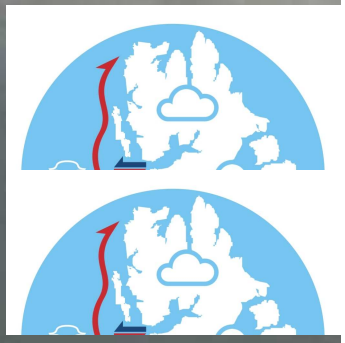
# *AWAKE*
# *Task 6.2*

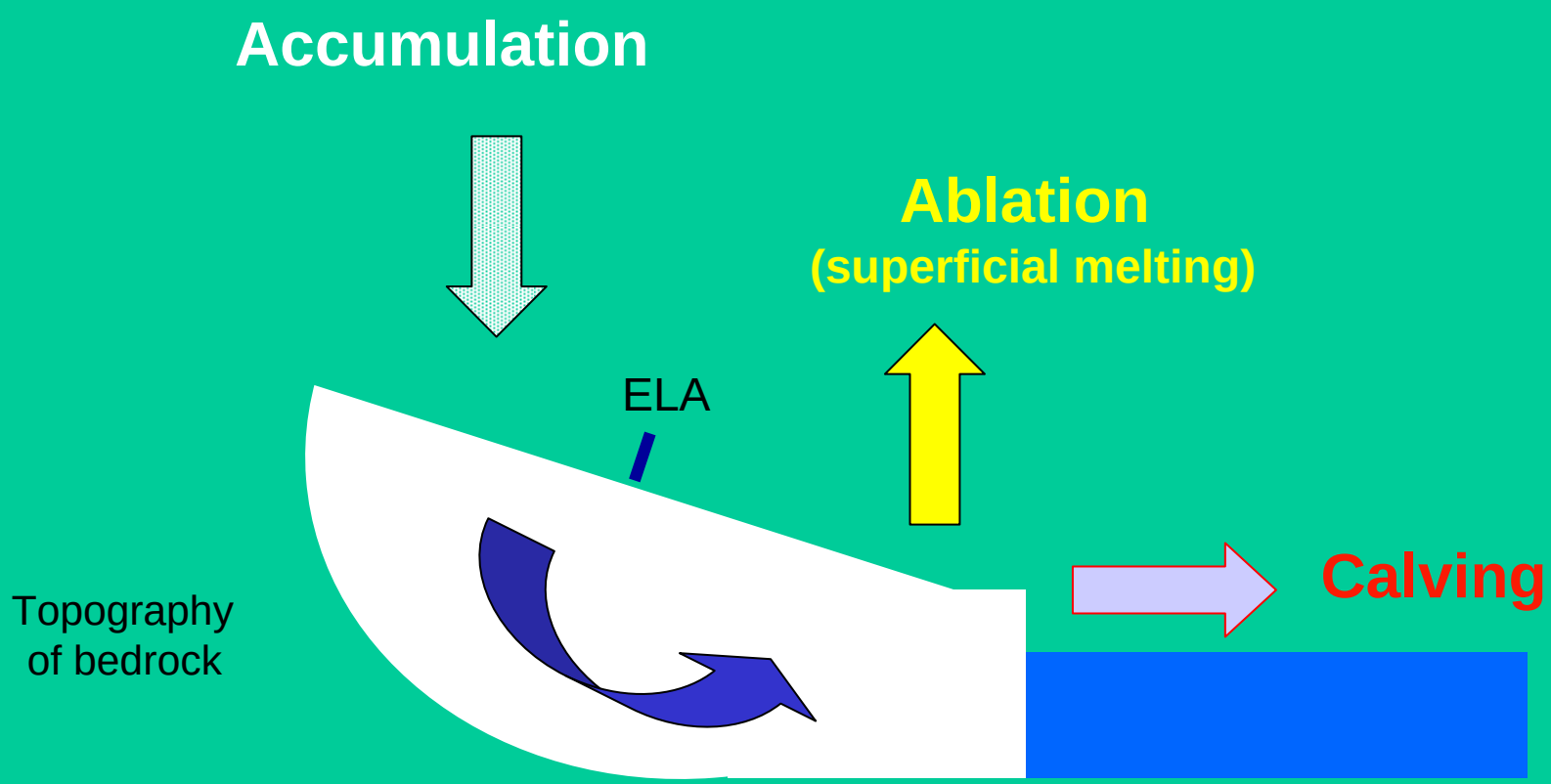
## *Progress and plans 2010-2011*

Jacek Jania
University of Silesia



Hansbreen, Photo by W. Kaszkin

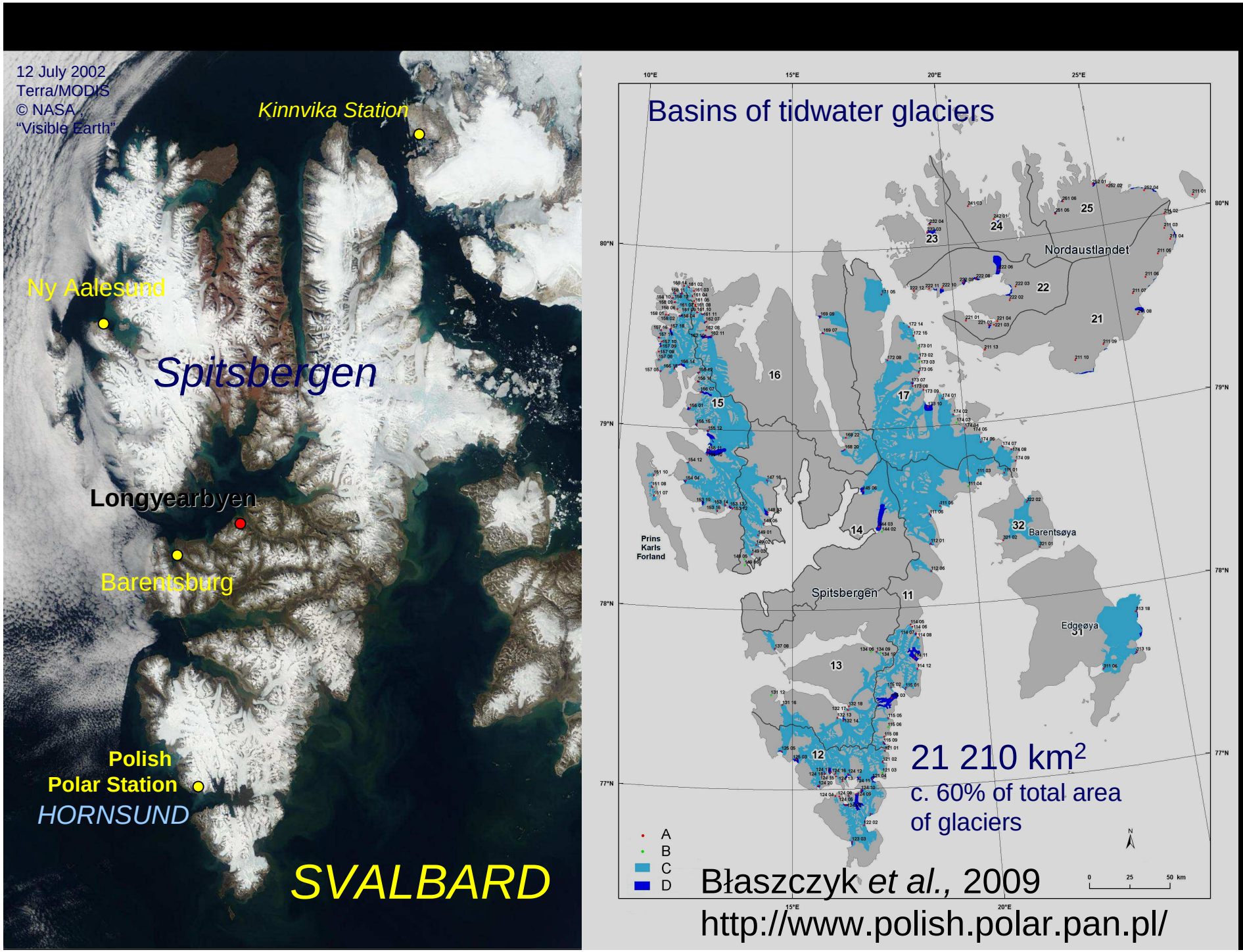
# Mass turnover of a tidewater glacier

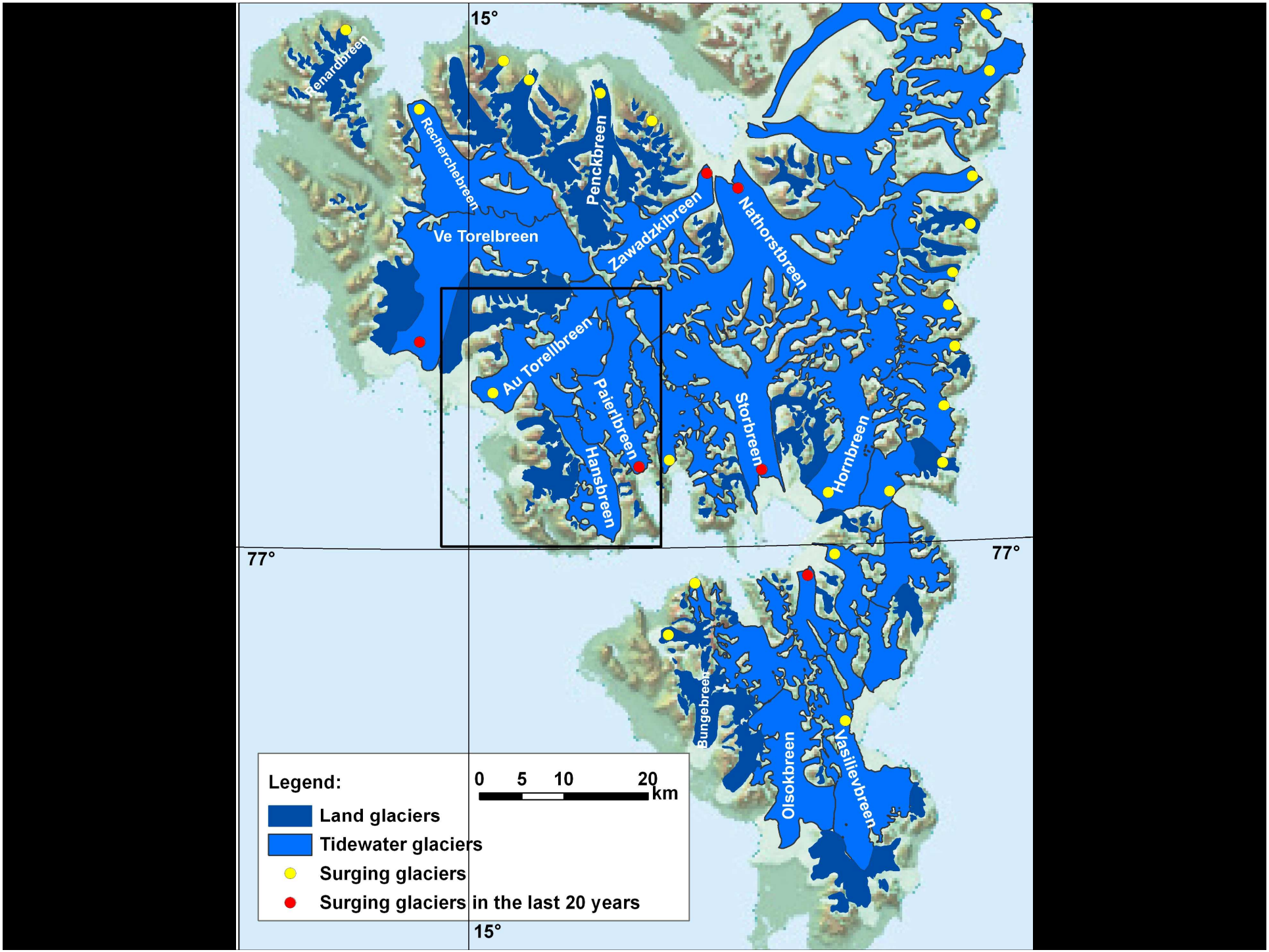


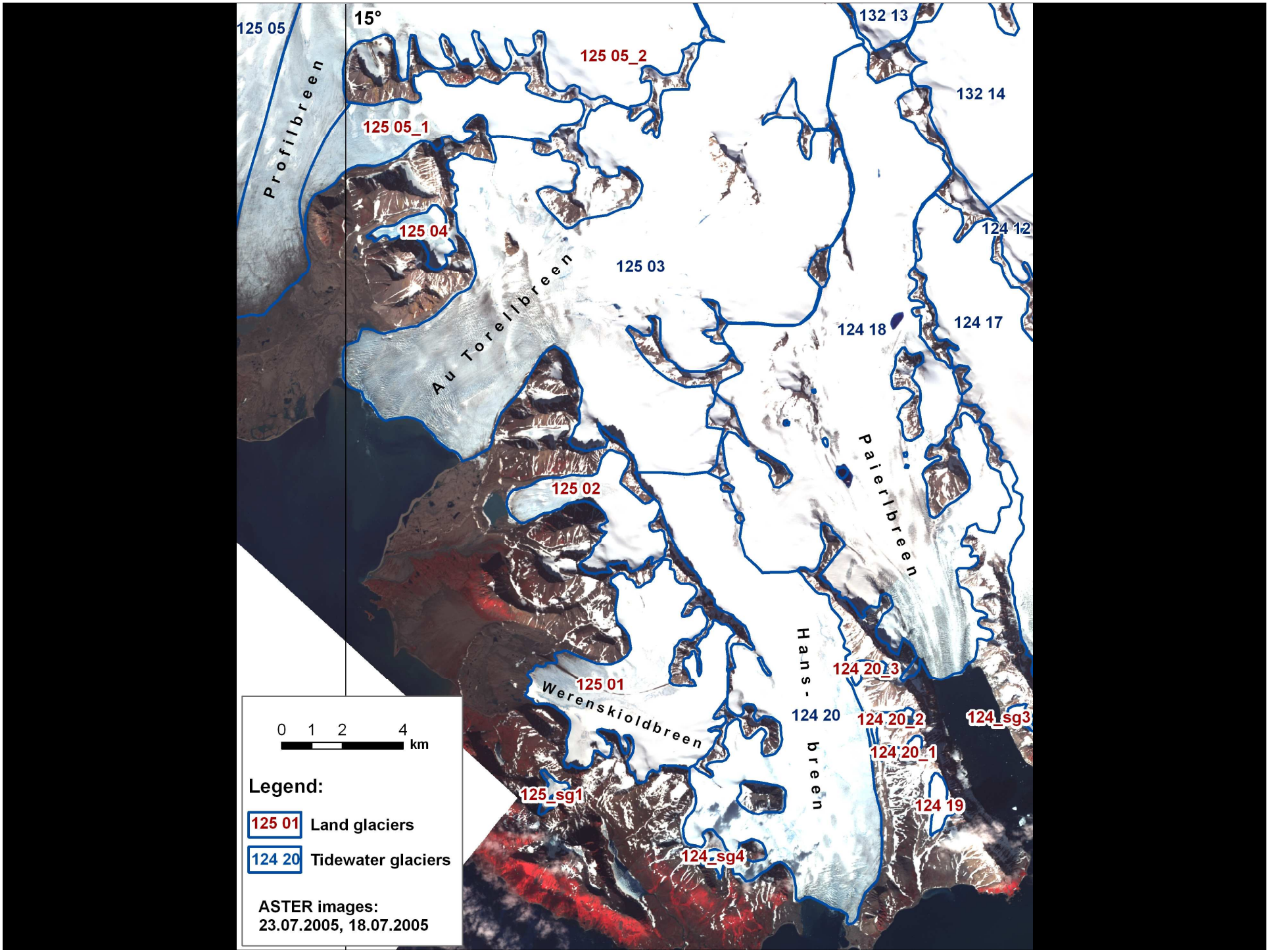

Steady state

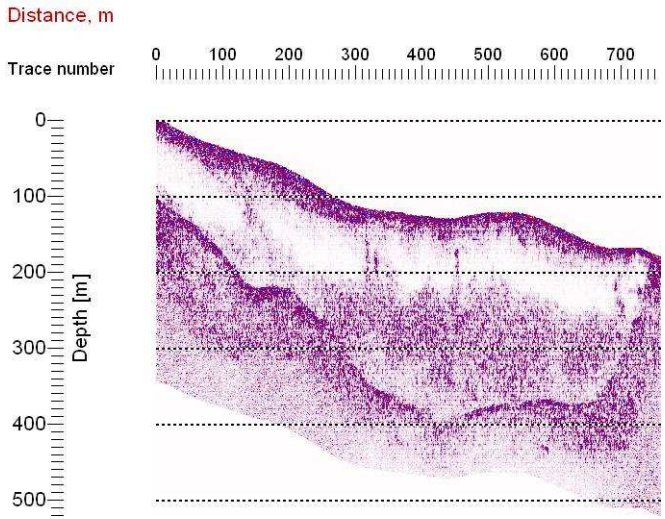
Accumulation = Ice discharge = Ablation (superficial + calving)

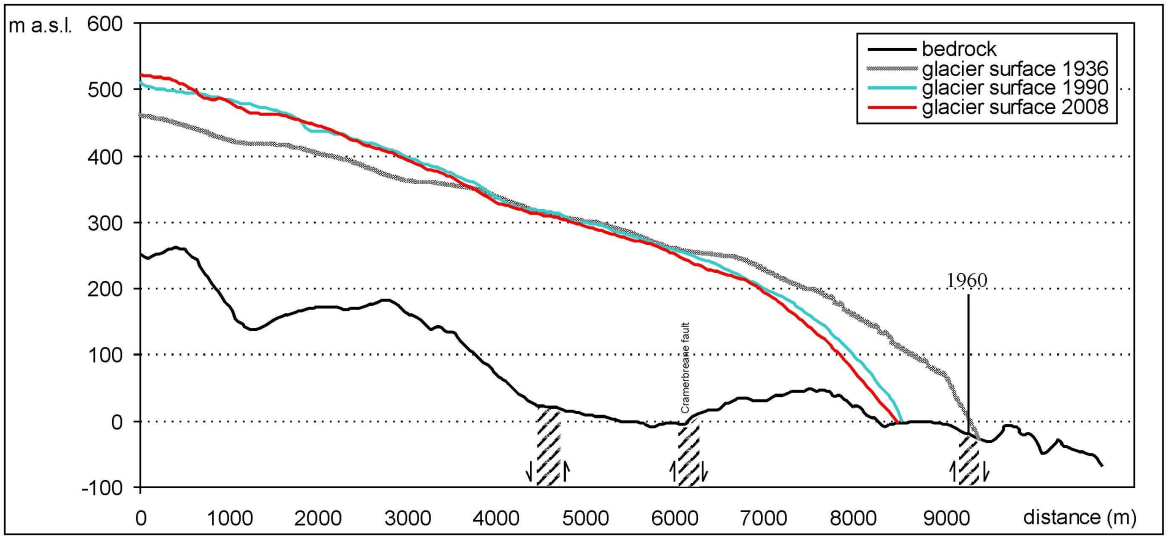
Foto J. Jania (wrzesień 2007)


12 July 2002
Terra/MODIS
© NASA,
"Visible Earth"
Kinnvika Station
Ny Aalesund
Spitsbergen
Longyearbyen
Barentsburg
Polish
Polar Station
HORNSUND
SVALBARD
Basins of tidwater glaciers
Nordaustlandet
Prins
Karls
Forland
Spitsbergen
Barentsøya
Edgeøya
A
B
C
D
21 210 km²
c. 60% of total area
of glaciers
Błaszczyk et al., 2009
http://www.polish.polar.pan.pl/


15°
77°
77°
15°
Renardbreen
Recherchebreen
Penckbreen
Ve Torelbreen
Zawadzkibreen
Nathorstbreen
Au Torellbreen
Paierlbreen
Hansbreen
Storbreen
Hornbreen
Bungebreen
Olsokbreen
Vasilievbreen
Legend:
Land glaciers
Tidewater glaciers
Surging glaciers
Surging glaciers in the last 20 years
0 5 10 20
km


15°
125 05
125 05_2
125 05_1
125 04
125 03
125 02
125 01
132 13
132 14
124 12
124 18
124 17
124 20_3
124 20
124 20_2
124 20_1
124 19
124_sg3
125_sg1
124_sg4
Profilbreen
Au Torellbreen
Paierlbreen
Hans-breen
Werenskioldbreen
0 1 2 4
km
Legend:
125 01 Land glaciers
124 20 Tidewater glaciers
ASTER images:
23.07.2005, 18.07.2005


Distance, m
Trace number
0
100
200
300
400
500
600
700
Depth [m]
0
100
200
300
400
500


m a.s.l.
600
500
400
300
200
100
0
-100
bedrock
glacier surface 1936
glacier surface 1990
glacier surface 2008
1960
Cramerbreane fault
0
1000
2000
3000
4000
5000
6000
7000
8000
9000
distance (m)

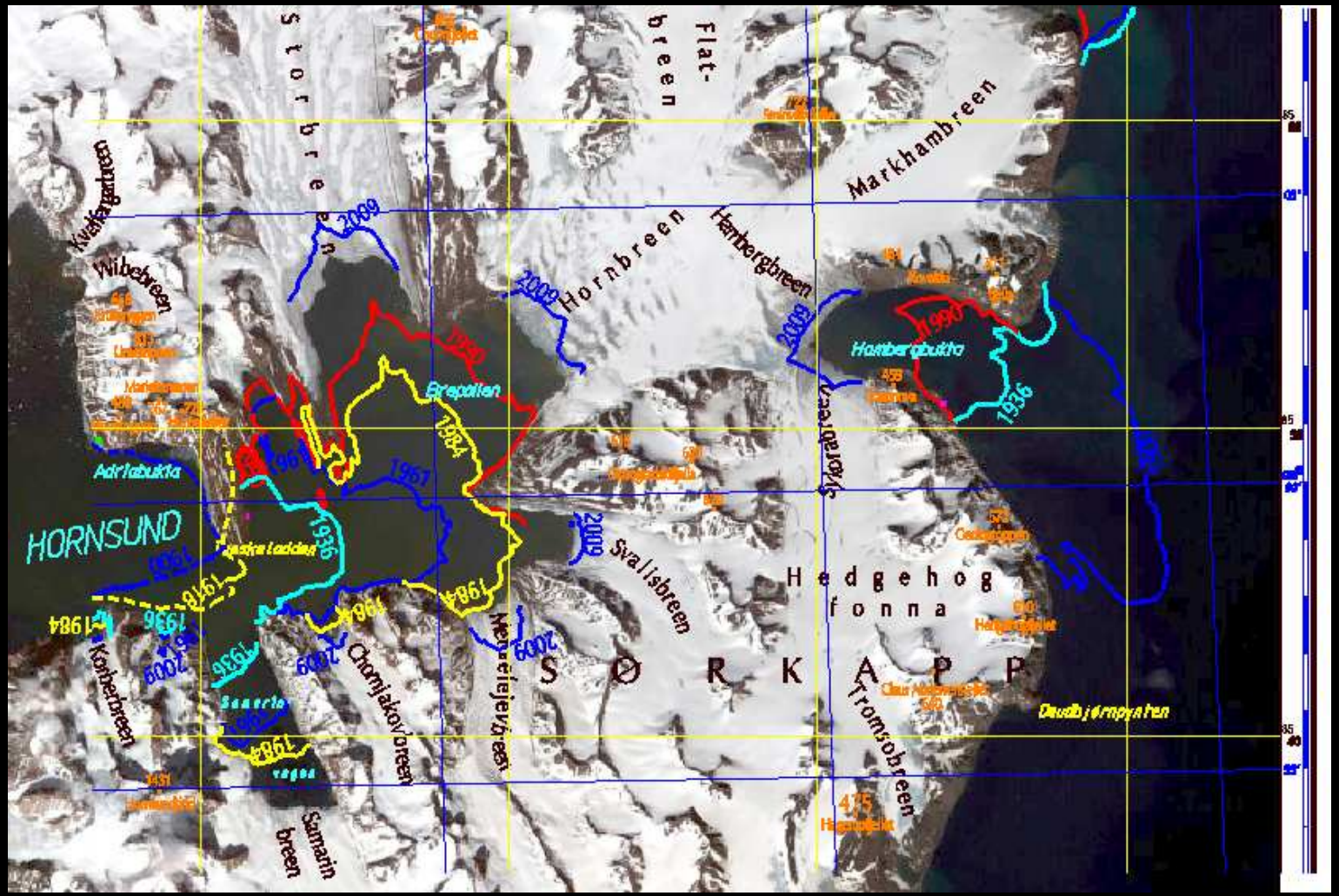
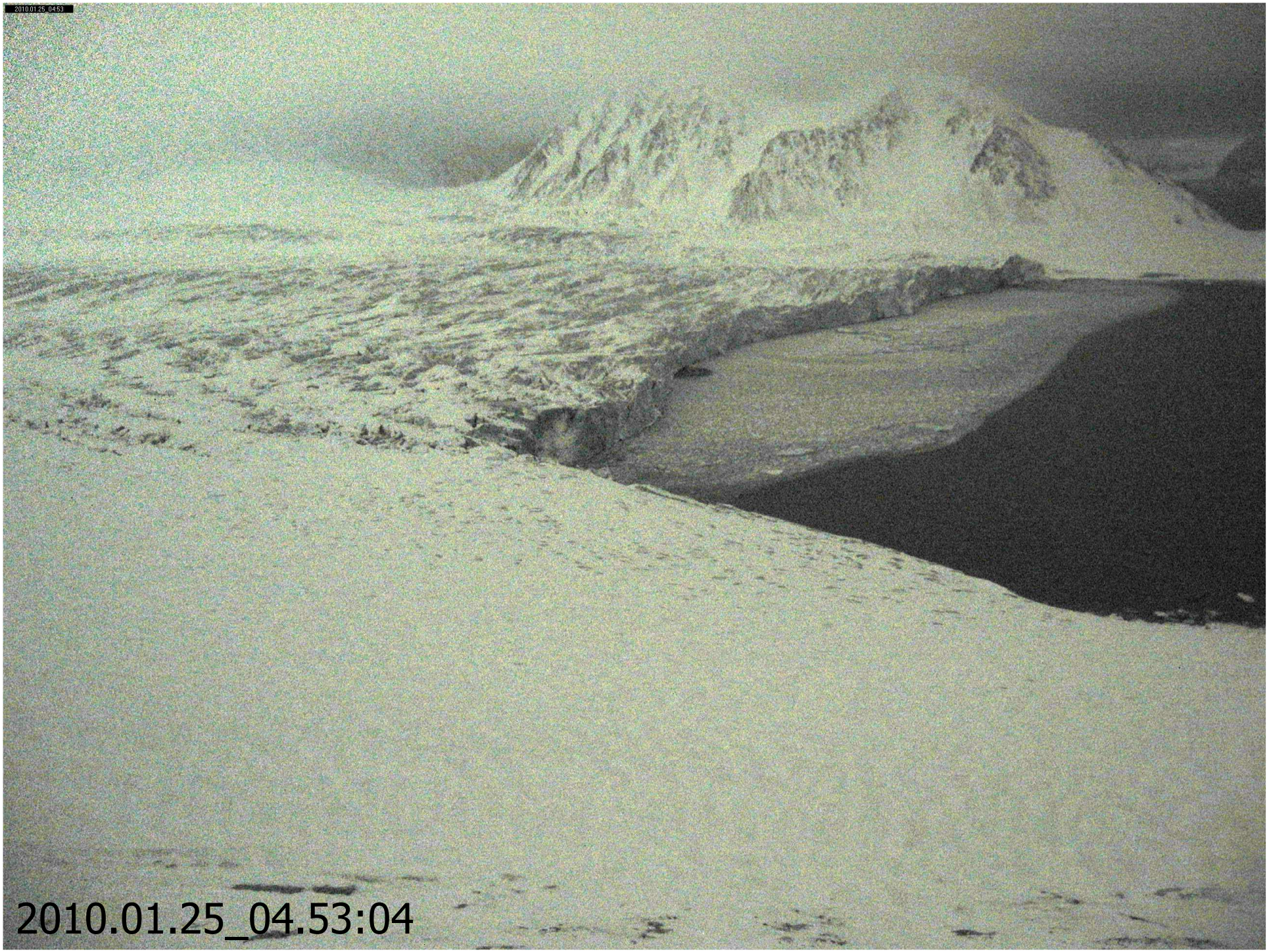

Storbreen
Flat-
breen
Markhambreen
Kvalfangarbreen
Wibebreen
Hornbreen
Hambergbreen
2009
1990
Hambergbutta
1936
Brepollen
1984
1961
Svalisbreen
Svalisbreen
Adriabukta
HORNSUND
Hedgehog
fonna
SØRKAPP
Konbrebreen
Chomjakovbreen
Mendeleijevbreen
Tromsobreen
Samarinbreen
Daudbjørnpynten

Photo by courtesy of the Univ. of Leeds, July 2004

Monitoring czołowej części Lodowca Hansa
automatycznymi kamerami cyfrowymi (stereoskopowo)
Co godzinę w okresie 12 lipca – 25 września 2007
Photo by L. Kolondra, July 2007

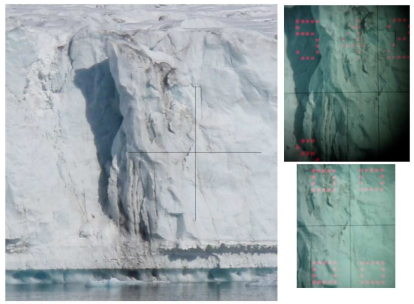

2010.01.25_04:53
2010.01.25_04.53:04

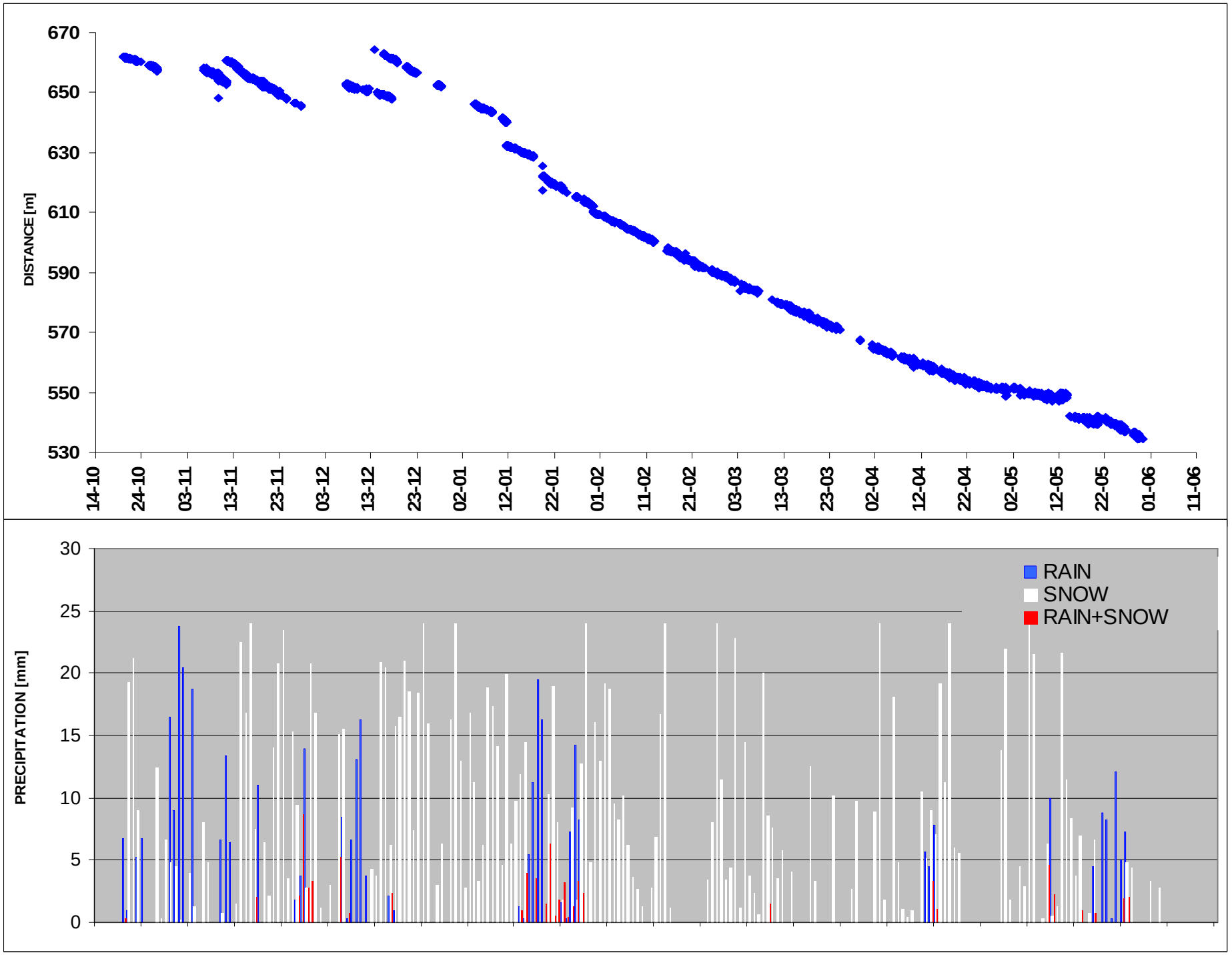
2010.01.20_15:47

Riegl FG21-LR distance meter mounted for winter close to cliff of Hansbreen

Survey every 10 min.

20-05-2010 miejsce “celowania”
dalmierza



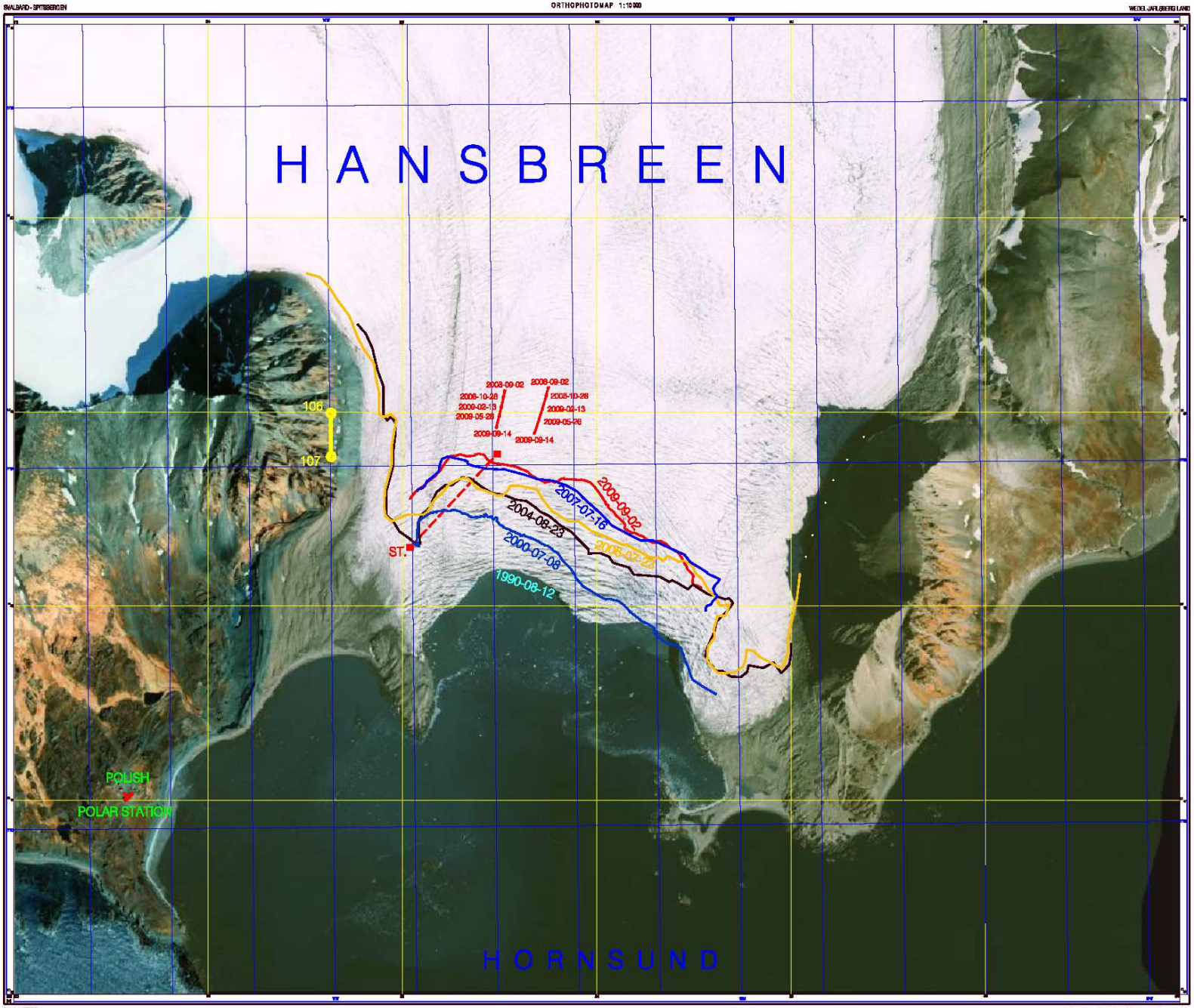

DISTANCE [m]
670
650
630
610
590
570
550
530
14-10
24-10
03-11
13-11
23-11
03-12
13-12
23-12
02-01
12-01
22-01
01-02
11-02
21-02
03-03
13-03
23-03
02-04
12-04
22-04
02-05
12-05
22-05
01-06
11-06
PRECIPITATION [mm]
30
25
20
15
10
5
0
RAIN
SNOW
RAIN+SNOW

HANSBREEN

ORTHOPHOTOMAP 1:10000

SVALBARD - SPITSBERGEN

WEDEL JARLSBERG LAND




Datum : WGS 84

Coordinates in UTM projection (zone 33 X - E1st)

10km 50 0 100 200 300 400 600 m

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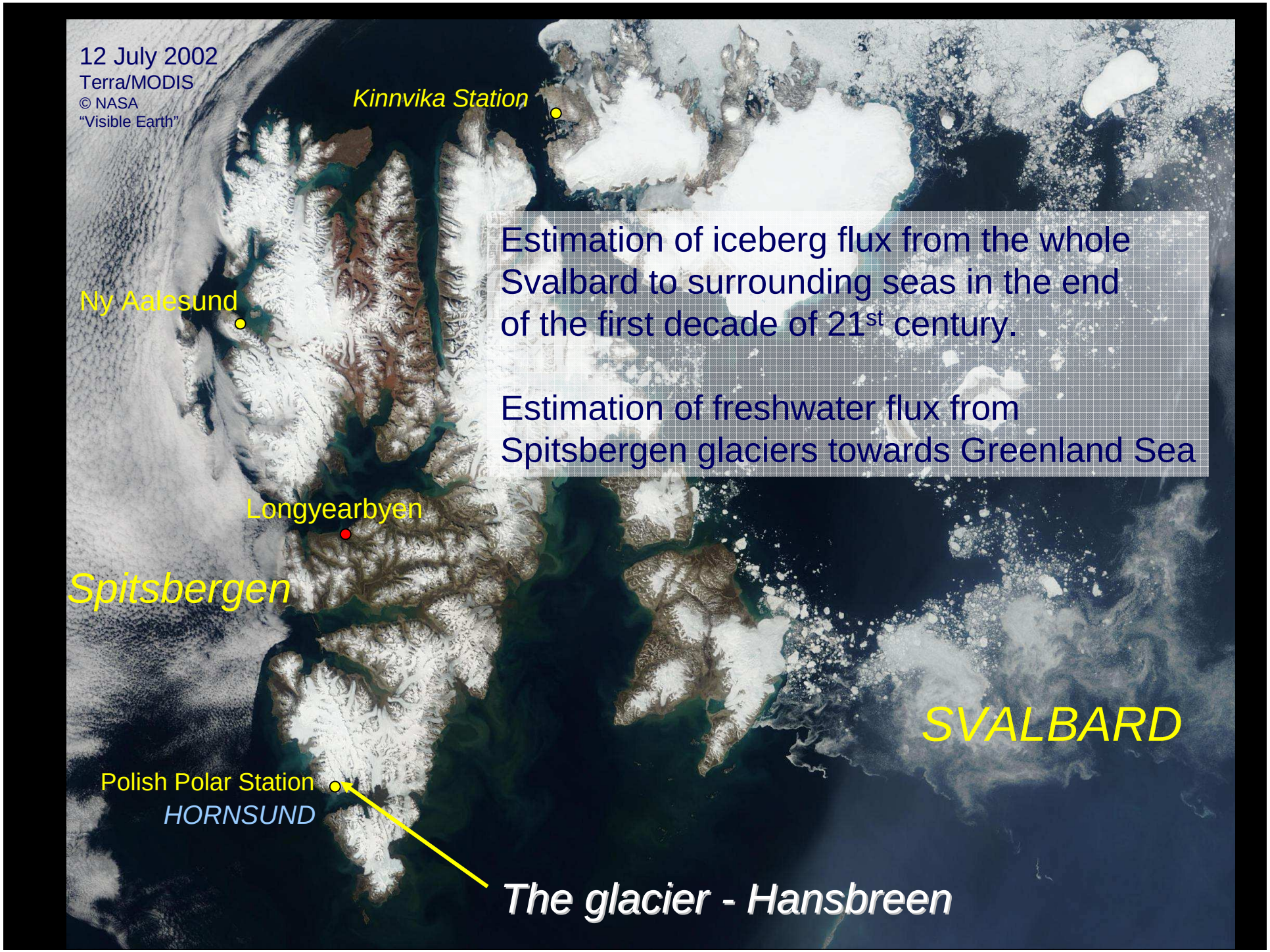
Processed in 2005 by Leszek Kolondra


12 July 2002
Terra/MODIS
© NASA
"Visible Earth"
Kinnvika Station
Estimation of iceberg flux from the whole Svalbard to surrounding seas in the end of the first decade of 21st century.
Estimation of freshwater flux from Spitsbergen glaciers towards Greenland Sea
Ny Aalesund
Longyearbyen
Spitsbergen
SVALBARD
Polish Polar Station
HORNSUND
The glacier - Hansbreen