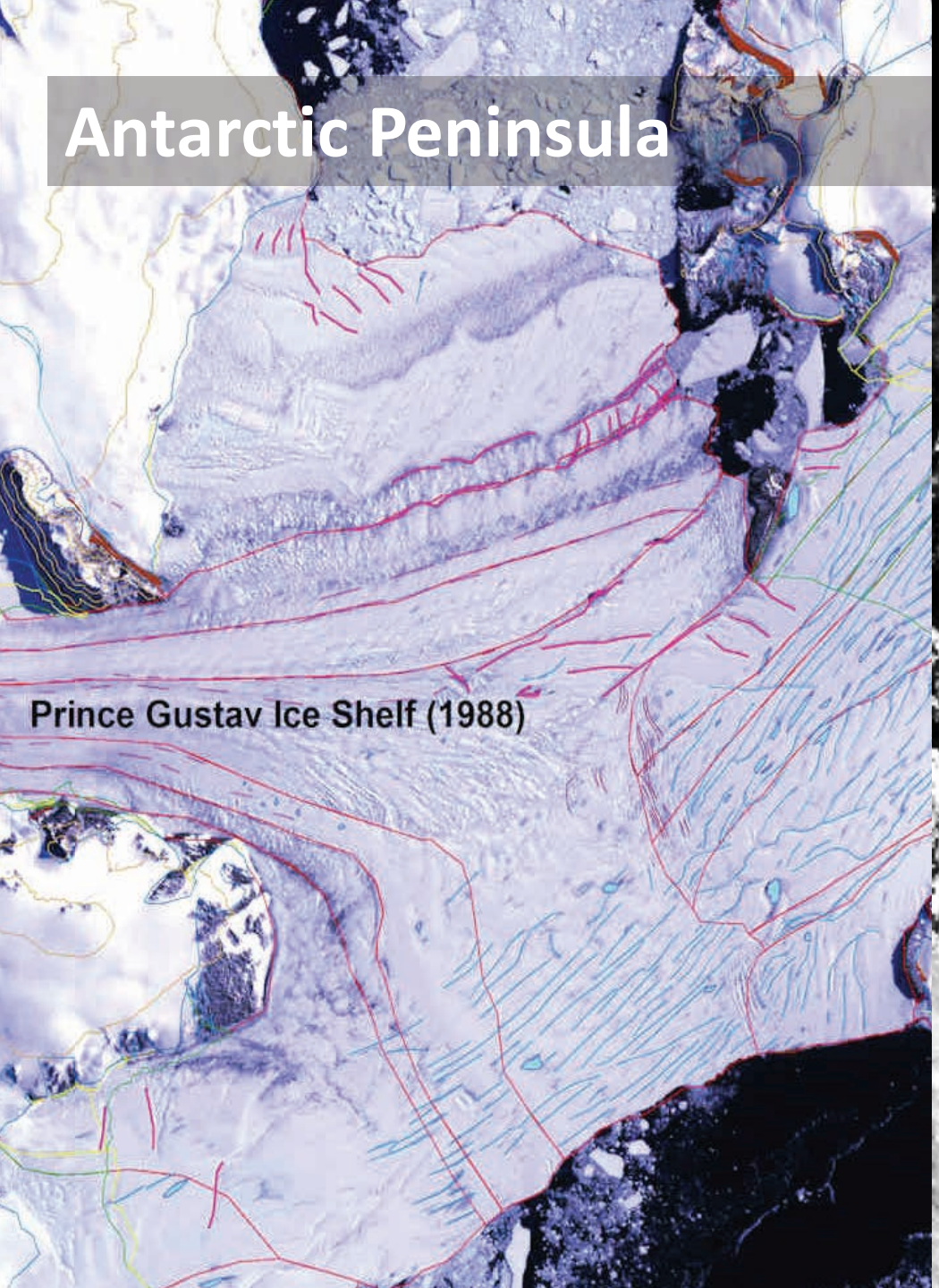
Apollo 8 (1968)

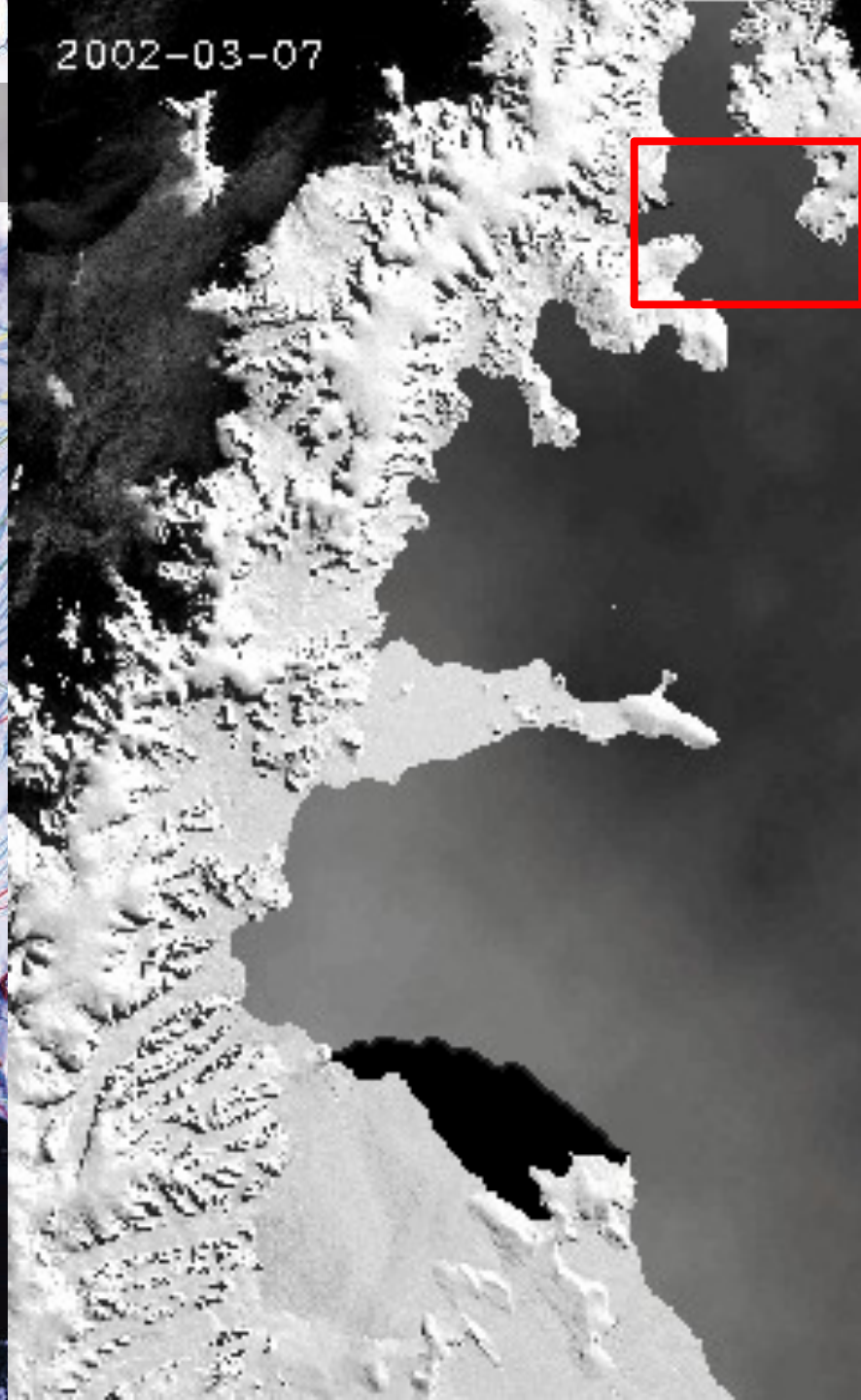
LandSat

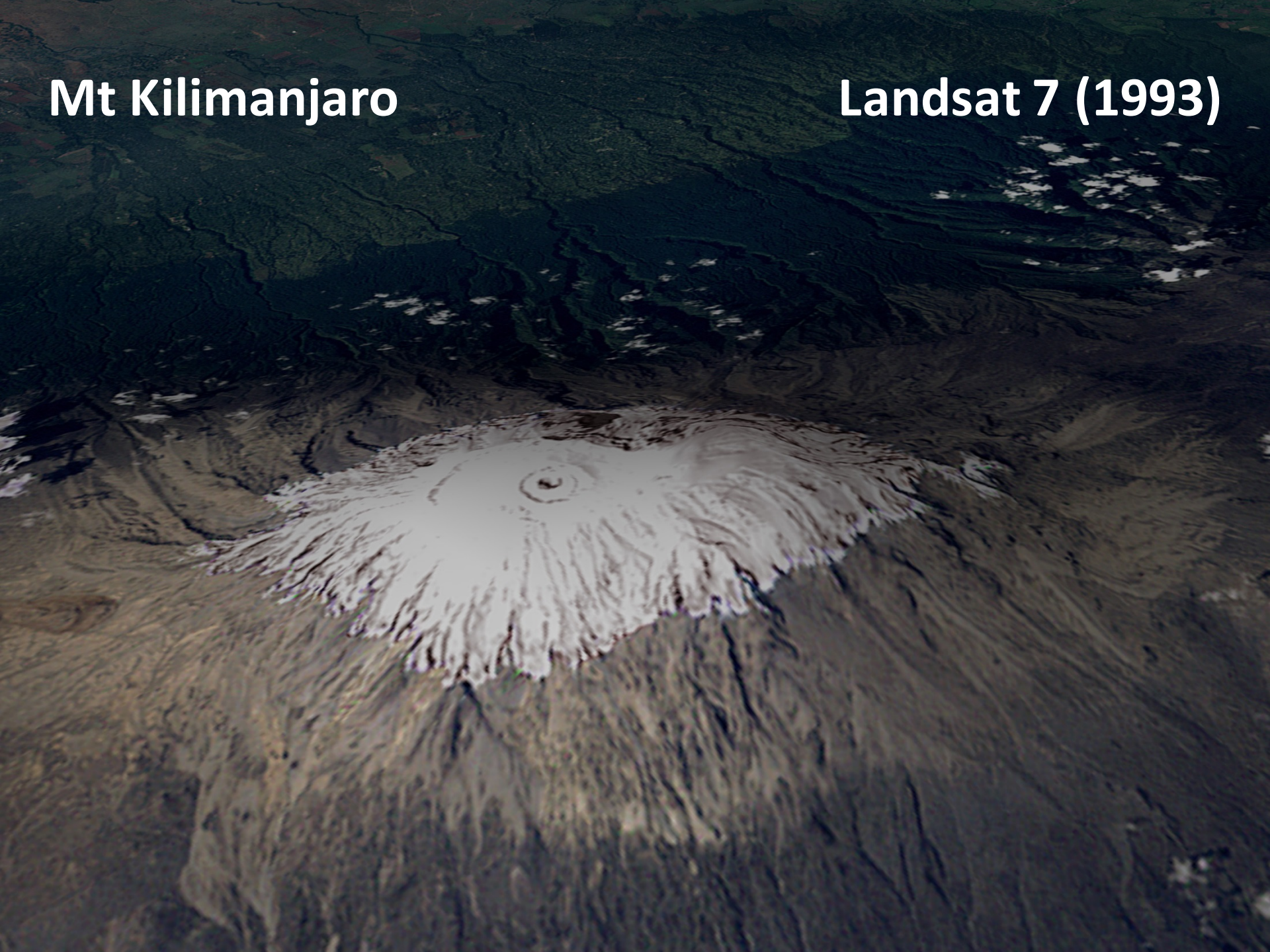


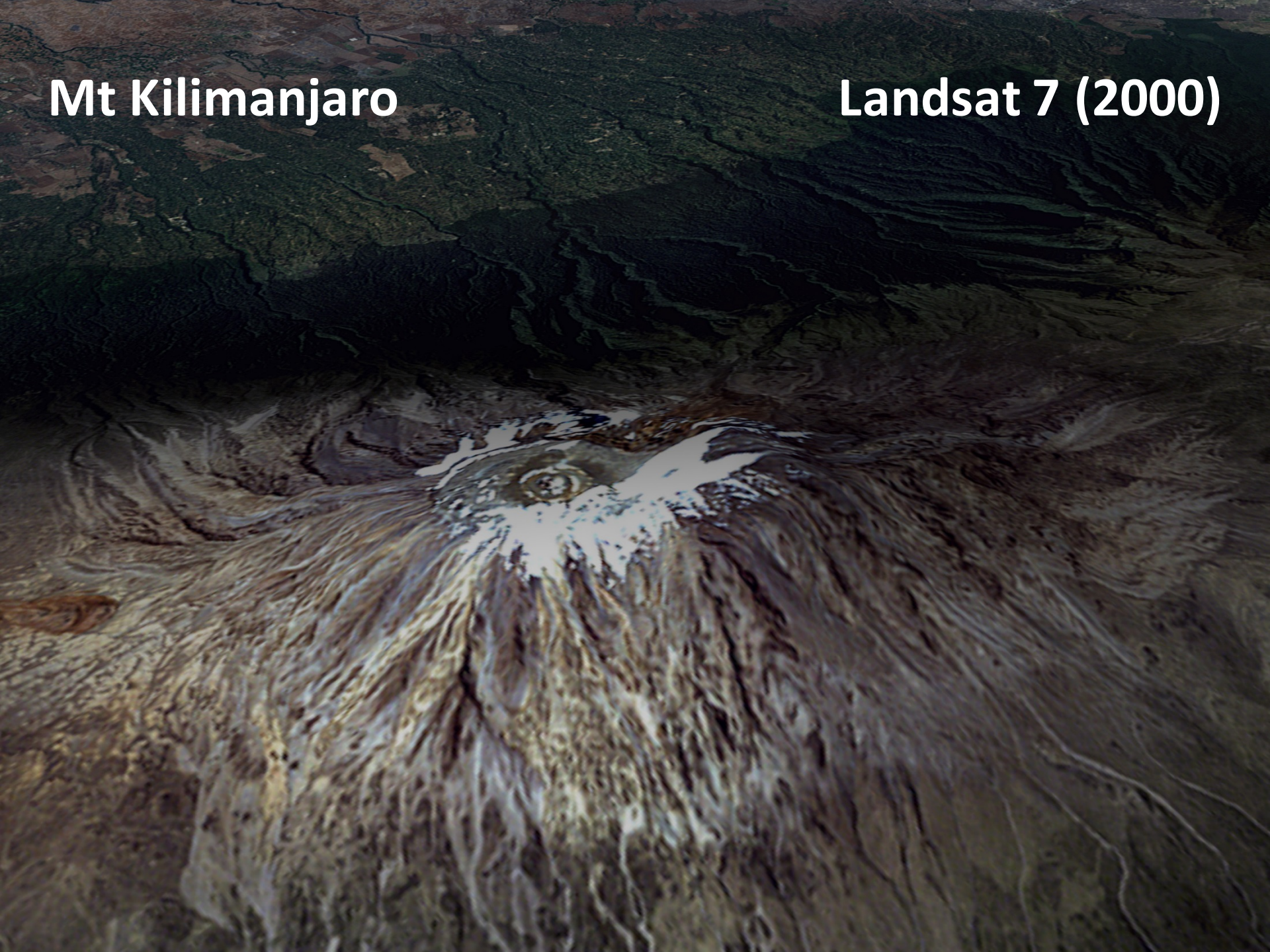

Dallas
LandSAT/ERTS-1 (1972)

Antarctic Peninsula



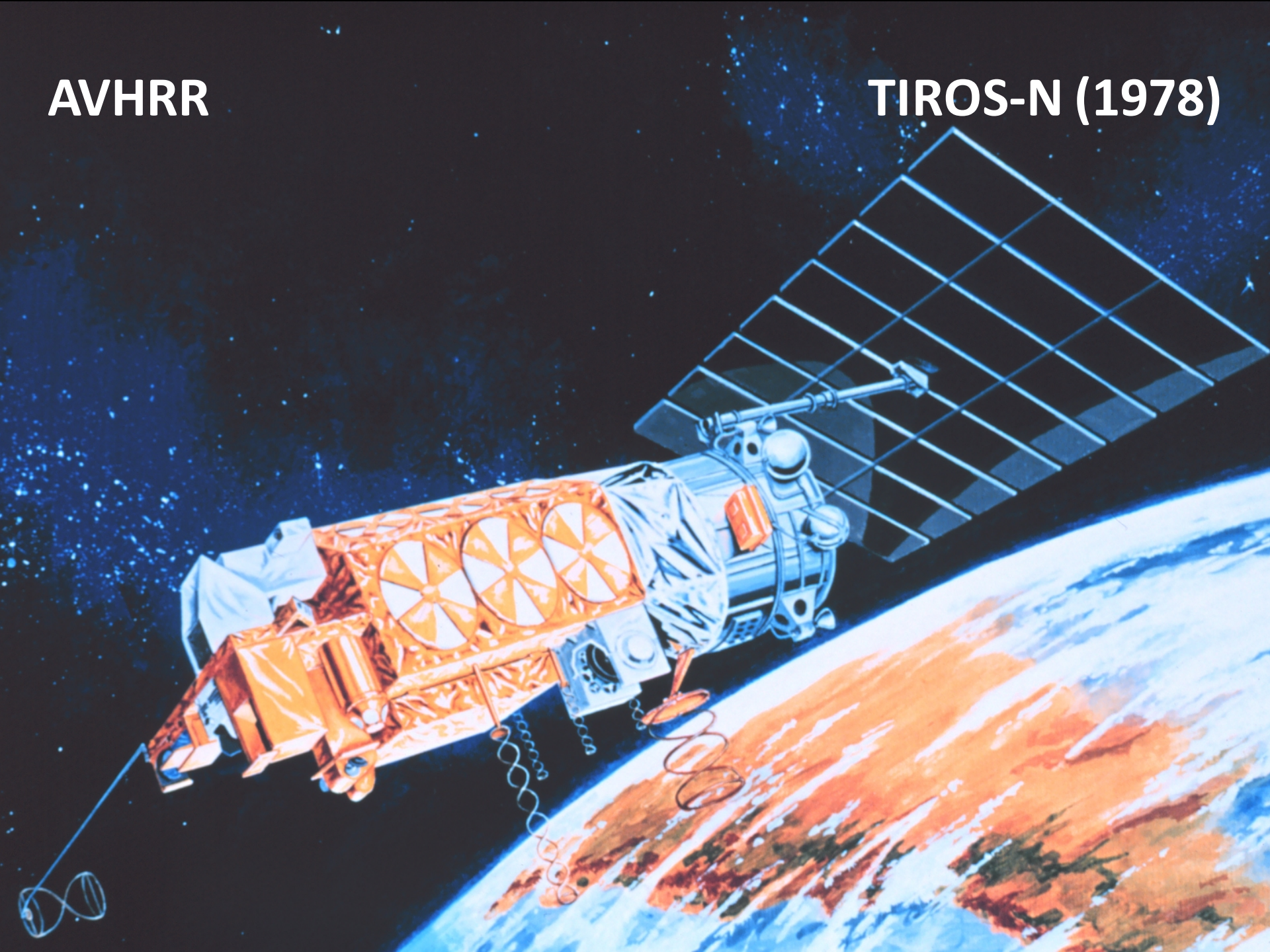



Mt Kilimanjaro
Landsat 7 (1993)


Mt Kilimanjaro
Landsat 7 (2000)

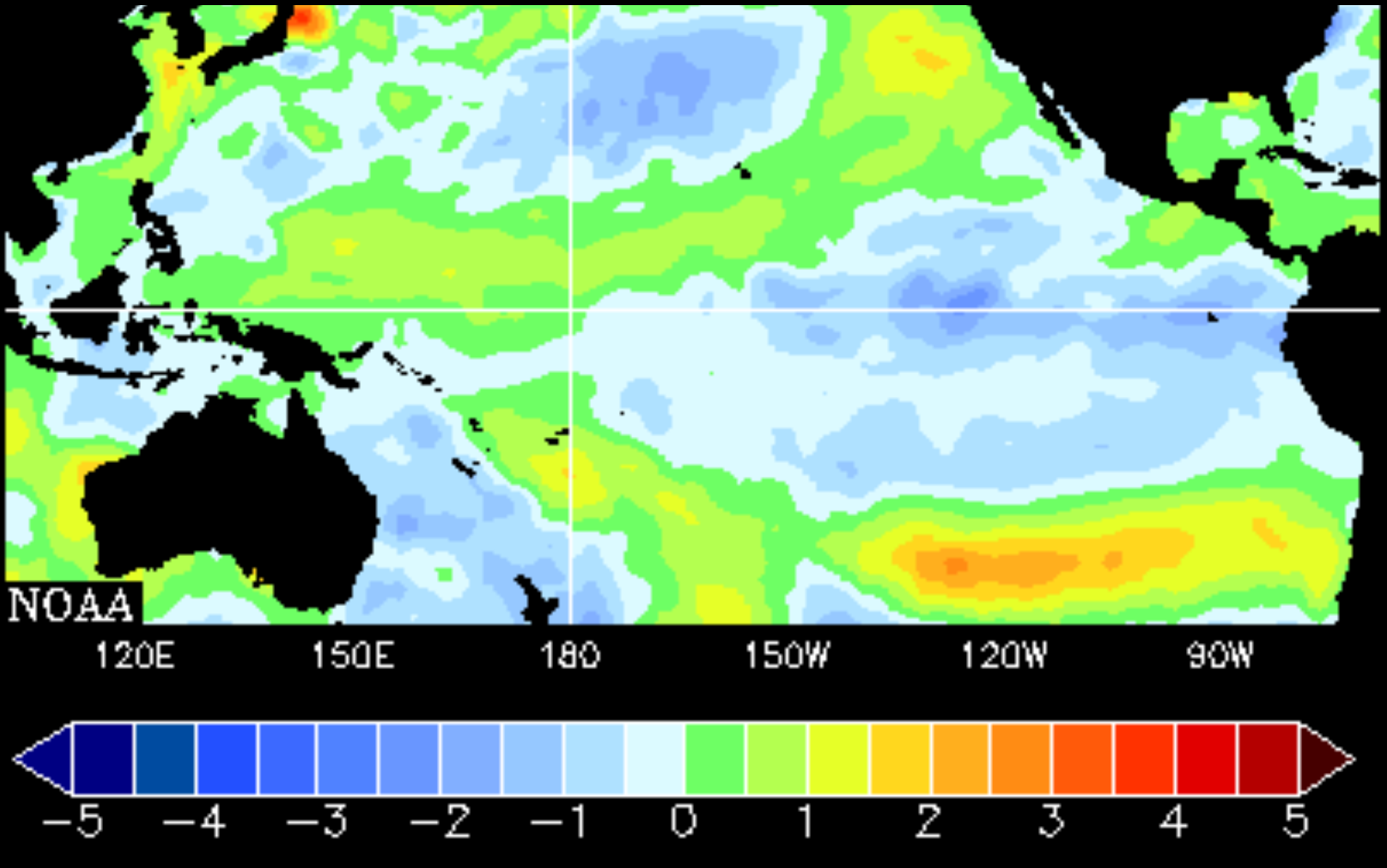
AVHRR

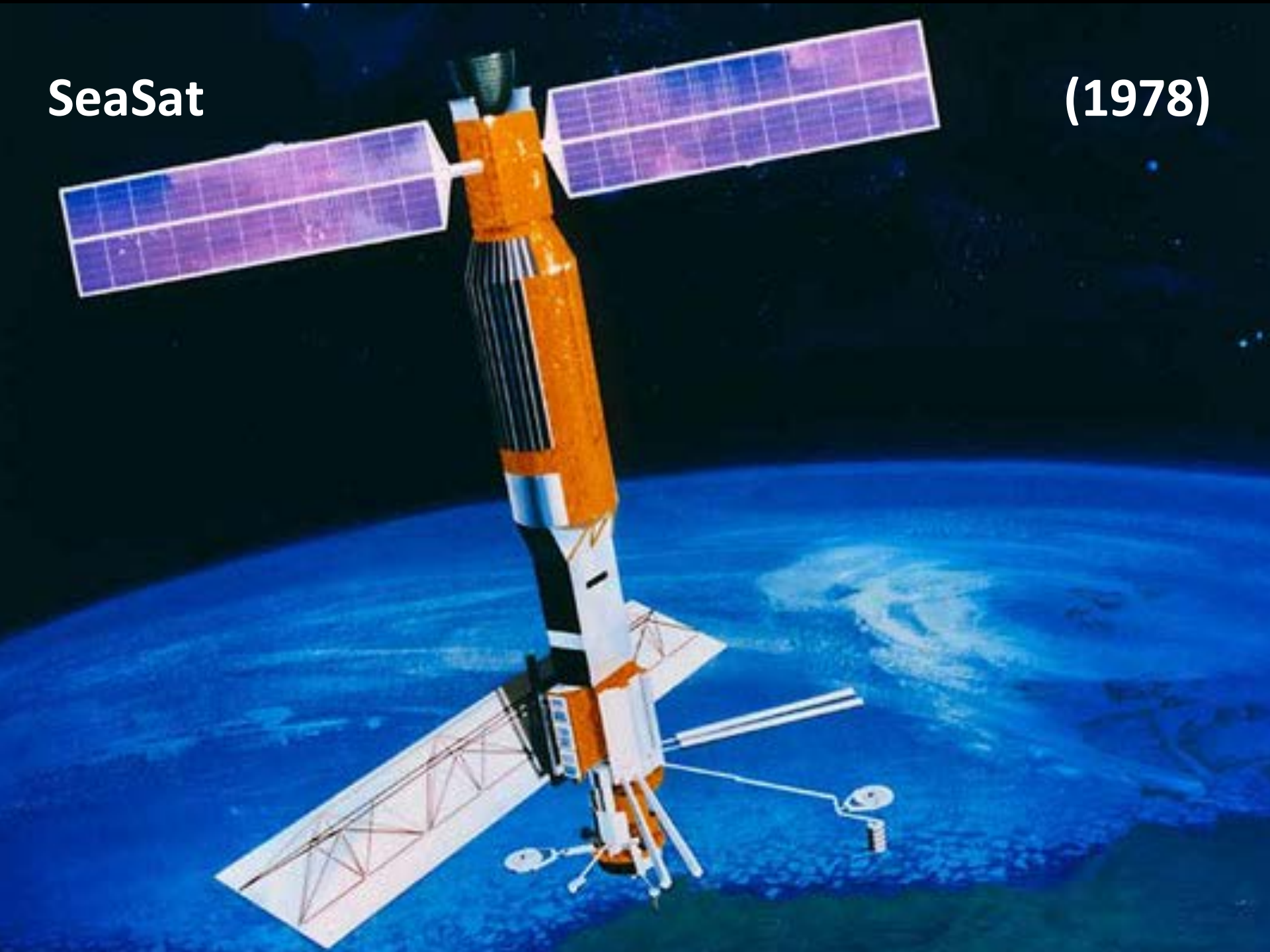
TIROS-N (1978)

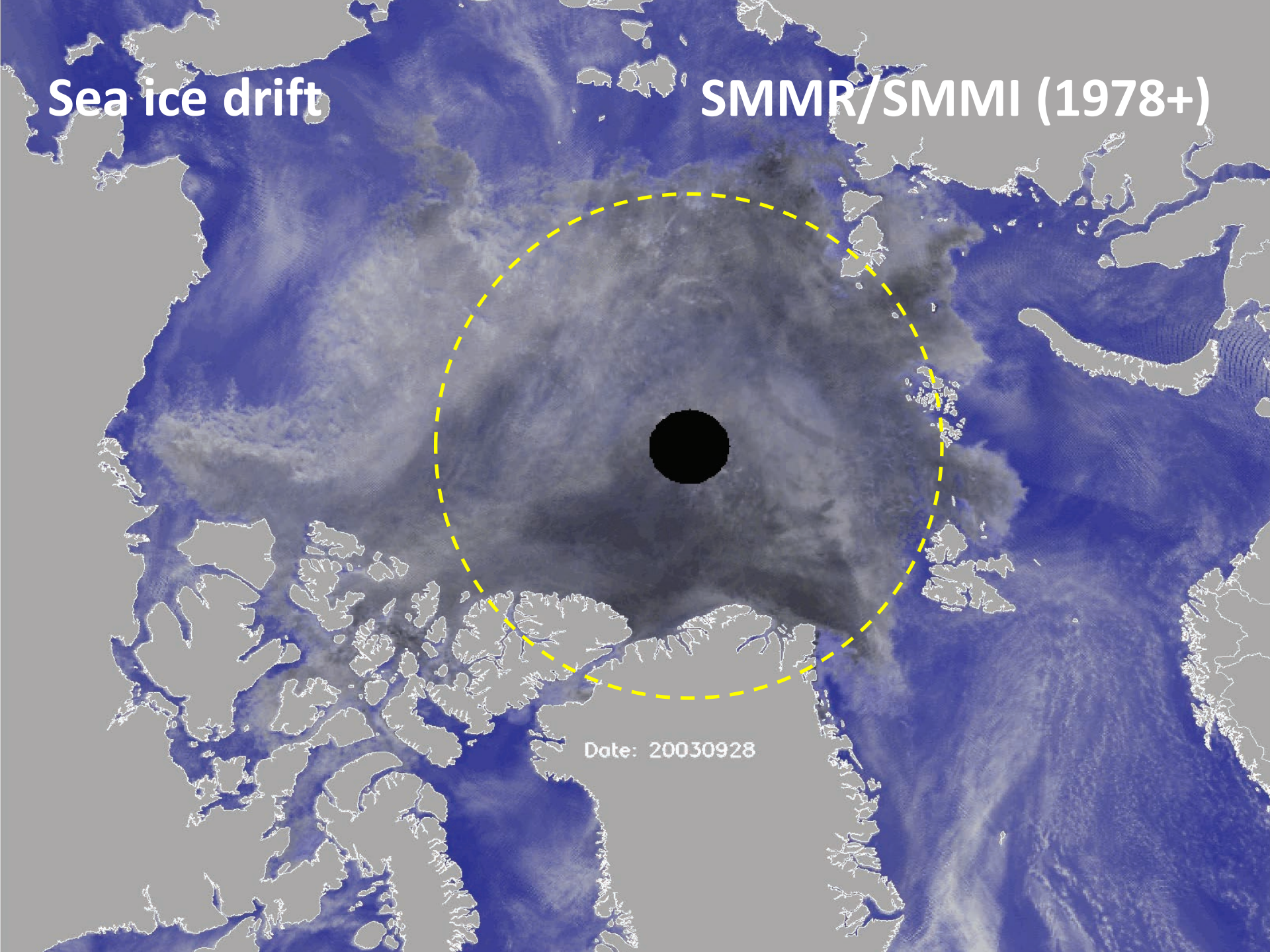


El Nino (1982)

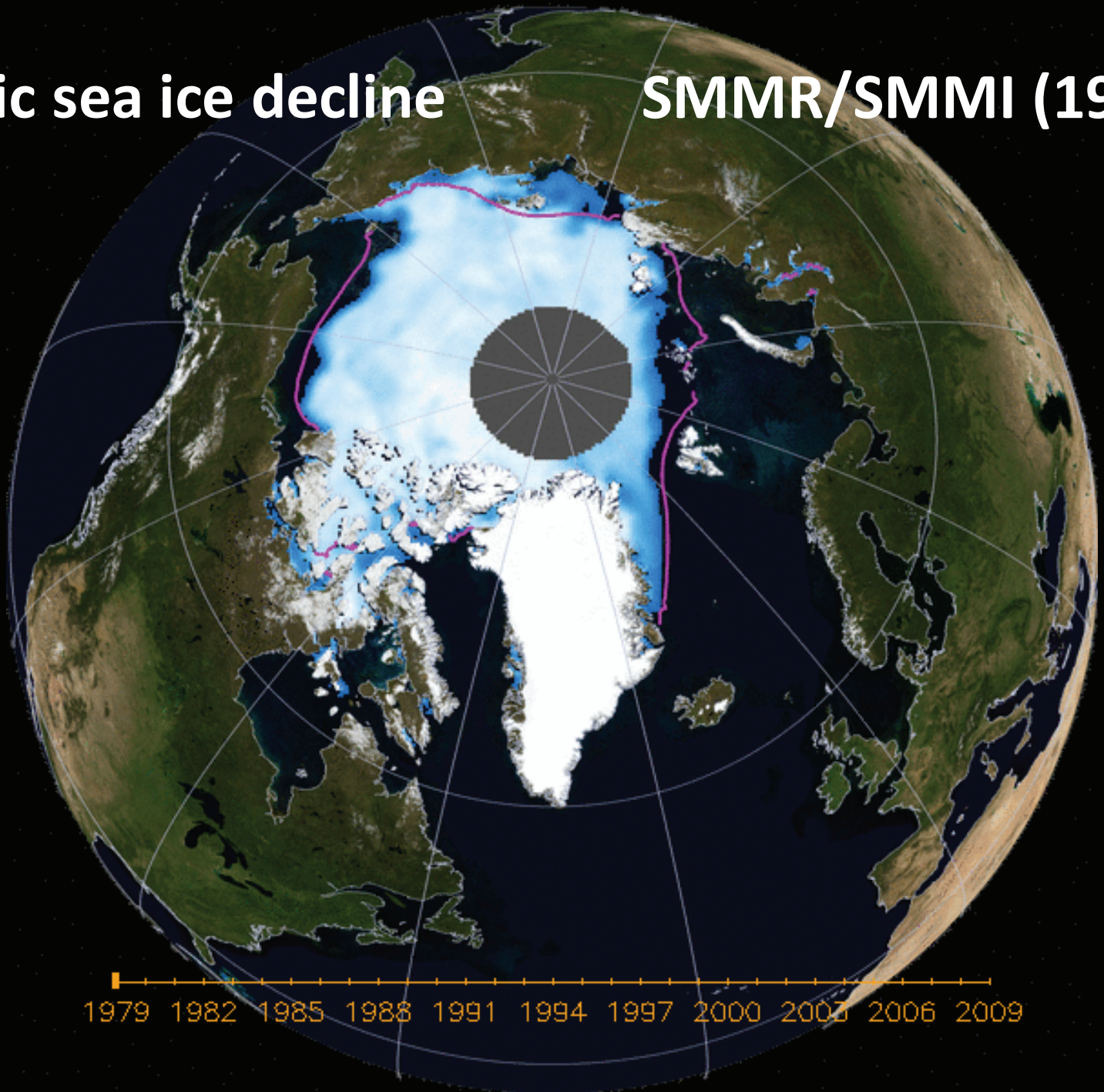
AVHRR (1997)




SeaSat
(1978)

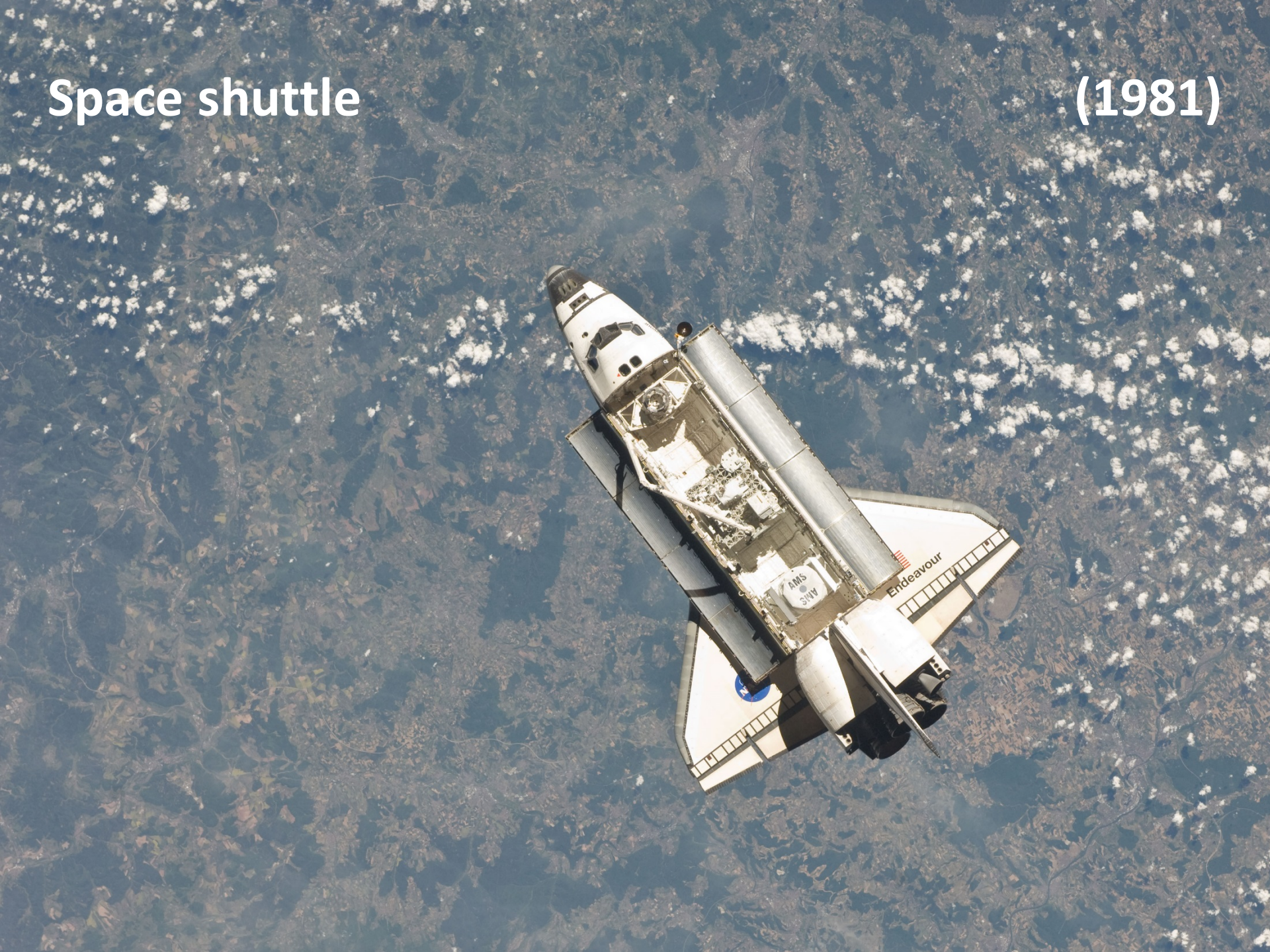

Sea ice drift
SMMR/SMMI (1978+)
Date: 20030928

Arctic sea ice decline SMMR/SMMI (1978+)



Greenland melt SMMR/SMMI (1978+)

Space shuttle (1981)

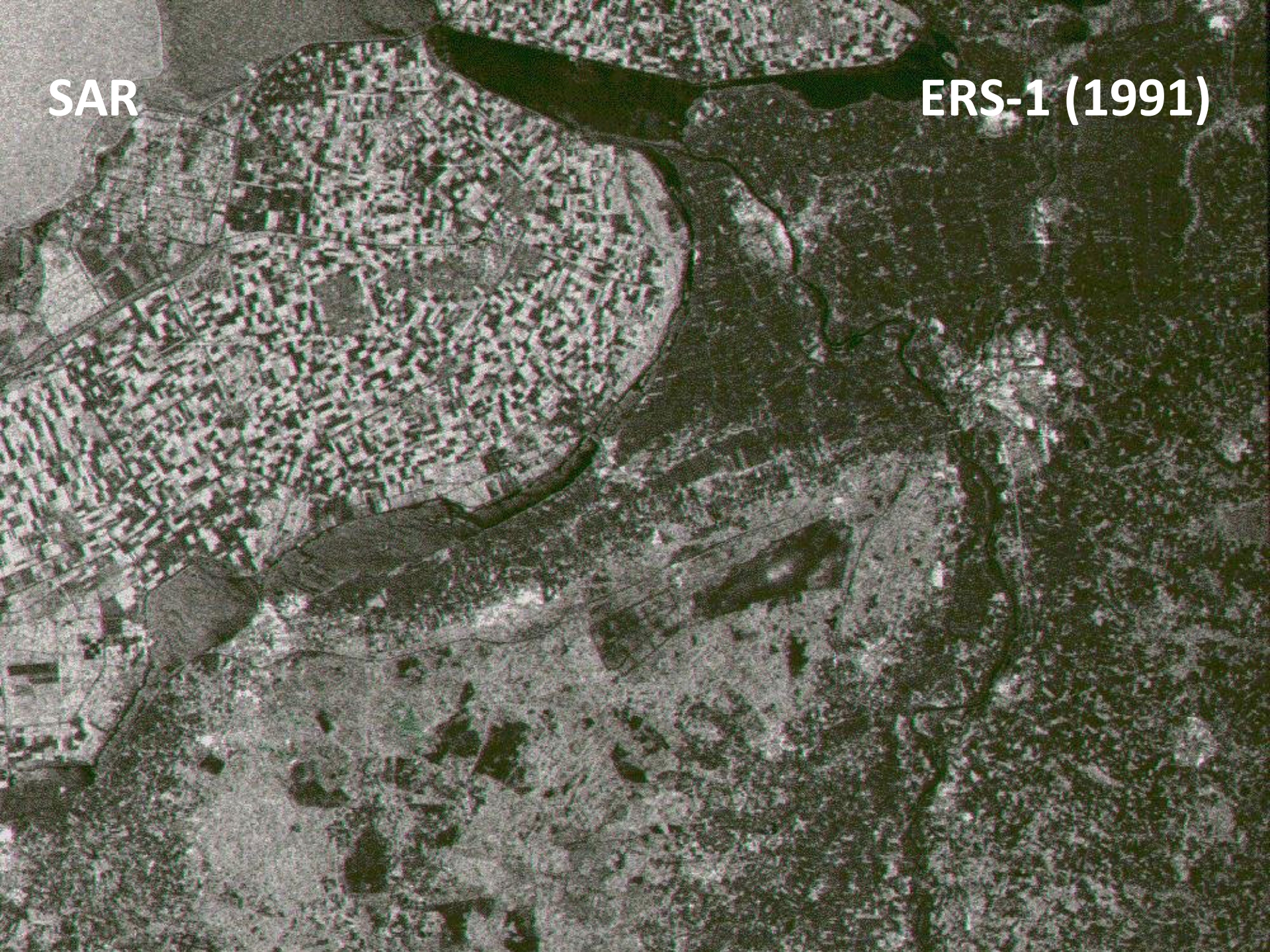


Greenland

SS (1992)

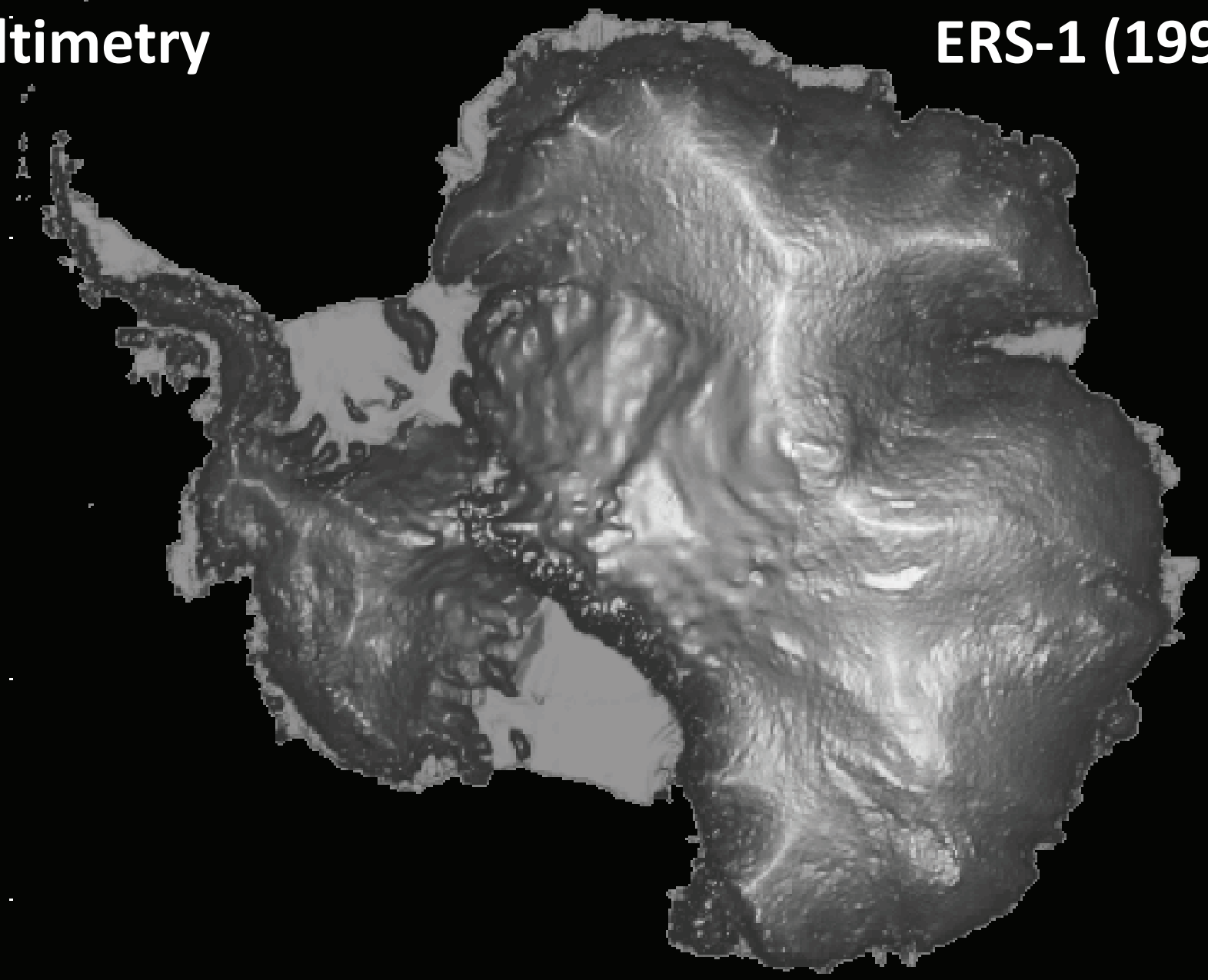
Kolka Glacier
SS (2002)

ERS-1
SPOT-4 (1998)

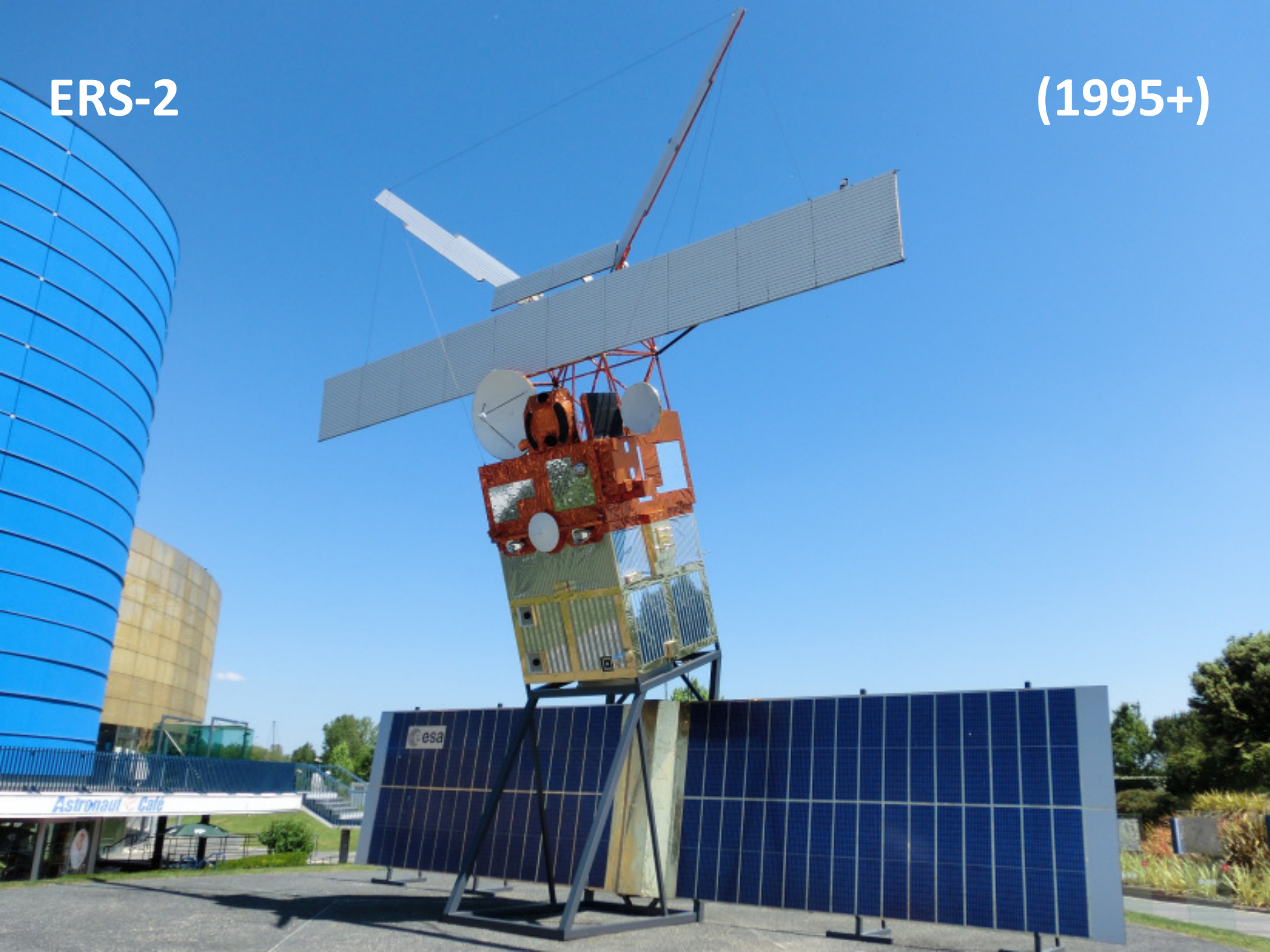

SAR
ERS-1 (1991)

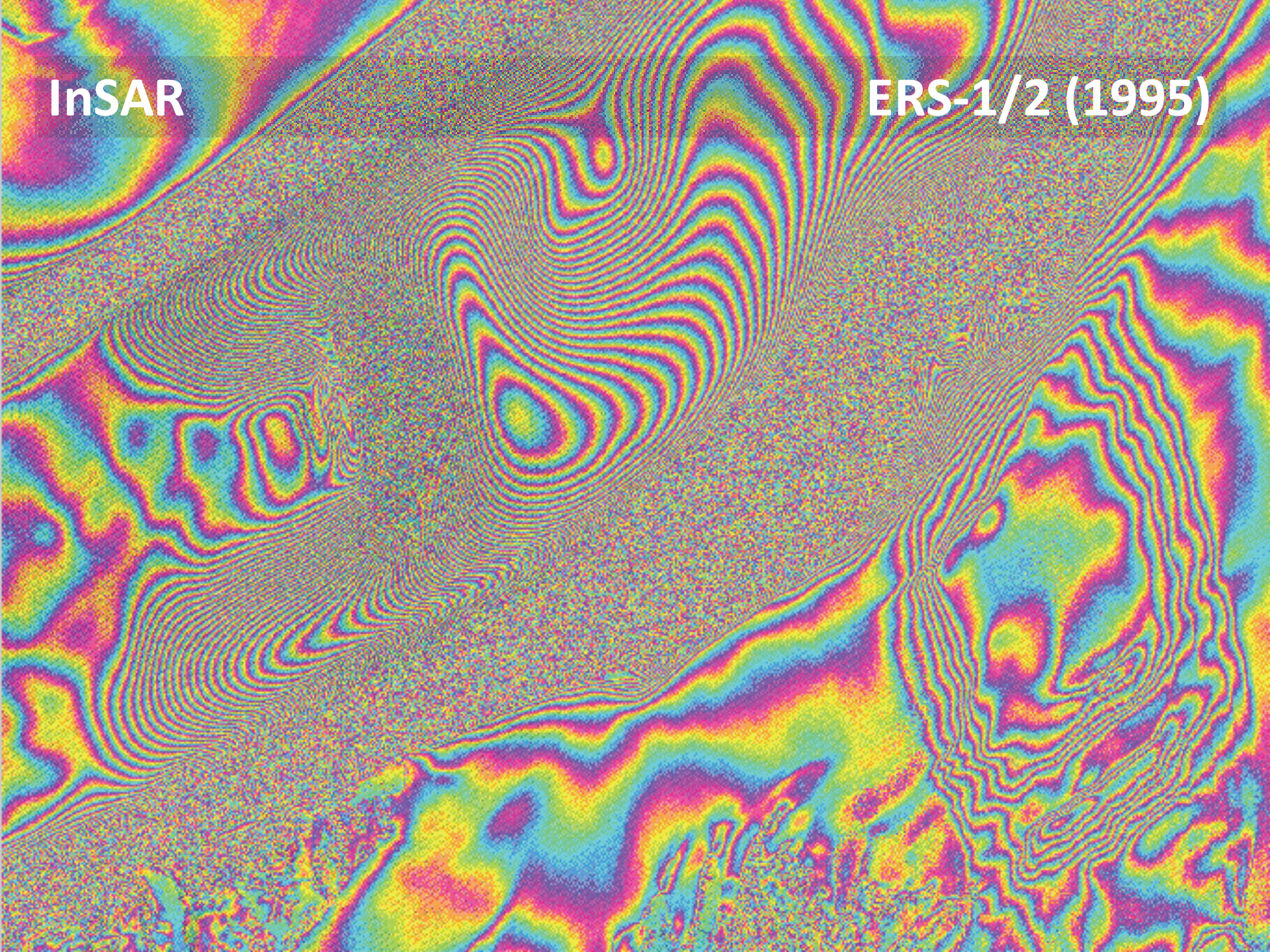
Altimetry

ERS-1 (1991+)

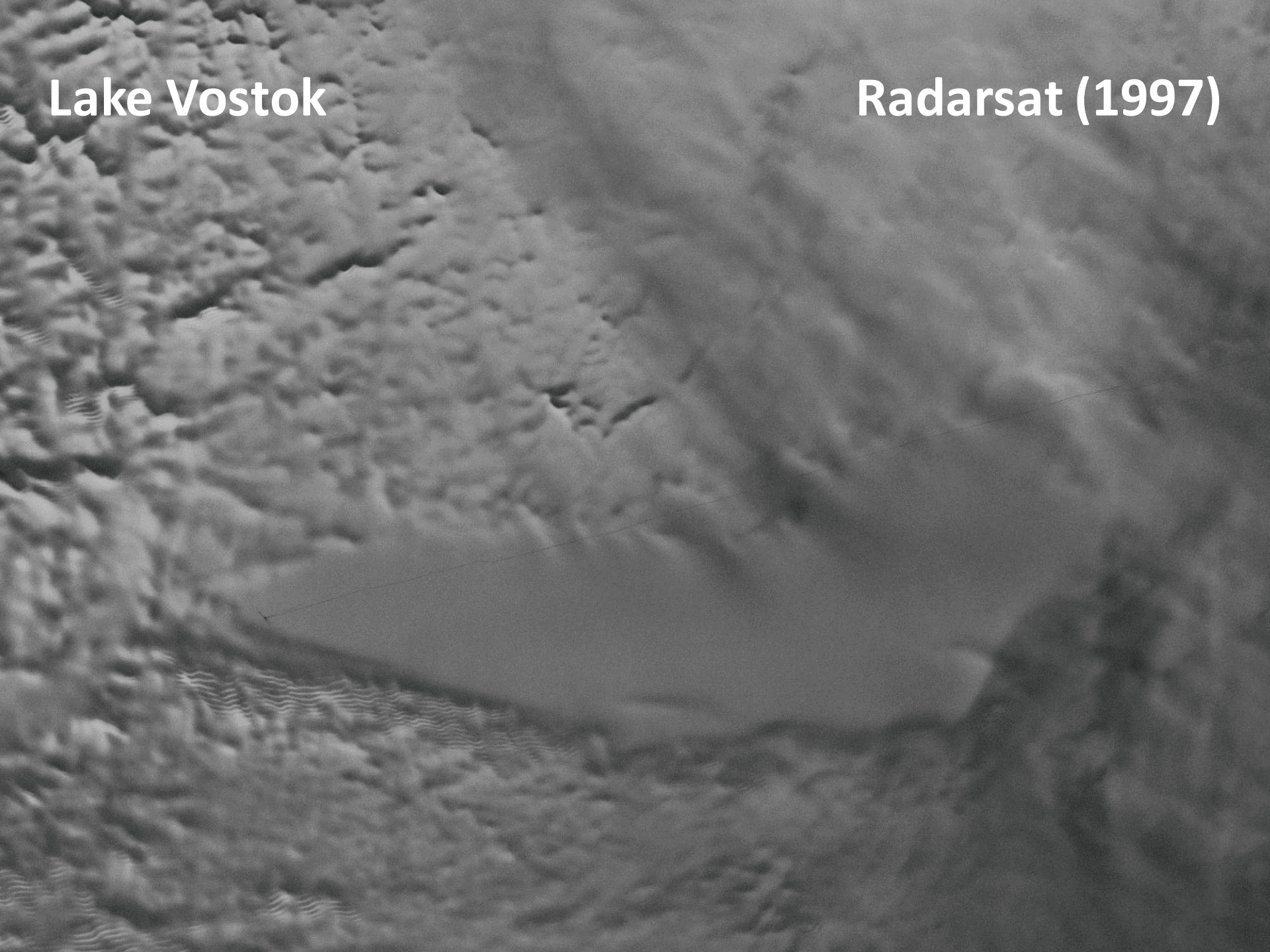


ERS-2 (1995+)

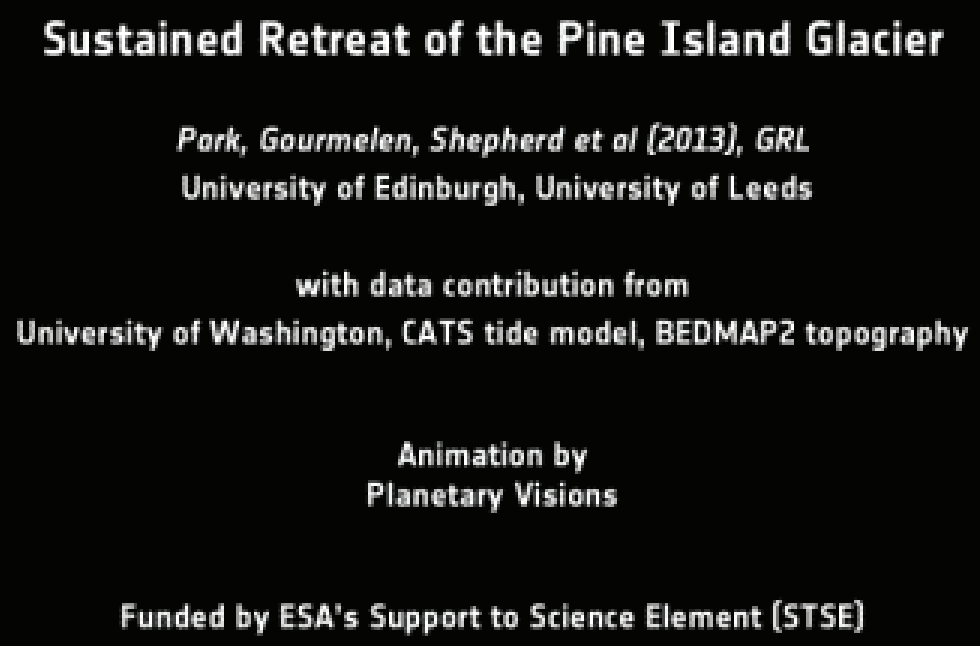



InSAR
ERS-1/2 (1995)

Ice flow (1978+)

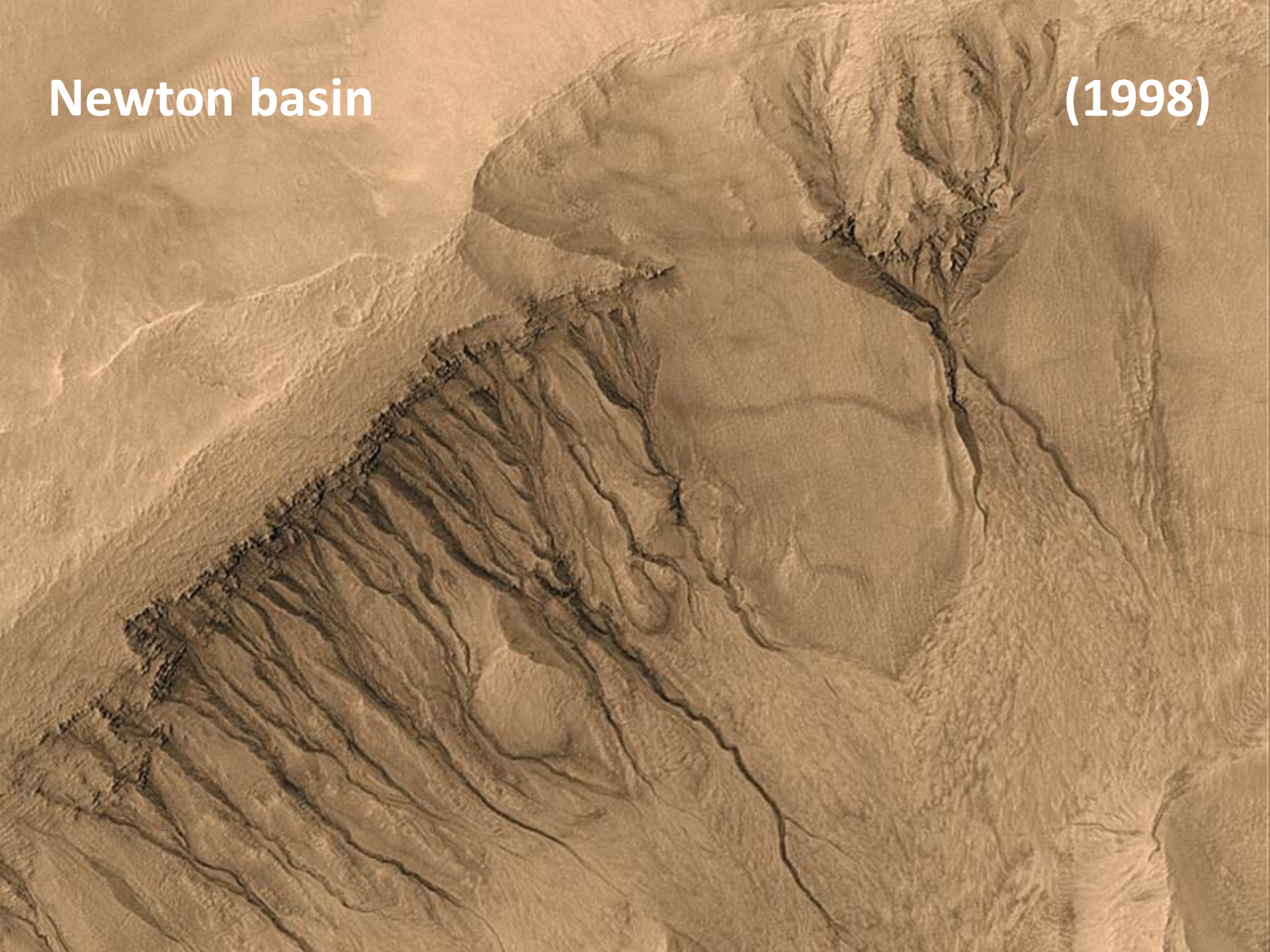

Lake Vostok
Radarsat (1997)

Grounding line (1992+)



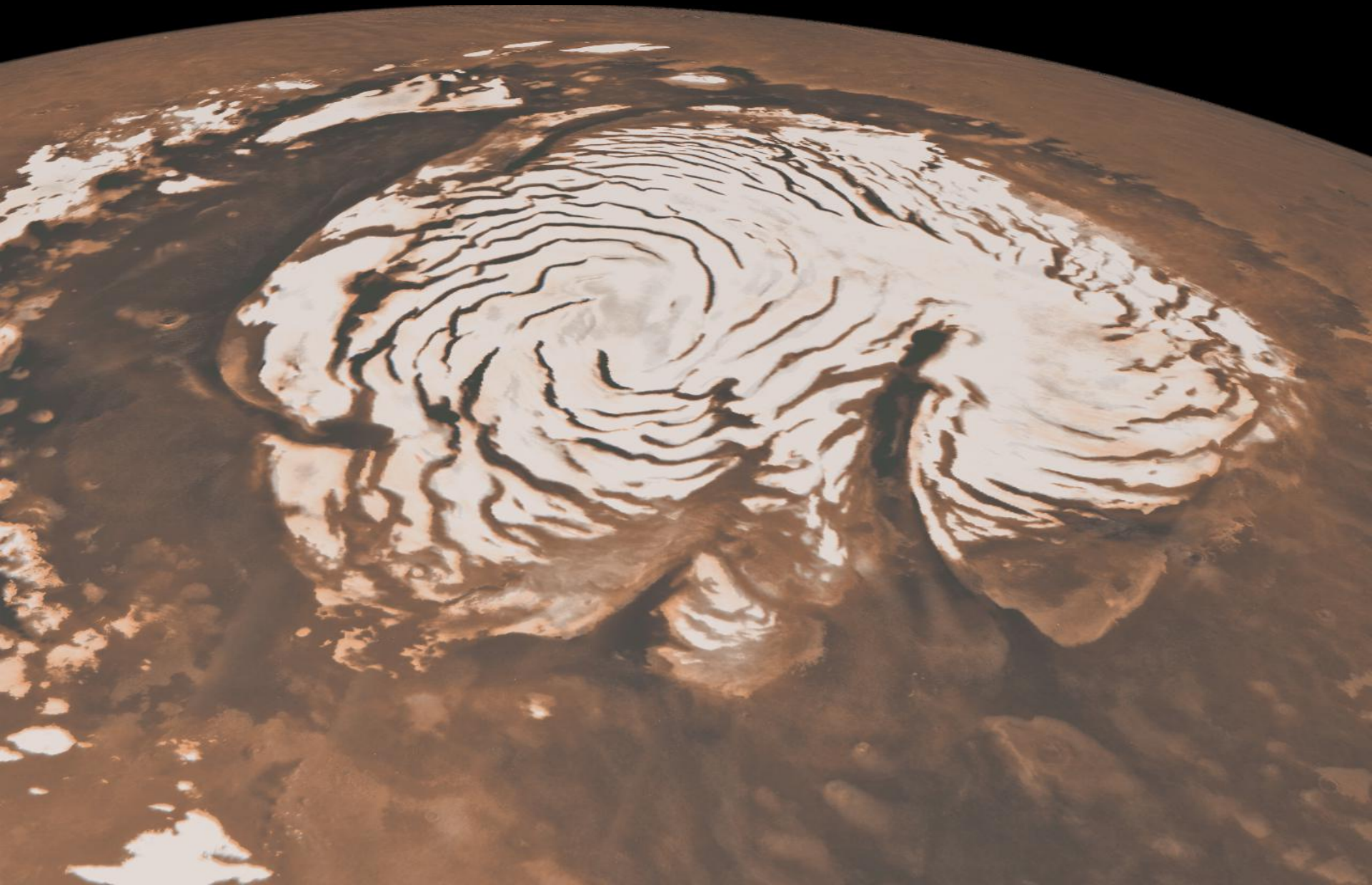
Mars global surveyor (1996)

Newton basin (1998)

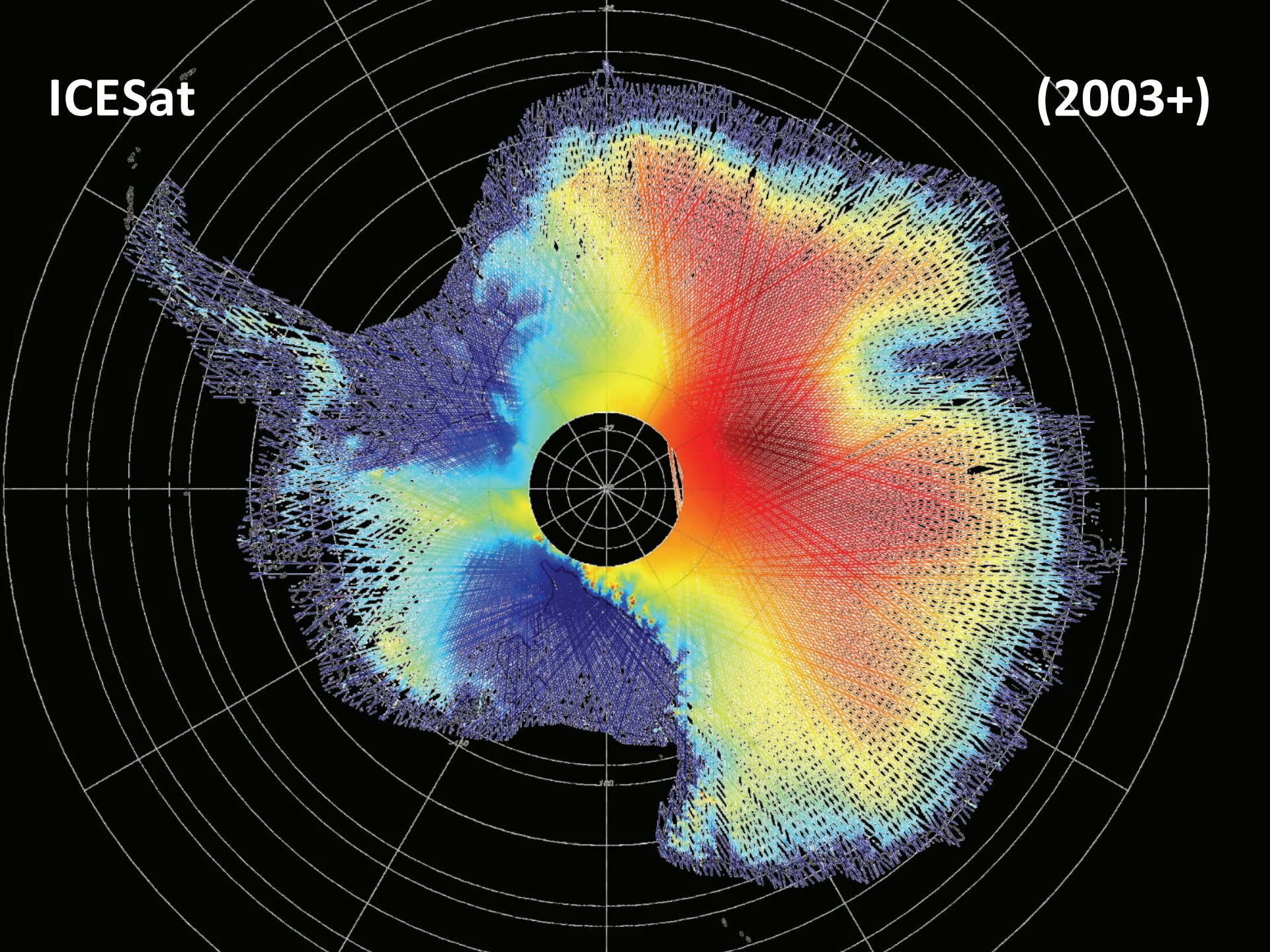


Mars ice cap

Mola (1996)



ICESat (2003)


ICESat
(2003+)

Subglacial lakes (2006+)

International Space Station (1998)

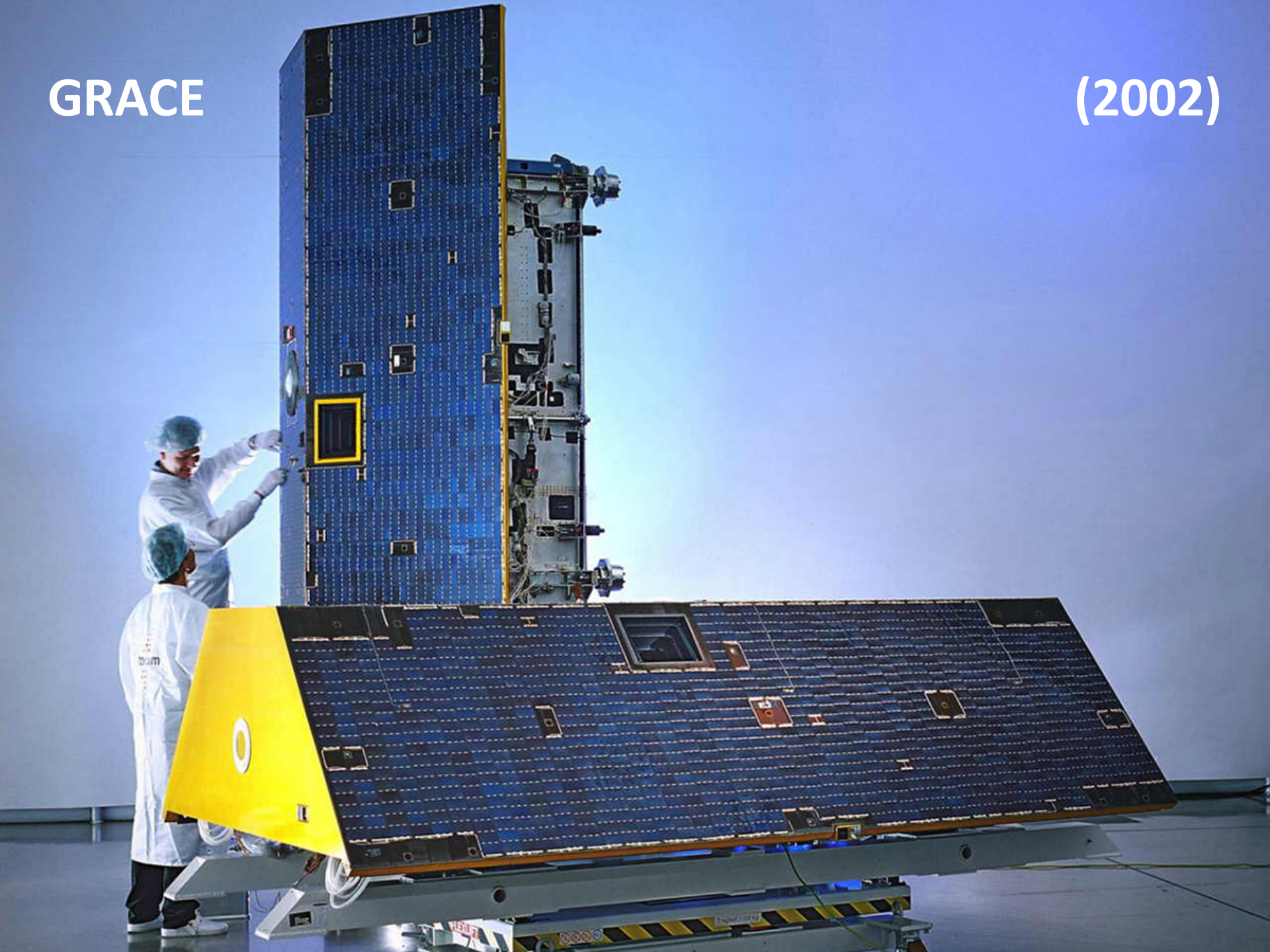
Upsala Glacier
ISS (2001)

Upsala Glacier
ISS (2004)

Hurricane

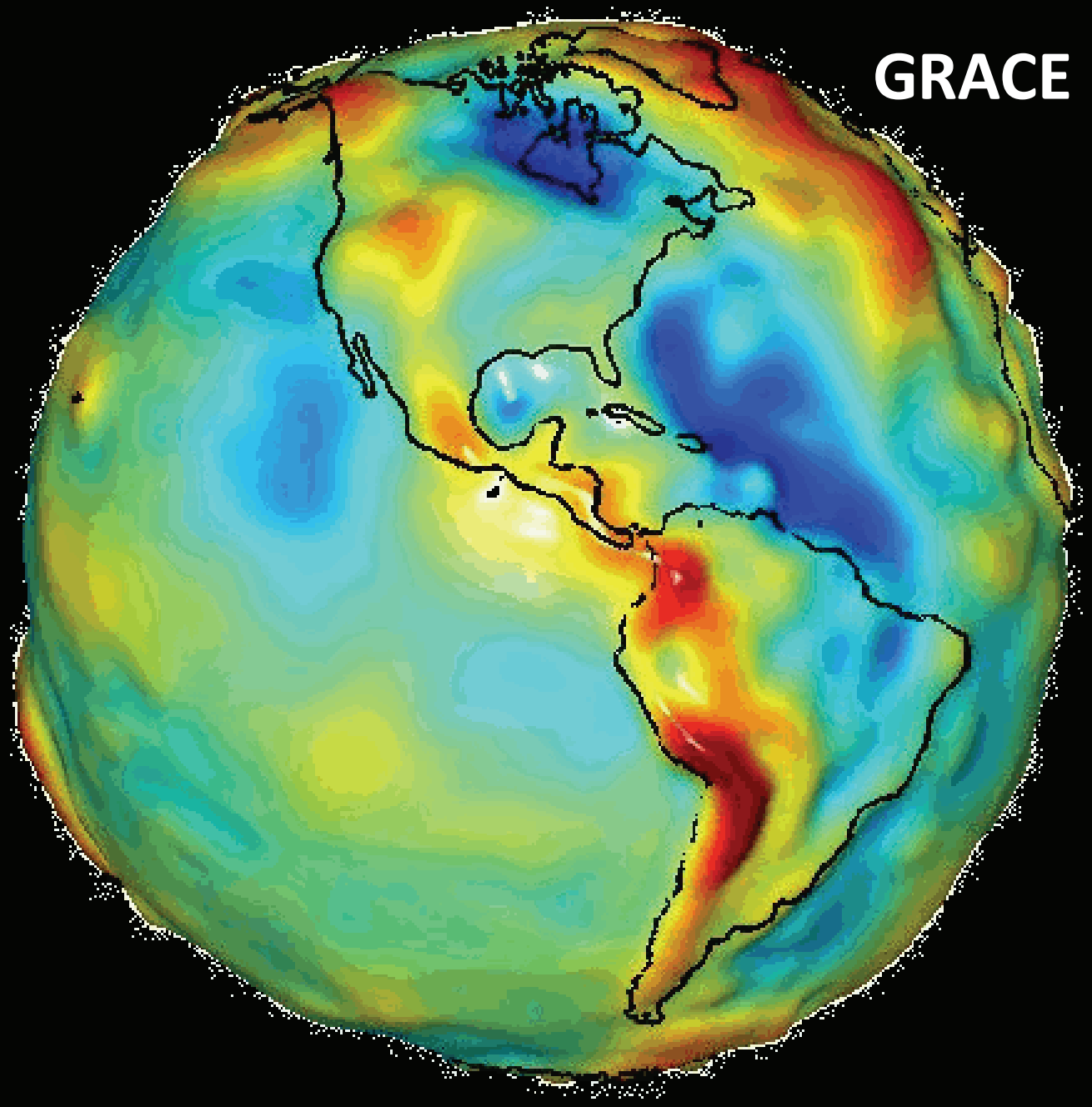
ISS (2007)

GRACE (2002)



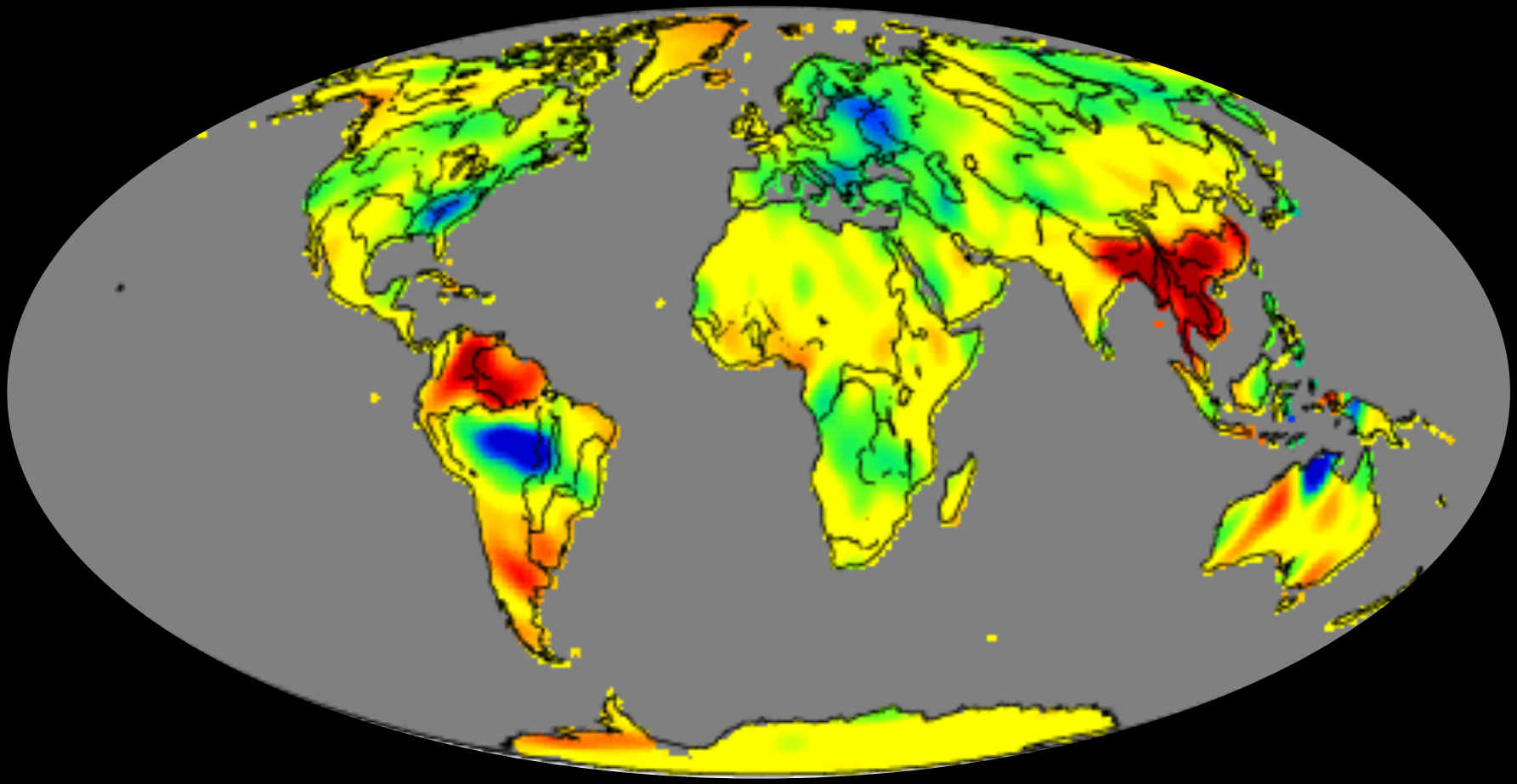
Geoid

GRACE (2003)



Mass transport

GRACE (2009)



CryoSat-2 (2010)

CryoSat-2 (2010+)

Day	Topic	Lecturers		Workshop
Monday	Glaciers	Andy Shepherd Pete Nienow	Frank Paul Tamsin Edwards	Mapping Glacier Area using Sentinel-2
Tuesday	Ice flow	Andy Hooper Anna Hogg	Andrea Minchella Twila Moon	Tracking ice motion using Sentinel-1
Wednesday	Ice thickness change	Louise Sorensen Noel Gourmelen Sinead Farrell	Eero Rinne Rachel Tilling Andy Shepherd	Determining sea ice thickness using CryoSat-2
Thursday	Ice mass balance	Kate Briggs Jeremie Mouginot	Rene Forsberg Andreas Groh Isabella Velicogna	Computing ice sheet mass balance using GRACE
Friday	Surface mass balance	David Small Marco Tedesco	Robert Ricker Michiel van den Broeke	