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Supplement of

Velocity increases at Cook Glacier, East Antarctica, linked to ice shelf loss and a subglacial flood event

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Figure S1

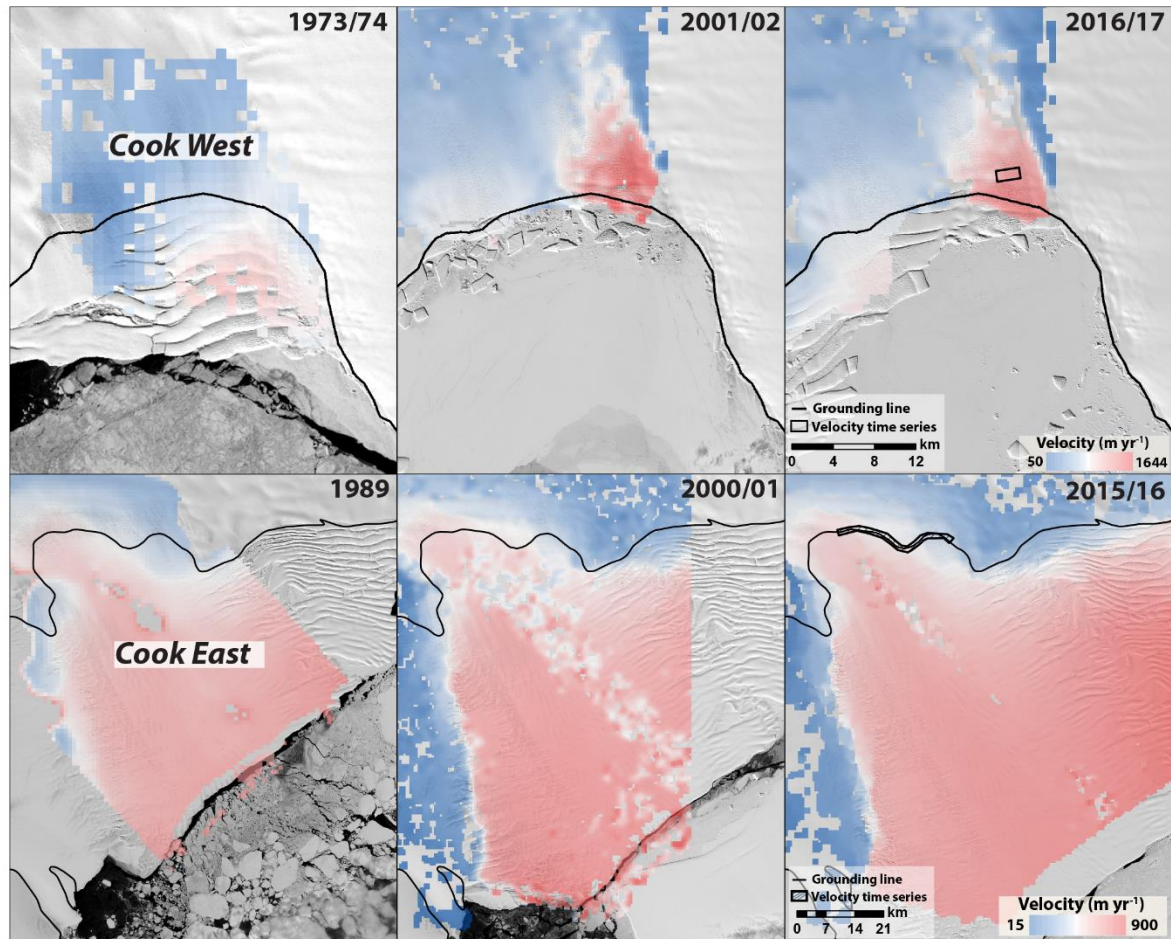


Figure S1: Examples of some of the velocity fields calculated in this study for Cook West and Cook East overlain on their corresponding Landsat image. Velocity time-series were calculated by taking the average value of pixels within the respective boxes.

Table S1: Sources of imagery used to map ice-front position change

Date	Satellite
1947	Operation Highjump aerial photography
1963	ARGON
1973-74	Landsat 1
1989	Landsat 4
1997	RADARSAT-1
2000-2012	Landsat 7
2002-2006	ASTER
2013-2018	Landsat 8

Table S2: Image pairs and associated error for feature tracking on Cook East Glacier.

Date	Satellite	Resolution (m)	Co-registration error (m)	Displacement error (m)	Total Error per year (m)
05/03/1989	Landsat 4 - Band 4	30	30	15	51
16/11/1989	Landsat 4 - Band 4	30			
23/02/2000	Landsat 7 - Band 8	15	15	7.5	19
17/11/2001	Landsat 7 -Band 8	15			
12/12/2005	ASTER - Band 3	15	15	7.5	23
01/12/2006	Landsat 7 - Band 8	15			
01/12/2006	Landsat 7 - Band 8	15	15	7.5	22
04/12/2007	Landsat 7 -Band 8	15			
04/12/2007	Landsat 7 - Band 8	15	15	7.5	22
07/12/2008	Landsat 7 -Band 8	15			
07/12/2008	Landsat 7 - Band 8	15	15	7.5	23
07/11/2009	Landsat 7 -Band 8	15			
07/11/2009	Landsat 7 - Band 8	15	15	7.5	22
10/11/2010	Landsat 7 -Band 8	15			
10/11/2013	Landsat 8 - Band 8	15	15	7.5	24
10/09/2014	Landsat 8 - Band 8	15			
10/09/2014	Landsat 8 - Band 8	15	15	7.5	21
16/11/2015	Landsat 8 - Band 8	15			
16/11/2015	Landsat 8 - Band 8	15	15	7.5	22
05/12/2016	Landsat 8 - Band 8	15			

Table S3: Image pairs and associated error for feature tracking on Cook West Glacier.

Date	Satellite	Resolution (m)	Co-registration error (m)	Displacement error (m)	Total Error per year (m)
04/11/1973	Landsat 1 - Band 4	60	60	30*	450
16/01/1974	Landsat 1 - Band 4	60			
05/03/1989	Landsat 4 - Band 4	30	30	15	51
16/11/1989	Landsat 4 - Band 4	30			
17/12/2001	Landsat 7 - Band 8	15	15	7.5	24
10/10/2002	ASTER - Band 3	15			
14/10/2006	ASTER - Band 3	15	15	7.5	22
09/11/2007	Landsat 7 - Band 8	15			
12/11/2008	Landsat 7 - Band 8	15	15	7.5	22
14/11/2009	Landsat 7 -Band 8	15			
17/01/2010	Landsat 7 - Band 8	15	15	7.5	22
20/01/2011	Landsat 7 -Band 8	15			
20/01/2011	Landsat 7 - Band 8	15	15	7.5	22
08/02/2012	Landsat 7 -Band 8	15			
20/01/2014	Landsat 8 - Band 8	15	15	7.5	22
15/02/2015	Landsat 8 - Band 8	15			
15/02/2015	Landsat 8 - Band 8	15	15	7.5	24
01/01/2016	Landsat 8 - Band 8	15			
01/01/2016	Landsat 8 - Band 8	15	15	7.5	22
13/02/2017	Landsat 8 - Band 8	15			

Table S4: Image pairs and associated error for ice-front advance rate on Cook East Glacier.

Date	Satellite	Resolution (m)	Co-registration error (m)	Mapping error (m)	Total Error (m yr ⁻¹)	Advance (m)	Advance (m yr ⁻¹)
11/1973	Landsat 1	60	60	30	6	10924	712
03/1989	Landsat 4	30					
03/1989	Landsat 4	30	30	30	86	480	685
11/1989	Landsat 4	30					
11/1989	Landsat 4	30	30	30	8	5645	717
10/1997	RADARSAT	25					
10/1997	RADARSAT	25	25	25	21	1725	720
02/2000	Landsat 7	15					
02/2000	Landsat 7	15	15	15	17	1278	737
11/2001	Landsat 7	15					
11/2001	Landsat 7	15	15	15	27	817	742
12/2002	Landsat 7	15					
12/2002	Landsat 7	15	15	15	8	2939	749
12/2006	Landsat 7	15					
12/2006	Landsat 7	15	15	15	30	798	792
12/2007	Landsat 7	15					
12/2007	Landsat 7	15	15	15	30	754	747
12/2008	Landsat 7	15					
12/2008	Landsat 7	15	15	15	33	694	757
11/2009	Landsat 7	15					
11/2009	Landsat 7	15	15	15	30	747	741
11/2010	Landsat 7	15					
11/2010	Landsat 7	15	15	8	21	846	758
12/2011	WorldView-2	0.5					
12/2011	WorldView-2	0.5	0.5	0.5	1	774	762
12/2012	WorldView-2	0.5					
12/2012	WorldView-2	0.5	15	8	26	666	768
11/2013	Landsat 8	15					
11/2013	Landsat 8	15	15	15	36	620	745
09/2014	Landsat 8	15					
09/2014	Landsat 8	15	15	15	25	899	760
11/2015	Landsat 8	15					
11/2015	Landsat 8	15	15	15	28	799	758
12/2016	Landsat 8	15					