



Topographic map of the SSSI No. 8, King George Island, West Antarctica

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ABSTRACT: A topographic map 1:12,500 scale of the SSSI No. 8 and the *Arctowski* Station region was prepared during the XXV Polish Polar Expedition (2000/2001) organized by the Department of Antarctic Biology, Polish Academy of Sciences. The map documents geomorphological changes which took place during the last 20 years. Several new place names have been introduced for the SSSI No. 8 area.

Key words: Antarctica, King George Island, SSSI No. 8, *Arctowski* Station, topographic map.

Introduction

A new large-scale (1:12,500) topographic map of *Arctowski* Station and its surroundings was prepared during the XXV Antarctic Expedition (2000/2001) organized by the Department of Antarctic Biology of the Polish Academy of Sciences. The topographic map is the basic material for drafts, thematic maps, and GIS data base.

The Site of Special Scientific Interest No. 8 (SSSI No. 8) was created by the Antarctic Treaty Consultative Parties in 1979, based on a Polish proposal. Diverse avian and mammalian species and locally rich vegetation provide a representative sample of maritime Antarctic ecosystem. The management of the SSSI No. 8 aims at the protection of bird colonies and seal breeding grounds against unnecessary and potentially damaging human activities.

Survey and methods of preparing the new topographic map

The field surveys were carried out using double frequency GPS receivers Ashtech Z-12. The first one, with a fixed location, served as a base receiver. The

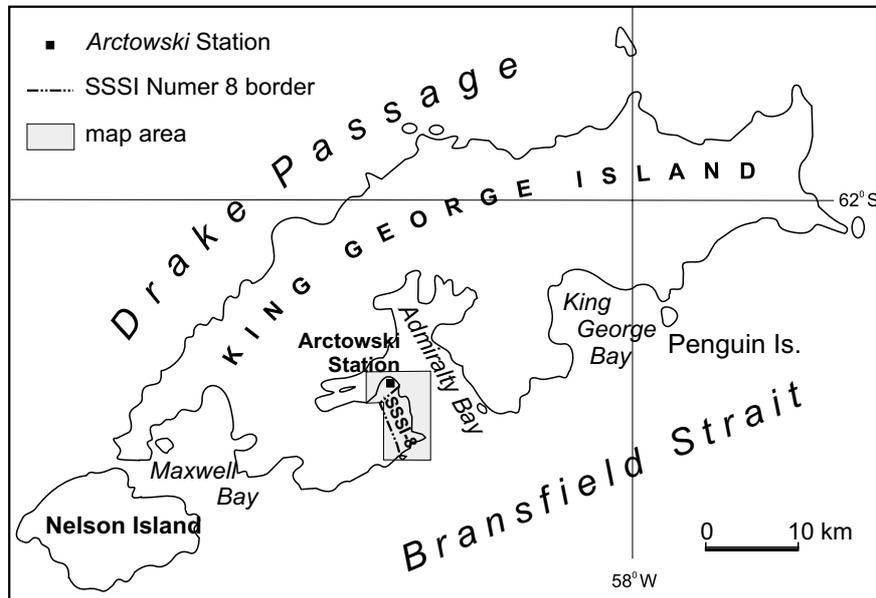


Fig. 1. King George Island. The figure shows location of SSSI No. 8 and the *Henryk Arctowski* Station.

second receiver, after an introductory 10-minute initialization (this is required for resolving the carrier phase ambiguity), was carried into the field, gathering information at 15-second interval. Co-ordinates of points (X, Y, Z) obtained during field survey were subsequently calculated by using *PNAV* application. Precision of the measurements has been estimated as better than 10 cm (see Czarnecki 1994). Essential conditions of correct measurements were: observations of at least 4 satellites by two receivers, and PDOP index below 4.0.

About sixteen thousand points were measured. The measurements were carried out in such a way as to allow the determination of the range of objects (including creeks, lake borders, ice ranges, ridges, shorelines, etc.) and to achieve density of point cover sufficient to interpolate contour lines. For a few objects, the GPS measurement was impossible to obtain because of the loss of contact with 4 satellites (under cliffs and rocky walls), or because of difficult terrain (glacial crevasses, ridges). In these cases, the measurement gaps were filled by analyses of aerial photos (made by Furmańczyk in 1979) and theodolite measurements.

The collected GPS data were processed using *ArcView*. Aerial photos were rectified by *Erdas Imagine* (both are Geographic Information System applications – GIS). Materials for printing were prepared in *Corel Draw* graphic environment.

Names on Battke's (1980,1990), Furmanczyk and Marsz's (1980) and Pudelko's (2002) maps were taken from Birkenmajer (1980, 1998), who introduced them in 1977/78 and 1978/79 (see Birkenmajer 1979).

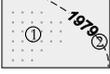
	Adelie Penguin colony	173,0	spot height (in metres)
	Chinstrap Penguin colony	• .34	point, numbered point (wooden post)
	Gentoo Penguin colony	⊕	GPS control point
	Giant Petrel colony	⌘	building
	fur seals	⊠	weather station
	elephant seals	⊞	bird observatory
	contours and scarps on ice-free area, contour interval 10 m	+	W. Puchalski's grave
	contours and scarps on ice, contour interval 10 m	⌚	lighthouse
	cliffs and rock exposures	⊞	helicopter aerodrome
	1 - creek 2 - flood area 3 - lake		zodiac slip
	1 - ice-cliff 2 - tidal flat		radio mast
	1 - dead ice zone 2 - glacier border in 1979		dyke
			path
			road
			SSSI-8 border

Fig. 2. Symbols used in the map (Fig. 4, Pudelko 2002).

Description of the 1:12,500 scale map

The 1:12,500 scale map presents the area of SSSI No. 8 (with the exception of a small glacier area in the western upper part of the SSSI No. 8) and ice-free terrain at northern margin of SSSI No. 8 where the *Arctowski* Station is located (Fig. 1).

SSSI No. 8 was defined according to Management Plan for Site of Special Scientific Interest No. 8 (see XII SATCM/ WP9 2000) as: “the area consist[ing] of land on the western shore of Admiralty Bay. The westerly boundary extends from Patelnia (Telefon) Point, NNW to The Tower (a distinctive peak above Tower Glacier), then continuing along a straight line to encompass the base of Jardine Peak. This line then runs NE to the sea (Admiralty Bay) where it bisects the coast immediately north of Rakusa Point. Thereafter, the Area is all the land which is bounded by the coastline south towards Demay Point, then SW along the coast to Patelnia (Telefon) Point.”

The legend of the map 1: 12,500 scale is shown in Fig. 2. Contours interval is 10 m. Projection properties are shown in Table 1.

Table 1

Projection properties.

Projection	Transverse Mercator (TM)
Spheroid	WGS 84
Central meridian	57° W
Reference latitude	0°
Scale factor	1
False westing	500 000 m
False northing	0 m

New place names introduced in 2001 for SSSI No. 8

Location of the place names is shown in Fig. 3. Their co-ordinates refer to averaged center of a defined object, except for creeks, which are given co-ordinates defining their beginning and end.

1. Baszta. — 62° 13' 27'' S – 58° 27' 44'' W, 156 m a.s.l. A peak between Bastion and Blue Dyke.

2. Dead Glacier. — 62° 13' 15'' S – 58° 27' 40'' W. The highest point – 185 m a.s.l., the lowest point – 95 m a.s.l. A small dead glacier between Baszta and Bastion. Customary name: Thawing Glacier. Polish name: Martwy Lodowiec.

3. Fosa Creek. — 62° 12' 36'' S – 58° 28' 14'' W, 200 m a.s.l., 62° 12' 09'' S – 58° 26' 29'' W, 0 m a.s.l. A creek carrying meltwater from Tower Glacier and Baranowski Glacier to Staszek Cove. This is a new geomorphological form that had formed as a result of glacier's thawing during the past twenty years. Polish name: Potok Fosa.

4. Ginger Lake. — 62° 12' 37'' S – 58° 27' 25'' W, 85 m a.s.l. A lake with ginger-colored water, between Brama and Demay Point. This is a new lake that had formed as a result of glacier's thawing during the past twenty years. Polish name: Jezioro Imbirowe.

5. Krzemień. — 62° 11' 10'' S – 58° 27' 19'' W. Top of a hill 152 m a.s.l. North-west of Sphinx Hill, near Sphinx Glacier's margin. After Krzemień Hill in the Polish Bieszczady Mountains, West Carpathians.

6. Mud Lake. — 62° 13' 11'' S – 58° 27' 18'' W, 85 m a.s.l. A muddy lake on Creeping Slope, east of Bastion. This is a new lake that had formed as a result of glacier's thawing during the past twenty years. Polish name: Jezioro Błotniste.

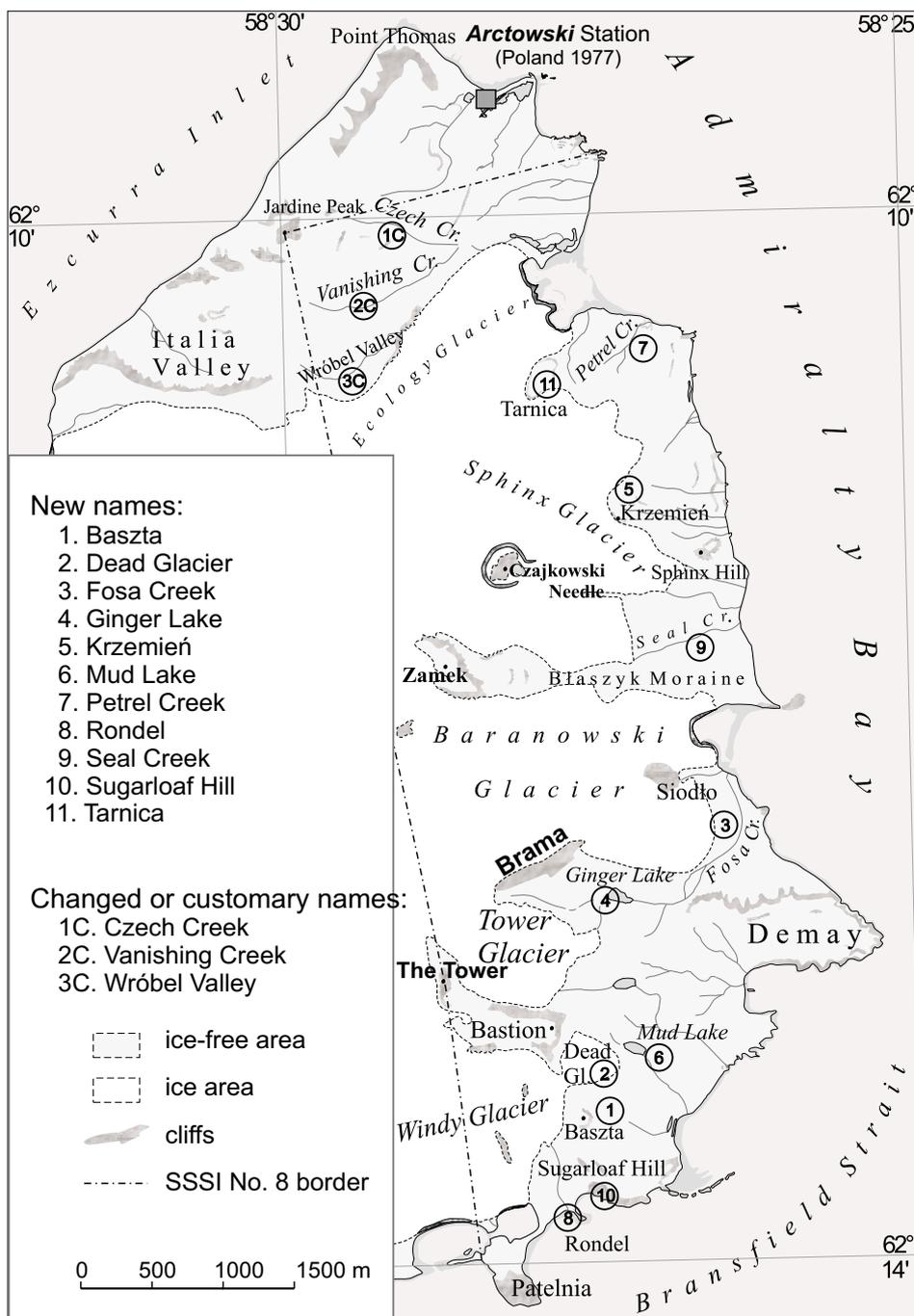


Fig. 3. Locations of geographical names, SSSI No. 8 (see Pudelko 2002).

7. Petrel Creek. — 62° 10' 35'' S 58° 27' 25'' W, 35 m a.s.l. 62° 10' 25'' S 58° 27' 00'' W, 0 m a.s.l. Petrel Creek runs from dead ice zone and northern moraines of Rescuers Hills to Suszczewski Cove. There are three Giant Petrel colonies next to Petrel Creek. Polish name: Potok Petrela.

8. Rondel. — 62° 13' 50'' S – 58° 27' 45'' W, 0–3 m a.s.l. Small rocky promontory at north–eastern Patelnia.

9. Seal Creek. — 62° 11' 43'' S – 58° 27' 14'' W, 60 m a.s.l. 62° 11' 36'' S – 58° 26' 21'' W, 0 m a.s.l. Seal Creek runs parallel to Blaszyk Moraine, carrying melt-water from southern part of Sphinx Glacier to Admiralty Bay. Next to Seal Creek, there are breeding grounds of sea elephants and fur seals. Polish name: Potok Foczy.

10. Sugarloaf Hill. — 62° 13' 43'' S – 58° 27' 39'' W, 104 m a.s.l. The shape of the top of this hill looks like a sugar loaf. It is located between Blue Dyke and Windy Glacier. Customary name: Sugar Mound. Polish name: Głowa Cukru.

11. Tarnica. — 62° 10' 40'' S – 58° 27' 58'' W. A hill reaching about 115 m a.s.l. at Ecology Glacier. After Tarnica Mountain in the Polish Bieszczady Mountains, West Carpathians.

The area presented in the map (Fig. 3, Pudelko 2002) is subject to rapid glacier range changes. This becomes apparent when comparing this study with earlier maps (Furmańczyk and Marsz 1980, Battke 1990) and measurements (Kejna *et al.* 1998, Battke *et al.* 2001, Birkenmajer 2002). The greatest changes were recorded in the vicinity of Bastion and close to Ecology Glacier forehead. Bastion and The Tower used to be nunataks some years ago (Battke 1990).

Changed place names

Two changes (Fig. 4) were introduced for named objects which were defined earlier (Birkenmajer 1980):

1. Wróbel Glacier was named by Birkenmajer (1979) as: “glacier, outlet of Warszawa Icefield, in the upper part of Italia Valley”. The glacier has disappeared since then, leaving a small valley covered with dead ice drained by a creek. The name was thus changed to **Wróbel Valley**.

2. Ornithologists Creek (Birkenmajer 1979, 1980) has changed its course. Its upper part has an outflow under the moraine of Ecology Glacier. As a result three new creeks were formed, informally renamed the Ornithologists-, the Czech-, and the Vanishing creeks).

Czech Creek – 62° 10' 00'' S – 58° 29' 28'' W – 165m a.s.l. 62° 10' 06'' S – 58° 28' 35'' W – 80 m a.s.l.

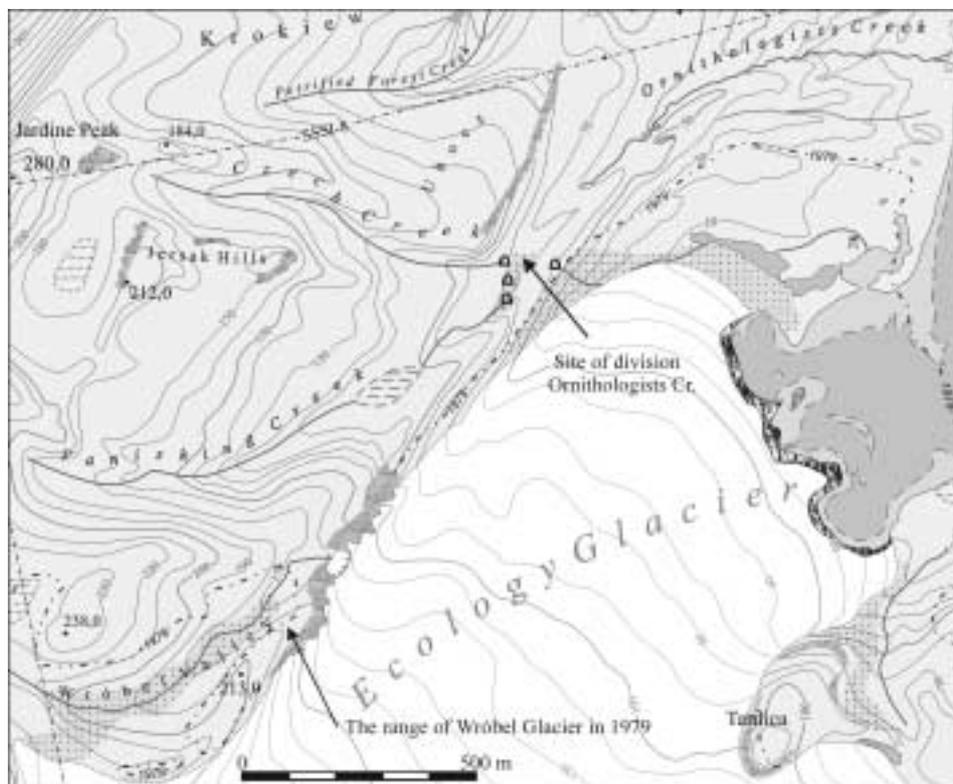


Fig. 4. A part of the map. Signatures are described in Fig. 2.

Vanishing Creek – $62^{\circ} 10' 18''$ S – $58^{\circ} 29' 47''$ W – 185 m a.s.l.. $62^{\circ} 10' 06''$ S – $58^{\circ} 28' 35''$ W – 80 m a.s.l.

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