

Description of supplementary data set to: Changes in ice dynamics, elevation and mass discharge of Dinsmoor-Bombardier-Edgeworth glacier system, Antarctic Peninsula

Seehaus, Thorsten¹; Marinsek, Sebastián^{2,3}; Helm, Veit⁴, Skvarca, Pedro⁵; Braun, Matthias¹

¹ *Institut für Geographie, Universität Erlangen-Nürnberg, Wetterkreuz 15, D-91058 Erlangen, Germany*

² *Instituto Antártico Argentino, Balcarce 290, C1064AAF, Buenos Aires, Argentina*

³ *Universidad Tecnológica Nacional, Facultad Regional Buenos Aires, Medrano 951, C1179AAQ, Buenos Aires, Argentina*

⁴ *Alfred-Wegener-Institut für Polar- und Meeresforschung, Am Alten Hafen 26, D-27568 Bremerhaven, Germany*

⁵ *Glaciarium, Museo del Hielo Patagónico, El Calafate 9405, Prov. Santa Cruz, Argentina*

Correspondence to: thorsten.seehaus@fau.de

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This data set contains surface velocity fields, digital elevation models, glacier front and grounding line positions for Dinsmoor-Bombardier-Edgeworth glacier system, Antarctic Peninsula.

Detailed information on the generation, processing and error assessment of the datasets can be found in Seehaus et al. (2015). DOI: 0.1016/j.epsl.2015.06.047

Overview:

1 Surface velocity fields

2 Digital elevation models

3 Glacier front positions

4 Grounding line position

1 Surface velocity fields:

Surface velocity fields were derived from repeat pass SAR acquisitions by intensity offset tracking. Subsets of the displacement fields (magnitude and direction) on the outlet glaciers and frontal retreat area are provided. The data are grouped by sensor.

Sensor names and abbreviation:

ERS: European Remote Sensing satellites 1&2
ENV: Environmental Satellite (Envisat)
RS1: Radarsat-1
PAL: Advanced Land Observing Satellite (SAR sensor: PALSAR)
TSX: TerraSAR-X
TDX: TanDEM-X

Data format:

GeoTIFF

File naming convention:

The GeoTIFF files are named according to the following conventions

dis_ang+2008-11-13—2009-02-13_PAL_FB_064x192_10x30_16280-129.tif

XXX_XXX+YYYY-MM-DD—YYYY-MM-DD_SSS_BB_WWWxWWW_SSxSS_OOOO-
PPP.tif

Variable	Description
xxx_xxx	Type of displacement information: dis_ang: direction of displacement (flow direction) in degree relative to North direction dis_mag: magnitude of displacement (flow speed) in m/d
YYYY-MM-DD — YYYY-MM-DD	Dates of SAR acquisitions used for the tracking process: YYYY: 4-digit year MM: 2-digit month DD: 2-digit day
SSS	Sensor name abbreviation (see above)
BB	Acquisition beam mode: SM: Stripmap (TSX & TDX) ST: Standard (RS1) IM: Imaging (ERS & ENV) FB: Fine beam (PAL)
WWWxWWW	Tracking window size in slant range geometry: range pixels x azimuth pixels
SSxSS	Tracking step size in slant range geometry: range pixels x azimuth pixels
OOOOO	5 digit orbit number
PPP	3 digit path number

2 Digital elevation models:

Digital elevation models (DEM) were interferometrically derived from bi-static TanDEM-X (TDX) acquisitions. Subsets of the DEMs covering the observation area (see Seehaus et al., 2015) are provided.

Data format:

GeoTIFF

File naming convention:

The GeoTIFF files are named according to the following conventions

2011-09-09-084023_TDX_DEM.tif

YYYY-MM-DD-hhmmss_TDX_DEM.tif

Variable	Description
YYYY-MM-DD	Date of bistatic TDX SAR acquisition: YYYY: 4-digit year MM: 2-digit month DD: 2-digit day
hhmmss	Time of bi-static TDX SAR acquisition: hh: 2-digit hour mm: 2-digit minute ss: 2-digit second

3 Glacier front positions

Glacier front positions were manually mapped on multilooked SAR intensity images. The data are summarized in a single shapefile named “DBE_ice_front_positions”. Each mapped glacier front position corresponds to a shapefile feature.

Data format:

Shapefile

Attribute table description:

The shapefile attribute table contains fields as described below.

Attribute	Format/unit	Description
Date	YYYY-MM-DD	Date of SAR image used for glacier front mapping. YYYY: 4-digit year MM: 2-digit month DD: 2-digit day
Sensor	NA	Name of SAR sensor (abbreviation): ERS: European Remote Sensing satellites 1&2 ENVISAT: Environmental Satellite RSAT: Radarsat-1 PALSAR: Advanced Land Observing Satellite (SAR sensor PALSAR) TSX: TerraSAR-X or TanDEM-X
Qual	NA	Quality factor of front position mapping (see Seehaus et al., 2015)
length	meters	Length of mapped glacier front

4 Grounding line position

The estimated grounding line position in 2014 is provided as a shapefile named “GL-2014”. It was derived from elevation change patterns on the lower part of the outlet glaciers (see Seehaus et al., 2015).

Data format:

GeoTIFF

Attribute table description:

NA