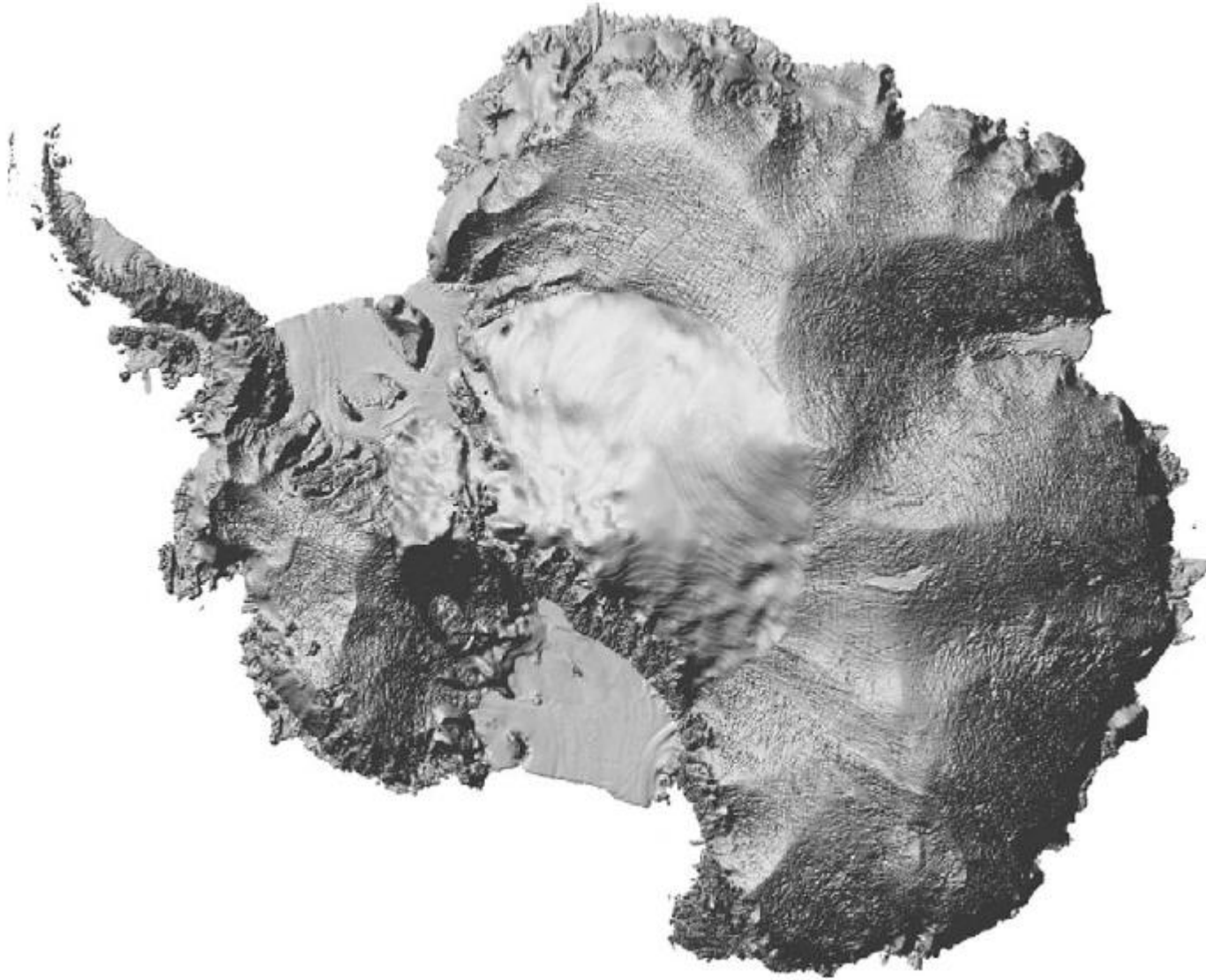




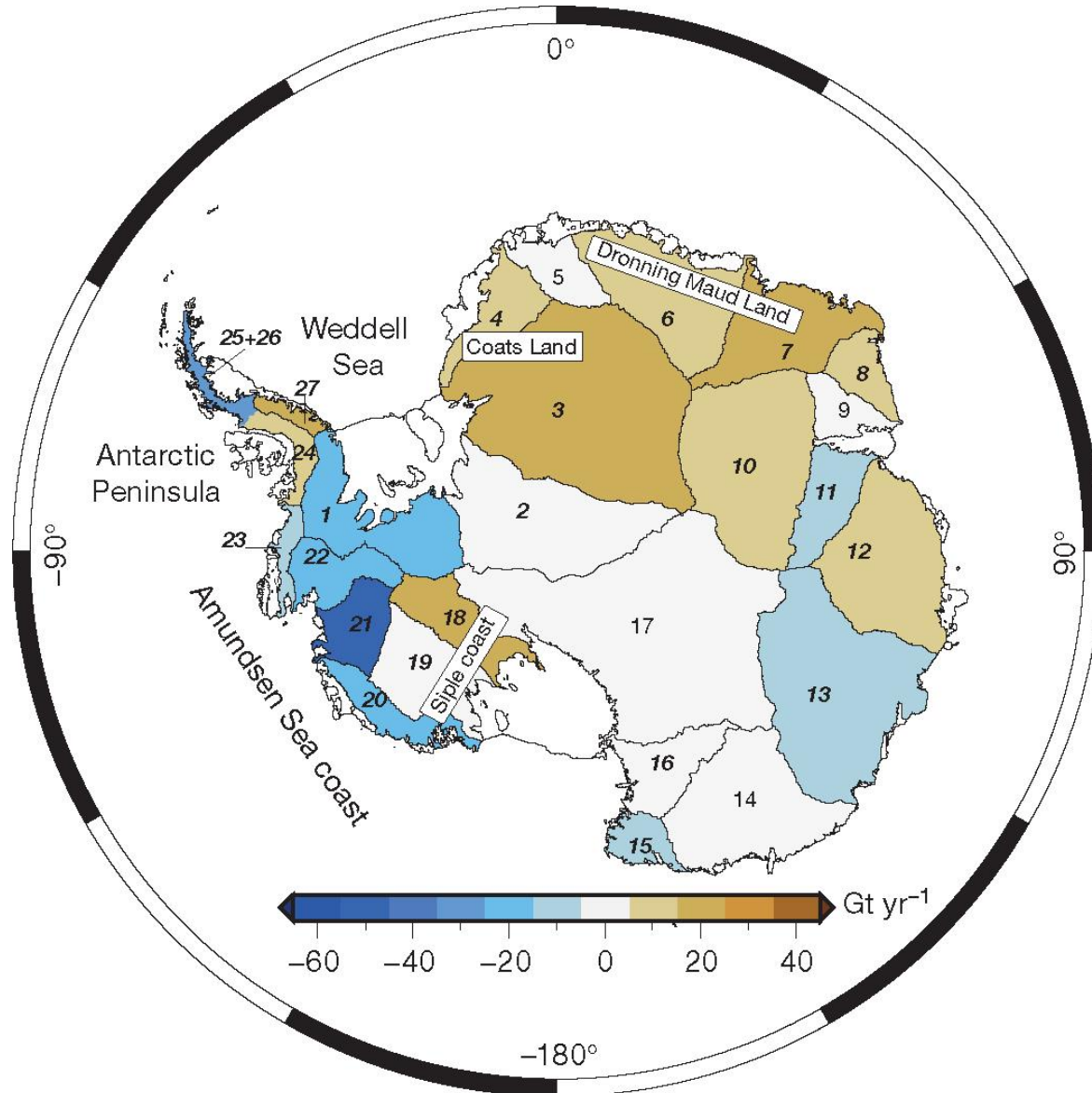
GLACIOLOGICAL OBSERVATIONS IN AND AROUND SCHIRMACHER OASIS, cDML, EAST ANTARCTICA

Presented by:
Dr. Sandip Kumar Roy

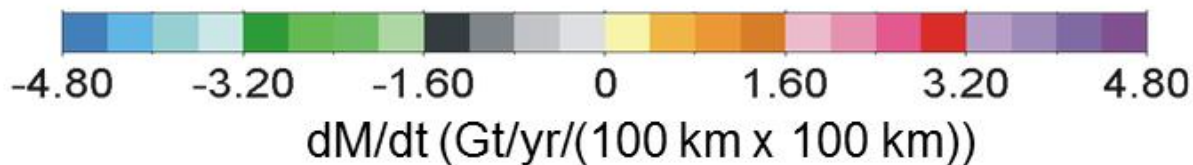
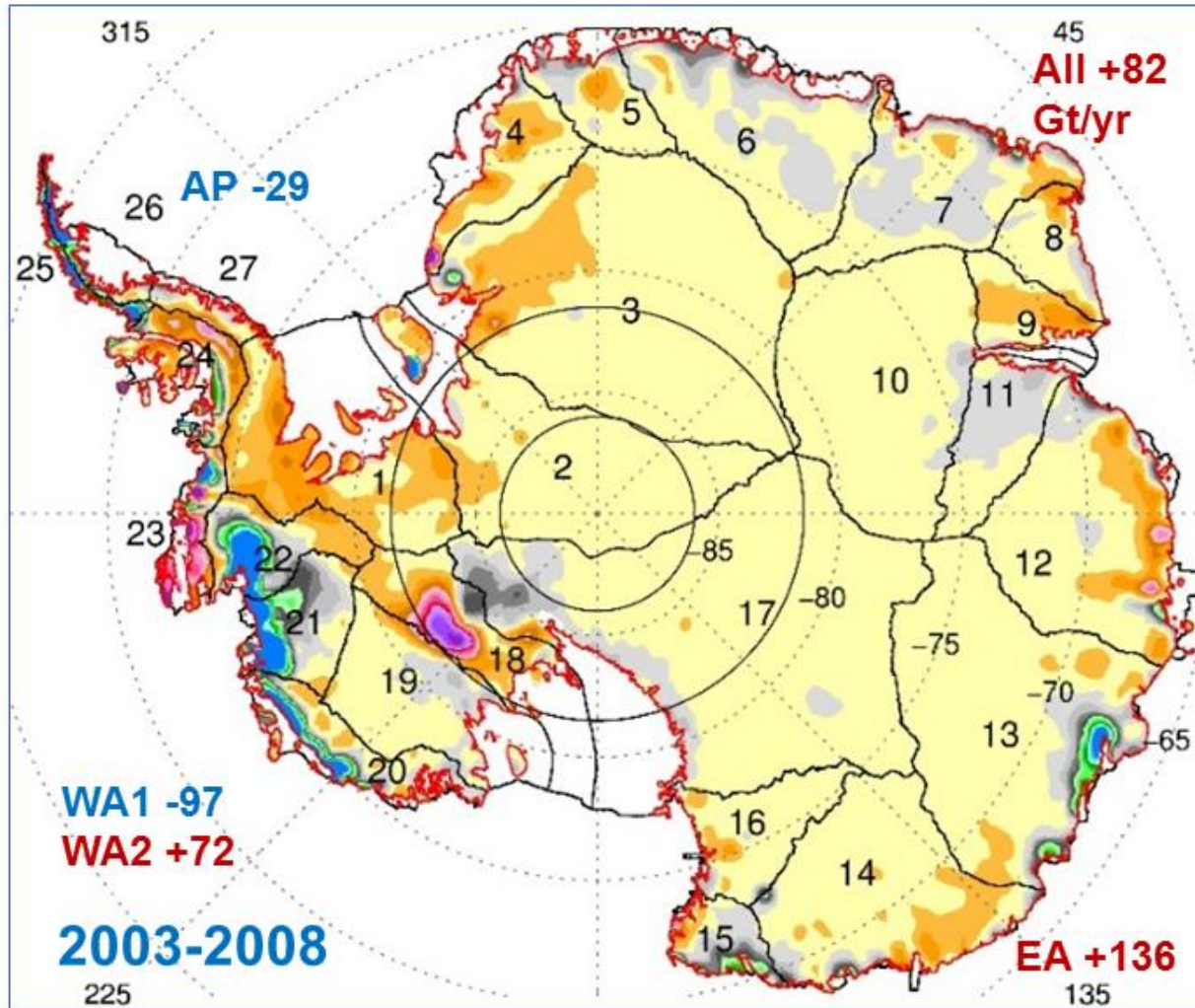
Shaded relief map of Antarctica



Mass change rates by drainage basin

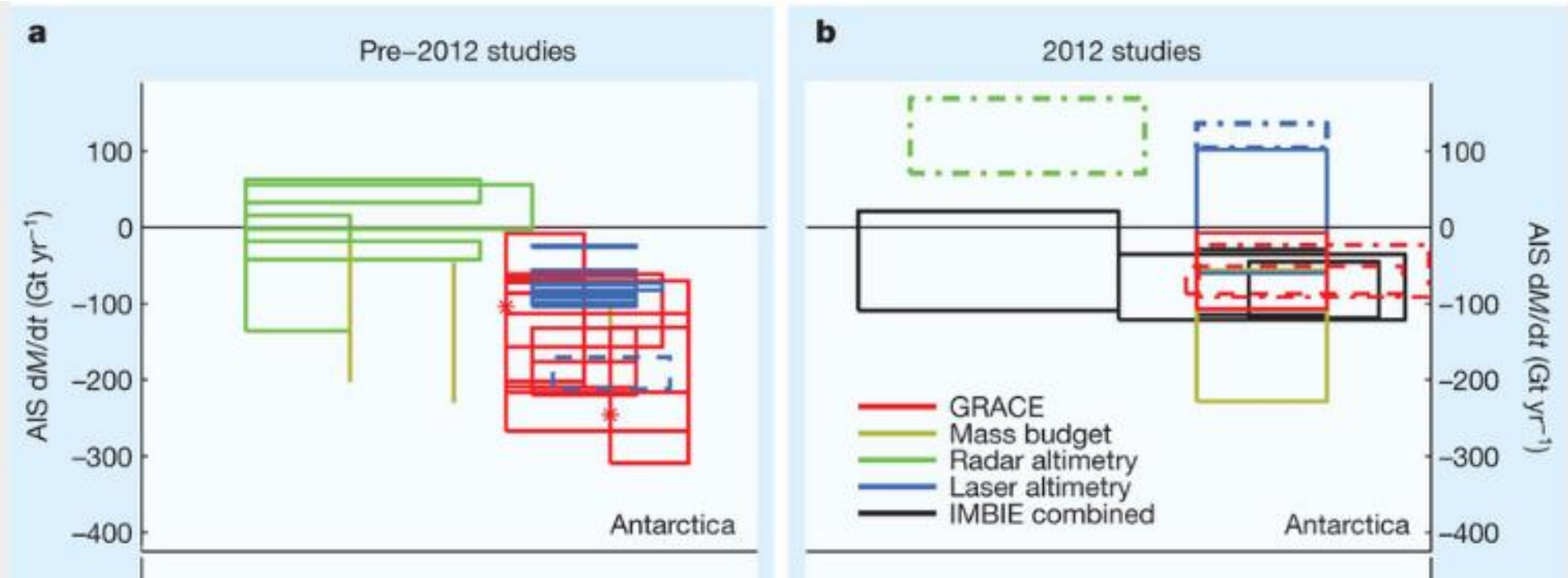


One more result.....



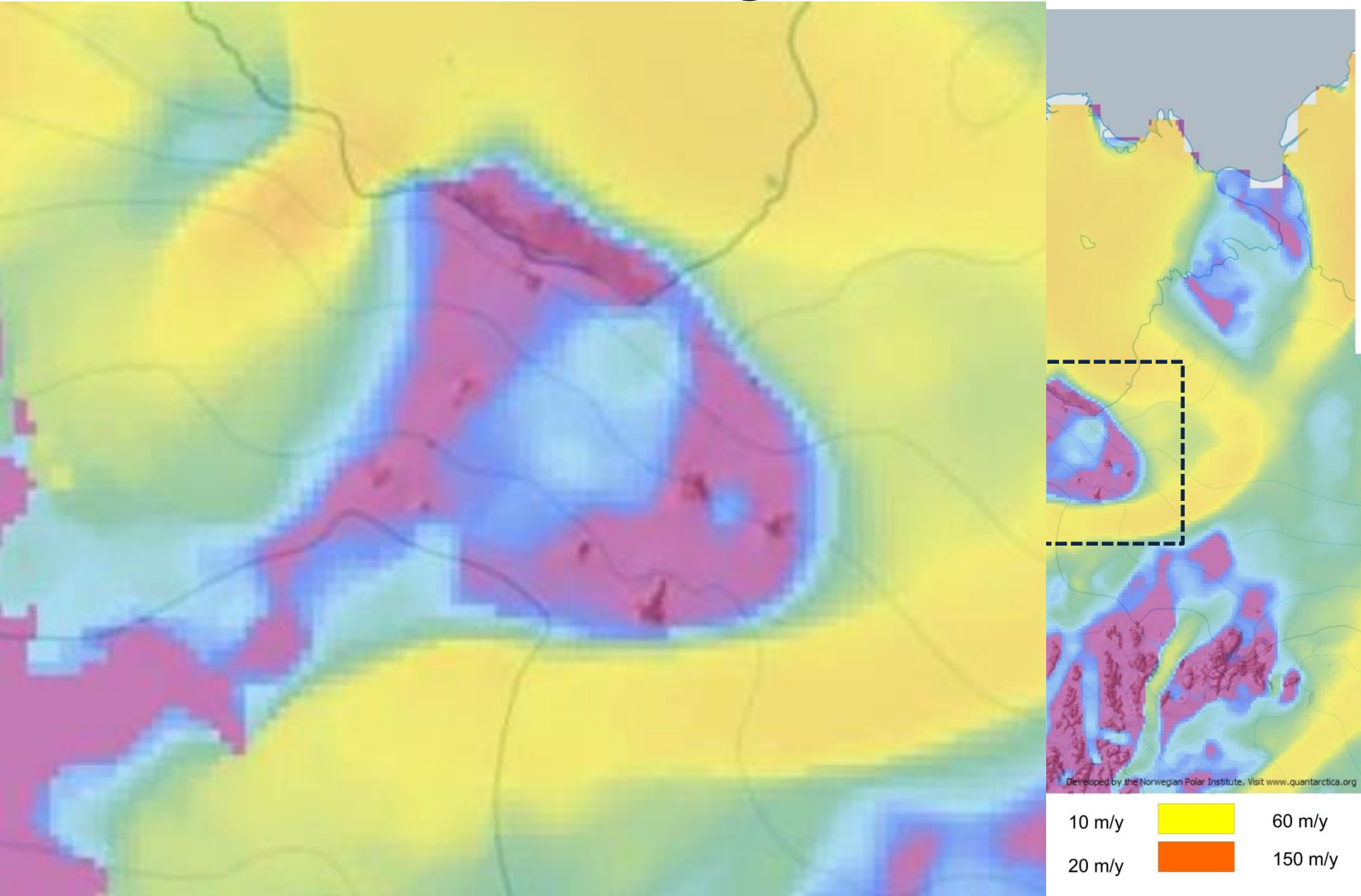
Source:
Zwally (2011)
Journal of Glaciology

Variation in Mass Balance values of Antarctica

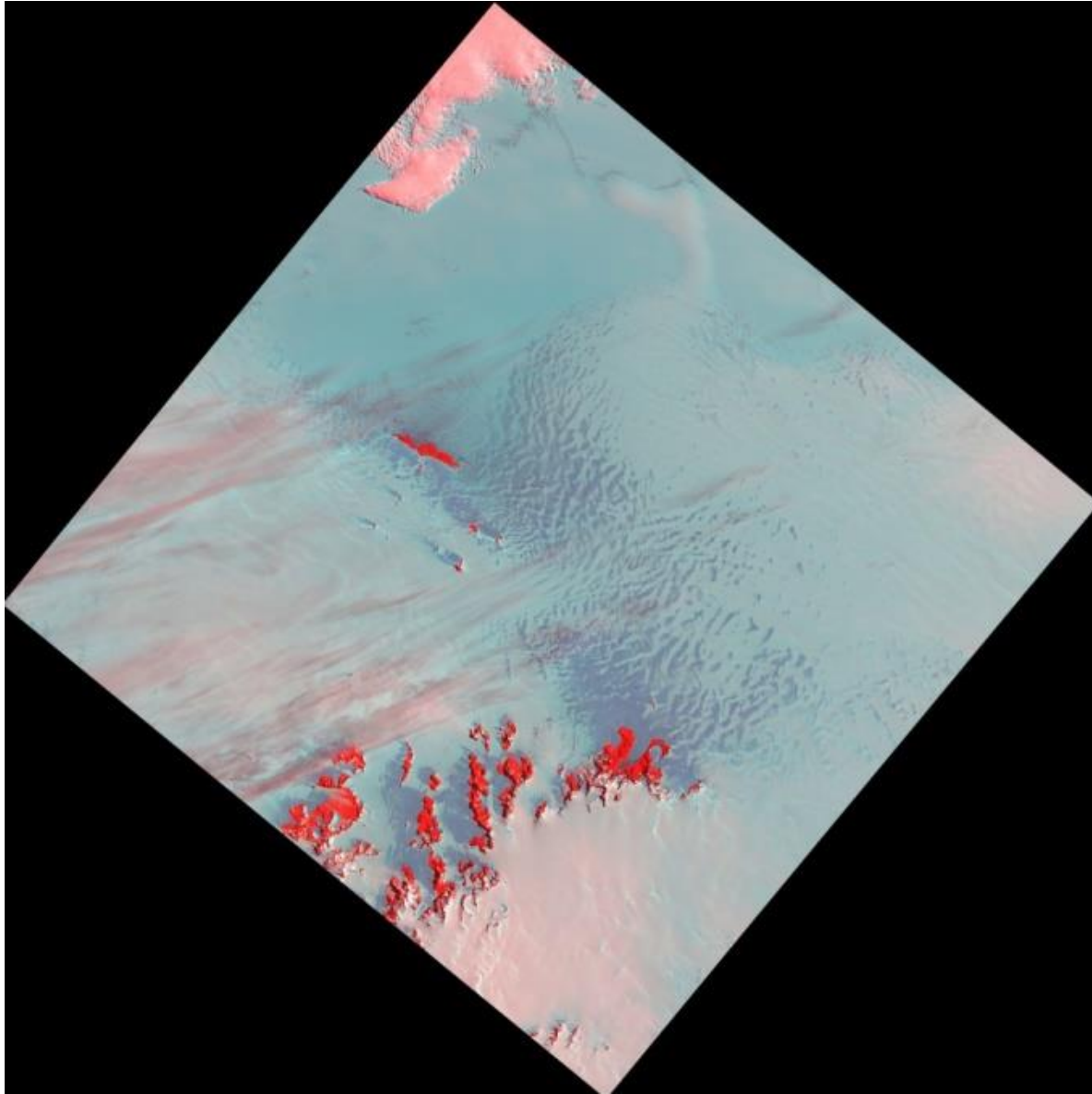


Source: Hanna et al., 2013 (Nature): Summary of estimates of rates of ice mass change for Antarctica and Greenland.

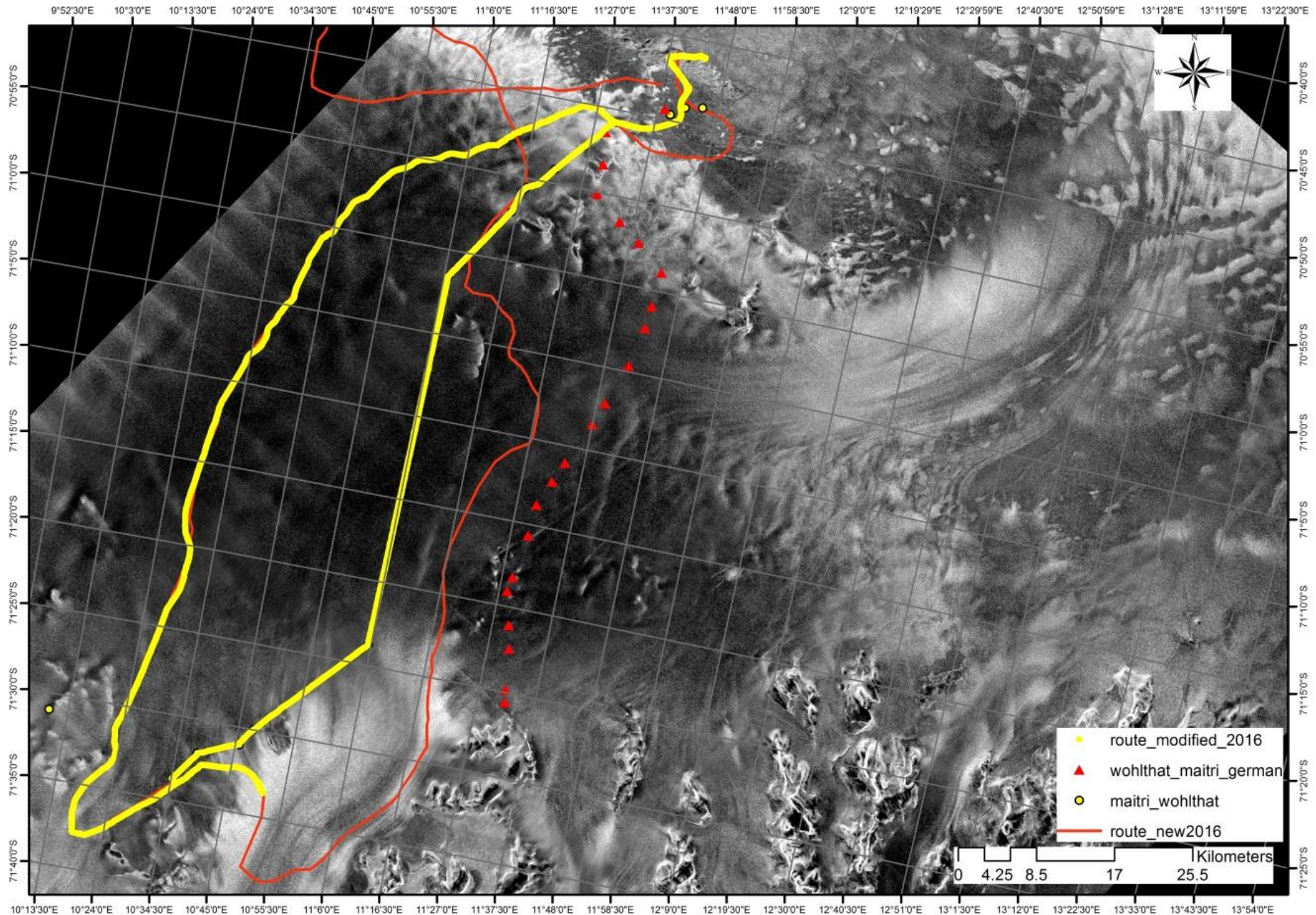
Central Dronning Maud Land



central Dronning Maud Land



Route followed on ground



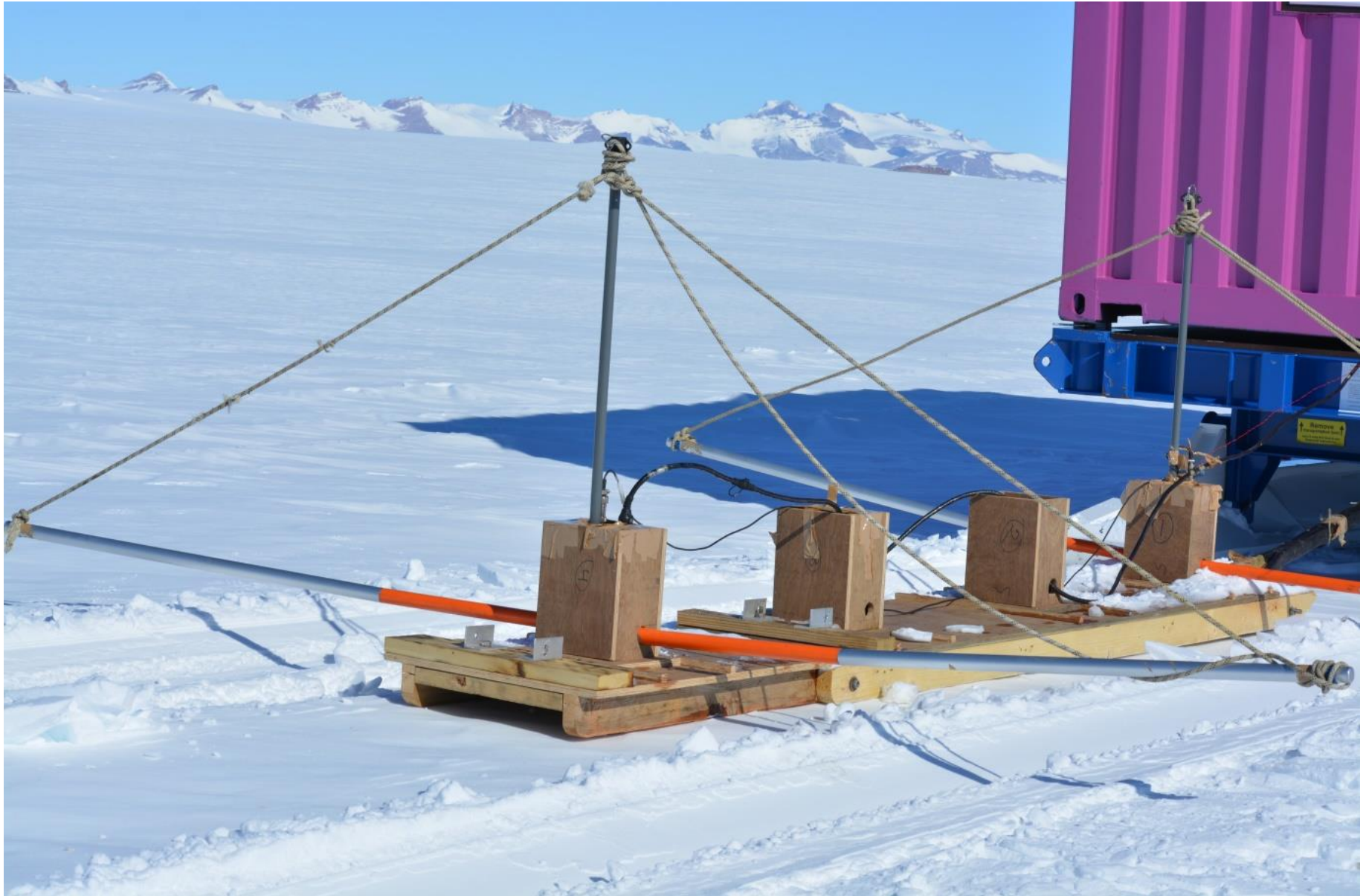
Crevasses on Polar ice sheet



GPR survey with MLF antenna



GPR survey with MLF antenna



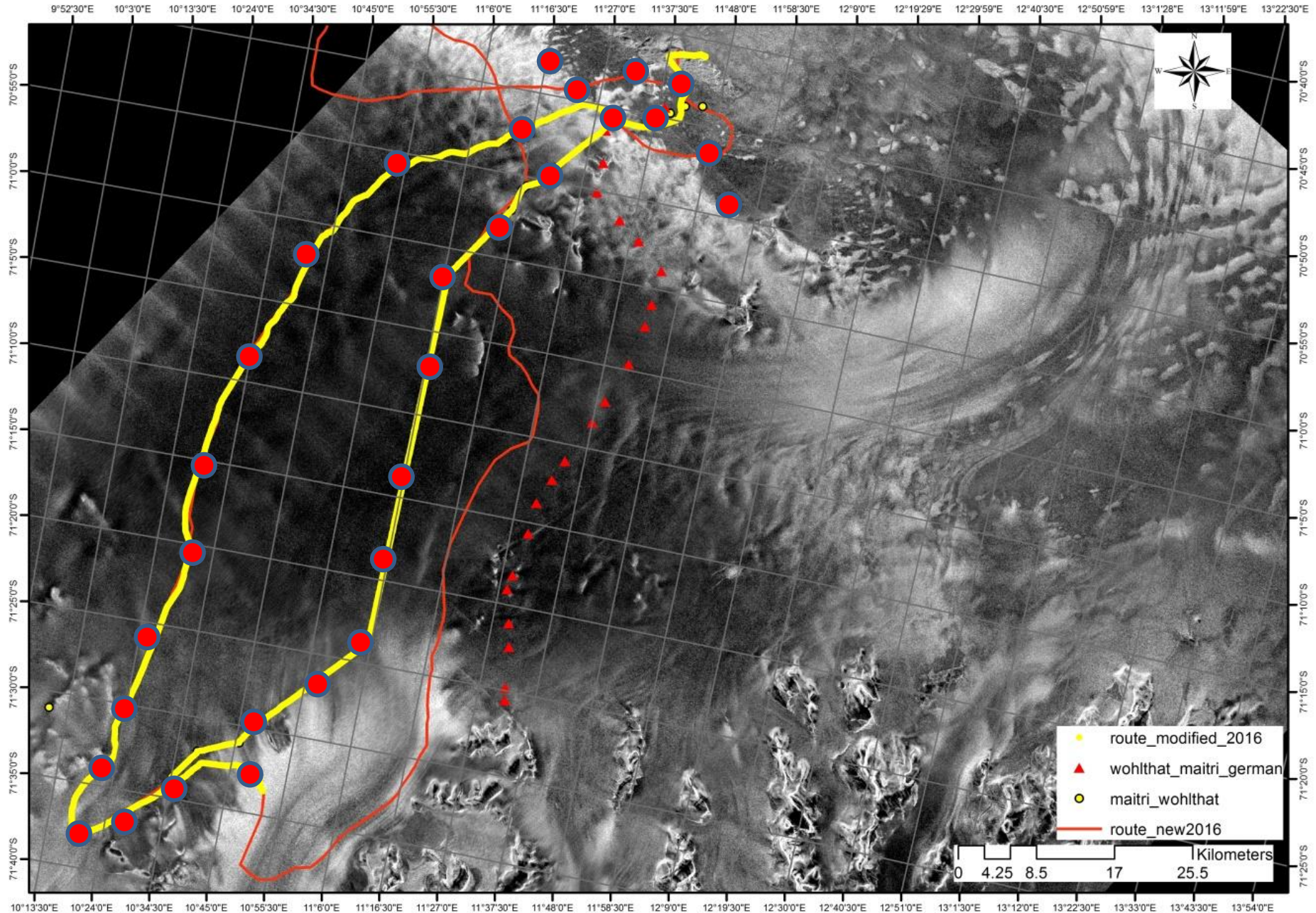
Flow velocity measurements with DGPS instruments



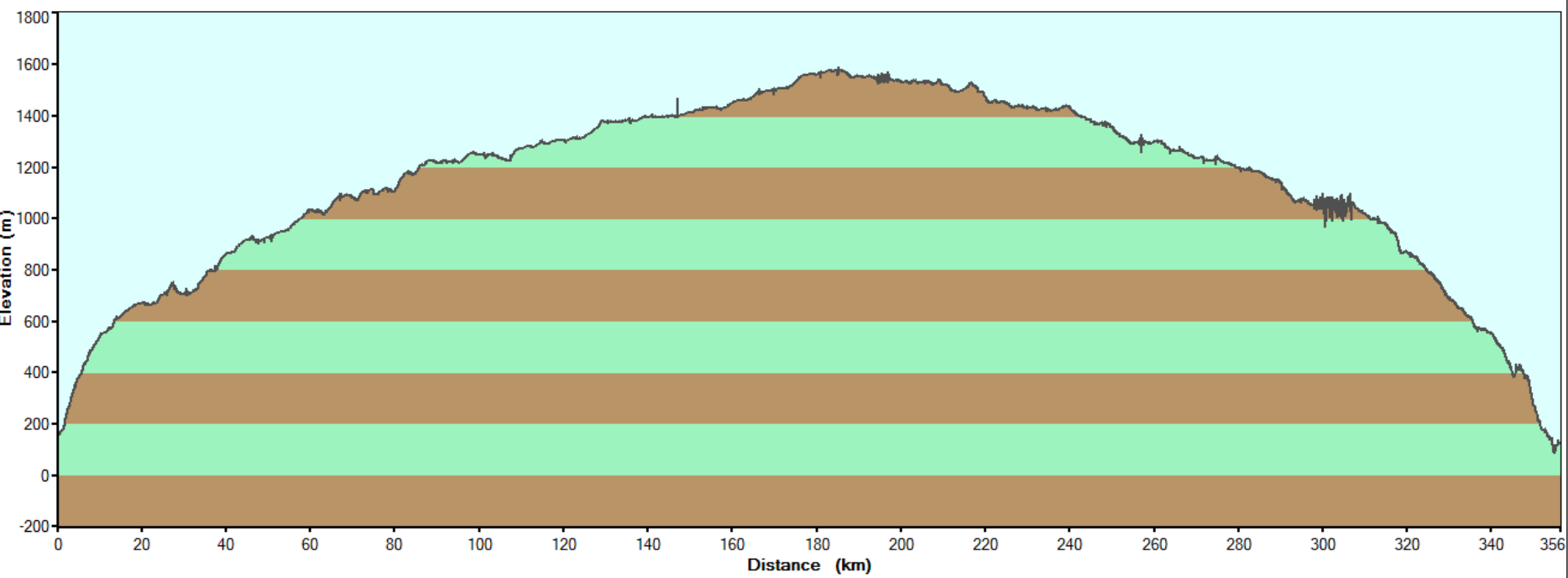
Flow velocity measurements with DGPS instruments



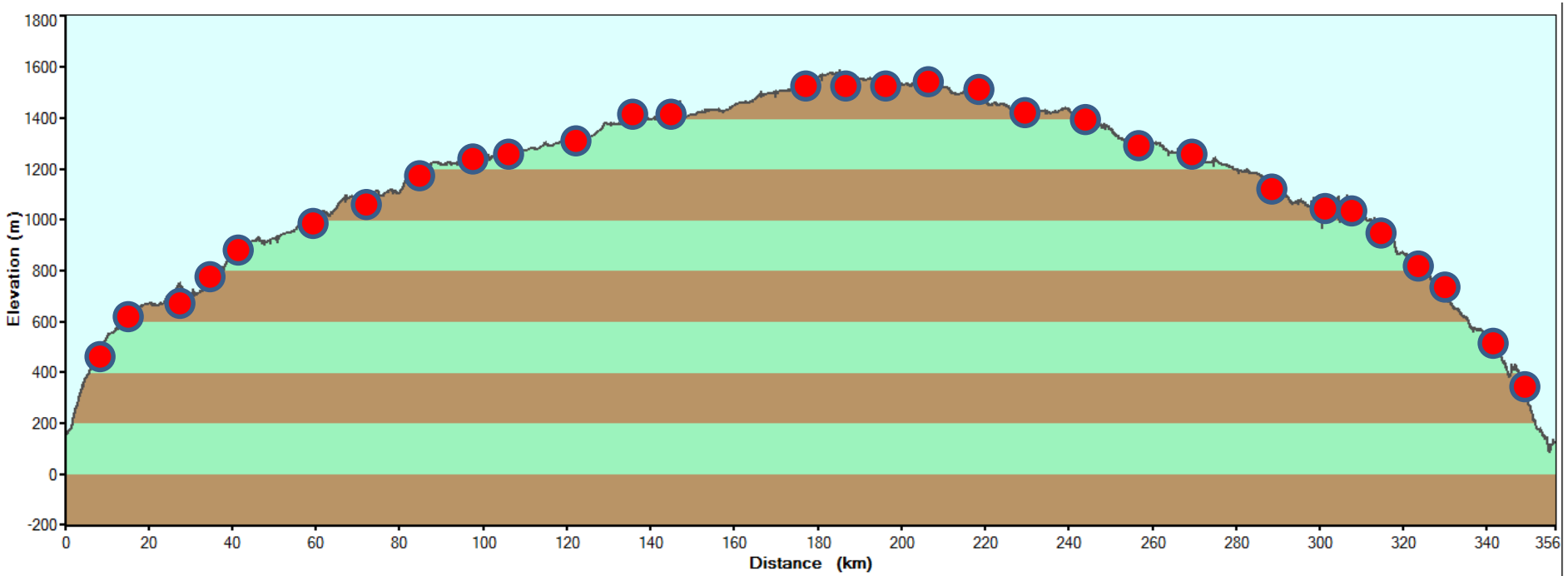
Location of DGPS stations



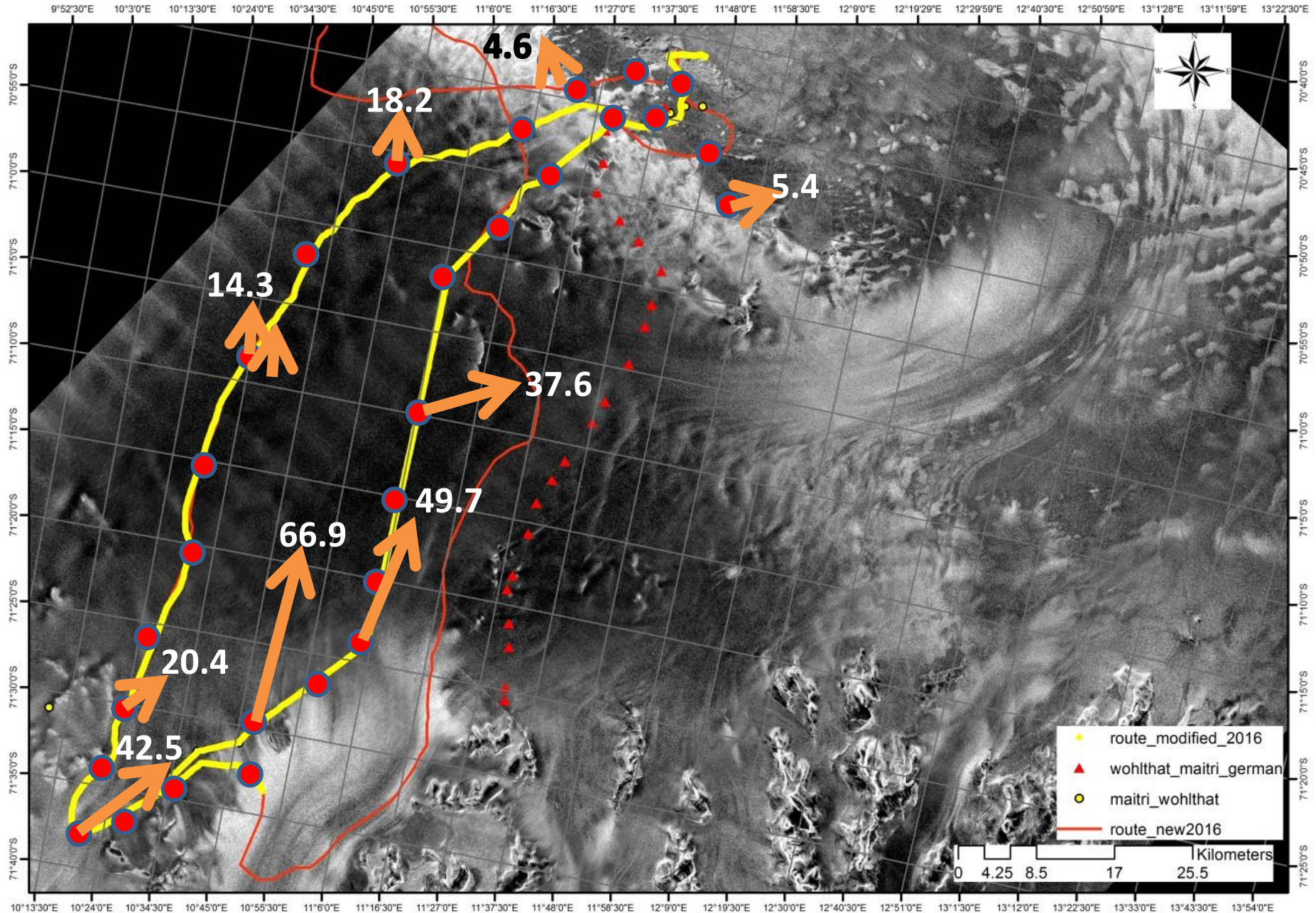
Elevation profile of the SO-WM traverse



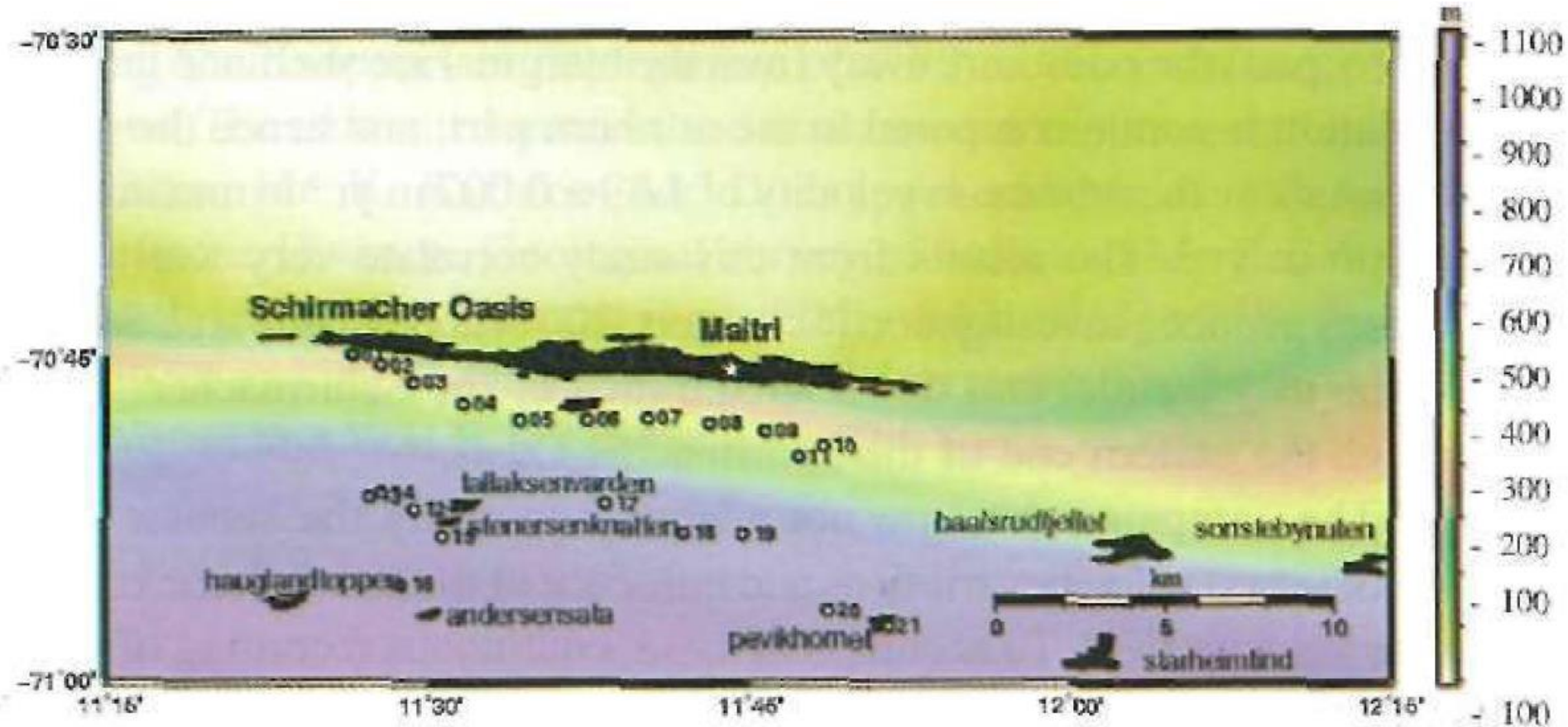
DGPS stations Elevations fixed on the SO-WM traverse



Calculated velocity of Polar ice sheet



Horizontal velocity components near Schirmacher Oasis



Source: Sunil et al. (2010) from IIG



Dakshin Gangotri Glacierthe receding frontier

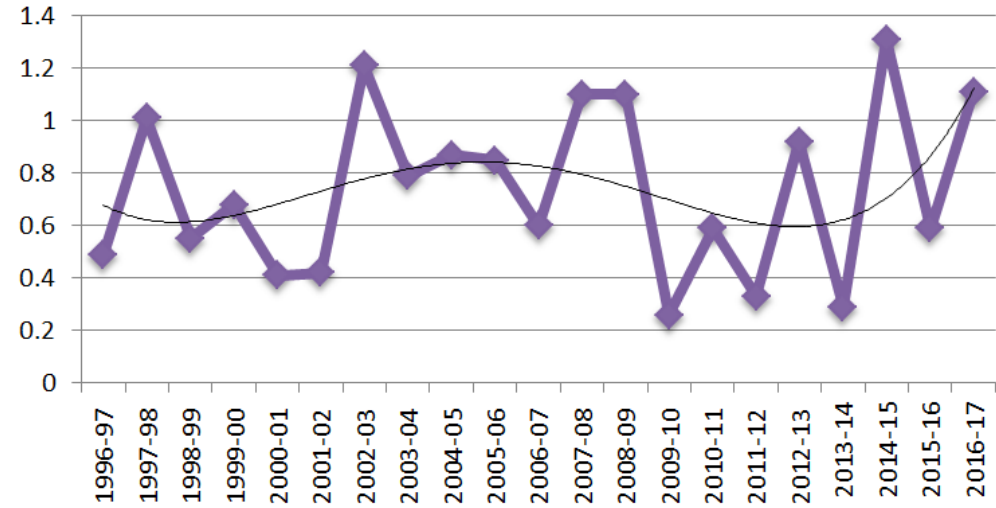
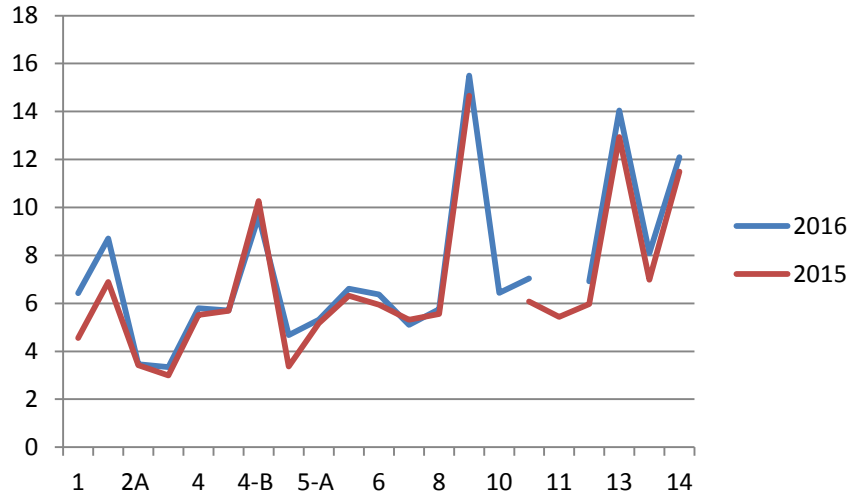


- Has receded about 15.48 m in last two decades.
- Has shown only minor advance in winter

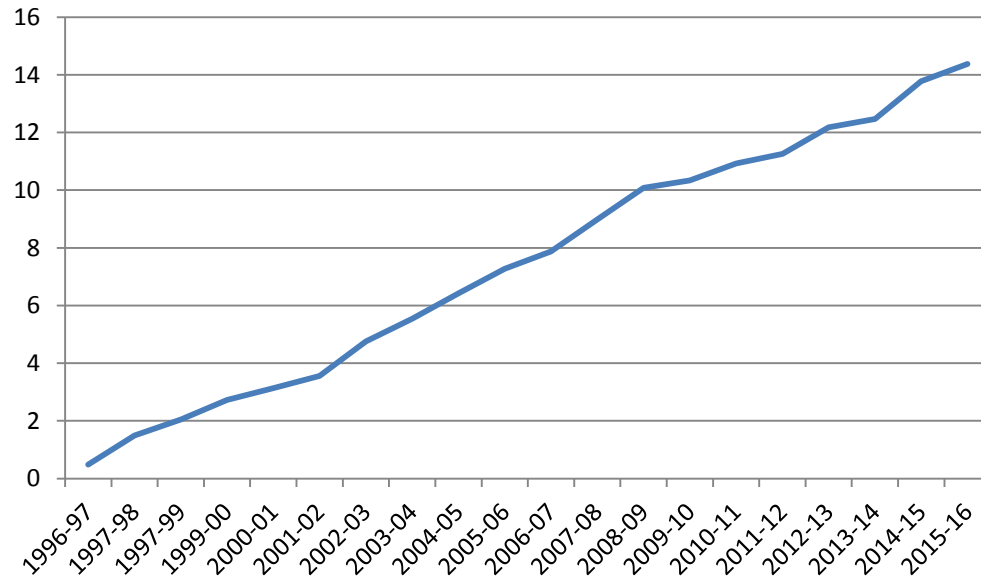
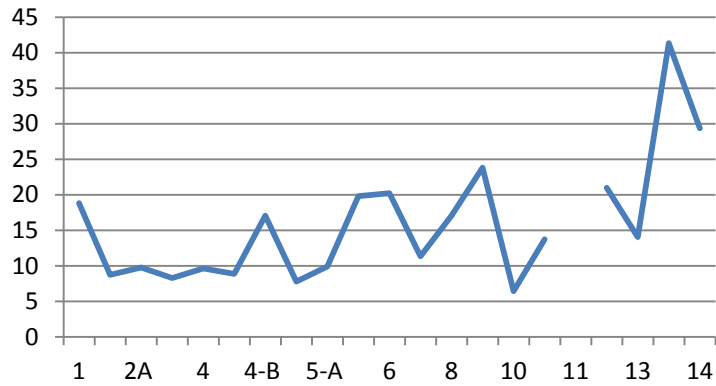
Period	Annual avg recession
1996-97	0.49
1997-98	1.01
1998-99	0.55
1999-00	0.68
2000-01	0.41
2001-02	0.42
2002-03	1.21
2003-04	0.79
2004-05	0.87
2005-06	0.85
2006-07	0.6
2007-08	1.1
2008-09	1.1
2009-10	0.26
2010-11	0.59
2011-12	0.33
2012-13	0.92
2013-14	0.29
2014-15	1.31
2015-16	0.59
2016-17	1.11

Total and cumulative Recession of DG Glacier snout, Schirmacher Oasis, East Antarctica

Annual avg recession



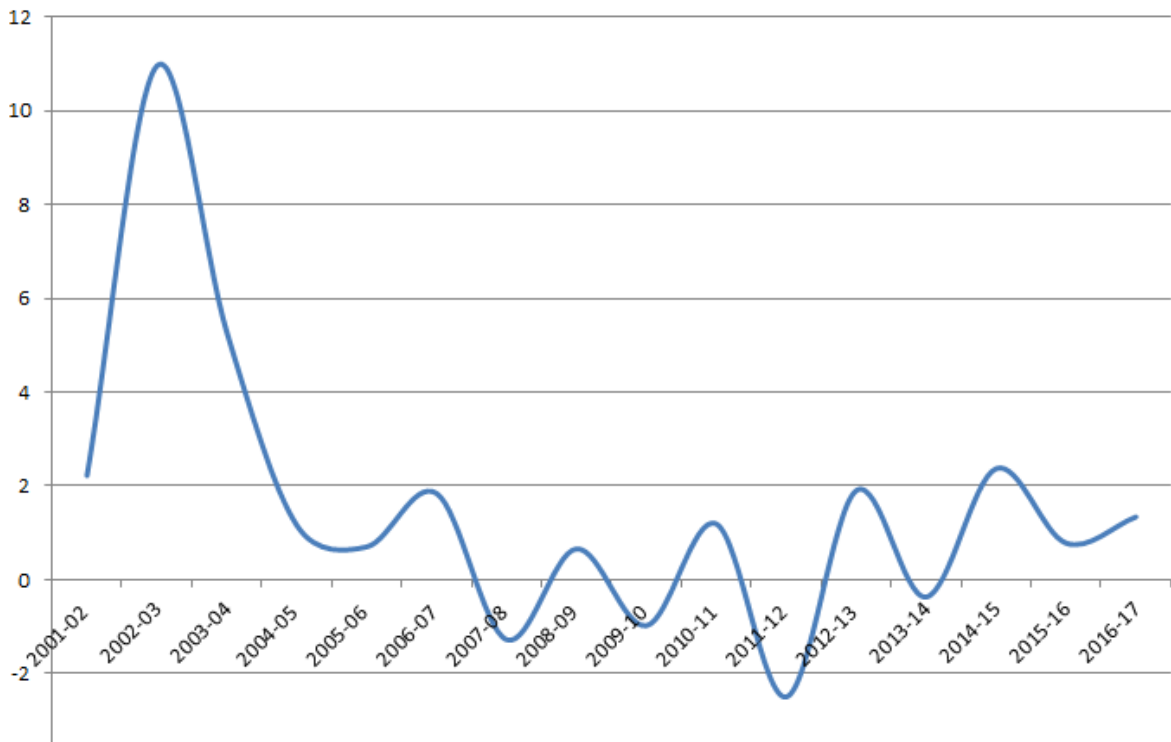
Total recession





Western wall Polar ice sheet movement pattern

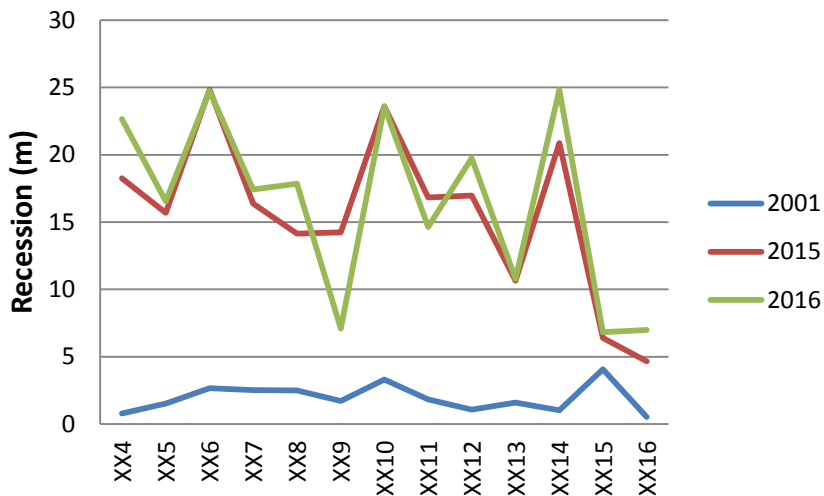
Recession in m



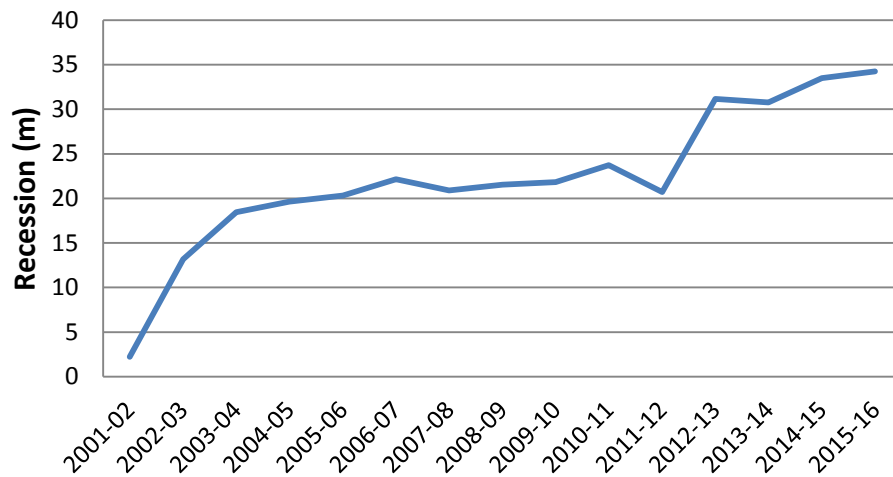
Period	Recession in m
2001-02	2.22
2002-03	10.96
2003-04	5.28
2004-05	1.16
2005-06	0.7
2006-07	1.84
2007-08	-1.28
2008-09	0.66
2009-10	-0.98
2010-11	1.19
2011-12	-2.5
2012-13	1.9
2013-14	-0.37
2014-15	2.37
2015-16	0.78
2016-17	1.34

- Has shrunk over 24 m in just over ten years with maxima at 10.96 m in 2002-03
- Has shown four minor advances.

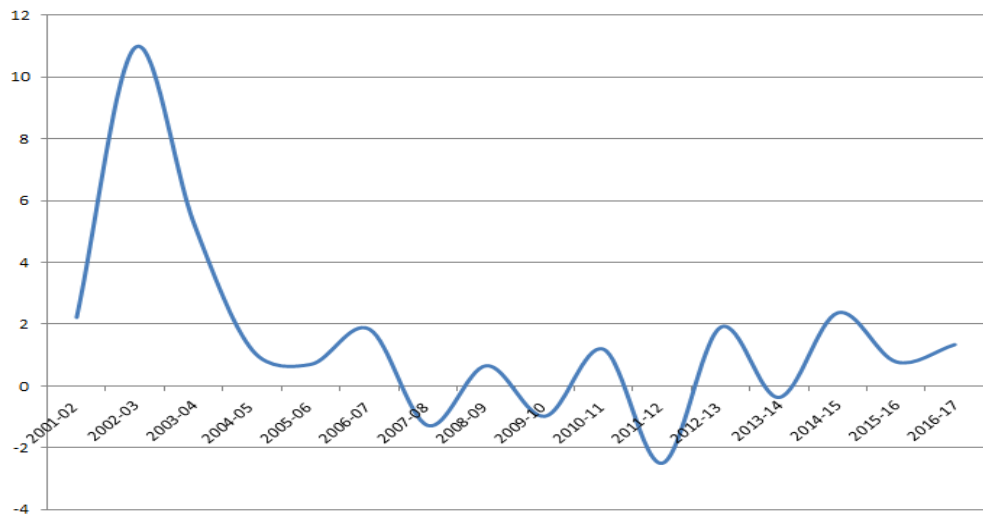
Recession of Western wall



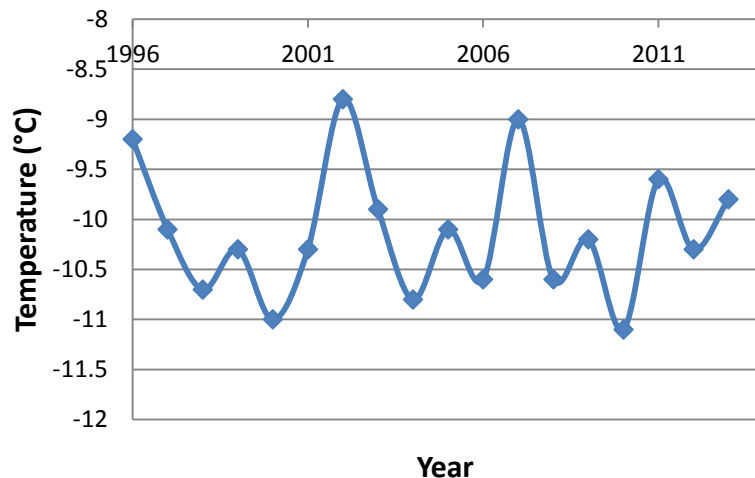
Cummulative recession of Western wall



Recession in m

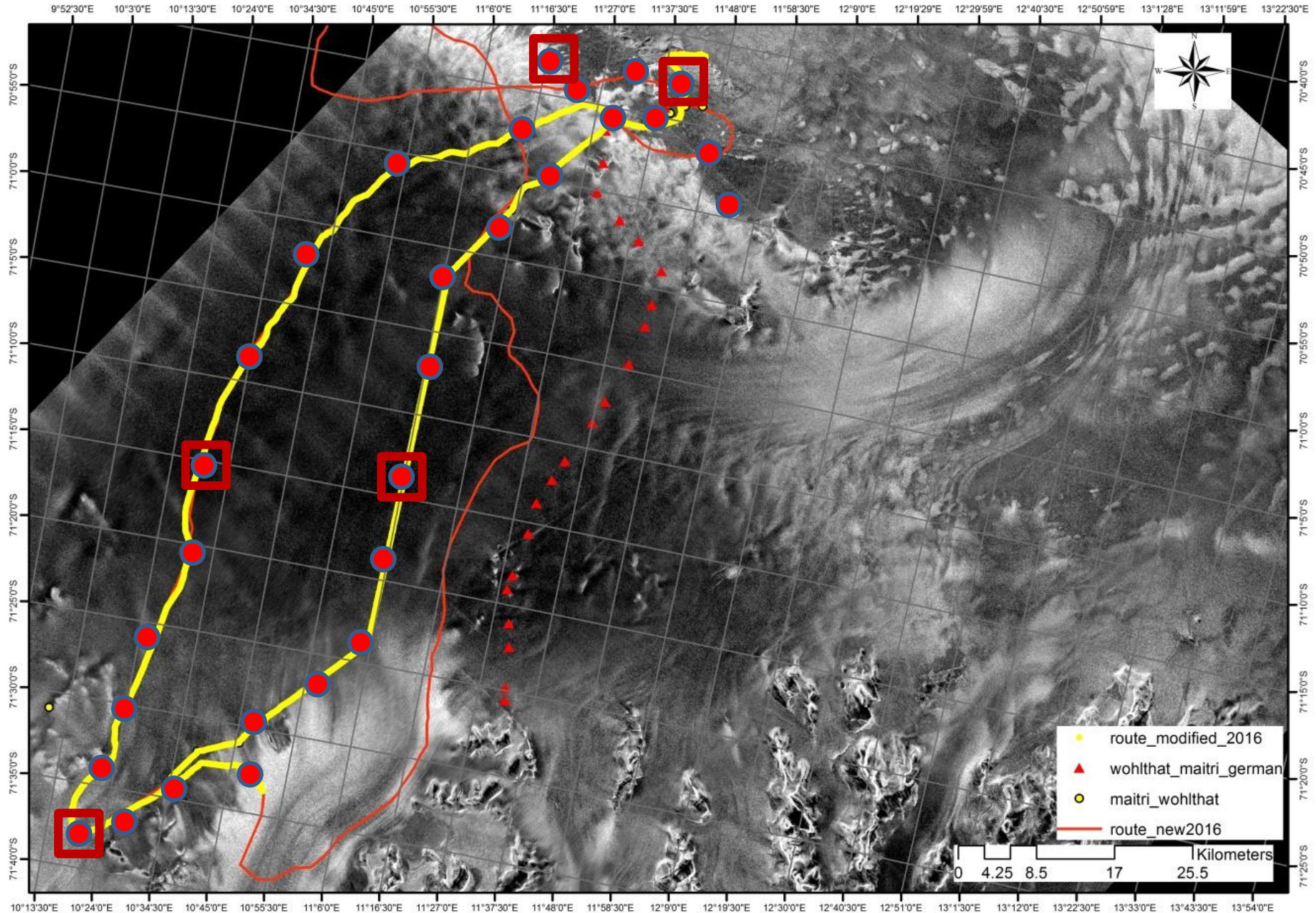


Mean annual surface air temperature



Total and cumulative Recession of Western wall, Schirmacher Oasis, East Antarctica

Location of Stake Networks



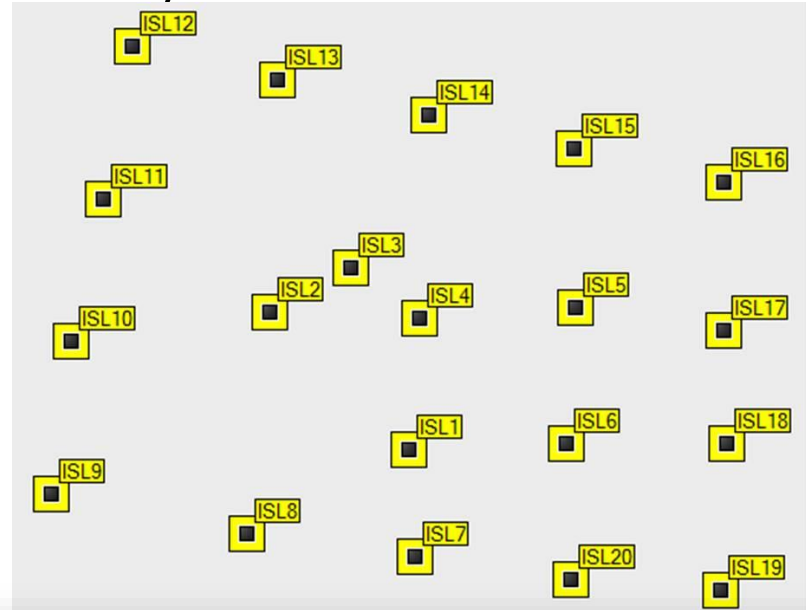
Overall accumulation on Ice shelf

N ←



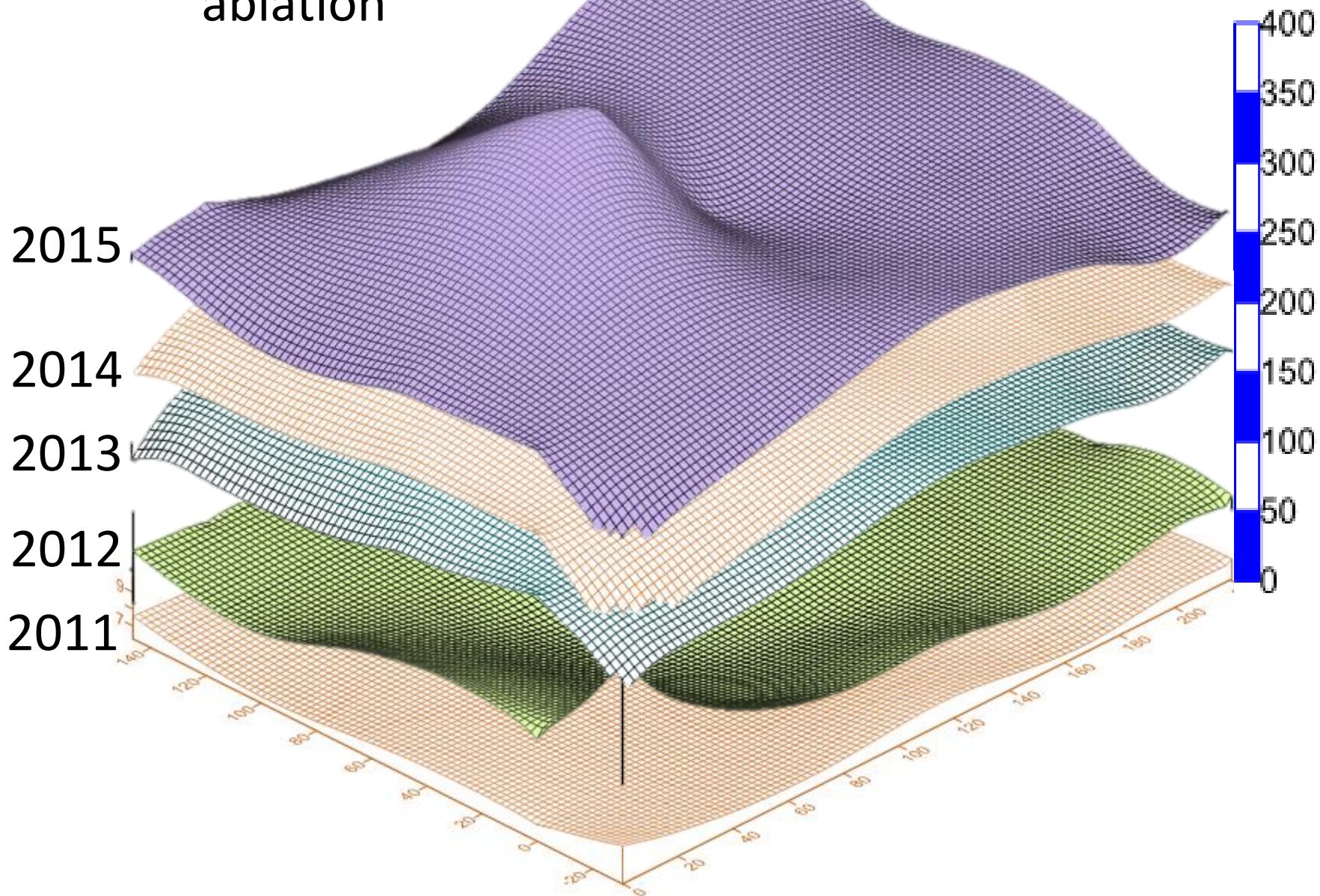
Stake network at the Ice shelf

(70° 4.417'S: 12° 1.185É)



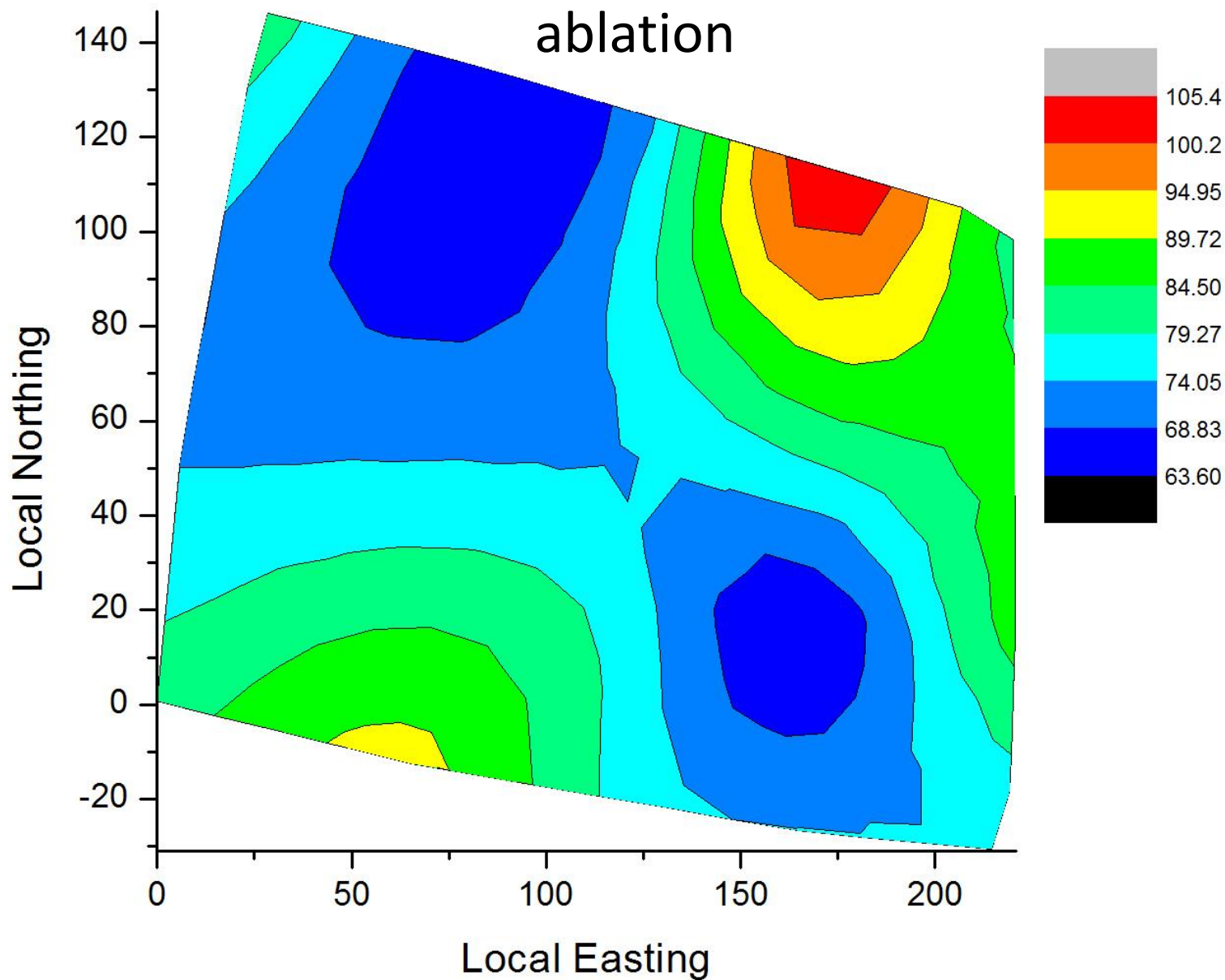
Sl No.	Stake No.	Latitude (S)	Longitude (E)	Acc 2011	Acc 2012	Acc 2013	Acc 2014	Acc 2015
1	1	70°04.414	12°01.185	6.24	43.86	129	14	78.68
2	2	70°04.390	12°01.113	6.76	41.54			
3	3	70°04.382	12°01.155	6.74	86.86			
4	4	70°04.391	12°01.190	6.7	91.7	72	20	73.74
5	5	70°04.389	12°01.271	7.2	79.5	87.5	25	85.28
6	6	70°04.413	12°01.266	7.2	69	111	26	63.66
7	7	70°04.433	12°01.188	7.2	94	91	31	77.79
8	8	70°04.429	12°01.101	6.76	97.34	71.6	16	91.55
9	9	70°04.422	12°01.0	7.2	145.4	36	10	82.07
10	10	70°04.395	12°01.01	7.18	145.12	12.5	42	73.85
11	11	70°04.370	12°01.027	6.7	87.4	61.4	35.6	73.04
12	12	70°04.343	12°01.042	7.22	110.08	61.7	31.3	83.09
13	13	70°04.349	12°01.117	7.2	96	59.8	27.2	66.594
14	14	70°04.355	12°01.195	6.7	85.4	93.2	22.3	70.51
15	15	70°04.361	12°01.270	7.2	97.6	83.4	29	105.38
16	16	70°04.367	12°01.348	7.2	113.1	66.9	11	82.47
17	17	70°04.393	12°01.348	6.76	81.14	103.8	12	85.9
18	18	70°04.413	12°01.349	6.7	90.9	75	14.5	87.2
19	19	70°04.439	12°01.346	7.2	104.5	43.4	15.1	74.91
20	20	70°04.437	12°01.269	6.74	82.86	74	30	74.39

Snow accumulation / ablation



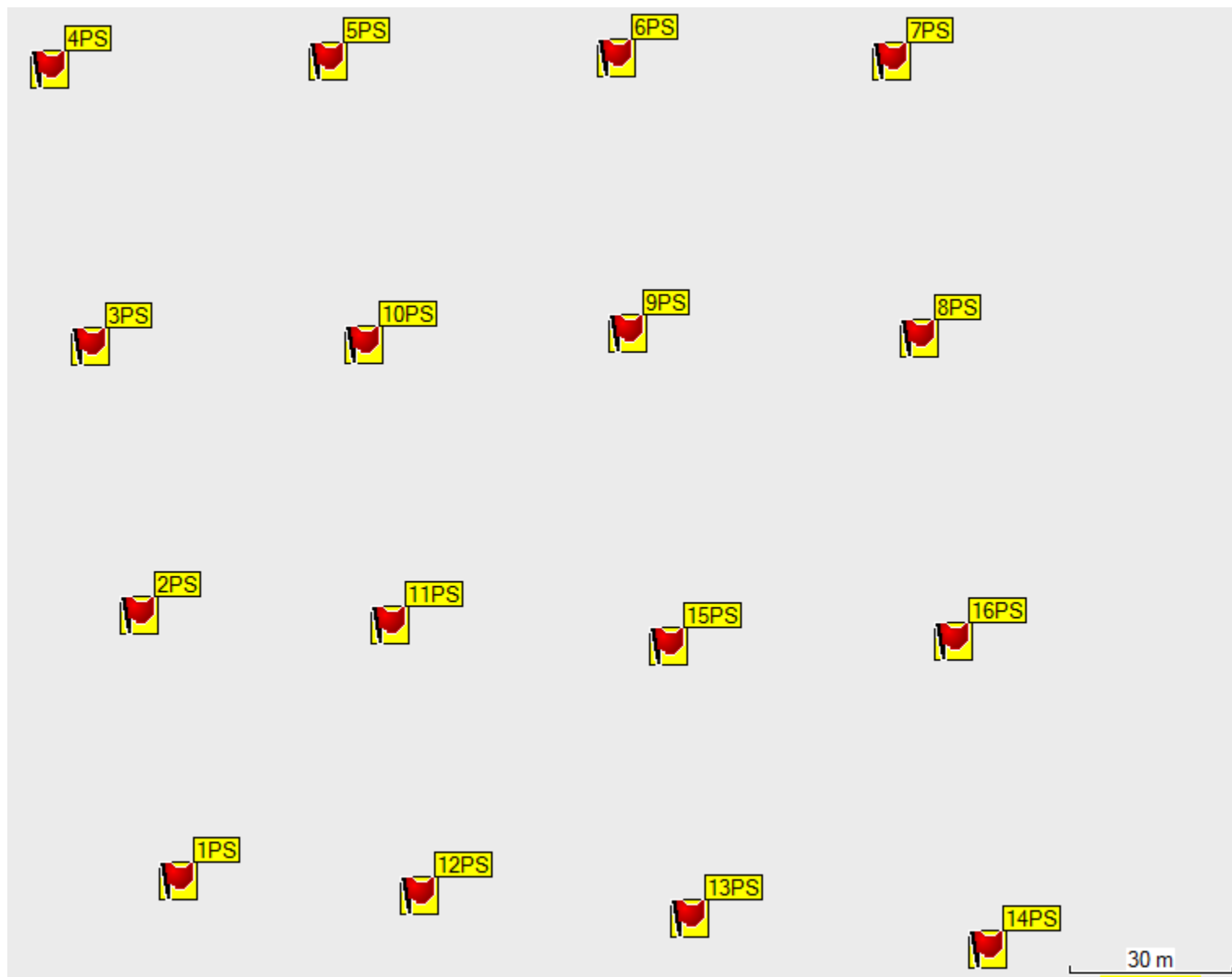
Snow accumulation / ablation

2011-2015

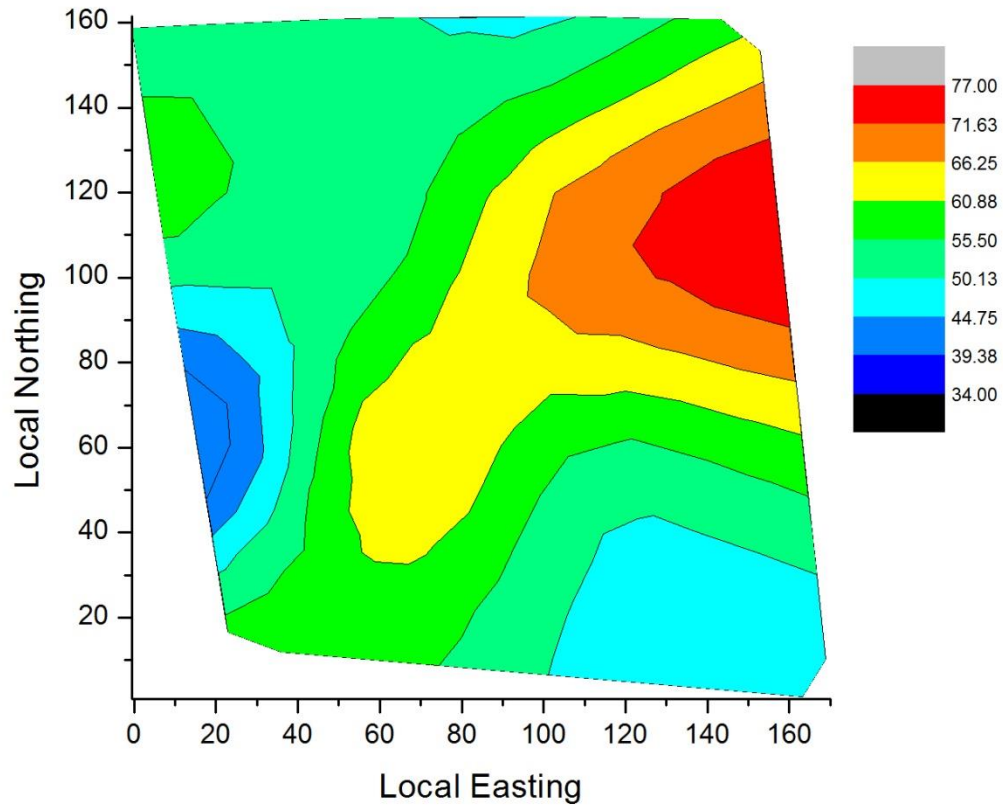


Snow accumulation on PIS with obstacles

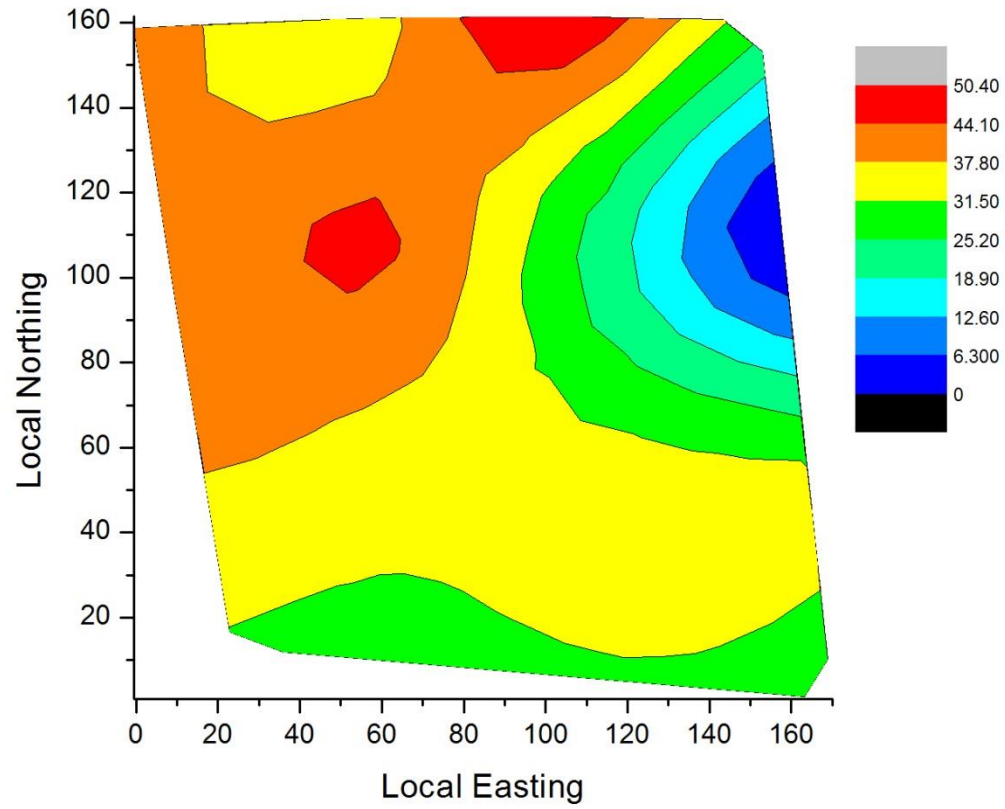




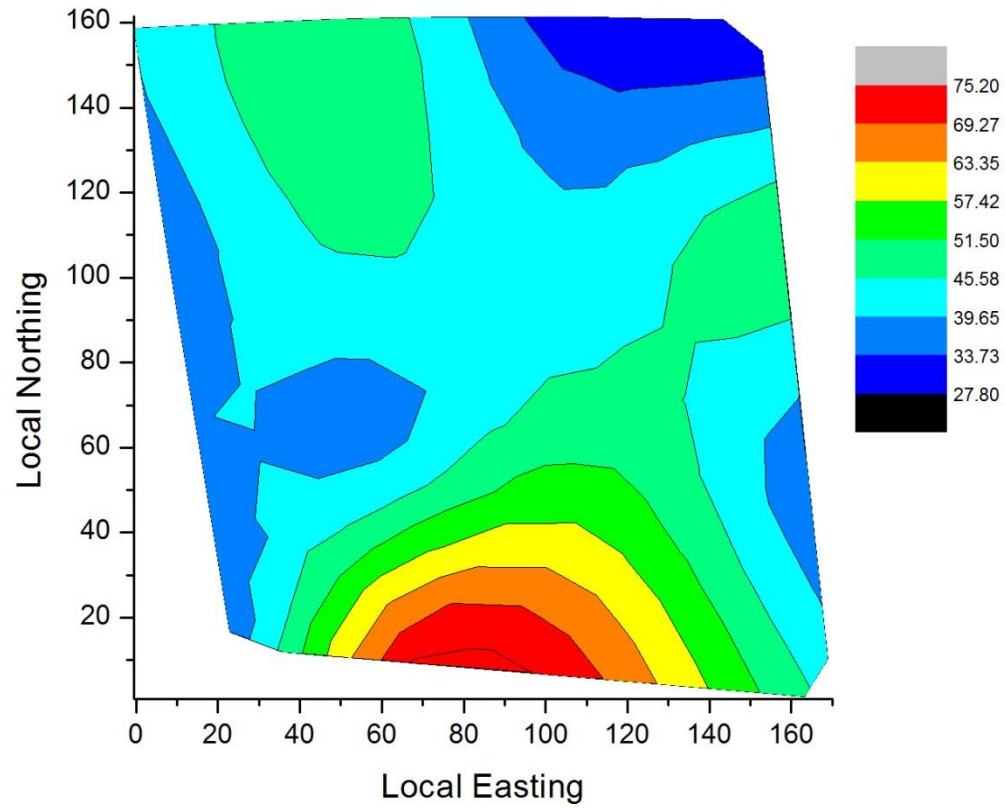
2013



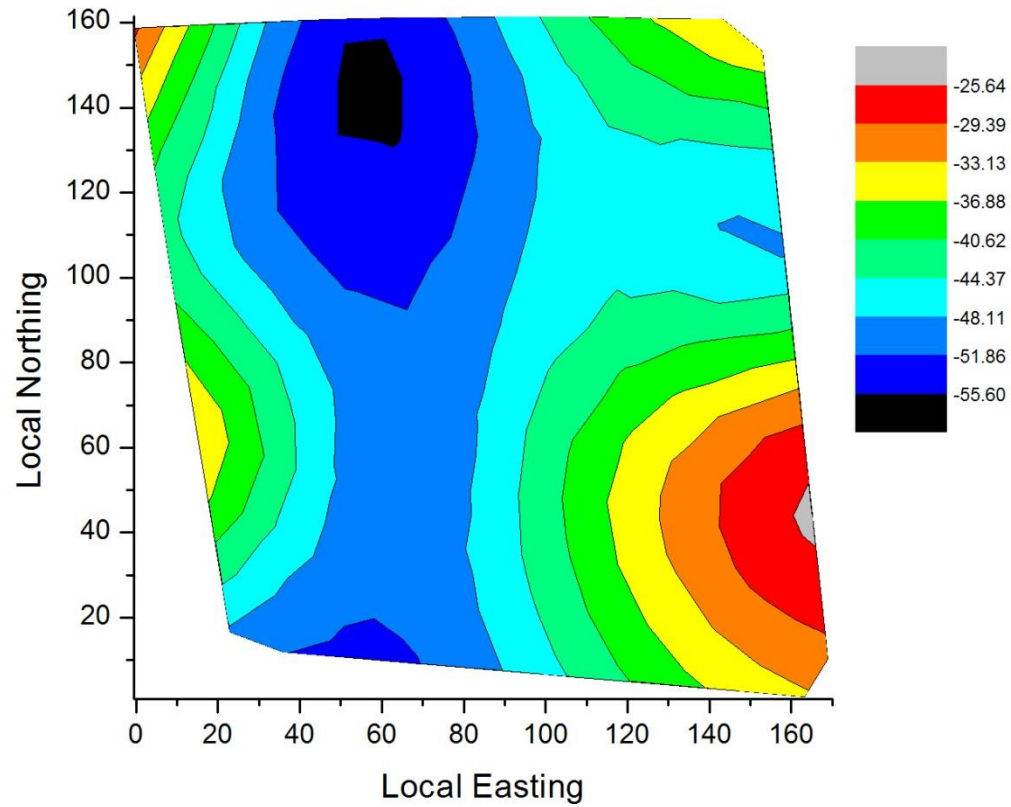
2014



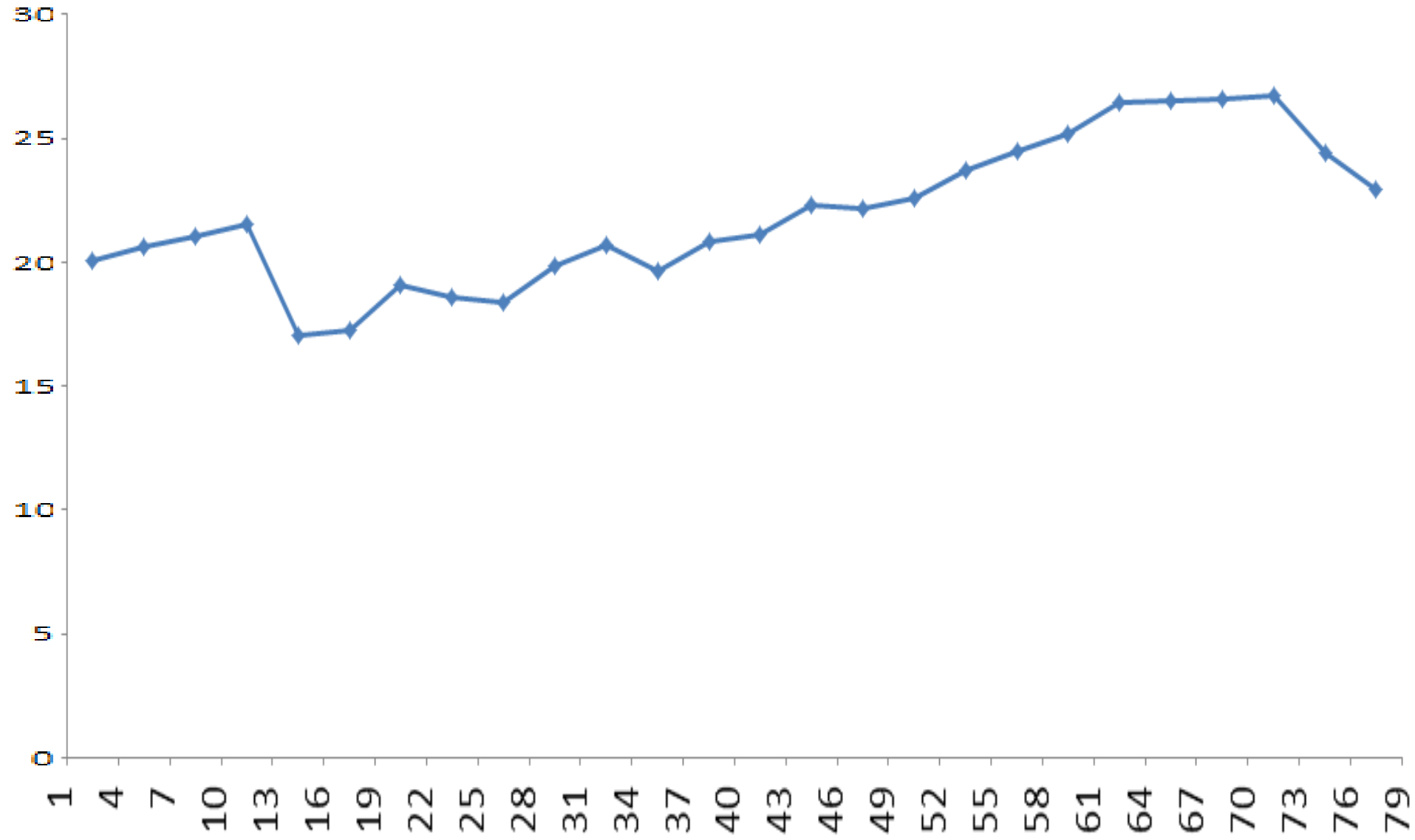
2015



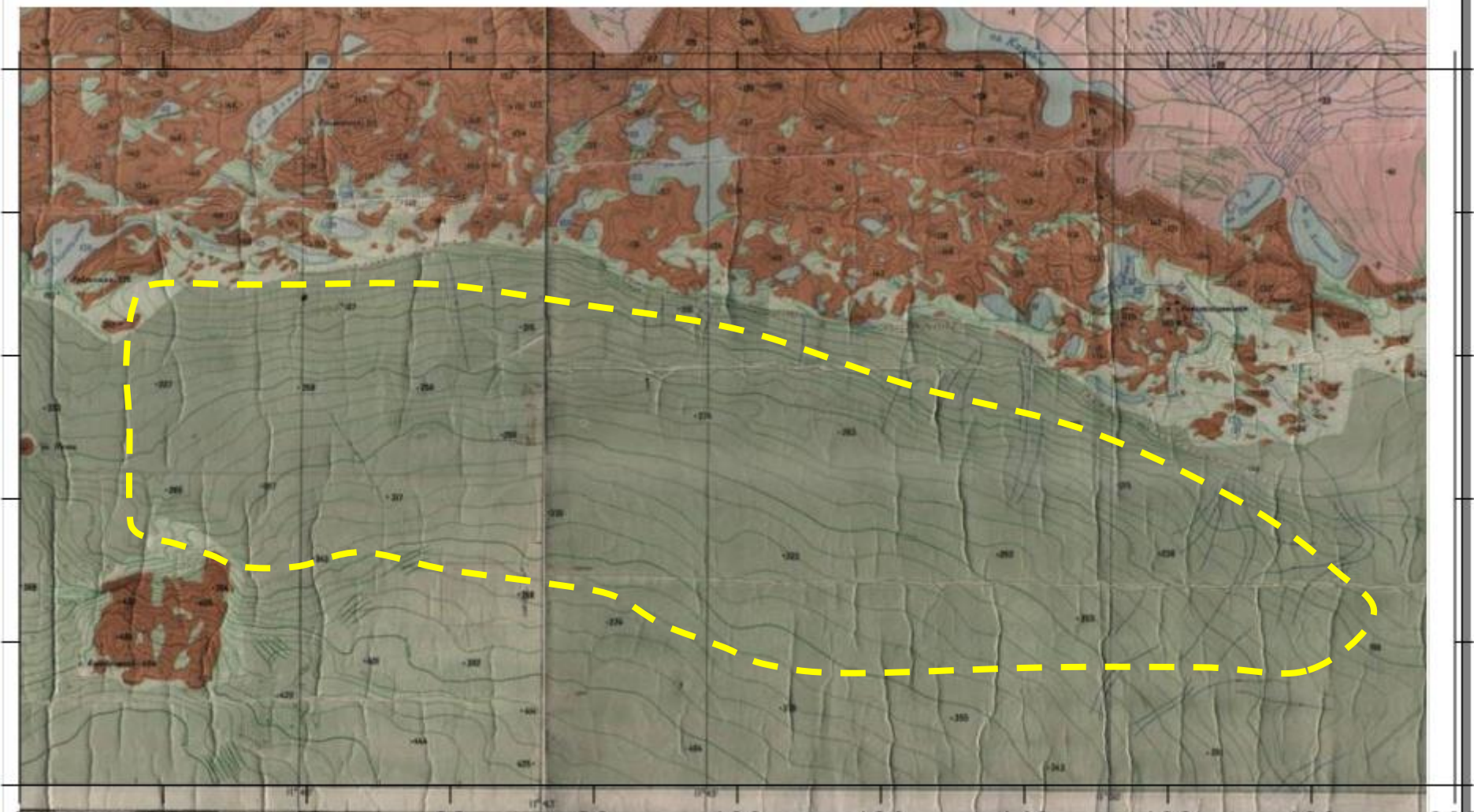
2016

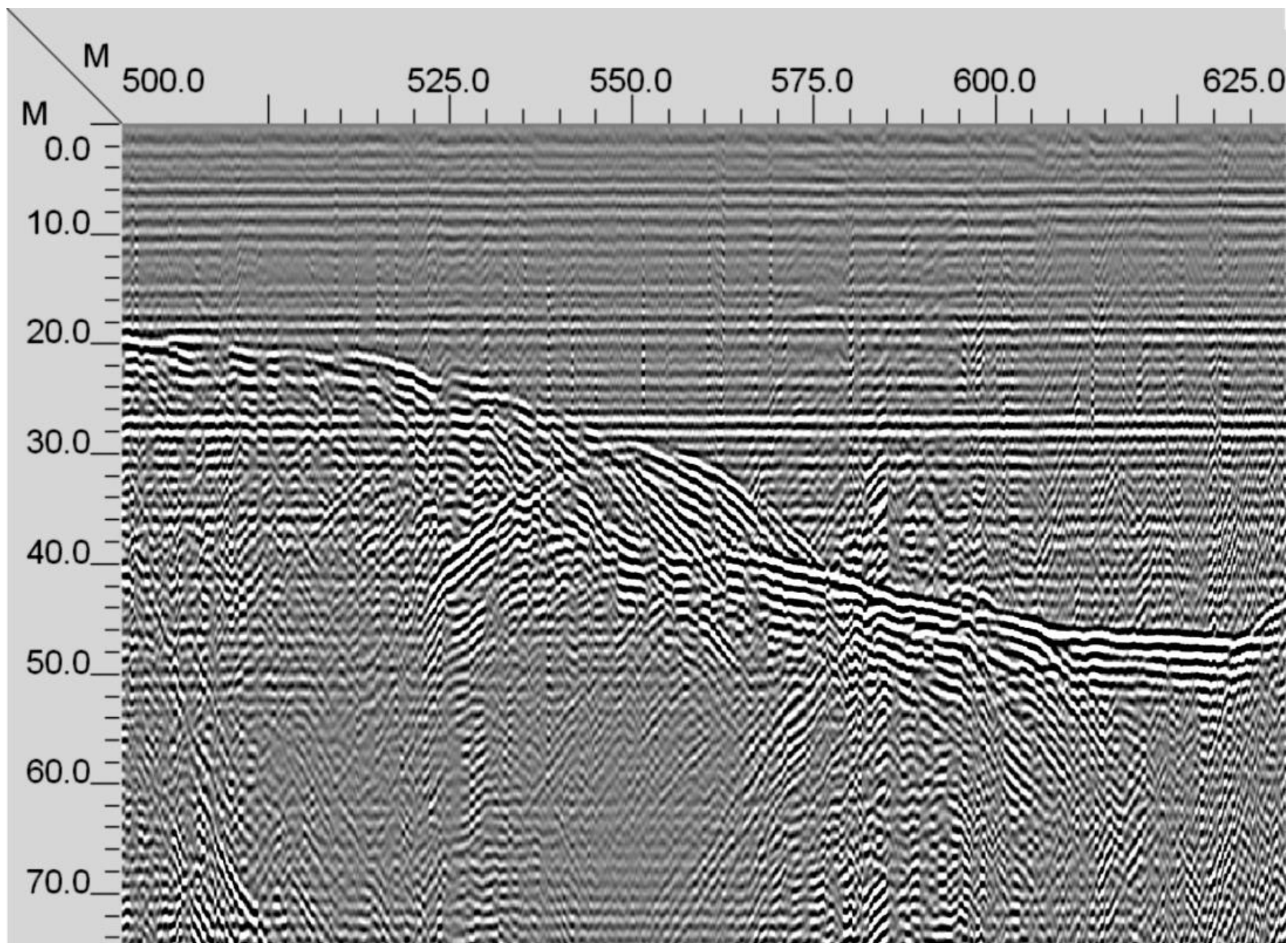


Snow accumulation pattern along ice shelf margin to Polar ice sheet (East of Schirmacher Oasis)

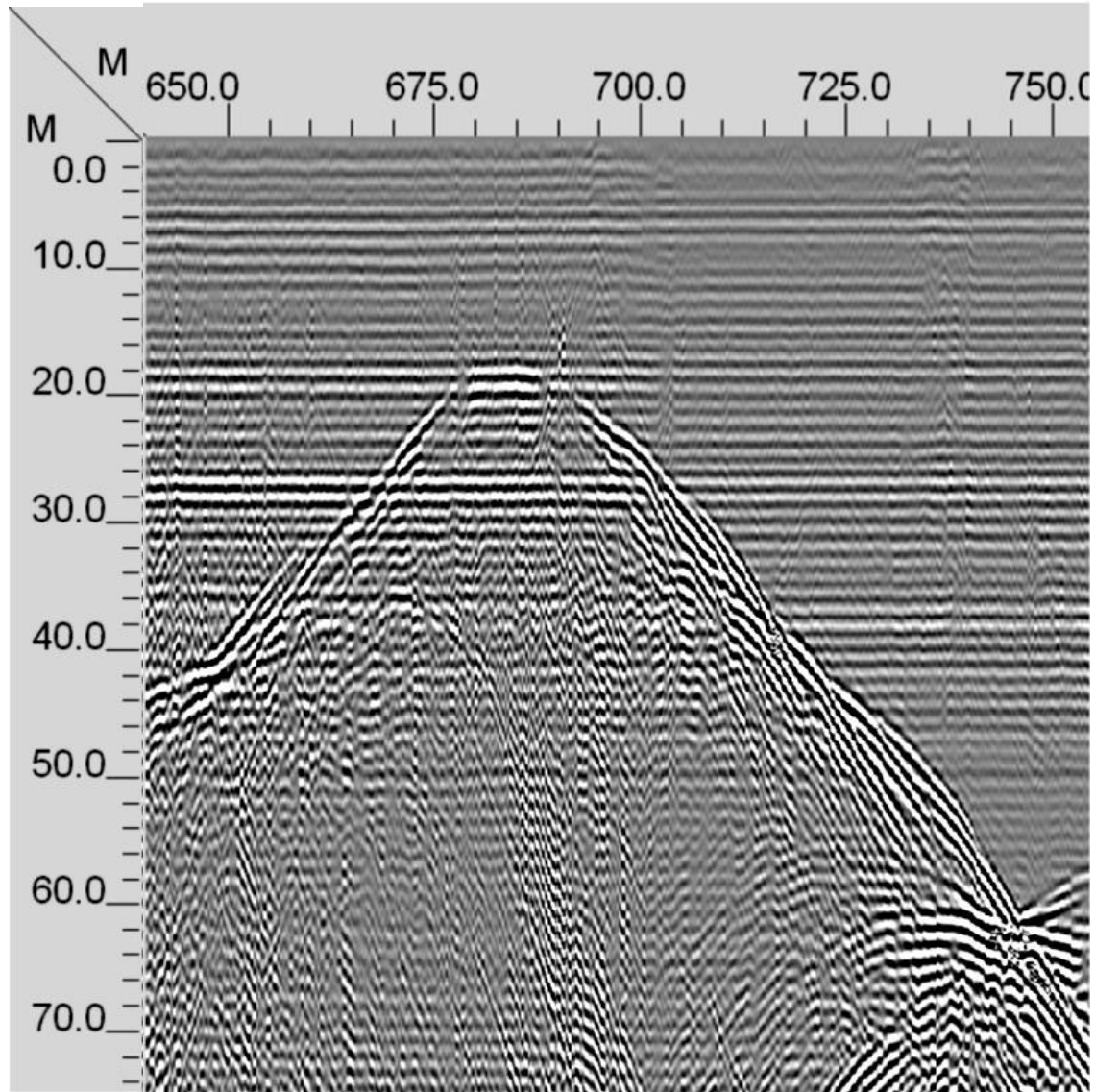


Ice thickness study by GPR

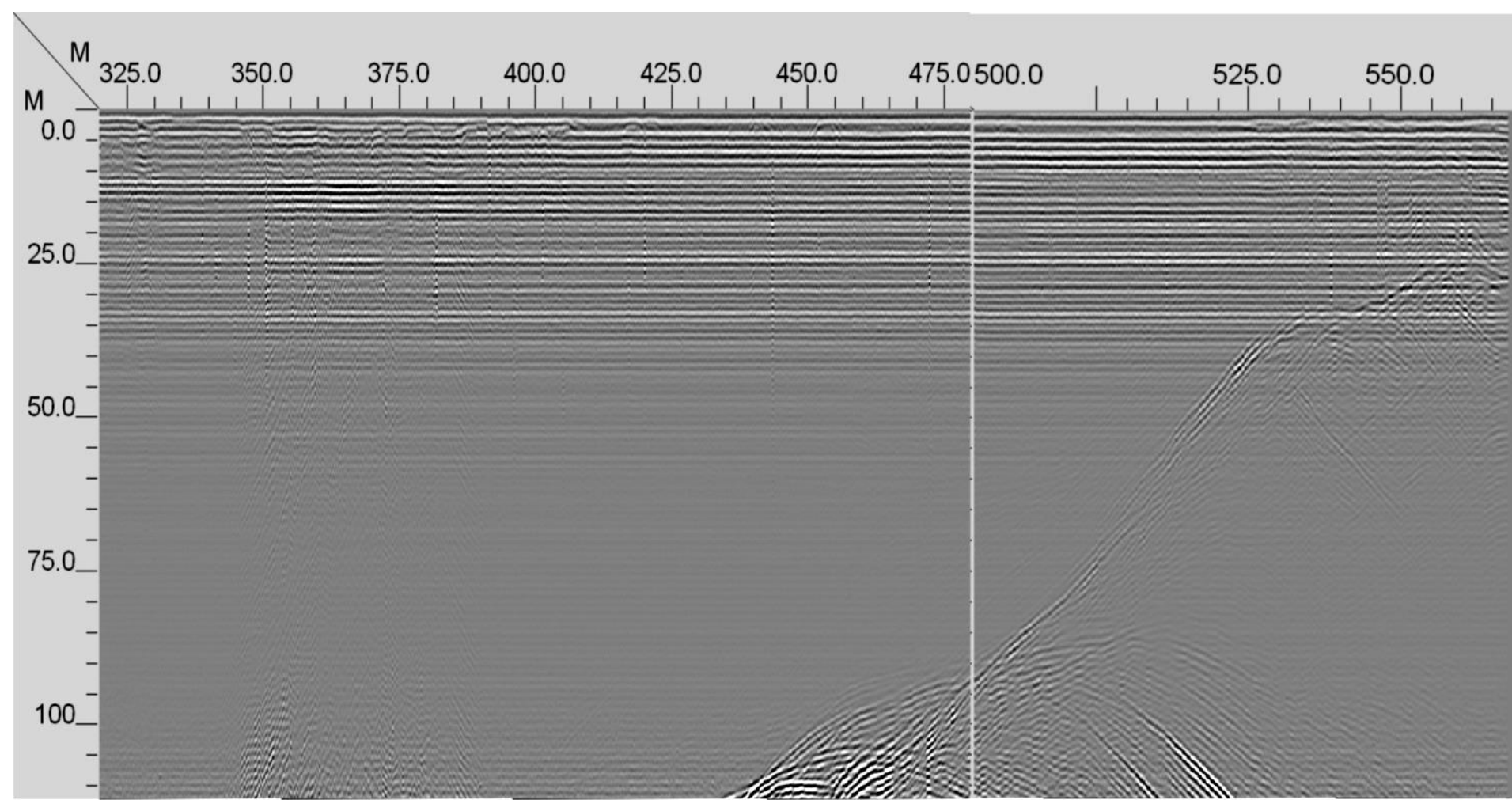




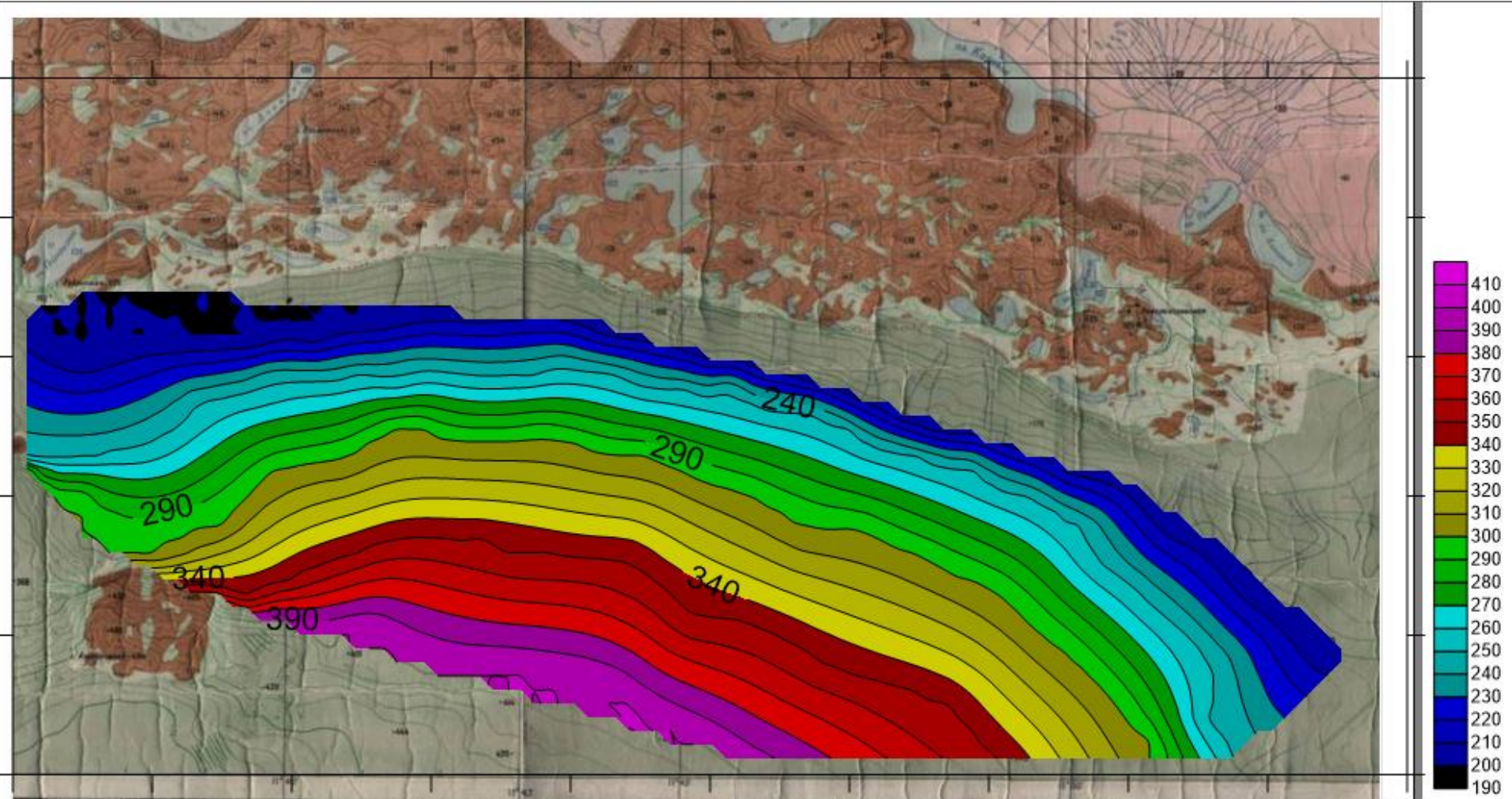
GPR profiles



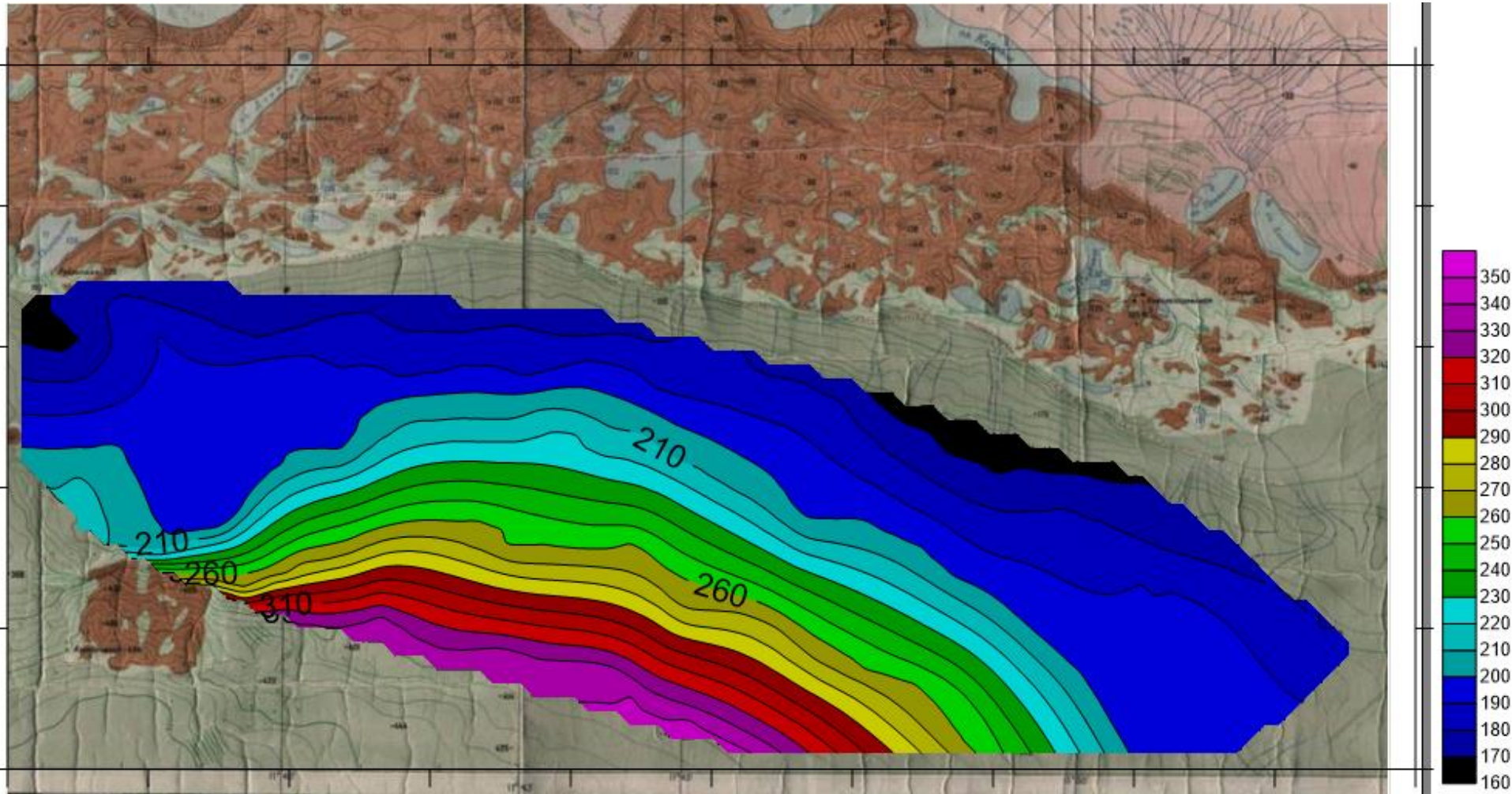
GPR profiles



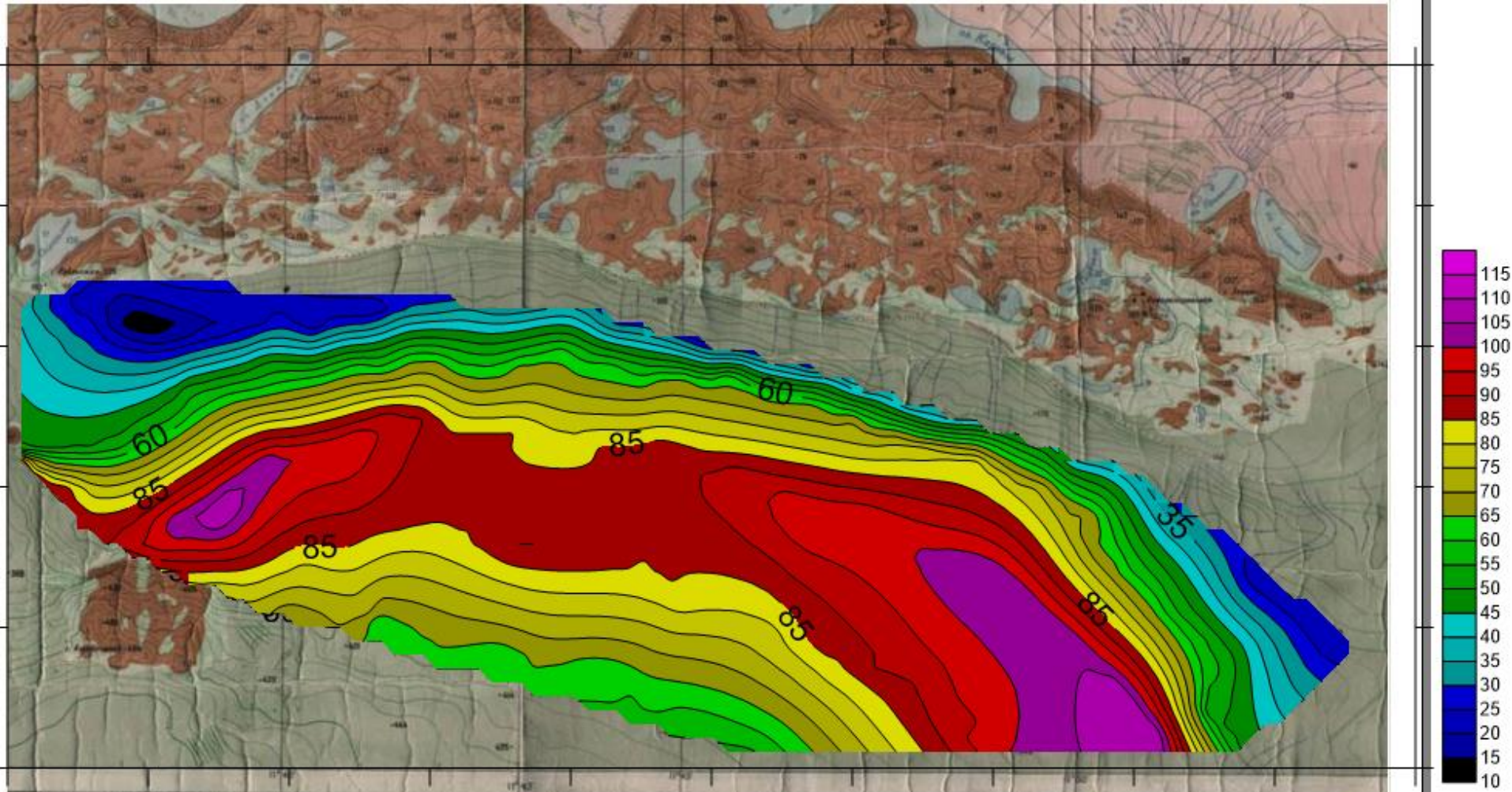
Topography



Bedrock configuration



Ice thickness



A photograph of a snowy landscape under a clear blue sky. A fence line with wooden posts runs across the middle ground. The snow is bright white, and the sky is a deep, clear blue. The text "Thank you" is overlaid in white on the lower right side of the image.

Thank you