



Supplement of

Dynamic thinning and grounding line retreat in Porpoise Bay, Wilkes Land, East Antarctica

Matilda Weatherley et al.

Correspondence to: Matilda Weatherley (matilda.weatherley@durham.ac.uk)

The copyright of individual parts of the supplement might differ from the article licence.

Supplementary Material

Table S1. Details of the optical satellite imagery used in the study, including resolution and error.

Date	Satellite	Scene ID	Resolution (m)	Error (m)
1963	KH-5 ARGON	ARGON mosaic (Kim et al., 2007)	140	210
03/11/1973	Landsat 1	LANDSAT/LM01/L1GS/098107_19731103_20180428_01_T2	60	90
19/03/1989	Landsat 4	LANDSAT/LT04/C02/T2_TOA/LT04_094107_19890319	30	45
13/02/1991	Landsat 5	LANDSAT/LT05/C02/T2_TOA/LT05_094107_19910213	30	45
07/01/2000	Landsat 7	LANDSAT/LE07/C02/T2_TOA/LE07_093107_20000107	30	45
10/02/2001	Landsat 7	LANDSAT/LE07/C02/T2_TOA/LE07_093107_20010210	30	45
21/12/2002	Landsat 7	LANDSAT/LE07/C02/T2_TOA/LE07_094107_20021221	30	45
22/01/2003	ASTER	ASTER/AST_L1T_003/20030122004242	15	45
27/12/2005	ASTER	ASTER/AST_L1T_003/20051227005243	15	45
07/11/2006	ASTER	ASTER/AST_L1T_003/20061107003450	15	45
18/02/2007	Landsat 7	LANDSAT/LE07/C02/T2_TOA/LE07_094107_20070218	30	45
14/09/2007	Landsat 7	LANDSAT/LE07/C02/T2_TOA/LE07_094107_20070914	30	45
08/03/2008	Landsat 7	LANDSAT/LE07/C02/T2_TOA/LE07_094107_20080308	30	45
07/02/2009	Landsat 7	LANDSAT/LE07/C02/T2_TOA/LE07_094107_20090207	30	45
14/03/2010	Landsat 7	LANDSAT/LE07/C02/T2_TOA/LE07_094107_20100314	30	45
01/03/2011	Landsat 7	LANDSAT/LE07/C02/T2_TOA/LE07_094107_20110301	30	45
10/03/2011	Landsat 7	LANDSAT/LE07/C02/T2_TOA/LE07_093107_20110310	30	45
24/01/2012	Landsat 7	LANDSAT/LE07/C02/T2_TOA/LE07_093107_20120124	30	45
18/02/2013	Landsat 7	LANDSAT/LE07/C02/T2_TOA/LE07_094107_20130218	30	45
03/04/2013	Landsat 8	LANDSAT/LC08/C02/T2_TOA/LC08_095107_20130403	30	45
17/03/2014	Landsat 8	LANDSAT/LC08/C02/T2_TOA/LC08_094107_20140317	30	45
29/03/2015	Landsat 8	LANDSAT/LC08/C02/T2_TOA/LC08_093107_20150329	30	45
29/03/2015	Landsat 8	LANDSAT/LC08/C02/T2_TOA/LC08_093107_20150329	30	45
28/02/2016	Landsat 8	LANDSAT/LC08/C02/T2_TOA/LC08_093107_20160228	30	45
04/01/2017	Landsat 8	LANDSAT/LC08/C02/T2_TOA/LC08_094107_20170104	30	45
24/02/2018	Landsat 8	LANDSAT/LC08/C02/T2_TOA/LC08_094107_20180224	30	45
19/03/2018	Landsat 8	LANDSAT/LC08/C02/T2_TOA/LC08_095107_20180319	30	45
27/02/2019	Landsat 8	LANDSAT/LC08/C02/T2_TOA/LC08_094107_20190227	30	45
26/03/2020	Landsat 8	LANDSAT/LC08/C02/T2_TOA/LC08_093107_20200326	30	45
29/01/2020	Landsat 8	LANDSAT/LC08/C02/T2_TOA/LC08_094107_20200129	30	45
24/01/2021	Landsat 8	LANDSAT/LC08/C02/T2_TOA/LC08_093107_20210124	30	45
15/01/2021	Sentinel 2	COPERNICUS/S2/20210115T003509_20210115T003505_T52DDM	10	15
20/02/2022	Landsat 9	LANDSAT/LC09/C02/T2_TOA/LC09_093107_20220220	30	30
11/03/2023	Landsat 9	LANDSAT/LC09/C02/T2_TOA/LC09_093107_20230311	30	30
17/03/2023	Landsat 9	LANDSAT/LC08/C02/T2_TOA/LC08_095107_20230317	30	30
01/02/2024	Landsat 9	LANDSAT/LC09/C02/T2_TOA/LC09_094107_20240201	30	30
12/02/2025	Landsat 9	LANDSAT/LC09/C02/T2_TOA/LC09_093107_20250212	30	30

5 Table S2. Velocity error measurements within the define boxes (IN, GL, and FT) across each glacier. Missing values show the velocity data omitted from the study due to < 25% data coverage, > 50% associated error of the velocity magnitude, or lack of available data.

Year	IN velocity error (m yr ⁻¹)				GL velocity error (m yr ⁻¹)				FT velocity error (m yr ⁻¹)			
	FR	G1	HE	HW	FR	G1	HE	HW	FR	G1	HE	HW
2000	110.8	-	-	-	147.1	40.0	-	100.2	98.3	179.3	-	-
2001	55.6	86.8	-	-	81.9	45.8	-	195.2	53.5	65.1	-	-
2002	-	-	-	-	-	40.2	-	37.8	48.9	-	-	-
2006	-	-	-	-	-	-	-	183.7	412.8	345.1	-	-
2007	35.9	50.6	-	-	13.8	10.8	-	22.0	10.1	48.9	-	-
2008	86.7	64.3	-	-	36.1	19.5	-	36.9	25.4	75.4	-	-
2009	150.1	101.8	-	-	47.5	30.0	-	53.4	27.0	95.4	-	-
2010	95.8	68.5	-	-	30.4	33.8	-	78.4	19.1	90.4	-	-
2011	68.6	75.6	-	-	29.3	30.9	-	45.9	23.0	78.4	-	-
2012	-	-	-	-	63.0	62.2	-	56.6	62.0	-	-	-
2013	24.8	25.1	36.8	158.1	23.4	18.1	23.9	33.2	20.9	22.4	13.8	15.3
2014	4.3	5.1	11.4	40.3	2.7	2.1	11.5	4.3	2.4	2.3	7.4	6.6
2015	2.5	2.9	4.3	6.1	2.6	1.6	3.9	3.0	2.2	1.9	3.5	3.3
2016	2.0	3.8	6.4	10.9	2.1	0.8	7.2	4.1	1.5	1.3	5.1	8.1
2017	3.6	4.4	13.0	15.3	2.8	1.5	10.3	3.9	2.3	2.9	5.3	5.2
2018	6.3	7.9	96.1	57.3	4.4	2.1	57.2	6.1	3.8	3.7	8.4	6.8
2019	58.1	112.4	123.1	93.1	36.2	48.5	100.2	81.6	39.8	69.9	95.3	152.0
2020	49.4	181.9	220.7	104.0	28.8	54.3	106.3	85.2	51.6	70.0	209.2	240.4
2021	37.0	103.5	108.2	140.0	36.3	43.6	122.2	76.1	35.4	52.1	167.9	163.9
2022	152.5	107.4	121.9	105.5	29.5	43.9	107.4	50.6	43.9	86.6	212.1	185.7