Appendix: Marine Important Bird and Biodiversity Areas for penguins in Antarctica, targets for conservation action.

Authors

Jonathan Handley[1*], Marie-Morgane Rouyer[2], Elizabeth J. Pearmain[1], Victoria Warwick-Evans[3], Katharina Teschke[4, 5], Jefferson T. Hinke[6], Heather Lynch[7, 8], Louise Emmerson[9], Colin Southwell[9], Gary Griffith[10], César A. Cárdenas[11], Aldina M. A. Franco[2], Phil Trathan[3], Maria P. Dias[1, 12*]

[1] BirdLife International, Cambridge, UK

[2] School of Environmental Sciences, University of East Anglia, Norwich Research Park, Norwich, UK

[3] British Antarctic Survey, Cambridge, UK

[4] Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Bremerhaven, Germany

[5] Helmholtz Institute for Functional Marine Biodiversity at the University Oldenburg (HIFMB), Ammerländer Heerstraße 231, 26129 Oldenburg, Germany

[6] Antarctic Ecosystem Research Division, Southwest Fisheries Science Center, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, La Jolla, California, USA

[7] Department of Ecology and Evolution, Stony Brook University, Stony Brook, New York, USA

[8] Institute for Advanced Computational Science, Stony Brook University, Stony Brook, New York, USA

[9] Australian Antarctic Division, Department of Agriculture, Water and the Environment, Kingston, Tas., Australia

[10] Norsk Polarinstitutt/Norwegian Polar Institute, Tromsø, Norway

[11]Departamento Científico, Instituto Antártico Chileno Plaza Muñoz Gamero 1055. Punta Arenas, Chile.

[12] MARE - Marine and Environmental Sciences Centre, ISPA - Instituto Universitário

*Corresponding authors: BirdLife International, David Attenborough Building, Pembroke Street, Cambridge, CB3 3QZ, UK; jonathan.m.handley@gmail.com, maria.dias@birdlife.org

This document outlines additional details regarding the identification of marine IBAs for penguins in waters surrounding Antarctica. Data used to delineate marine IBAs is specific to chick-rearing adult penguins within CCAMLR MPA planning domains 1, 3, 4, 7, 8 and 9. This appendix relates to the manuscript:

- Handley & Rouyer, et al. (2020). Marine Important Bird and Biodiversity Areas for penguins in Antarctica, targets for conservation action. BirdLife International, Cambridge, UK

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Introduction

Marine IBAs: Key Criteria

Marine Important Bird and Biodiversity Areas (marine IBAs) are areas located at-sea that are of global importance for the persistence of seabird species (Lascelles et al., 2016; Donald et al., 2018). Examples are foraging areas around breeding colonies, non-breeding concentrations, migratory bottlenecks and feeding areas for pelagic species (BirdLife International, 2010). For an area to qualify as an IBA (terrestrial or marine) it must meet one of four criteria: A1 (Globally threatened species), A2 (Restricted range species), A3 (Biome-restricted assemblages) and A4 (Congregations). Criteria A1 and A4 apply to seabirds. For this study, we considered:

- criteria **A4 (Congregations):** that is, the site is known, or thought to hold congregations of ≥1% of the global population of one or more species on a regular basis.

The identification of marine IBAs requires information on the at-sea distribution of seabirds, along with estimates of the number of birds using the sites, usually derived from the number of breeding pairs in the colony of origin (Lascelles et al., 2016). Marine IBA's are therefore those areas that are determined to likely contain >1% of the global population based on knowledge of a species foraging range coupled with their population numbers at colonies, but based solely on their marine foraging distributions.

Penguin species considered

We considered the four penguin species that regularly breed on mainland Antarctica and adjacent islands, i.e.: Adélie Penguins (*Pygoscelis adeliae*), Chinstrap Penguins (*Pygoscelis antarctica*), Gentoo Penguins (*Pygoscelis papua*) and Emperor Penguins (*Aptenodytes forsteri*). Chinstrap and Gentoo Penguins, which are ice-intolerant species (Forcada and Trathan, 2009), are largely confined to the Antarctic Peninsula and islands along the Scotia Arc. Whereas, Adélie and Emperor Penguins are ice-obligate species and have a circumpolar distribution on the Antarctic continent (Figure 1); although the former does require ice-free terrain when breeding (Forcada and Trathan, 2009).

During the breeding period, these species are central place foragers. Meaning, they perform regular foraging trips to sea and then return to the colony to provision developing offspring. If the duration of provisioning trips exceeds a critical threshold or birds are unable to capture sufficient prey within a given time period, reduced breeding success (number of chicks surviving to crèche per nest) can occur (Takahashi et al., 2003; Croll et al., 2006; Black, 2016). Of the pygoscelid penguins, Adélie and Chinstrap Penguins are particularly susceptible to changes in prey availability and its impact on breeding success as, unlike Gentoo Penguins, they are dietary specialists (Miller et al., 2009; Herman et al., 2017). Nevertheless, krill forms an important part of the diet for all four penguin species, and is the primary component of Adélie and Chinstrap Penguin diet. Gentoo and Emperor Penguins have a more mixed diet, which also includes fish and squid (Ratcliffe and Trathan, 2011).

The pygoscelid penguins are summer breeders, whereas Emperor Penguins breed during the winter. Therefore, some of the most critical months for these species – in terms of access to prey within a restricted range – are the months that correspond to the chick-rearing period (brood-guard and crèche phase of the breeding cycle). During this time, adults are the most constrained in foraging duration because of the regular requirement to provision developing offspring. Exact timing of breeding does fluctuate from year to year (Black, 2016) and for the Adélie penguins can be related to breeding site latitude (Ainley, 2002; Emmerson et al., 2011) (Ainley et al, 2002, Emmerson et al 2011), however, the critical months for summer breeders typically include November to February, while for the Emperor Penguins critical months include August to mid-December.

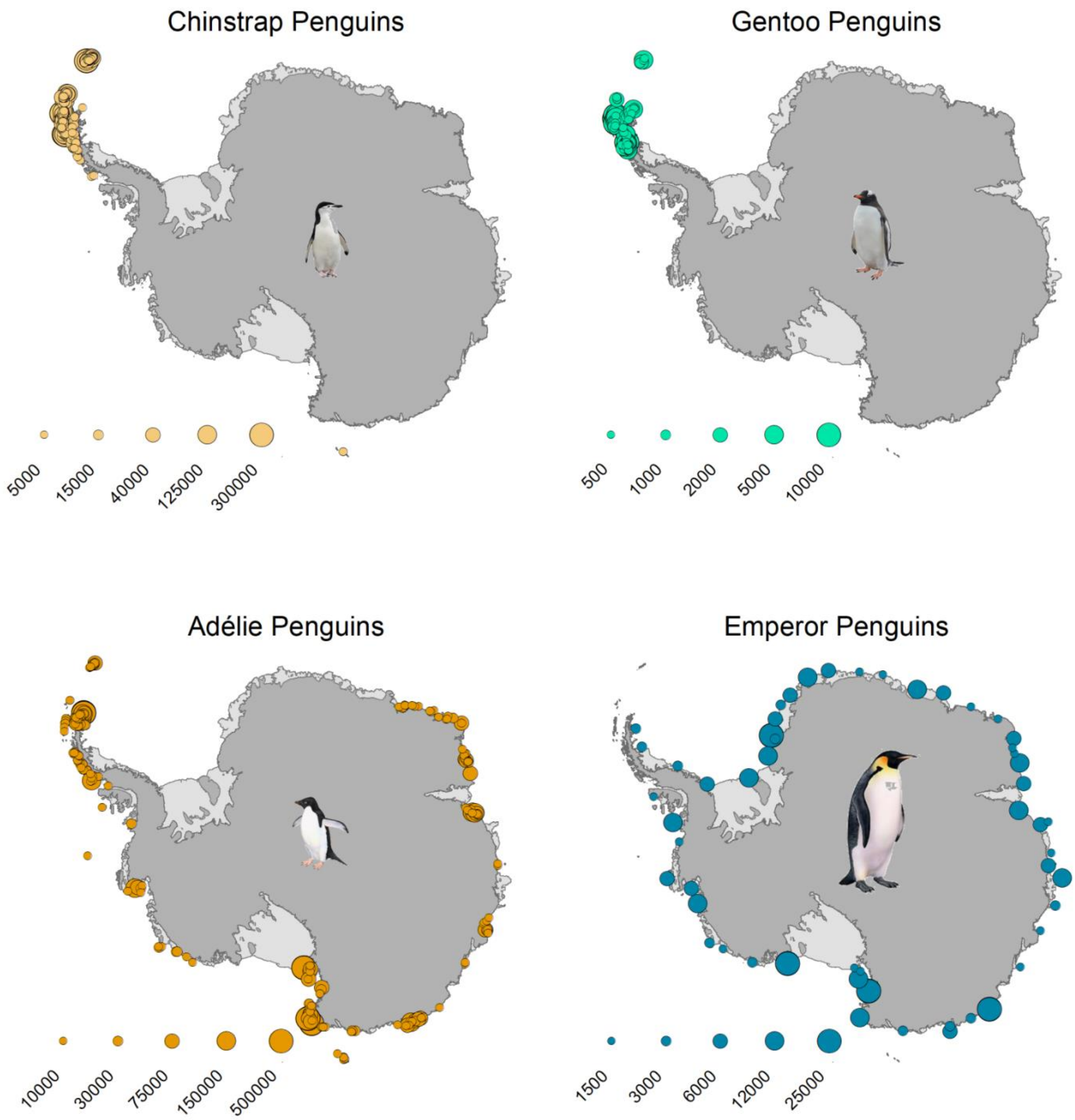

Figure 1: Distribution and most recent population count (breeding pairs) for the four species of penguins breeding in Antarctica. See text describing population estimates.

Methods

Study area and key spatial data

A high resolution shapefile of the Antarctic coastline (v7.1) was sourced from the Antarctic Digital Database (http://www.scar.org/data-products/add) (ADD-Consortium, 2000). MPA planning domains and MPA boundary shapefiles were sourced either from the CCAMLR GIS data portal (https://data.ccamlr.org/) or directly from project leads. MPA boundaries include (as of Sep 2020):

Adopted:

- Ross Sea Region MPA: RSRMPA
- South Orkney Islands Southern Shelf MPA: SOISS MPA

Proposed:

- Domain 1 MPA: D1MPA
- East Antarctica MPA: EAMPA
- Weddell Sea MPA Phase 1: WSMPA Phase 1
- Weddell Sea MPA Phase 2: WSMPA Phase 2 (MPA planning area)

Boundaries of the Voluntary Restricted Zones (VRZs, https://www.ark-krill.org/ark-voluntary-measures) along the Antarctic Peninsula, regions in which 85% of krill fishing companies agreed a voluntary permanent stop to krill fishing between certain dates depending on the region (Antarctic Peninsula: 1 Oct – 1 Feb, Gerlache Strait: 15 Oct – 15 Feb, South Shetland Islands: 1 Nov – 1 Mar), were sourced from the British Antarctic Survey (Trathan P, pers. comm., see also: https://www.ark-krill.org/ark-voluntary-measures). Miscellaneous spatial data (e.g. place names) were sourced from the Quantarctica data portal (Matsuoka et al., 2018). See Figure 2.

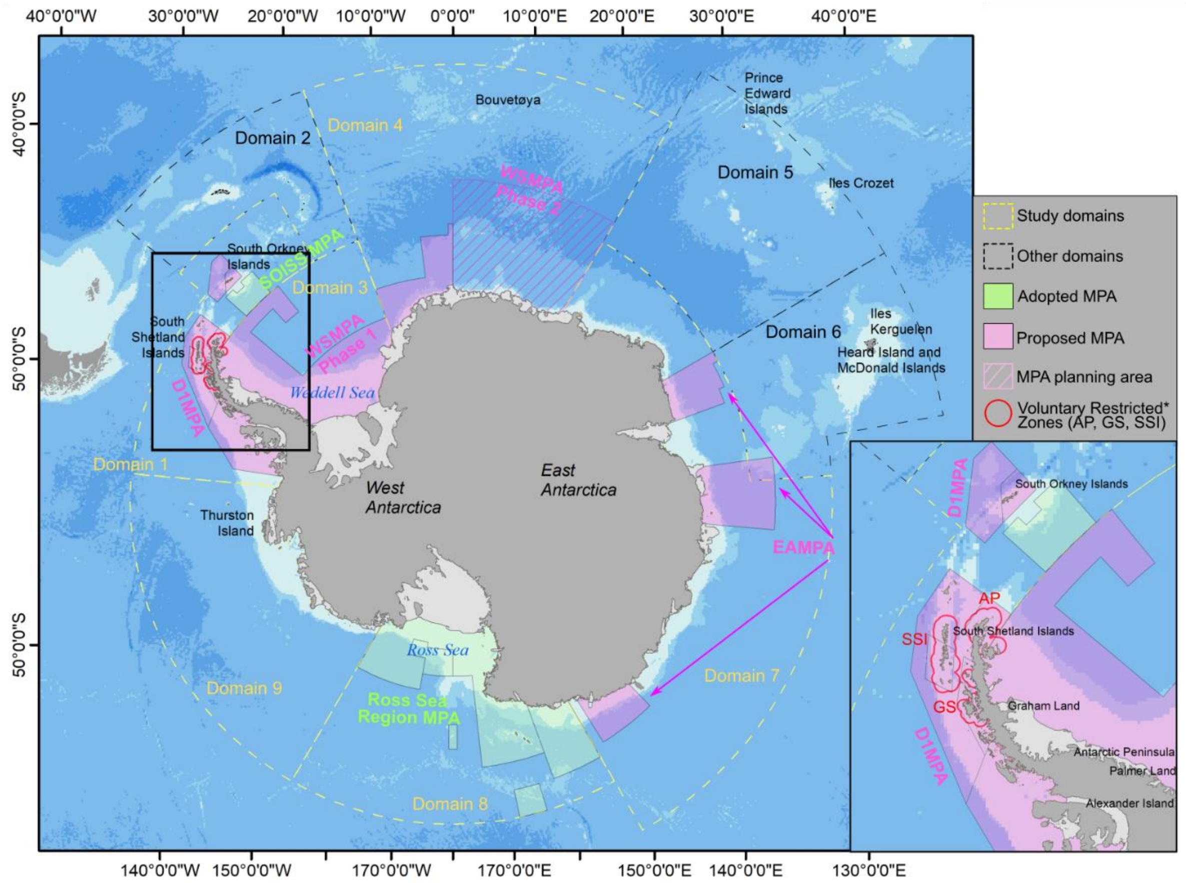

Figure 2: CCAMLR MPA planning domains in which the identification of marine Important Bird and Biodiversity Areas for penguins was undertaken for the study (Domains 1, 3, 4, 7, 8 and 9). Adopted MPAs within the planning domains include, the Ross Sea Region MPA and the South Orkney Islands Southern Shelf MPA (SOISS MPA). Proposed MPAs include the Domain 1 MPA (D1MPA), Weddell Sea MPA Phase 1 (WSMPA Phase 1) and the East Antarctica MPA (EAMPA). Also shown are the Weddell Sea MPA Phase 2 Planning Area (WSMPA Phase 2) and the Voluntary Restricted Zones (VRZs) in which a majority of krill fishing fleets have limited their operations in certain regions during parts of the summer (AP: Antarctic Peninsula: 1 Oct – 1 Feb, GS: Gerlache Strait: 15 Oct – 15 Feb, SSI: South Shetland Islands: 1 Nov – 1 Mar). Inset map area indicated by black bounding box.

Delineating marine IBAs for Antarctic penguins

Population estimates

We derived abundance estimates for penguins breeding in Antarctica from several sources. Primarily, we collated abundance estimates and colony location data for penguins via the MAPPPD data portal, a database designed specifically for the monitoring of Antarctic penguin population data (Humphries et al. 2017). Notably, colonies in this data portal are categorised as those areas that represent one biologically relevant population. This portal contains records of 3743 penguin colony counts from 117 sources and 662 sites around the Antarctic; the most recent update occurred on 02 April 2019. After excluding 21 colonies for which no counts existed, colony counts for each species were present for 280 Adélie Penguin colonies, 331 Chinstrap Penguin colonies, 108 Gentoo Penguin colonies and 47 Emperor Penguin colonies.

In addition to the abundance estimates recorded from MAPPPD, we supplemented these data for Emperor Penguins to include eight additional colony locations (Ancel et al., 2017) and abundance estimates (Wienecke, 2012; Trathan et al., 2019b). For Emperor Penguins, historical records of the Emperor Island colony appear in the MAPPPD data portal. However, the Emperor Island colony no longer exists or is restricted to a very small number of individuals, and was therefore removed for the analysis (Trathan et al., 2011). Abundance estimates derived for six colonies from Trathan et al. (2019b) refer to the minimum population estimate for each colony (0, 2000, 4000, 8000, 12000, or 16000).

We also supplemented the Chinstrap Penguin population estimates available from the MAPPPD data portal with a recent collation of evidence which is in preparation for publication (Strycker et al., 2020). The data available in Strycker et al. (2020) relates to 368 breeding Chinstrap Penguin breeding colonies. We crossed referenced the data available in the MAPPPD data portal with that of Strycker et al. (2020). Nine colonies in the original MAPPPD data were not present in Strycker et al. (2020), likely because records were amalgamated into updated records. The Strycker et al. (2020) data also had population estimates for an additional 47 colonies. Based on the Colony Status, Population Change and Notes given in Strycker et al. (2020) we selected only those colonies from the 47 new ones that were confirmed still to exist and where chinstrap penguin populations had been confirmed; yielding an additional 30 colonies for the analysis. The other 17 colonies, were either extirpated or further confirmation is needed to identify species. We updated population estimates for 10 of the colonies originally sourced from MAPPPD as these had updated recent or maximum population estimates.

From the aggregated data, and filtering of records from the MAPPPD data portal (See: Refinements to population estimates from MAPPPD data portal, below) we derived the minimum, median, maximum and most recent number of breeding pairs for each colony; the primary metric for monitoring penguin populations. The final number of colonies considered for each species was 280 for Adélie Penguins, 326 for Chinstrap Penguins, 108 for Gentoo Penguins and 54 for Emperor Penguins (Figure 1).

Additional sources of Antarctica wide and colony specific population estimates exist for the four penguin species. However, as of the time of this manuscript sources have yet to be published, updated, or do not yet provide a common peer review metric for all four penguin species (See Appendix: Antarctica wide sources of penguin and seabird abundance estimates).

Refinements to population estimates from MAPPPD data portal

Within the MAPPPD data portal, abundance estimates are reported for individual colonies as number of nests, adults, or chicks, and in two instances count type was unknown (

Table 1).

Table 1: Number and type of abundance estimates reported for penguin species within the MAPPPD data portal.

	Count type			
Species	Nests	Adults	Chicks	Unknown
Adélie Penguin	1002	223	207	-
Chinstrap Penguin	741	87	114	-
Gentoo Penguin	878	1	229	-
Emperor Penguin	3	126	102	2

Counts primarily occurred during the breeding period for species (Figure 3). Therefore, we converted adult counts 1:1 to nest counts; following the assumption that an appropriately timed adult count during the breeding period is closely related to the number of nesting pairs, minimising uncertainty in the abundance estimate (Che-Castaldo et al., 2017).

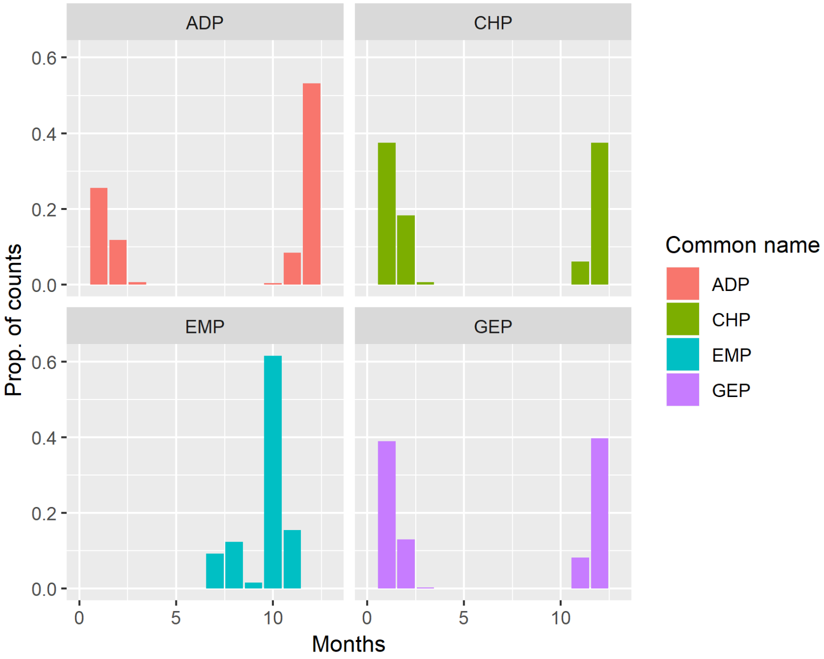

Figure 3: Month of censuses (all count types) for major Antarctic penguin species, as recorded in the MAPPPD data portal (Humphries et al., 2017). ADP Adélie Penguin, CHP Chinstrap Penguin, EMP Emperor Penguin, GEP Gentoo Penguin.

As nest counts are indicative of breeding pair numbers and day time adult counts during the breeding period closely reflect nest counts, chick counts were only used for penguin colonies where neither nest or adult counts existed. For the seventeen pygoscelid colonies where this occurred, we estimated the number of breeding pairs by converting according to a breeding success ratio of 0.9 (Che-Castaldo et al., 2017). When multiple counts were present for a colony during a single season, we took the maximum value for the season on the basis that this count would reflect the peak number of breeding pairs in a given season.

For all colonies in the MAPPPD database where abundance estimates were available, the number of seasons with data was typically 1 to 2 for each species (Figure 4); highlighting the historical constraints in annual monitoring of colonies on an Antarctic-wide basis. Although a number of estimates are older than the suggested 8-12 year maximum age of counts for IBA sites, these estimates remain the best available (Trathan et al., 2019a). The development of remote monitoring technologies such as satellite imagery (Fretwell and Trathan, 2009; Lynch et al., 2012) and time-lapse cameras (Southwell and Emmerson, 2015; Hinke et al., 2018; Jones et al., 2018), may offer solutions to this challenge in future.

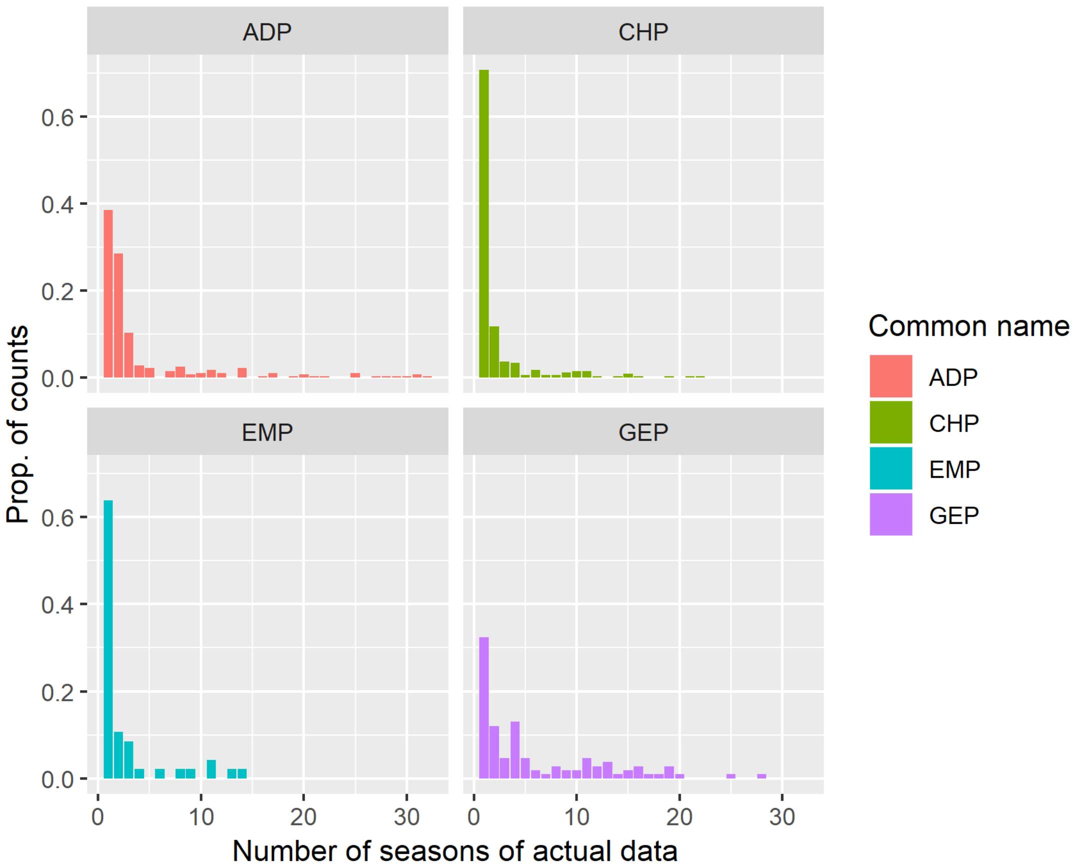

Figure 4: Histogram showing the number of seasons of actual data for Antarctic penguin colonies. ADP Adélie Penguin, CHP Chinstrap Penguin, EMP Emperor Penguin, GEP Gentoo Penguin.

Antarctica wide sources of penguin and seabird abundance estimates.

When delineating marine IBAs, the choice of abundance estimates – both for the potential colony in question and global population estimate – may influence whether a site meets a given criteria or not. In the case of the four Antarctic penguin species, this relates to IBA criteria A4 (>1% of the global population). Furthermore, as IBAs are a subset of Key Biodiversity Areas (KBA Secretariat, 2019; KBA Standards and Appeals Committee, 2019), sites should be assessed every 8-12 years and can only be delineated based on the current presence of biodiversity, rather than future estimates from predictive models (IUCN, 2016). In remote areas where population monitoring is difficult, older data may be used to delineate sites so long as no major perturbation is thought to have occurred in the region (for example, in sites where there has been extensive anthropogenic habitat alteration).

Antarctica wide population estimates for penguin species were previously collated for the seabird colony IBAs delineated in 2015 (Harris et al., 2015) (Figure 5). These IBAs were delineated based on population data derived for 20 seabird species (9 Procellariiformes, 5 Sphenisciformes, 1 Suliformes, 5 Charadriiformes) assessed against the IBA criteria, and provide a robust account of the most critical terrestrial sites for seabirds in Antarctica.

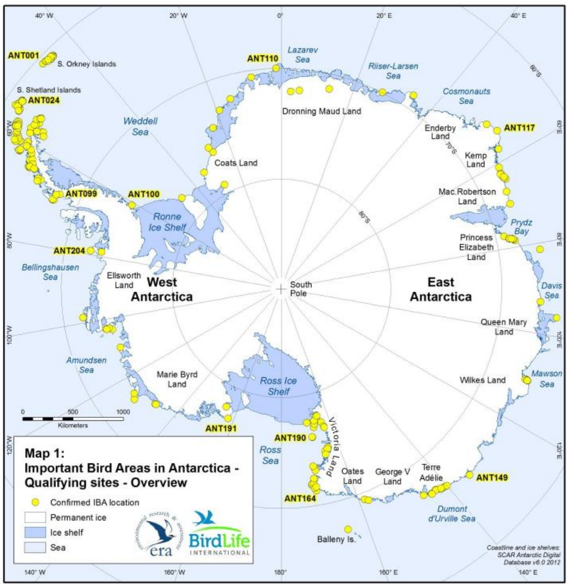

Figure 5: Network of terrestrial IBAs in Antarctica (seabird colonies). From Harris et al. (2015)

Since the 2015 austral summer season and the delineation of the terrestrial IBA sites, there are an additional 249 abundance estimates recorded for the three pygoscelid penguin species in Antarctica, and additional estimates readily available for Emperor Penguins (Trathan et al., 2019b) and Chinstrap Penguins (Strycker et al., 2020), each of which also have revised global population estimates.

In light of the updated abundance estimates being available (see: Population estimates), and the requirement for sites to be delineated based on the current presence of biodiversity, we delineated marine IBAs using the newly collated records as oppose to those presented in Harris et al. (2015). Furthermore, we acknowledge the peer-reviewed Antarctica wide population models for Adélie (Che-Castaldo et al., 2017) and Emperor Penguins (Jenouvrier et al., 2014, 2017, 2019). Also, the precise Antarctica wide population models (i.e. well parameterised) for Chinstrap and Gentoo Penguins (Heather Lynch, unpublished data) available via the MAPPPD data portal (Humphries et al., 2017), which are still in development. Once peer-reviewed meta-population models are available for all four penguin species across Antarctica, future efforts to refine sites critical to the conservation of penguins and their associated biodiversity should consider using these abundance estimates.

Determining at-sea distribution

Several methodologies for estimating seabird at-sea distribution in un-sampled regions have been proposed. For example, a foraging radius approach whereby either the mean of mean-maximum distances reported from tracked colonies is used to delineate a buffer around focal colonies (Thaxter et al., 2012; Soanes et al., 2016), or the mean of maximum distances reported at other colonies is used to generate a buffer in which a density decay function is applied to estimate species abundances at specified intervals from the focal colony (Grecian et al., 2012; Critchley et al., 2018, 2019). For data rich regions, species distribution/habitat models which correlate species distributions with physical and environmental covariates can be used to make predictions at un-sampled locations (Franklin, 2010; Wakefield et al., 2017; Dias et al., 2018; Warwick-Evans et al., 2018). Alternatively, individual based models IBMs (rule-based models), which nevertheless should be parameterised through known correlations with physical and environmental covariates, might offer a solution to estimate distribution (Grimm et al., 2016; Warwick-Evans et al., 2017; Zhang et al., 2017). We built upon the method outlined in Critchley et al. (2018) to map the distribution (on a 5 km x 5 km grid) and estimate the abundance of penguins at sea from individual colonies during the chick rearing period.

Density distribution surfaces - methods

For each colony in our dataset, we:

1) determined the travel distance to each at-sea cell bound by the foraging radius associated to a specific colony.

- A land mask was used when determining this distance, thereby, accounting for land which would limit dispersal.
- Given the typically short-ranging movements undertaken by the penguin species compared to volant seabird species (Oppel et al., 2018), we also specified a bearing for each colony that directed birds directly away from the colony of origin. A 60 degree buffer was specified on either side of this bearing which constrained birds to forward movement away from the colonies only.

2) Distance values where inverted and normalised so the highest values were found closest to colonies.

3) A decay function (which accounts for greater use of cells closest to the colony) was implemented whereby values in each cell were weighted by the inverse log distance from the colony.

- Unlike Critchley et al. (2018), we did not normalise cell values a second time following step 3, as this assumes all birds from a colony distribute themselves simultaneously throughout the possible range of the specified buffer. This might be more suited to volant species. However, diving species are required to travel through every cell and for Antarctic penguins in particular, their typical foraging strategy during the breeding period indicates they often commence diving and searching behaviours from the vicinity of their focal colony (Ratcliffe and Trathan, 2011).

4) The final density distribution surface (produced in step 3) was multiplied by the number of breeding pairs from the given colony to generate the predicted number of breeding pairs which would potentially utilise a cell.

- i.e. producing a raster surface with a predicted number of breeding pairs using each cell from a given colony

Steps 1 through 4 were repeated for all colonies and the distributions were summed to generate a projected distribution map for breeding adult Antarctic penguins during the chick-rearing period; the period when their range is most constrained (Appendix Figures: Density distribution surfaces). Projected distributions were generated for all four population estimates (see details to follow).

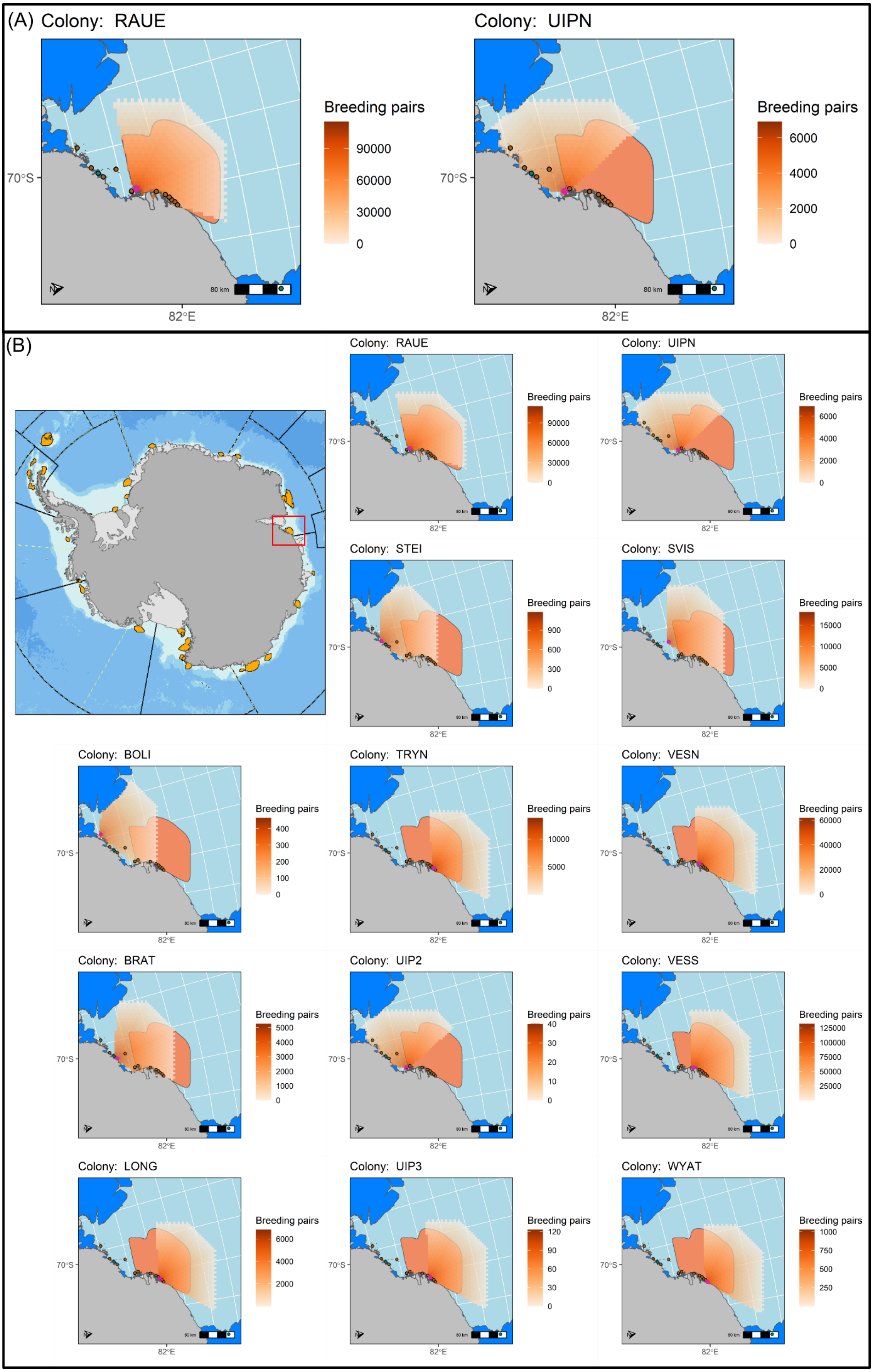
(A) Colony: RAUE
Breeding pairs
90000
60000
30000
0
70°S
82°E
80 km
Colony: UIPN
Breeding pairs
6000
4000
2000
0
70°S
82°E
80 km
(B)
Colony: RAUE
Colony: UIPN
Colony: STEI
Breeding pairs
900
600
300
0
Colony: SVIS
Breeding pairs
15000
10000
5000
0
Colony: BOLI
Breeding pairs
400
300
200
100
0
Colony: TRYN
Breeding pairs
10000
5000
Colony: VESN
Breeding pairs
60000
40000
20000
0
Colony: BRAT
Breeding pairs
5000
4000
3000
2000
1000
0
Colony: UIP2
Breeding pairs
40
30
20
10
0
Colony: VESS
Breeding pairs
125000
100000
75000
50000
25000
Colony: LONG
Breeding pairs
6000
4000
2000
Colony: UIP3
Breeding pairs
120
90
60
30
0
Colony: WYAT
Breeding pairs
1000
750
500
250

Figure 6: Example of density distribution surfaces generated for chick-rearing adult Adélie Penguins from 13 colonies which contributed to the delineation of marine IBA 35 (orange polygon). Upper panel (A) provides enlarged view for 2 of 13 sites displayed in lower panel (B). Pink border indicates colony of origin. Site names given in Colony Codes section.

Once distributions for a species have been generated or determined directly from observations, a critical next step in site-based species conservation is determining which region of that species distribution should be conserved; both qualitative and quantitative methods can be employed. Qualitative methods may include delineating sites within the boundaries of existing conservation areas or management units. Quantitative methods commonly applied to seabird distributions include, kernel density analysis, maximum curvature boundaries and Getis-Ord analysis (Cleasby et al., 2018; Sussman et al., 2019). As all four penguin species were assessed only against IBA criteria A4, the methods indicated above were not applicable as there is a minimum requirement to retain all cells which hold >1% of the global population. For globally threatened species which require much lower thresholds to be met when assessing against IBA criteria, additional quantitative steps may be applicable. For example, when assessing for an area that best balances the proportion of a population to be considered for site protection against the extent of the possible area (maximum curvature analysis). Or, when trying to identify clusters of a species which are statistically distinct from patterns in the surrounding landscape (Getis-Ord analysis).

Given the differences in census efforts at each colony we derived density distribution surfaces for each species and their respective colonies based on four population estimates determined from the aggregated dataset: minimum, median, maximum and most recent number of breeding pairs at a given colony (Appendix Figures: Density distribution surfaces). This is a pragmatic choice on our part to account for the varied availability of population estimates from colonies (seldom collected in consecutive years from many colonies) when delineating marine IBA boundaries that acknowledges uncertainties with specific population estimates from individual colonies (Croxall and Kirkwood, 1979; Southwell et al., 2013; Lynch and LaRue, 2014) (Figure 7). The density distribution surfaces from each colony were then summed; providing an Antarctic-wide estimate of each species likely distribution at sea that accounts for potential geographic structuring between species breeding colonies (Santora et al., 2020). For each layer derived, we selected only those cells which had >1% of the global population (IBA criteria A4). Then, for each species, we selected only those cells which triggered IBA criteria for at least three of four population estimates (i.e. cells had to have >1% of the global population for at least the median, maximum and most recent counts, Figure 7).

Once marine IBAs were identified at the species level, the final layers for each species were then aggregated to delineate Antarctic-wide marine IBA boundaries for all penguin species.

These boundaries distinguished between marine IBAs specific to a single species, versus marine IBAs specific to two or more species. To avoid the cell based nature of areas through the identification process and delineate practicable management units, the final marine IBAs were converted to polygons which were further smoothed using Gaussian kernel regression, where the bandwidth was set according to the number of vertices in each polygon (Strimas-Mackey, 2018) (Figure 8).

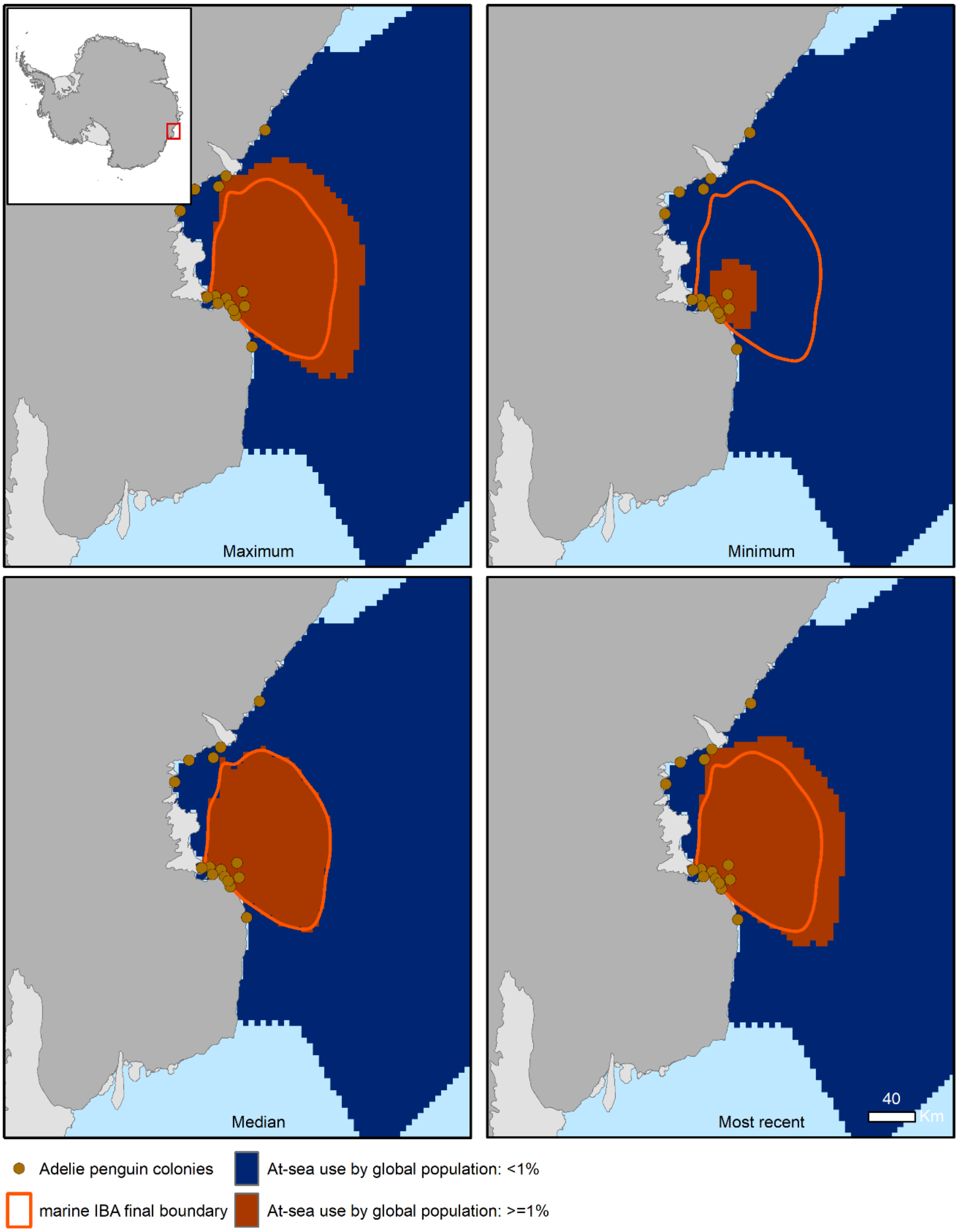

Figure 7: Final marine IBA boundaries for individual species were selected where cells from the density distribution surfaces triggered IBA criteria for at least three of four population estimates (i.e. cells had to have >1% of the global population for at least the median, maximum and most recent counts). Marine IBA in this example is the site marine IBA 39.

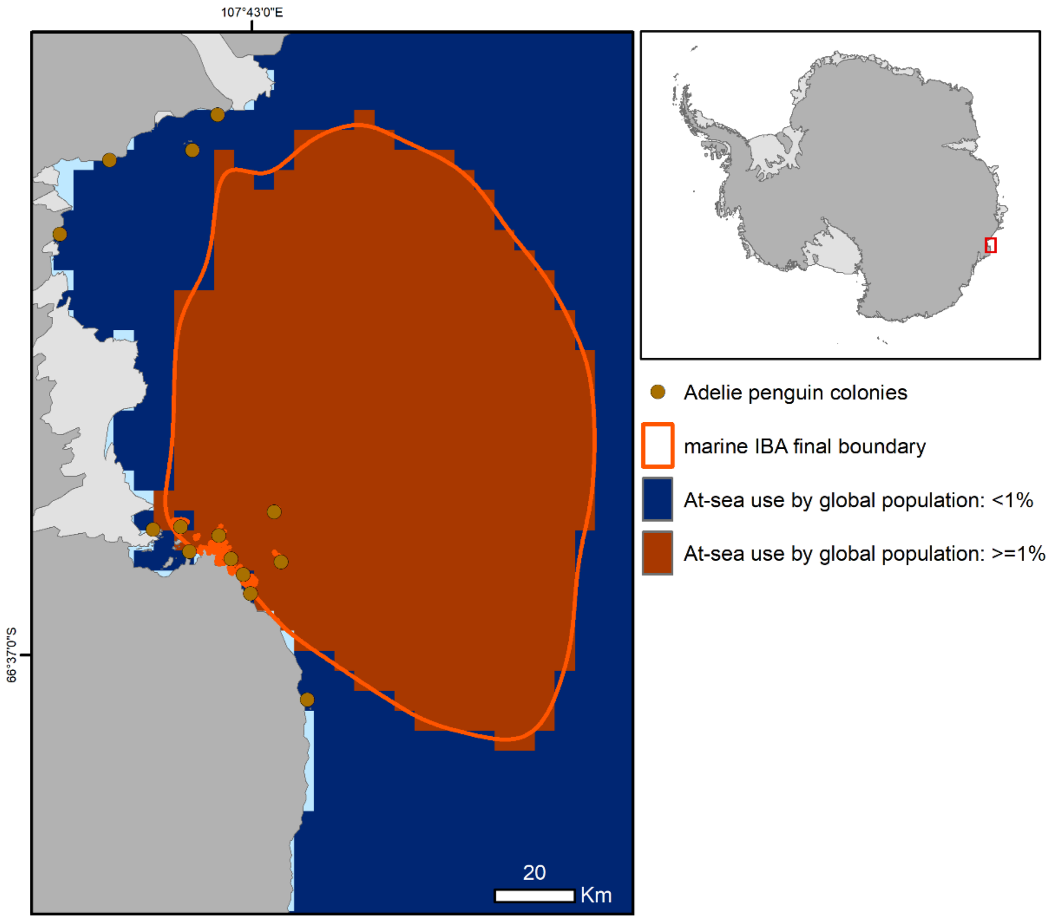

Figure 8: Raster cells (brown cells) to polygon (orange border) conversion for final marine IBA sites, facilitating the delineation of practicable management units. Raster cells were converted to polygons which were further smoothed using Gaussian kernel regression, where the bandwidth was set according to number of vertices in each polygon (Strimas-Mackey, 2018).

Literature review - Foraging radii

Table 2: Weighted mean-maximum foraging radius for Antarctic penguin species during the chick-rearing period, according to CCAMLR subarea. Reference source indicates whether radii determined from literature review (Appendix: Literature review – foraging radii) or based on the most conservative estimate for those subareas where tracking data were not available.

Species	CCAMLR subarea	Weighted mean max distance during chick rearing in km (SD)	Reference source	Studies (n)
Adélie	48.1	54 (25.4)	Literature	13
	48.2	84 (NA)	Literature	2
	58.4.1	149 (49.5)	Literature	5
	58.4.2	92 (NA)	Literature	2
	88.1	96 (59.3)	Literature	8
	88.2	54	Conservative estimate	
	88.3	54	Conservative estimate	
Chinstrap	48.1	51 (9.9)	Literature	7
	48.2	92 (32.8)	Literature	10
	88.1	51	Conservative estimate	
Gentoo	48.1	32 (11.6)	Literature	6
	48.2	32	Conservative estimate	
Emperor	48.1	109	Conservative estimate	
	48.5	109	Conservative estimate	
	48.6	109	Conservative estimate	
	58.4.1	109 (NA)	Literature	1
	58.4.2	213 (NA)	Literature	2
	88.1	109	Conservative estimate	
	88.2	109	Conservative estimate	
	88.3	109	Conservative estimate	

We found that not all studies reported a maximum or mean-maximum distance travelled by birds from their breeding colony, probably because of the varied aims for each study. To account for this, we utilised only those data from colonies where the necessary foraging parameter had been reported (Figure 9, Table 3). For CCAMLR subareas where the mean of maximum foraging radii could not be established clearly, we used the most conservative estimated value.

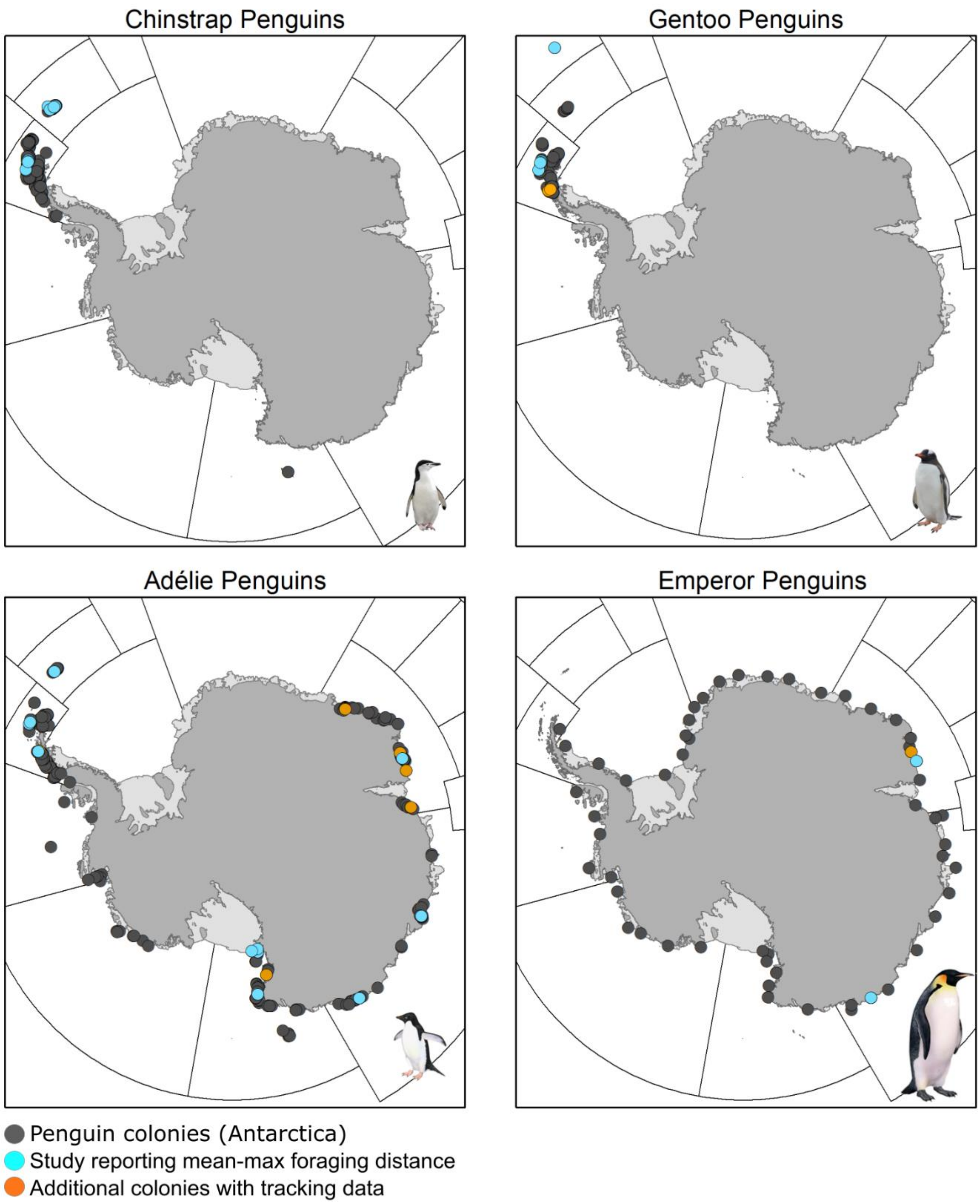

Figure 9: Penguin colonies of Antarctica considered in this study for deriving weighted mean maximum travel distances during the critical chick-rearing period of the breeding cycle. Colonies include those where tracking studies report maximum foraging distance of birds (derived from GPS or PTT devices), and where additional tracking studies were recorded following a literature review (See Table 3).

Table 3: Colonies for four Antarctica penguin species (ADP: Adélie Penguin, CHP: Chinstrap Penguin, GEP: Gentoo Penguin, EMP: Emperor Penguin), from which mean or maximum foraging radii (FR) could be determined during the breeding period (CR: Chick rearing, I: Incubation) Colonies were identified through a systematic literature review.

Species	Region	Site	CCAMLR subarea	Long	Lat	Breeding period	Device	Mean max distance (km)	Mean max distance (*FR)	Max distance (km)	Alternate estimate of distance reported	Reference
ADP	South Orkney Islands	Gourlay Peninsula	48.2	-45.5863	-60.7309	CR	PTT	99.9 ± 13.1	99.9	177.1		Lynnes et al, 2002
		Gourlay Peninsula	48.2	-45.5863	-60.7309	CR	PTT	57.8 ±17.1	57.8	163.8		Lynnes et al, 2002
		Gourlay Peninsula	48.2	-45.5863	-60.7309	I	GPS	75.9 ±19.7	75.9			Clewlow et al 2018
		Gourlay Peninsula	48.2	-45.5863	-60.7309	CR	GPS	24.6 ±4.8	24.6			Clewlow et al 2018
		Gourlay Peninsula	48.2	-45.5863	-60.7309	C	GPS	95.6 ±11.4	95.6			Clewlow et al 2018
	South Shetland Islands	Admiralty Bay	48.1	-58.5	-62.167	CR	PTT	28.6±19.9	28.6			Hinke et al. 2017
	Antarctica	Cape Bird (Ross Island)	88.1	166.433	-77.217	I	PTT	112	112	260		Davis and Miller, 1992
		Cape Crozier	88.1	169.32	-77.46	CR	GPS	53.8	53.8	146		Ainely et al. 2015
		Petrel Island	58.4.1	140.167	-66.667	CR	PTT	37	37			Kerry et al, 1997
		Shirley Island	58.4.1	110.5	-66.283	CR	PTT	68 ±29	68			Wienecke et al, 2000
		Shirley Island	58.4.1	110.5	-66.283	C	PTT	113 ±17	113			Wienecke et al, 2000
		Pointe Géologie	58.4.1	140.01	-66.67	CR	PTT	79.96	79.96			Angelier et al, 2008
		Dumont d'Urville	58.4.1	140	-66.65	I	GPS	267 ±45	267			Cottin et al. 2012
		Dumont d'Urville	58.4.1	140	-66.65	I	GPS	287 ±54	287			Widman et al. 2015
		Dumont d'Urville	58.4.1	140	-66.65	CR	GPS	57.6 ±45	57.6			Widman et al. 2015
		Petrel Island	58.4.1	140.167	-66.667	CR	PTT	37 ±21	37			Wienecke et al. 1998
		Petrel Island	58.4.1	140.167	-66.667	C	PTT	36 ±17	36			Wienecke et al. 1998
		Magnetic Island	58.4.2	77.9	-68.55	CR	PTT	200	200			Clarke et al, 2003
		Scullin Monolith	58.4.2	66.6968	-67.7833	CR	PTT	120	120			Clarke et al, 2003
		Ufs Island	58.4.2	61.1406	-67.4694	CR	PTT	120	120			Clarke et al, 2003
		Béchervaise Island	58.4.2	62.8167	-67.5833	CR	PTT	131 ±6.4	131			Nicol et al. 2008
		Béchervaise Island	58.4.2	62.8167	-67.5833	CR	PTT	163 ±12.4	163			Nicol et al. 2008

CHP	South Shetland Islands	Admiralty Bay	48.1	-58.5	-62.167	CR	PTT	17.3 ±11	17.3		Hinke et al. 2017
		Cape Shirreff	48.1	-60.7874	-62.4575	CR	PTT	24.3 ±12.3	24.3		Hinke et al. 2017
		Barton Peninsula	48.1	-58.791	-62.224	CR	GPS	16.4 ±10.1	16.4		Kokubun et al. 2010
		Barton Peninsula	48.1	-58.791	-62.224	CR	GPS	22.3 ±9.9	22.3		Kokubun et al. 2013
		Barton Peninsula	48.1	-58.791	-62.224	CR	GPS	23.68 ±8.60	23.68		Kokubun et al. 2015
		Narębski point	48.1	-58.775	-62.238	I	GPS	56.58	56.58	65.2	Lee et al. 2017
		Narębski point	48.1	-58.775	-62.238	CR	GPS	24.73	24.73	44.8	Lee et al. 2017
		Admiralty Bay, Cape Shirreff	48.1	-58.5	-62.167	CR	PTT	13.5 ±8.6	13.5		Miller et al. 2010
		Cape Shireff	48.1	-60.7874	-62.4575	CR	PTT	26.2 ±11.5	26.2		Miller et al. 2011
	South Orkney Islands	Gourlay Peninsula	48.2	-45.95	-60.2	I	GPS	135 ±9.2	135		Clewlow et al 2018
		Gourlay Peninsula	48.2	-45.95	-60.2	G	GPS	40.9 ±7.8	40.9		Clewlow et al 2018
		Gourlay Peninsula	48.2	-45.95	-60.2	C	GPS	35.9 ±20.21	35.9		Clewlow et al 2018
		Gourlay Peninsula	48.2	-45.95	-60.2	CR	PTT	57.8 ±8.2	57.8	112	Lynnes et al. 2002
		Gourlay Peninsula	48.2	-45.95	-60.2	CR	PTT	35.1 ±3.4	35.1	55.6	Lynnes et al. 2003
		Monroe	48.2	-46.05	-60.6	I	GPS	91 ±54	91		Warwick-Evans et al. 2018
		Monroe	48.2	-46.05	-60.6	G	GPS	35 ±17	35		Warwick-Evans et al. 2018
		Monroe	48.2	-46.05	-60.6	C	GPS	49 ±39	49		Warwick-Evans et al. 2018
		Powell Island	48.2	-45.029	-60.725	I	GPS	103 ±80	103		Warwick-Evans et al. 2018
		Powell Island	48.2	-45.029	-60.725	G	GPS	26 ±17	26		Warwick-Evans et al. 2018
		Powell Island	48.2	-45.029	-60.725	C	GPS	26 ±17	26		Warwick-Evans et al. 2018
		Laurie	48.2	-44.657	-60.725	I	GPS	39 ±47	39		Warwick-Evans et al. 2018
		Laurie	48.2	-44.657	-60.725	G	GPS	22 ±8	22		Warwick-Evans et al. 2018
		Gourlay Point	48.2	-45.5863	-60.7309	I	GPS	132 ±55	132		Warwick-Evans et al. 2018
		Gourlay Point	48.2	-45.5863	-60.7309	I	GPS	134 ±43	134		Warwick-Evans et al. 2018
		Gourlay Point	48.2	-45.5863	-60.7309	G	GPS	13 ±7	13		Warwick-Evans et al. 2018

		Gourlay Point	48.2	-45.5863	-60.7309	G	GPS	51 ±38	51			Warwick-Evans et al. 2018
		Gourlay Point	48.2	-45.5863	-60.7309	C	GPS	67 ±58	67			Warwick-Evans et al. 2018
EMP	Antarctica	Pointe Géologie	58.4.1	140.01	-66.67	CR	PTT	90	90	NA		Rodary et al, 2000
		Pointe Géologie	58.4.1	140.01	-66.67	CR	PTT	60	60	NA		Rodary et al, 2000
		Pointe Géologie	58.4.1	140.01	-66.67	I	PTT	94 ±16	94	NA		Zimmer et al, 2008
		Pointe Géologie	58.4.1	140.01	-66.67	PH	PTT	106 ±28	106	NA		Zimmer et al, 2008
		Pointe Géologie	58.4.1	140.01	-66.67	C	PTT	85 ±8	85	NA		Zimmer et al, 2008
		Auster	58.4.2	63.98	-67.39	C	PTT	67.5	68	91		Wienecke et al, 2004
		Taylor Glacier	58.4.2	60.88	-67.45	C	PTT	79.6	80	98		Wienecke et al, 2004
		Auster	58.4.2	63.98	-67.39	CR	PTT	133 ±27	133			Wienecke and Robertson, 1997
		Auster	58.4.2	63.98	-67.39	G	PTT	65 ±49	65			Wienecke and Robertson, 1997
GEP	South Shetland Islands	Admiralty Bay	48.1	-58.5	-62.167	CR	PTT	15.3 ±11.5	15.3			Hinke et al. 2017
		Cape Shirreff	48.1	-60.7874	-62.4575	CR	PTT	15.6 ±6.0	15.6			Hinke et al. 2017
		King George (Barton Peninsula)	48.1	-58.791	-62.224	CR	GPS	12.4 ±8.7	12.4			Kokubun et al. 2010
		King George (Barton Peninsula)	48.1	-58.791	-62.224	CR	GPS	17.7 ±6.7	17.7			Kokubun et al. 2013
		King George (Barton Peninsula)	48.1	-58.791	-62.224	CR	GPS	17.36 ±7.76	17.36			Kokubun et al. 2015
		Admiralty Bay, Cape Shirreff	48.1	-58.5	-62.167	CR	PTT	15.1 ±9.5	15.1		Distance from shore	Miller et al. 2010
		Cape Shireff	48.1	-60.7874	-62.4575	CR	PTT	14.4 ±6.6	14.4			Miller et al. 2011
Additional studies considered for determining suitable foraging radius of penguin species in Antarctica: Studies either did not report a mean or maximum foraging distance or fell beyond the region of interest												
ADP	South Shetland Islands	Ardley Island, King George Island	48.1	-58.933	-62.213	CR	OTH			35		Wilson et al, 2010
	Antarctica	Biscoe Point	48.1	-63.7775	-64.8114	G	PTT				-	Picket et al. 2018
		Béchervaise Island	88.1	62.9406	-67.5563	CR	PTT				90% <20km for males, 40% for females (majority 80-120km)	Clarke et al. 1998
		Cape Bird (Ross Island)	88.1	166.433	-77.217	I	PTT			272		Davis & Miller 1992

		Cape Crozier	88.1	169.32	-77.46	CR	PTT			~180		Ford et al. 2015
		Cape Bird	88.1	166.433	-77.217	CR	PTT			~50		Ford et al. 2015
		Cape Royds	88.1	166.1639	-77.5545	CR	PTT			~30		Ford et al. 2015
		Edmonson Point	88.1	165.0666	-74.3167	CR	PTT				birds ranged from 50 to 135km	Kerry et al. 1997
		Petrel Island	58.4.1	140.167	-66.667	CR	PTT				birds ranged from 50 to 135km	Kerry et al. 1997
		Shirley Island	58.4.1	110.5	-66.283	CR	PTT				birds ranged from 50 to 135km	Kerry et al. 1997
		Dumont d'Urville	58.4.1	140	-66.65	G	GPS				-	Thiebot et al. 2016
		Mawson Coast (Béchervaise Island)	58.4.2	62.9406	-67.5563	I	PTT			272		Clarke et al, 2006
		Mawson Coast (Béchervaise Island)	58.4.2	62.9406	-67.5563	CR	PTT			60		Clarke et al, 2006
		Mawson Coast (Béchervaise Island)	58.4.2	62.9406	-67.5563	C	PTT			125		Clarke et al, 2006
		Béchervaise Island	58.4.2	62.8167	-67.5833	CR	PTT				birds ranged from 50 to 135km across all 7 sites	Kerry et al. 1997
		Scullin Monolith	58.4.2	66.6968	-67.7833	CR	PTT				birds ranged from 50 to 135km	Kerry et al. 1997
		Ufs Island	58.4.2	61.1406	-67.4694	C	PTT				birds ranged from 50 to 135km	Kerry et al. 1997
		Magnetic Island	58.4.2	77.9	-68.55	CR	PTT				birds ranged from 50 to 135km	Kerry et al. 1997
		Hukuro Cove	58.4.2	39.65	-69.217	G	GPS				-	Watanabe et al. 2014
CHP	South Shetland Islands	Ardley Island	48.1	-58.933	-62.213	CR	OTH			33.5		Wilson and Peters, 1999 and Wilson,2010
	Antarctica	Powell Island	48.2	-45.029	-60.725	G	GPS					Lowther et al. 2017
	South Orkney Islands	Laurie, Monroe	48.2	-46.05	-60.6	I	GPS				-	Dias et al. 2018
	Norway	Bouvet Island	48.6	3.29	-54.41	CR	PTT			48		Biuw et al, 2010
		BouvetÃ¸ya	48.6	3.29	-54.41	CR	PTT	10 ±12	10	57		Blanchet et al. 2013
GEP	South Shetlands	Ardley Island	48.1	-58.933	-62.213	I	OTH				80% of time was spent within 50km	Wilson et al, 1998
		Ardley Island	48.1	-58.933	-62.213	CR	OTH			16	almost all time was spent within 5 km of the colony	Wilson et al, 1998 and Wilson, 2010

Antarctica	Anvers Island	48.1	-64.25	-64.66	G	PTT				-	Oliver et al. 2012
	Biscoe Point	48.1	-63.7775	-64.8114	G	PTT				-	Picket et al. 2018
South Georgia	Bird Island (Square Pond)	48.3	-38.5	-54.167	I	GPS	5.40 ±0.01	5.4	26.7		Ratcliffe et al. 2018
	Bird Island (Square Pond)	48.3	-38.5	-54.167	CR	GPS	6.20 ±0.02	6.2	37.8		Ratcliffe et al. 2018
Marion Island	Trypot Beach	58.7	37.867	-46.887	CR	GPS	10	10			Carpenter-Kling et al. 2017
French OT	Kerguelen (Estacade, Point Suzanne)	58.5.1	69.25	-49.317	C	GPS	21.6 ±18.7	21.6			Camprasse et al. 2017
	Kerguelen (Estacade, Morbihan Gulf, Antarctic Cove)	58.5.1	69.25	-49.317	I	PTT	8.30 ±4.20	8.3	11		Lescroel et al 2005
	Kerguelen (Estacade, Morbihan Gulf, Antarctic Cove)	58.5.1	69.25	-49.317	I	PTT	28.30 ±14.10	28.3	46		Lescroel et al 2005
	Kerguelen (Estacade, Morbihan Gulf, Antarctic Cove)	58.5.1	69.25	-49.317	CR	PTT	30.80 ±8.10	30.8			Lescroel et al 2005
Southwest Atlantic	New Island	out	-61.255	-51.692	I	PTT			<25	4.1 km+_3.8 km and 6.3 +-6.3 (EACH BIRD)	Boersma et al. 2002
	New Island (South)	out	-61.255	-51.692	CR	GPS	69.1 ±9.8	69.1	87.6		Masello et al. 2017
	New Island (South)	out	-61.255	-51.692	CR	GPS	49.6 ±33.0	49.6	89.3		Masello et al. 2017
	New Island (North)	out	-61.255	-51.692	CR	GPS	33.3 ±17.4	33.3	60.1		Masello et al. 2017
	Cow Bay, Bull Roads	out	-57.899	-51.389	G	GPS				-	Handley et al. 2018
	New Island	out	-61.255	-51.692	CR	GPS			60		Masello et al. 2010

Literature review: Key references

The references outlined below contributed to the literature review needed to determine the weighted mean-maximum foraging radius for Antarctic penguin species during the chick-rearing period. For interested parties, the reference list also includes studies which describe the non-breeding period distribution of the four penguin species.

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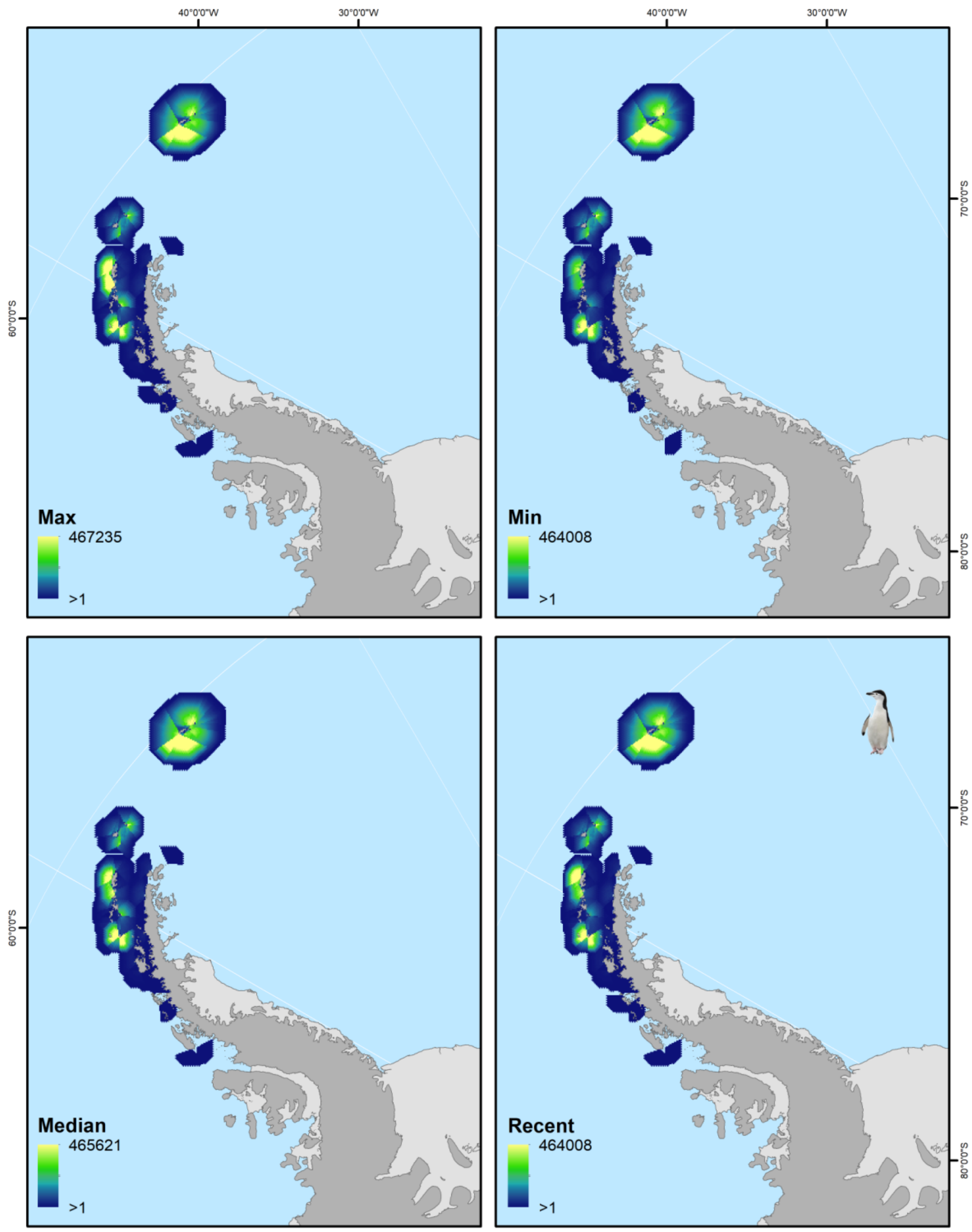
Results

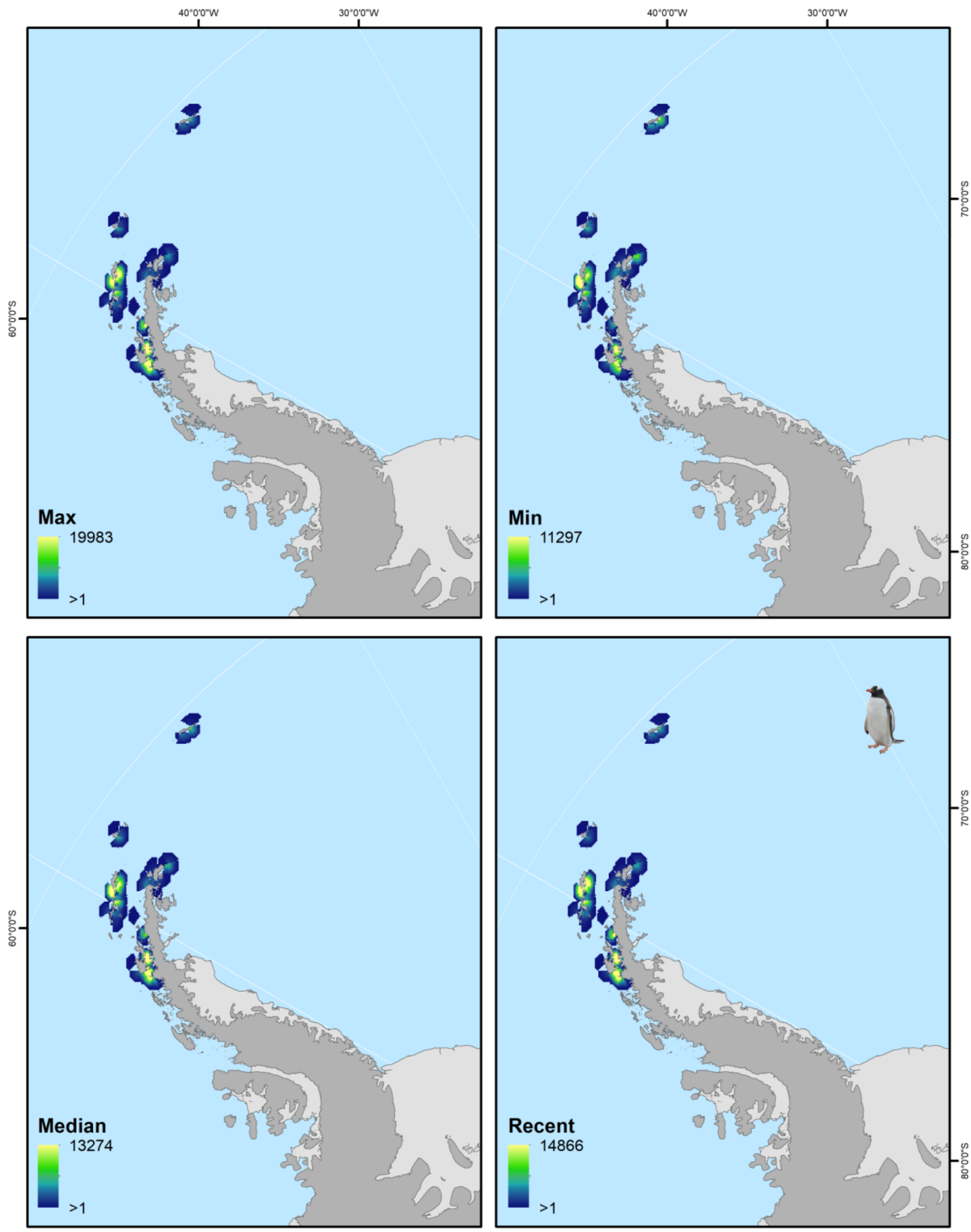
Density distribution surfaces

Density distribution surfaces derived for each of the four population estimates (minimum, median, maximum and most recent number of breeding pairs), for a given species.

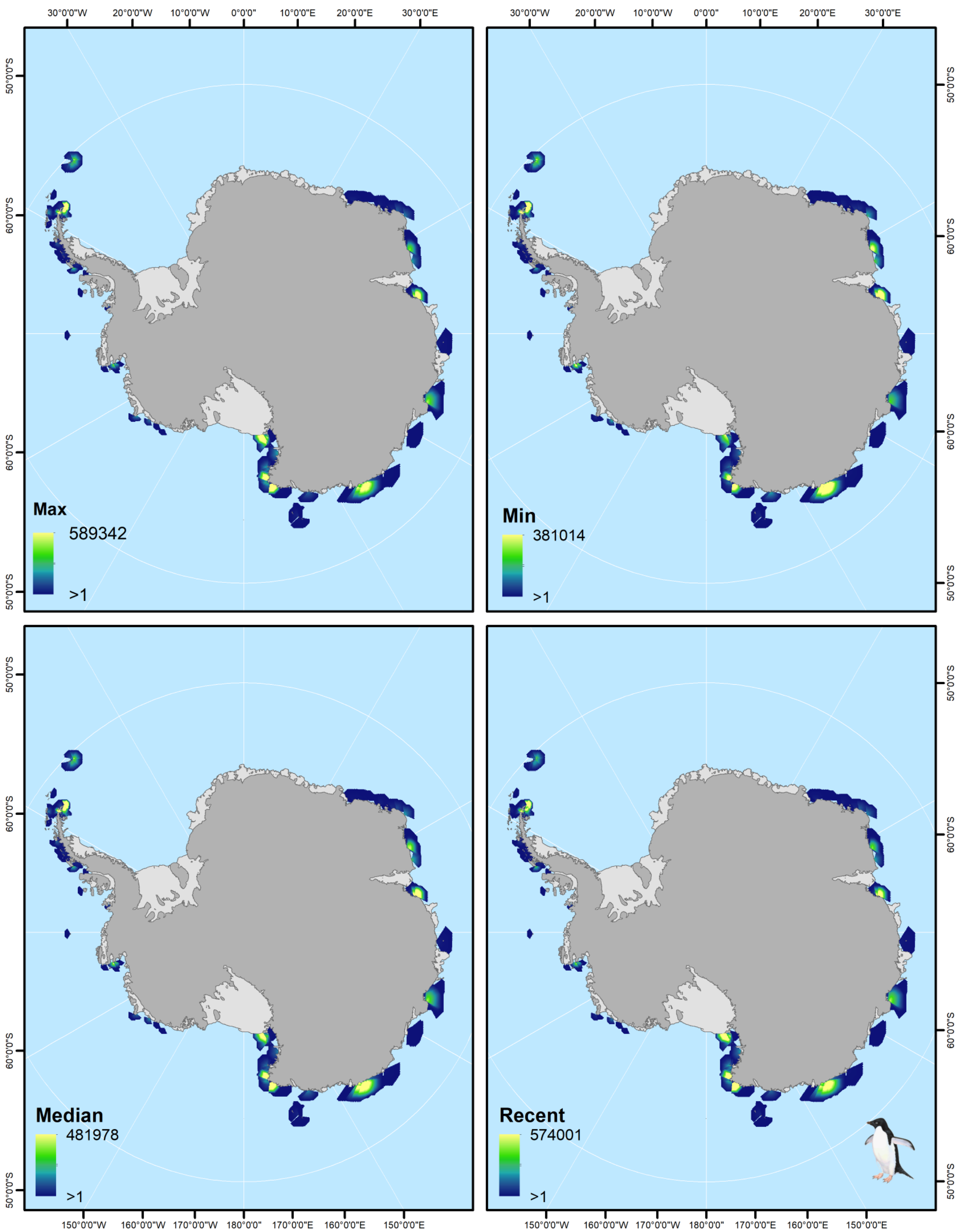
Estimated distributions of adult penguins during the chick-rearing period plotted on a 5km x 5km grid. The method for individual colonies utilises a modified foraging radius approach with a decay function (Critchley et al., 2018), further buffered by a 60 degree buffer on either side of a bearing that directs birds directly away from land. Legend indicates estimated number of breeding pairs utilising at-sea area based on summation over individual colony distributions (i.e. individual raster layers). Population estimates were derived from the four metrics determined for each individual colony.



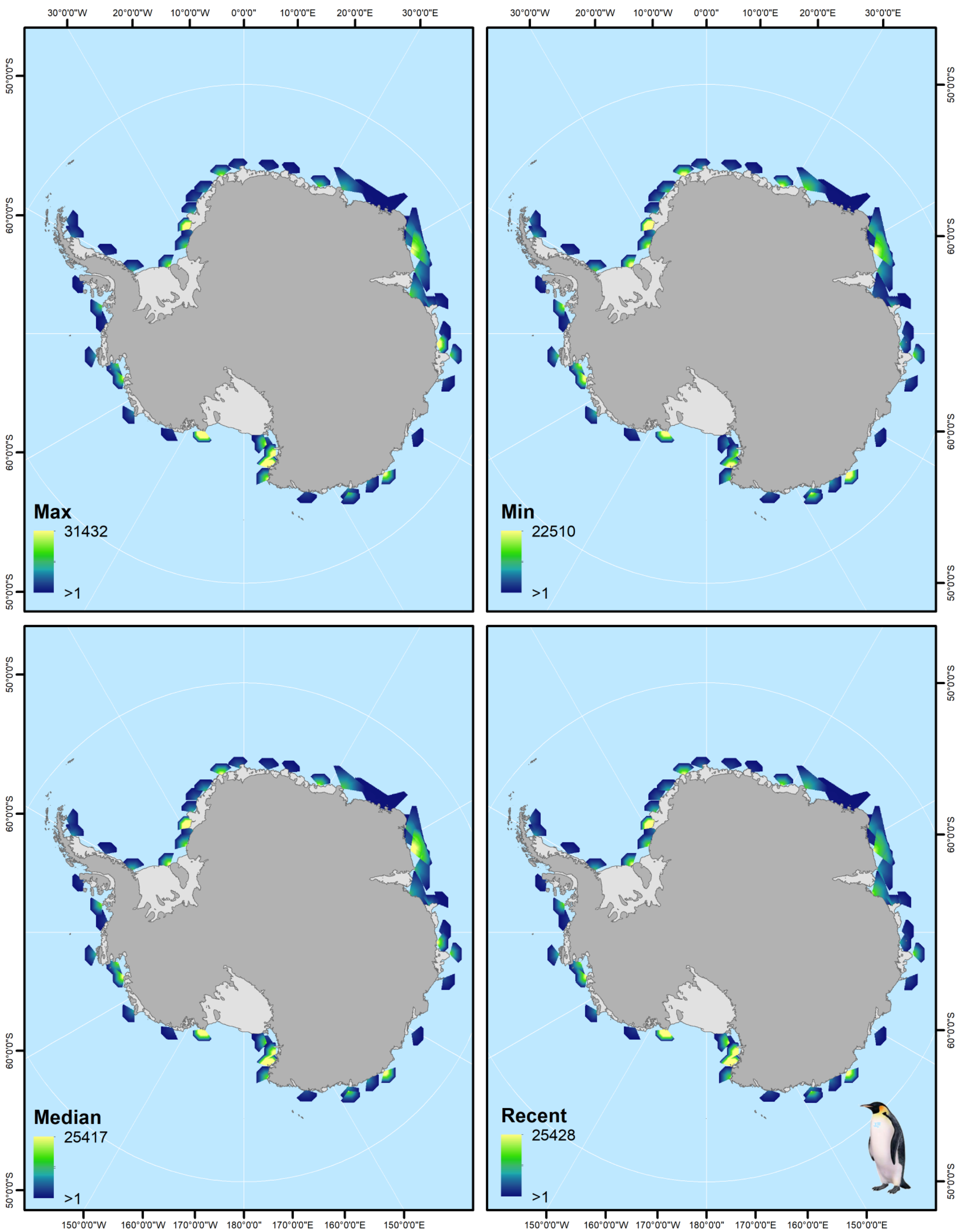
Chinstrap Penguin: Within CCAMLR MPA planning domains 1, 3, 4, 7, 8 and 9, range is largely restricted to the Antarctic Peninsula. The Balleny Islands colony (MPA planning domain 8: Ross Sea) is not shown as this colony holds <1% of the global population. Therefore, for Chinstrap Penguins alone, it would not qualify as an IBA under criteria A4.



Gentoo Penguins: Within CCAMLR MPA planning domains 1, 3, 4, 7, 8 and 9, range is restricted to the Antarctic Peninsula.



Adélie Penguins: Within CCAMLR MPA planning domains 1, 3, 4, 7, 8 and 9, this species has a circumpolar distribution.



Emperor Penguins: Within CCAMLR MPA planning domains 1, 3, 4, 7, 8 and 9, this species has a circumpolar distribution.

Inventory - Antarctica marine IBAs

For a detailed review of individual colonies and their population estimates (derived through colony specific density distribution surfaces) which contributed to each marine IBA, an Inventory to Antarctic marine IBAs for penguin species (Supplementary Material) is available.

Marine IBAs for Antarctic penguin species

We identified 63 marine IBAs for the four penguin species across Antarctica. These marine IBAs ranged across all CCAMLR subareas and MPA Planning Domains within our study area (Figure 10).

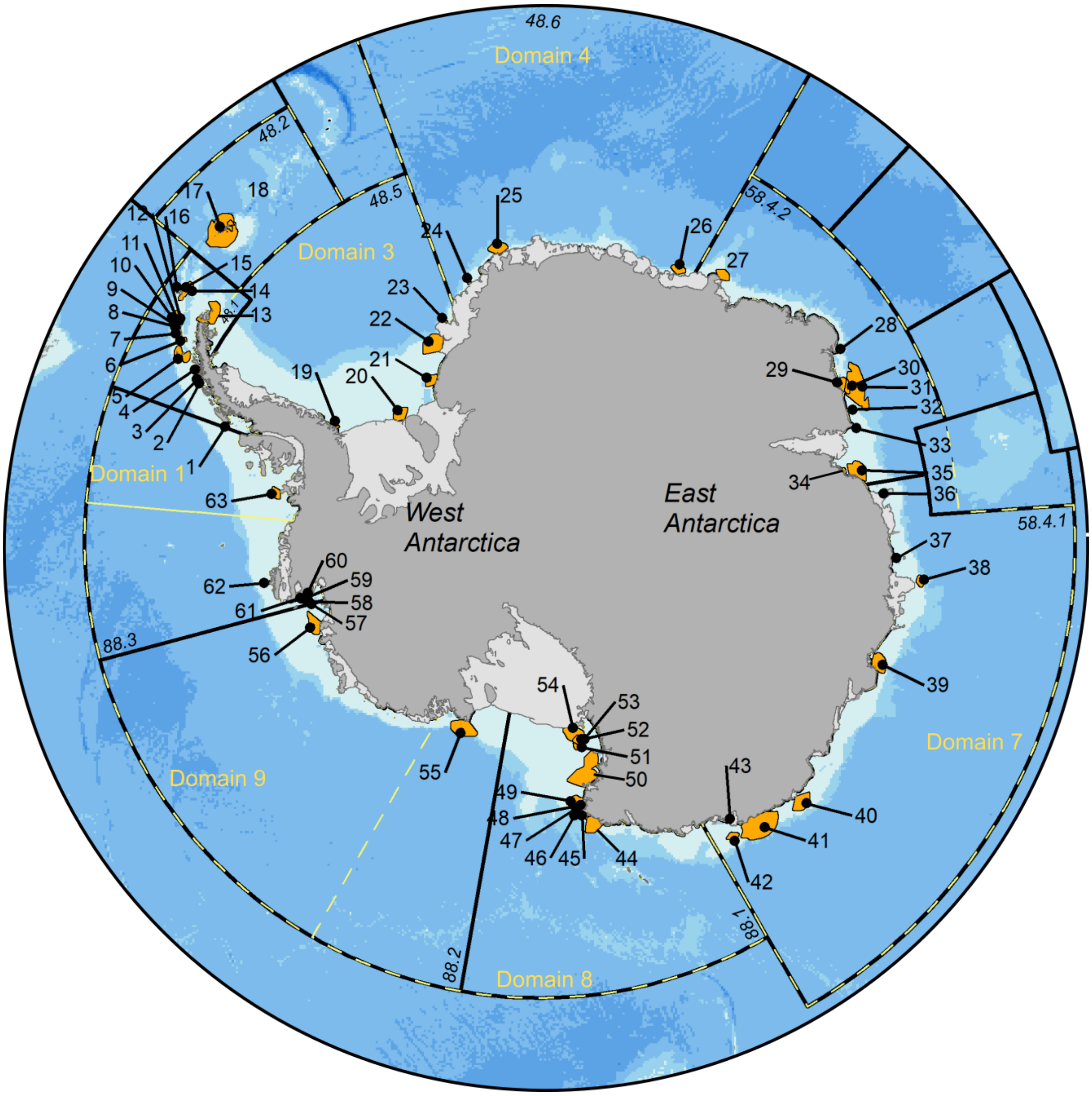


Figure 10: Marine IBAs (orange polygons, 1-63) for the four species of penguins breeding in Antarctica (Adélie, Chinstrap, Gentoo and Emperor Penguins). Marine IBAs delineated based

on foraging distribution data from breeding adult penguins during the chick-rearing period. See Table 4 for population details specific to each marine IBA.

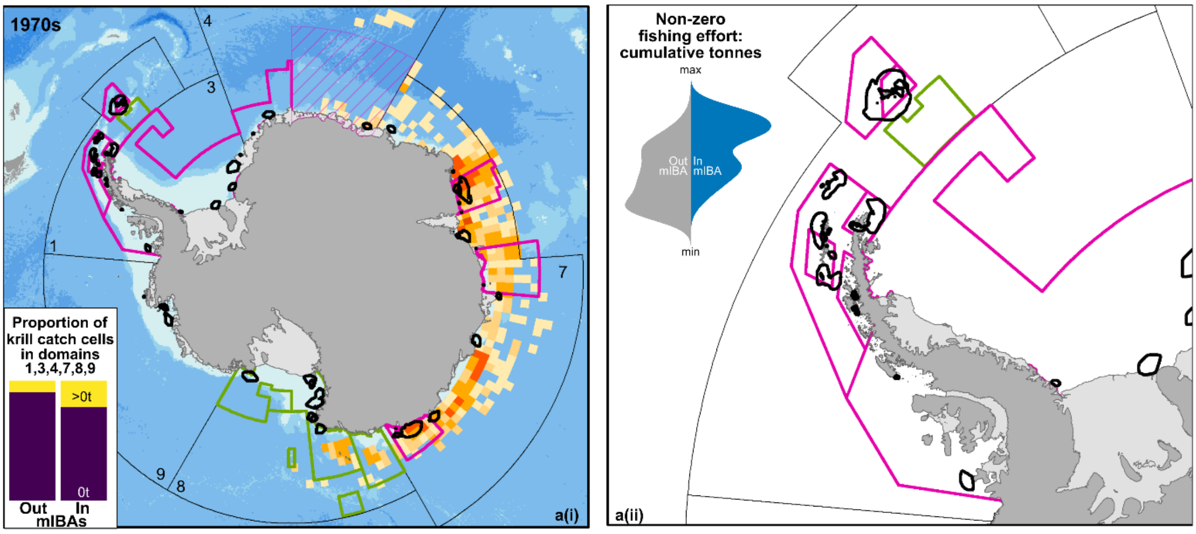
Table 4: Summary of marine IBAs for penguins in Antarctica where IBA criteria A4 was met (congregations of >1% of the global population), and key management areas (See Figure 2 for details) that marine IBAs overlap with. Marine IBAs numbered according to Figure 10. Species codes indicate Adélie Penguin (ADP), Chinstrap Penguin (CHP), Gentoo Penguin (GEP) and Emperor Penguin (EMP). Lower and upper population estimates refer to the estimated minimum and maximum number of breeding pairs utilising the marine IBA area, where the minimum estimate is bound by the species specific >1% of global population threshold. A: Number of colonies whose at-sea density distribution surfaces (Appendix – Density distribution surfaces) contributed to the final marine IBA boundary. For a detailed review of individual colonies and their population estimates (derived through colony specific density distribution surfaces) which contributed to each marine IBA, see the Inventory to Antarctic marine IBAs for penguin species (Supplementary Material).

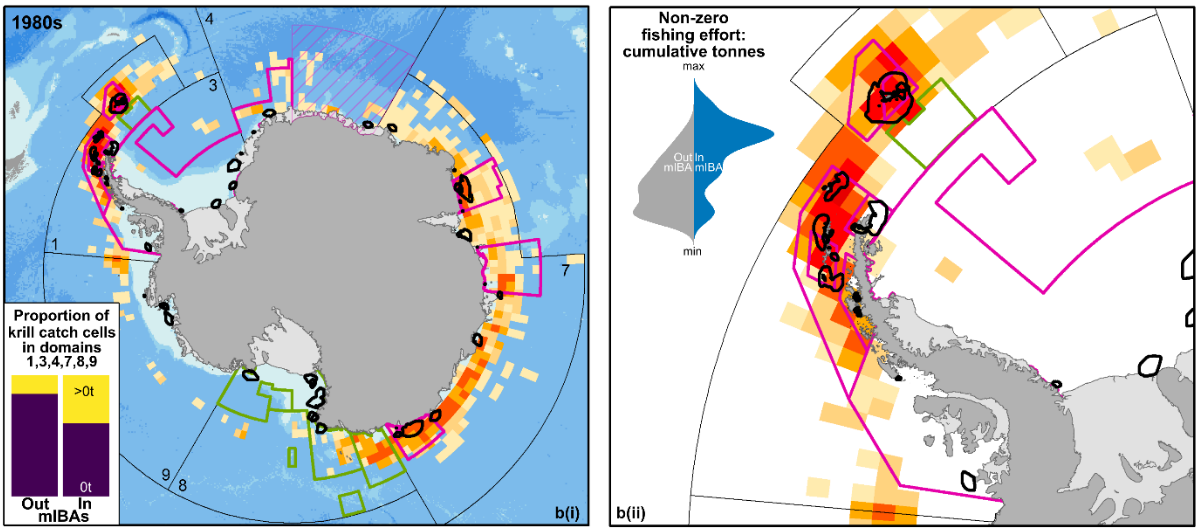
mIBA	Species	Population (lower)	Population (upper)	Area km^2	CCAMLR subarea	MPA planning domain	MPA Overlap	MPA Type	Colonies [A]
1	ADP	38219	79794	268.5269	48.1	1	D1MPA	Proposed	8
2	GEP	4164	7620	190.7557	48.1	1	D1MPA	Proposed	18
3	GEP	3960	9474	530.0771	48.1	1	D1MPA	Proposed	19
4	GEP	4157	19983	718.1682	48.1	1	D1MPA	Proposed	20
5	CHP	34187	292050	8871.402	48.1	1	D1MPA	Proposed	50
6	CHP	34171	140564	866.4857	48.1	1	D1MPA	Proposed	24
7	GEP	4054	5739	33.54876	48.1	1	D1MPA	Proposed	4
8	CHP	37290	301750	73.05973	48.1	1	D1MPA	Proposed	13
9	CHP	49772	285255	678.366	48.1	1	D1MPA	Proposed	32
9	GEP	4045	11129	678.366	48.1	1	D1MPA	Proposed	4
10	CHP	34111	318626	8081.26	48.1	1	D1MPA	Proposed	54
11	GEP	4527	14018	33.5837	48.1	1	D1MPA	Proposed	3
12	GEP	3931	9438	297.2377	48.1	1	D1MPA	Proposed	6
13	ADP	38212	589342	13043.12	48.1	1	D1MPA	Proposed	29
14	CHP	34228	147889	6575.311	48.1	1	D1MPA	Proposed	38
15	CHP	34921	44342	70.22016	48.1	1	D1MPA	Proposed	17
16	CHP	34513	42731	101.208	48.1	1	D1MPA	Proposed	19

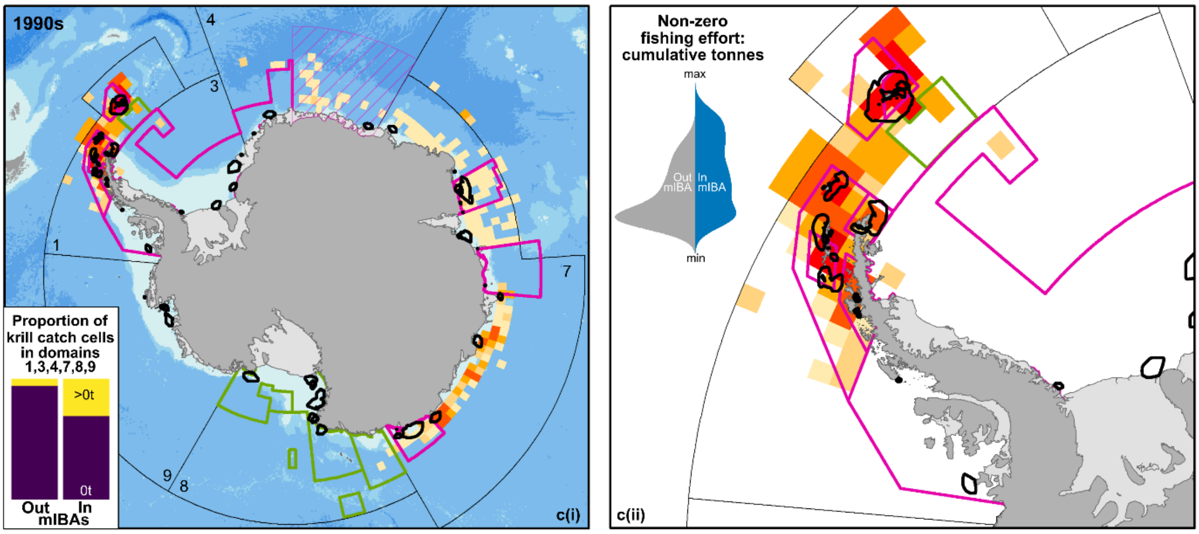
17	CHP	34100	467235	39223	48.2	1	D1MPA	Proposed	82
18	ADP	37900	132814	2521.771	48.2	1	D1MPA	Proposed	18
18	CHP	34100	129978	2521.771	48.2	1	D1MPA	Proposed	67
19	EMP	2579	4018	800.9626	48.5	3	WSMPA Phase1	Proposed	1
20	EMP	2600	8242	8217.892	48.5	3	WSMPA Phase1	Proposed	1
21	EMP	2592	6498	5800.423	48.5	3	WSMPA Phase1	Proposed	2
22	EMP	2649	22510	17385.93	48.5	3	WSMPA Phase1	Proposed	2
23	EMP	2579	5455	292.6615	48.5	3	WSMPA Phase1	Proposed	1
24	EMP	2579	4013	398.1111	48.6	4	WSMPA Phase1	Proposed	1
25	EMP	2566	9657	9031.138	48.6	4	WSMPA Phase1	Proposed	1
26	EMP	2568	6870	5836.787	48.6	4	WSMPA Phase2	Planning domain	1
27	EMP	2568	4652	6150.34	58.4.2	7	none	none	1
28	EMP	2568	3531	304.3231	58.4.2	7	none	none	3
29	ADP	37918	86306	4772.574	58.4.2	7	EAMPA	Proposed	24
30	ADP	38111	74994	3188.85	58.4.2	7	EAMPA	Proposed	25
30	EMP	3594	9154	3188.85	58.4.2	7	EAMPA	Proposed	2
31	EMP	2565	11000	32881.16	58.4.2	7	EAMPA	Proposed	5
32	ADP	38020	54499	366.844	58.4.2	7	EAMPA	Proposed	1
33	EMP	2633	5000	81.93346	58.4.2	7	EAMPA	Proposed	1
34	EMP	2565	6831	1024.669	58.4.2	7	none	none	1
35	ADP	38127	219752	13971.97	58.4.2	7	none	none	13
36	EMP	2716	3436	31.83076	58.4.1	7	none	none	1
37	EMP	2607	17000	121.6548	58.4.1	7	EAMPA	Proposed	1
38	EMP	2614	6471	3661.932	58.4.1	7	EAMPA	Proposed	1
39	ADP	37900	98239	12053.84	58.4.1	7	none	none	15
40	EMP	2686	12476	12469.63	58.4.1	7	EAMPA	Proposed	1
41	ADP	37900	148640	40352.12	58.4.1	7	EAMPA	Proposed	15
42	EMP	2575	5946	3991.522	58.4.1	7	EAMPA	Proposed	2
43	EMP	2726	3000	39.97123	58.4.1	7	EAMPA	Proposed	1
44	ADP	39488	437471	10735	88.1	8	RSRMPA	Confirmed	6

45	ADP	80365	227204	40.71784	88.1	8	RSRMPA	Confirmed	3
46	EMP	2623	5509	375.0417	88.1	8	RSRMPA	Confirmed	1
47	ADP	46301	239983	3507.576	88.1	8	RSRMPA	Confirmed	7
47	EMP	2569	9505	3507.576	88.1	8	RSRMPA	Confirmed	1
48	ADP	57922	159149	380.2592	88.1	8	RSRMPA	Confirmed	4
49	ADP	38210	151544	5284.485	88.1	8	RSRMPA	Confirmed	9
50	EMP	2592	31432	31390.22	88.1	8	RSRMPA	Confirmed	4
51	EMP	2567	6047	1605.281	88.1	8	RSRMPA	Confirmed	3
52	ADP	38871	178557	3013.238	88.1	8	RSRMPA	Confirmed	9
52	EMP	2573	8102	3013.238	88.1	8	RSRMPA	Confirmed	3
53	ADP	55504	102587	43.24253	88.1	8	RSRMPA	Confirmed	7
54	ADP	37900	324656	10802.17	88.1	8	RSRMPA	Confirmed	9
55	EMP	2655	26266	18348.72	88.2	9	RSRMPA	Confirmed	1
56	EMP	2586	9457	10628.17	88.2	9	none	none	2
57	EMP	2567	5732	3527.048	88.3	9	none	none	1
58	ADP	40807	92256	511.5843	88.3	9	none	none	4
58	EMP	2569	2988	511.5843	88.3	9	none	none	1
59	ADP	37923	88800	964.9422	88.3	9	none	none	4
60	ADP	37986	53180	509.9334	88.3	9	none	none	3
60	EMP	2923	4613	509.9334	88.3	9	none	none	1
61	ADP	38126	58058	61.3147	88.3	9	none	none	2
62	EMP	2571	3568	252.5589	88.3	9	none	none	1
63	EMP	2566	6061	4495.01	88.3	9	D1MPA	Proposed	1

Overlap of krill fisheries with marine IBAs







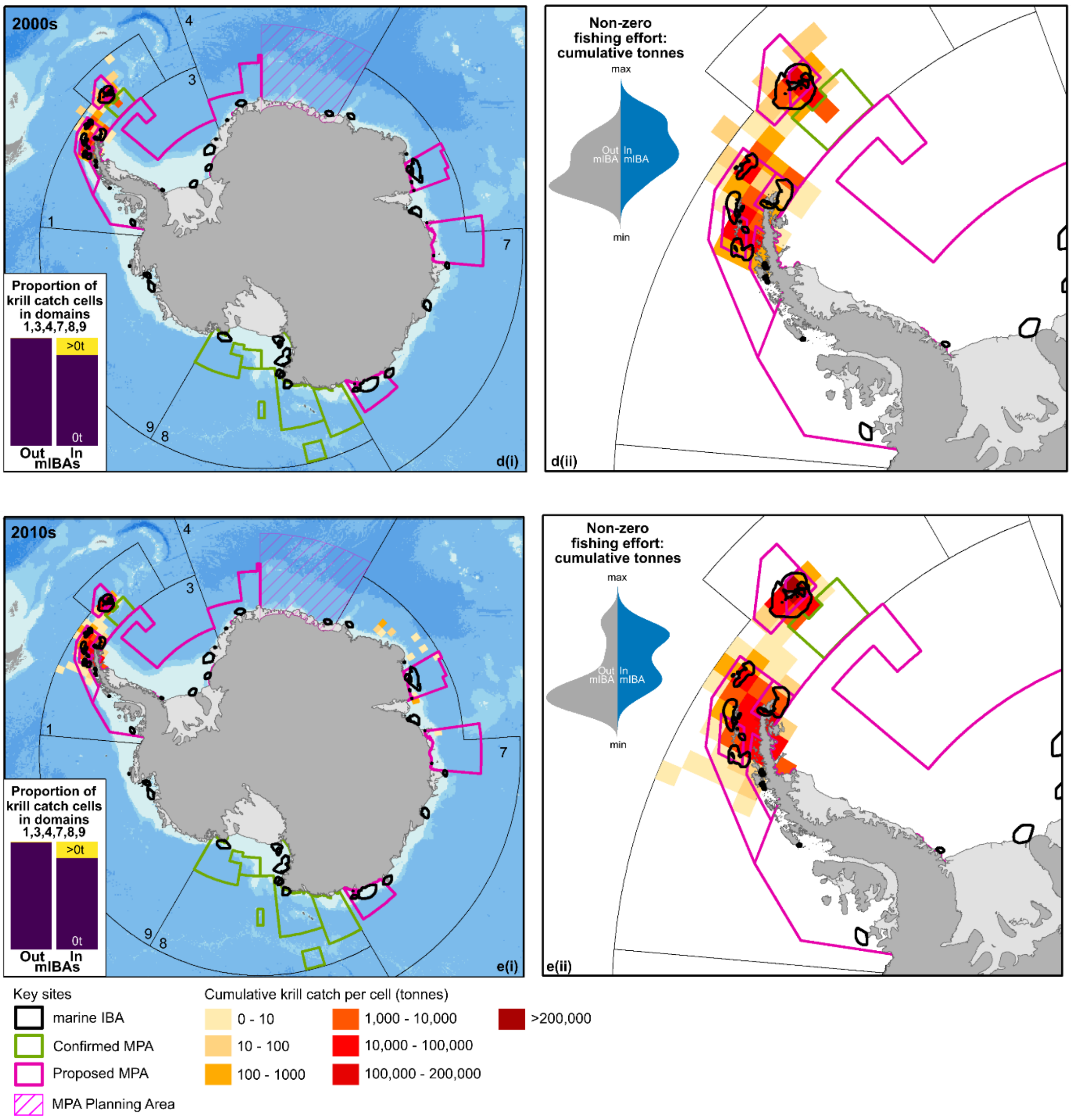


Figure 11: Summer krill fishing effort (Oct – Mar) for five decades (panels a-e) across MPA planning domains contiguous to mainland Antarctica (Domains: 1, 3, 4, 7, 8, 9). Fishing effort recorded as cumulative krill biomass caught per cell (tonnes). Panels i, indicate continent wide fishing effort across relevant domains, while panels ii, indicate fishing effort for the Antarctic Peninsula. Inset in panels i, indicates proportions of cells inside and outside marine IBAs in which krill was caught (>0t, yellow) or not caught (0t, purple). Inset in panels ii (kernel density plots), show the distribution of cumulative krill biomass caught per cell (zero values not shown) inside (blue) versus outside (grey) marine IBAs. The scale for kernel density plots ranges between the minimum and maximum krill biomass caught per cell in a given decade.

Table 5: Test results from the permutation test and percentage of marine IBA cells with krill catches, within MPA planning domains 1, 3, 4, 7, 8 and 9.

Decade	Permutation test (p-value)	Permutation test (Z-score)	Percentage of mIBA cells with krill catches
1970s	<0.001	-9.07	22.02
1980s	<0.001	-11.91	39.88
1990s	<0.001	-11.10	31.60
2000s	<0.001	-10.12	16.18
2010s	<0.001	-5.68	15.48

Table 6: Key MPA management units and species of relevance in relation to the marine IBAs and krill fisheries operations within the study area where high krill biomass catches occurred per decade. Study area is bound by MPA planning domains 1, 3, 4, 7, 8 and 9. See Figure 11. Fisheries operations within specific zones of each MPA are still under consideration (as of Sep 2020). Current details are available in the working group documentation (CCAMLR, 2019a, 2019b, 2019c) but may be subject to change.

Decade	MPA planning domains	Specific MPAs (Zones in parenthesis)	Specific marine IBAs with high krill catches	Key species
1970s	7	EAMPA (MacRobertson, Drygalski)	29 – 32, 41	ADP, EMP
1980s	1	D1MPA (GPZ-SOI, KFZ-SOI, GPZ-AP, GPZ-SSI, KFZ-NWAP)	2 -12, 14 – 18	ADP, CHP, GEP
	7	EAMPA (MacRobertson, D'Urville Sea-Mertz, Drygalski)	29 – 33, 38, 40 - 42	ADP, EMP
1990s	1	D1MPA (GPZ-SOI, KFZ-SOI, GPZ-AP, GPZ-SSI, KFZ-NWAP)	3-18	ADP, CHP, GEP
	7	-		
2000s	1	D1MPA (GPZ-SOI, KFZ-SOI, GPZ-AP, GPZ-SSI, KFZ-NWAP)	3 – 15, 17, 18	ADP, CHP, GEP
2010s	1	D1MPA (GPZ-SOI, KFZ-SOI, GPZ-AP, GPZ-SSI, KFZ-NWAP)	5 - 18	ADP, CHP, GEP

Colony Codes

Species code	CCAMLR subarea	Site code	Site name	Longitude (EPSG: 4326)	Latitude (EPSG: 4326)	Years of data for mIBA assessment
ADP	48.1	AMBU	Ambush Bay	-55.393	-63.184	1
ADP	48.1	ANCH	Anchorage Island	-68.2089	-67.6042	2
ADP	48.1	ANDI	Andresen Island Site 2	-66.711	-66.875	3
ADP	48.1	ANDR	Andresen Island Site 1	-66.649	-66.879	3
ADP	48.1	ARDL	Ardley Island	-58.933	-62.213	20
ADP	48.1	ARMS	Armstrong Reef	-66.2117	-65.8919	2
ADP	48.1	AVIA	Avian Island	-68.8855	-67.7732	2
ADP	48.1	BARC	Barcroft Islands	-67.1397	-66.4575	2
ADP	48.1	BEAG	Beagle Island	-54.6675	-63.4139	2
ADP	48.1	BERT	Berthelot Islands (excl. Green Island)	-64.112	-65.333	4
ADP	48.1	BISC	Biscoe Point	-63.7775	-64.8114	11
ADP	48.1	BONG	Bongrain Point (Pourquoi Pas Island)	-67.7319	-67.7233	4
ADP	48.1	BOWL	Cape Bowles	-54.091	-61.316	2
ADP	48.1	BRAS	Brash Island	-54.9142	-63.3864	2
ADP	48.1	BROW	Brown Bluff	-56.905	-63.5222	2
ADP	48.1	CHAT	Chatos Island	-69.152	-67.66	2
ADP	48.1	CHIS	Christine Island	-64.0236	-64.7946	5
ADP	48.1	COCK	Cockburn Island	-56.8412	-64.2005	1
ADP	48.1	CONE	Cone Island	-69.1531	-67.6749	2
ADP	48.1	CORM	Cormorant Island	-63.9667	-64.7939	7
ADP	48.1	DARB	Darbel Island	-65.9003	-66.3808	2
ADP	48.1	DARW	Darwin Island	-54.726	-63.437	2
ADP	48.1	DARX	Darboux Island	-64.215	-65.4028	1
ADP	48.1	DEEI	Dee Island	-59.7836	-62.4229	1
ADP	48.1	DESC	Descazes Island	-67.3334	-67.3334	1
ADP	48.1	DETA	Detaille Island	-66.7867	-66.8708	4
ADP	48.1	DEVI	Devil Island	-57.2889	-63.7992	2
ADP	48.1	DREA	Dream Island	-64.2256	-64.7254	3
ADP	48.1	DURO	Duroch Islands	-57.8903	-63.3033	1
ADP	48.1	DURV	d'Urville Monument	-56.2944	-63.4267	3
ADP	48.1	DUTH	Duthoit Point	-58.835	-62.307	1
ADP	48.1	EARL	Earle Island	-54.7833	-63.4833	2
ADP	48.1	EDEN	Eden Rocks	-55.7018	-63.4946	2
ADP	48.1	EMPE	Emperor Island	-68.71	-67.8647	1
ADP	48.1	ETNA	Etna Island	-55.179	-63.0948	1
ADP	48.1	EVEN	Cape Evensen (mainland)	-65.683	-66.164	3
ADP	48.1	EVER	Cape Evensen (offshore rocks)	-65.7205	-66.1579	1
ADP	48.1	FISH	Fish Islands	-65.3611	-66.0275	4
ADP	48.1	FIZK	Fizkin Island (islet northeast of Fizkin Island)	-65.48	-65.514	2
ADP	48.1	FLIE	Fliess Bay	-55.2412	-63.2045	1
ADP	48.1	GERL	Gerlache Island	-64.214	-64.601	1
ADP	48.1	GING	Ginger Island	-68.6858	-67.7494	1

ADP	48.1	GOUR	Gourdin Island	-57.3074	-63.1969	2
ADP	48.1	GREI	Green Island	-64.1487	-65.3236	1
ADP	48.1	HANN	Hannah Point	-60.6134	-62.6545	2
ADP	48.1	HERO	Heroina Island	-54.6083	-63.3944	2
ADP	48.1	HOLD	Holdfast Point (mainland and offshore rocks)	-66.5867	-66.7917	2
ADP	48.1	HOPE	Hope Bay	-56.9978	-63.3972	4
ADP	48.1	HUMB	Humble Island	-64.0875	-64.7647	7
ADP	48.1	JING	Jingle Island	-65.3253	-65.4303	1
ADP	48.1	JOUB	Joubin Islands	-64.3992	-64.7744	3
ADP	48.1	KING	King Point	-55.481	-63.16	1
ADP	48.1	KNOB	Knobble Head, Bransfield Island	-56.5694	-63.1619	1
ADP	48.1	KUNO	Kuno Point	-67.1603	-66.3978	1
ADP	48.1	LAGO	Lagotellerie Island	-67.4017	-67.8869	2
ADP	48.1	LAKT	Islet next to Laktionov Island	-65.7897	-65.7585	1
ADP	48.1	LAVO	Islet 1 km west of Lavosier Island	-66.829	-66.122	2
ADP	48.1	LION	Lions Rump	-58.1229	-62.1331	8
ADP	48.1	LITC	Litchfield Island	-64.0919	-64.7708	27
ADP	48.1	LLAN	Llano Point	-58.446	-62.176	29
ADP	48.1	MADD	Madder Cliff (Joinville Island)	-56.4831	-63.2989	1
ADP	48.1	MADI	Madder Cliff Island	-56.499	-63.306	2
ADP	48.1	NCAP	North Cape (d'Urville Island)	-56.489	-62.974	1
ADP	48.1	NESM	Northeast of Smiggers Island	-65.3465	-65.4516	1
ADP	48.1	PATE	Patella Island	-55.5238	-63.1294	1
ADP	48.1	PAUL	Paulet Island	-55.7881	-63.5801	4
ADP	48.1	PCHA	Port Charcot	-64.026	-65.067	14
ADP	48.1	PEIN	Peine Island (Comb Island)	-54.717	-63.411	2
ADP	48.1	PENG	Penguin Island	-57.9269	-62.102	8
ADP	48.1	PEPO	Penguin Point (Seymour Island)	-56.7114	-64.3061	3
ADP	48.1	PETE	Petermann Island	-64.137	-65.176	20
ADP	48.1	PLAT	Plato Island (Platter Island)	-54.6742	-63.433	2
ADP	48.1	PLEN	Pleneau Island	-64.0556	-65.104	1
ADP	48.1	PPPT	Pink Pool Point	-54.079	-61.309	1
ADP	48.1	PTHO	Point Thomas	-58.4615	-62.1631	14
ADP	48.1	REDI	Red Island	-57.88	-63.7356	1
ADP	48.1	RHYO	Rhyolite Island	-68.5709	-69.6488	2
ADP	48.1	RRRI	Red Rock Ridge	-67.1686	-68.2878	1
ADP	48.1	SAXU	Saxum Nunatak	-56.0533	-63.1367	1
ADP	48.1	SHEN	Sheppard Nunatak	-57.0154	-63.3629	1
ADP	48.1	SHEP	Sheppard Point	-56.9844	-63.3707	1
ADP	48.1	SMIG	Smiggers Island	-65.3514	-65.4597	1
ADP	48.1	SOMI	South of Martin Islands	-65.3381	-65.6881	2
ADP	48.1	STRA	Stranger Point	-58.6161	-62.26	8
ADP	48.1	TAYH	Tay Head (Joinville Island)	-55.5508	-63.3486	3
ADP	48.1	TORG	Torgersen Island	-64.0741	-64.7731	5
ADP	48.1	TRUN	Trundle Island	-65.2885	-65.3938	1

ADP	48.1	TSIS	Three Sisters	-57.9135	-62.0779	3
ADP	48.1	TURR	Turret Point (King George Island)	-57.9514	-62.0875	5
ADP	48.1	VIEU	Vieugue Island	-65.2144	-65.6682	2
ADP	48.1	VORT	Vortex Island	-57.6415	-63.7257	2
ADP	48.1	WELL	Weller Island	-65.3817	-65.4453	1
ADP	48.1	WIDE	Wideopen Islands	-55.8492	-63.0042	1
ADP	48.1	WINK	Winkle Island (two islets next to Winkle Island)	-65.686	-65.52	1
ADP	48.1	YALO	Yalour Islands	-64.1564	-65.2389	8
ADP	48.2	ACUN	Acuna Island	-44.637	-60.7612	4
ADP	48.2	AMPH	Amphibolite Point	-45.339	-60.684	2
ADP	48.2	CHRI	Christoffersen Island	-45.035	-60.728	1
ADP	48.2	CORP	Cormorant Point	-44.732	-60.756	2
ADP	48.2	FERR	Ferrier Peninsula	-44.425	-60.715	3
ADP	48.2	FITC	Fitchie Bay	-44.494	-60.714	3
ADP	48.2	GERD	Gerd Island	-45.7437	-60.6574	1
ADP	48.2	GOPT	Gourlay Point	-45.5863	-60.7309	2
ADP	48.2	GOSL	Gosling Islands	-45.9178	-60.6406	1
ADP	48.2	GRAP	Graptolite Island	-44.4621	-60.7159	3
ADP	48.2	HANS	Cape Hansen, Coronation Island	-45.584	-60.659	2
ADP	48.2	MART	Point Martin	-44.7185	-60.7709	3
ADP	48.2	NOPT	North Point	-45.626	-60.672	3
ADP	48.2	OUTE	Outer Island	-45.5806	-60.7069	1
ADP	48.2	PAGE	Pageant Point	-45.5843	-60.7286	2
ADP	48.2	PANT	Pantomime Point	-45.5833	-60.7266	2
ADP	48.2	POWE	Powell Island	-45.029	-60.725	1
ADP	48.2	SHIN	Shingle Cove (Coronation Island)	-45.5636	-60.6469	2
ADP	48.2	SPRO	Spindrift Rocks	-45.644	-60.683	3
ADP	48.2	STEN	Stene Point	-45.707	-60.654	2
ADP	48.2	WEDD	Weddell Island	-44.8479	-60.6359	1
ADP	48.2	WPEC	Watson Peninsula (east coast)	-44.5436	-60.6761	5
ADP	88.1	ADAR	Cape Adare	170.1999	-71.3063	8
ADP	88.1	ANNE	Cape Anne	169.85	-73.617	9
ADP	88.1	ARTH	Arthurson Ridge	158.5109	-69.3634	1
ADP	88.1	BEAN	Beaufort Island North	166.881	-76.9288	5
ADP	88.1	BEAU	Beaufort Island	166.8978	-76.9694	19
ADP	88.1	BRDM	Cape Bird Middle	166.4187	-77.2304	30
ADP	88.1	BRDN	Cape Bird North	166.4459	-77.2145	31
ADP	88.1	BRDS	Cape Bird South	166.3794	-77.2594	31
ADP	88.1	BUCK	Buckle Island	163.2871	-66.8908	2
ADP	88.1	CBAR	Cape Barne	166.2416	-77.578	3
ADP	88.1	CDAV	Cape Davis	163.5333	-66.65	2
ADP	88.1	CHAL	Cape Hallett	170.2142	-72.3179	17
ADP	88.1	CHII	Chinstrap Islet	163.311	-66.925	2
ADP	88.1	CMID	Coulman Middle	169.8854	-73.4372	14
ADP	88.1	CNOR	Coulman North	169.8401	-73.3822	11

ADP	88.1	CONI	Conical Island (Aviation Islands)	158.7833	-69.2667	1
ADP	88.1	CORN	Cape Cornish (NE Buckle)	163.2139	-66.7031	2
ADP	88.1	COTT	Cape Cotter	170.3122	-72.4045	10
ADP	88.1	CROZ	Cape Crozier	169.32	-77.46	28
ADP	88.1	CSOU	Coulman South	169.8779	-73.5137	11
ADP	88.1	DOME	Dome Island (Aviation Islands)	158.7833	-69.2667	1
ADP	88.1	DOWN	Downshire Cliffs	170.592	-71.5582	10
ADP	88.1	DUKE	Duke of York Island	170.0635	-71.6235	7
ADP	88.1	EDMO	Edmonson Point	165.0666	-74.3167	11
ADP	88.1	FBER	Fortenberry	167.0789	-70.7662	1
ADP	88.1	FRAE	Franklin Island East	168.4101	-76.1581	12
ADP	88.1	FRAW	Franklin Island West	168.3383	-76.1618	10
ADP	88.1	HBAY	Harald Bay	157.6894	-69.1977	1
ADP	88.1	INEX	Inexpressible Island	163.7287	-74.9009	14
ADP	88.1	JONE	Cape Jones	169.2272	-73.2762	9
ADP	88.1	MAND	Mandible Cirque	169.25	-73.117	7
ADP	88.1	NELL	Nella/Thalla Islands	166.0873	-70.6136	2
ADP	88.1	NORF	Northern Foothills (Terra Nova Bay)	164	-74.75	14
ADP	88.1	PHIL	Cape Phillips	169.6168	-73.0714	8
ADP	88.1	POSS	Possession Island	171.1692	-71.8946	5
ADP	88.1	ROYD	Cape Royds	166.1639	-77.5545	32
ADP	88.1	SABR	Sabrina Island	163.309	-66.9171	3
ADP	88.1	SENT	Sentry Rocks	167.4046	-70.7543	2
ADP	88.1	SEPR	SE Promontory	163.05	-66.65	2
ADP	88.1	STUR	Sturge Island	164.633	-67.467	1
ADP	88.1	SVEN	Sven Foyn Island	171.0695	-71.956	11
ADP	88.1	SWIS	Southwest Island (Aviation Islands)	158.7833	-69.2666	1
ADP	88.1	UNGE	Unger Island (Unger Rock)	166.919	-70.6811	3
ADP	88.1	WHEA	Cape Wheatstone	170.2024	-72.6217	12
ADP	88.1	WOOD	Wood Bay	165.1332	-74.3299	8
ADP	88.2	BURK	Cape Burks	-136.83	-74.7505	2
ADP	88.2	CLAR	Clark Island	-105.193	-74.056	1
ADP	88.2	CRUZ	Cruzen Island	-140.327	-74.7341	1
ADP	88.2	LAUF	Lauff Island	-126.775	-73.2325	2
ADP	88.2	LOVI	Lovill Bluff	-127.436	-73.538	2
ADP	88.2	MAHE	Maher Island	-127.05	-73.1983	2
ADP	88.2	SHEI	Shepard Island	-132.552	-74.3773	1
ADP	88.2	WOPT	Worley Point	-132.777	-74.4057	1
ADP	88.3	BACK	Backer Islands	-102.552	-74.4112	1
ADP	88.3	BSON	Brownson Islands	-103.636	-74.1681	1
ADP	88.3	CHAR	Charcot Island	-75.4074	-69.7617	1
ADP	88.3	EDWI	Edwards Islands	-103.006	-73.8701	1
ADP	88.3	LSAY	Lindsay Islands	-103.183	-73.6094	1
ADP	88.3	PIIS	Peter I Island	-90.4917	-68.835	1
ADP	88.3	SIMS	Sims Island	-78.5407	-73.2725	1

ADP	88.3	WAIT	Cape Waites	-103.451	-72.713	1
ADP	58.4.1	ADAM	Adams Island	92.5486	-66.5459	2
ADP	58.4.1	BALA	Balaena Islands	111.0688	-66.0158	1
ADP	58.4.1	BERK	Berkley/Cameron	110.64	-66.2163	3
ADP	58.4.1	BIEN	Cape Bienvenue	140.5252	-66.7203	3
ADP	58.4.1	CHAP	Chappel Island	110.4193	-66.1772	3
ADP	58.4.1	CHIC	Chick Islands	120.9934	-66.7918	1
ADP	58.4.1	CHUN	Cape Hunter	142.349	-66.963	2
ADP	58.4.1	CURZ	Curzon Islands	141.5669	-66.767	2
ADP	58.4.1	DAVI	Davis Island	108.4444	-66.6637	2
ADP	58.4.1	DENI	Cape Denison	142.6647	-67.0072	1
ADP	58.4.1	FRAM	Fram Islands	139.825	-66.637	2
ADP	58.4.1	HASW	Haswell Island	93.01	-66.52	1
ADP	58.4.1	HENR	Henry Islands	120.6206	-66.8781	2
ADP	58.4.1	HOLL	Holl/O'Connor	110.4315	-66.4118	2
ADP	58.4.1	IFOI	Ifo Island Area	139.728	-66.627	1
ADP	58.4.1	IVAN	Ivanhoff Head	109.1276	-66.8803	1
ADP	58.4.1	JANE	Janet Rock	139.1651	-66.5698	1
ADP	58.4.1	JULE	Cape Jules	140.9189	-66.7438	2
ADP	58.4.1	LEWI	Lewis Island	134.3849	-66.1051	2
ADP	58.4.1	MACK	MacKellar Islands	142.65	-66.967	1
ADP	58.4.1	MALL	Mallory Point	108.6433	-66.83	2
ADP	58.4.1	MERR	Merritt Island	107.1565	-66.4588	2
ADP	58.4.1	MIDG	Hollin/Midgley	110.4036	-66.3259	3
ADP	58.4.1	NEIS	Nelly Island	110.1782	-66.2294	3
ADP	58.4.1	NUTT	Cape Nutt	108.2127	-66.6352	2
ADP	58.4.1	ODBE	Odbert Island	110.5421	-66.3742	2
ADP	58.4.1	PGEO	Point Geologie	140.01	-66.67	2
ADP	58.4.1	PIGE	Cape Pigeon Rocks	143.894	-66.9334	1
ADP	58.4.1	PISL	Peterson Island	110.4993	-66.4665	3
ADP	58.4.1	PMAR	Port Martin	141.3997	-66.8113	2
ADP	58.4.1	SEFB	SE Fisher Bay	146.0809	-67.5949	1
ADP	58.4.1	SHLY	Shirley/Beall	110.5	-66.283	2
ADP	58.4.1	WATT	Watt Bay	144.2854	-66.9949	1
ADP	58.4.1	WAYA	Way Archipelago	143.5895	-66.8571	1
ADP	58.4.1	WHTY	Blakeney/Whitney	110.5573	-66.2457	3
ADP	58.4.2	AKAR	Akarui Point	41.3901	-68.4999	3
ADP	58.4.2	ALAS	Alasheyev Bight	46.109	-67.654	1
ADP	58.4.2	ANDS	Andersen Island	63.3572	-67.4353	1
ADP	58.4.2	AUST	Auster Islands	63.98	-67.39	1
ADP	58.4.2	BATT	Cape Batterbee	53.8129	-65.842	1
ADP	58.4.2	BECH	Bechervaise Island	62.8167	-67.5833	12
ADP	58.4.2	BENT	Benten	39.25	-69.0417	16
ADP	58.4.2	BOLI	Bolingen/Lichen Island	75.7474	-69.456	1
ADP	58.4.2	BRAT	Brattstrand Bluff	76.9995	-69.2157	1
ADP	58.4.2	CBAY	Casey Bay	48.6565	-67.3774	1

ADP	58.4.2	CHI1	Child Rocks Islands 1	63.2749	-67.4377	1
ADP	58.4.2	CHI2	Child Rocks Islands 2	63.2824	-67.438	1
ADP	58.4.2	CHI3	Child Rocks Islands 3	63.2715	-67.4387	1
ADP	58.4.2	COLB	Colbeck Archipelago Unnamed 1	61.0647	-67.3436	1
ADP	58.4.2	DOU1	Douglas Islands 1	63.3893	-67.3803	1
ADP	58.4.2	DOU2	Douglas Islands 2	63.3895	-67.3849	1
ADP	58.4.2	FORB	Forbes Glacier	62.2858	-67.5964	2
ADP	58.4.2	GNEY	Gibbney Island	62.3205	-67.5543	1
ADP	58.4.2	HINO	Cape Hinode	42.6612	-68.1453	3
ADP	58.4.2	HOKU	Hokuro Cove	39.629	-69.213	21
ADP	58.4.2	KIDS	Kidson Island	61.187	-67.2144	2
ADP	58.4.2	KIRB	Kirby Head	46.5372	-67.2726	1
ADP	58.4.2	KIRT	Kirton/Macklin	63.6378	-67.4907	1
ADP	58.4.2	KUZI	Kuzira Point	38.2667	-69.6	3
ADP	58.4.2	LONG	Long Peninsula Island	78.324	-68.4163	2
ADP	58.4.2	LOWT	Low Tongue	61.9906	-67.5456	1
ADP	58.4.2	MAME	Mame-zima	39.4833	-69.0167	25
ADP	58.4.2	MAWS	Mawson Coast (excl. Bechervaise Island)	62.9406	-67.5563	1
ADP	58.4.2	MBIS	Mount Biscoe	51.3275	-66.2209	2
ADP	58.4.2	MCDO	McDonald Point	59.6654	-67.3427	1
ADP	58.4.2	MEHO	Meholmen Island	39.4788	-69.0254	2
ADP	58.4.2	MGLE	Mount Gleadell	50.44	-66.941	1
ADP	58.4.2	MIZU	Mizukuguri Cove	39.614	-69.197	22
ADP	58.4.2	MRII	Mount Riiser-Larsen	50.5511	-66.7908	2
ADP	58.4.2	MYAL	Myall/McMahon	45.7356	-67.6721	1
ADP	58.4.2	NOKK	Nokkelholmane Islands	39.4635	-69.3811	14
ADP	58.4.2	OLDH	Oldham Island	61.7253	-67.5208	1
ADP	58.4.2	OMGA	Cape Omega	40.9833	-68.5667	3
ADP	58.4.2	ONGU	Ongulkaven	39.4252	-69.0171	25
ADP	58.4.2	PROC	Proclamation Island	53.6876	-65.8424	1
ADP	58.4.2	RAUE	Rauer Islands	77.6765	-68.8331	2
ADP	58.4.2	RBSN	Robinson	63.4596	-67.4543	2
ADP	58.4.2	RONW	Robinson (northwest)	63.413	-67.4489	1
ADP	58.4.2	ROOK	Rookery Islands	62.5099	-67.6044	2
ADP	58.4.2	ROSE	Robinson (southeast)	63.4956	-67.4749	2
ADP	58.4.2	RUMP	Rumpa Island	39.3905	-69.1441	25
ADP	58.4.2	SCUL	Scullin/Murray	66.6968	-67.7833	1
ADP	58.4.2	SHEE	Sheelagh Islands	50.1804	-66.5464	1
ADP	58.4.2	SIGA	Sigaren	39.4344	-69.1693	4
ADP	58.4.2	STAN	Stanton Continental Rock	61.7175	-67.5342	1
ADP	58.4.2	STEI	Steines Island	76.5825	-69.3412	2
ADP	58.4.2	STUN	Stanton unnamed	61.5978	-67.5078	1
ADP	58.4.2	SVIS	Svenner Islands	76.8346	-69.0341	1
ADP	58.4.2	TENM	Tenmondai Rock	41.701	-68.4445	2
ADP	58.4.2	THOR	Thorgaut	63.5433	-67.4425	2

ADP	58.4.2	TORI	Torinosu Cove	39.5667	-69.4833	17
ADP	58.4.2	TRYN	Tryne Islands	78.4125	-68.3809	1
ADP	58.4.2	UFSI	Ufs Island	61.1406	-67.4694	2
ADP	58.4.2	UIP2	Unnnamed Island PE 2	77.736	-68.9012	1
ADP	58.4.2	UIP3	Unnnamed Island PE 3	78.211	-68.4419	1
ADP	58.4.2	UIPN	Unnamed Island PE 2 North	77.7162	-68.9013	1
ADP	58.4.2	UNN2	Unnamed 2	63.5435	-67.4402	1
ADP	58.4.2	UNN7	Unnamed 7	63.3336	-67.4475	1
ADP	58.4.2	VESN	Vestfold North	78.0954	-68.4842	2
ADP	58.4.2	VESS	Vestfold South	77.9227	-68.5883	2
ADP	58.4.2	WYAT	Wyatt Earp Islands	78.5385	-68.3569	1
ADP	58.4.2	YTRE	Ytrehovdeholmen	39.4333	-69.2167	17
CHP	48.1	AITC	Barrientos Island (Aitcho Islands)	-59.7517	-62.4071	4
CHP	48.1	ALCO	Alcock Island	-61.127	-64.24	4
CHP	48.1	ARDL	Ardley Island	-58.933	-62.213	19
CHP	48.1	ARMS	Armstrong Reef	-66.2117	-65.8919	3
CHP	48.1	ASPL	Aspland Island	-55.894	-61.468	1
CHP	48.1	ASTR	Astrolabe Island	-58.683	-63.316	1
CHP	48.1	BACH	Bach Quartet	-58.028	-61.921	1
CHP	48.1	BAIL	Baily Head (Deception Is)	-60.506	-62.965	4
CHP	48.1	BAIS	Bath Island	-59.789	-62.381	1
CHP	48.1	BARN	Barnard Pt (Livingston Is)	-60.338	-62.758	1
CHP	48.1	BART	Barton Peninsula	-58.791	-62.224	16
CHP	48.1	BEAV	Beaver Rocks	-59.362	-63.679	1
CHP	48.1	BELI	Guesalaga Island	-61.9976	-64.2782	1
CHP	48.1	BELL	Bell Point	-58.889	-62.119	1
CHP	48.1	BELS	Cape Belsham	-54.883	-61.096	1
CHP	48.1	BLAK	Blake Island	-59.0303	-63.649	2
CHP	48.1	BOWL	Cape Bowles	-54.091	-61.316	1
CHP	48.1	BOYE	Boyer Rocks	-59.0371	-63.583	2
CHP	48.1	BPTS	Byewater Point (South)	-61.5263	-62.7747	1
CHP	48.1	BRIM	Brimstone Peak	-57.7525	-61.9124	2
CHP	48.1	BRIT	Britannia's Figleaf	-55.213	-61.278	2
CHP	48.1	BRPW	Brimstone Peak (West)	-57.7633	-61.9183	2
CHP	48.1	BUSK	Buskin Rocks	-55.149	-61.057	1
CHP	48.1	BYEW	Byewater Point	-61.5021	-62.7528	1
CHP	48.1	CARO	Caroline Bluff	-57.659	-61.911	1
CHP	48.1	CAST	Castle Rock	-61.5814	-62.7886	1
CHP	48.1	CASY	Casy Island	-57.5052	-63.2365	1
CHP	48.1	CCMP	Chinstrap Camp	-54.756	-61.156	1
CHP	48.1	CCOE	Cape Conway (East)	-61.424	-62.838	1
CHP	48.1	CHAB	Chabrier Rock - Vaureal Peak	-58.2961	-62.1874	3
CHP	48.1	CHIN	Chinstrap Cove	-54.197	-61.245	1
CHP	48.1	CHNE	Cape Herschel (North-East)	-60.986	-64.042	1
CHP	48.1	CHPT	Charles Point	-61	-64.236	5
CHP	48.1	CHSE	Cape Herschel (South-East)	-61.033	-64.078	3

CHP	48.1	CIPT	Cieslak Point	-58.655	-62.009	1
CHP	48.1	CLIN	Cape Lindsey	-55.48	-61.107	1
CHP	48.1	CLPT	Claude Point	-62.6177	-64.116	1
CHP	48.1	CMEL	Cape Melville	-57.58	-62.022	2
CHP	48.1	COBA	Cobalescou Island	-61.6499	-64.1795	3
CHP	48.1	CONE	Cone Island	-69.1531	-67.6749	2
CHP	48.1	CPTW	Cieslak Point (West)	-58.689	-62.012	1
CHP	48.1	CRAB	Crab Beach	-55.17	-61.246	1
CHP	48.1	CRAG	Near Craggy Point	-54.186	-61.302	1
CHP	48.1	CRBA	Cresta Run Bay	-55.359	-61.236	1
CHP	48.1	CRIS	Cricklewood Island	-59.774	-62.385	1
CHP	48.1	CRWL	Cornwallis Island	-54.4641	-61.0724	1
CHP	48.1	DAVE	Davey Point	-58.5302	-61.9689	2
CHP	48.1	DECI	Decimal Point	-54.702	-61.097	1
CHP	48.1	DELA	Delaite Island	-62.1881	-64.5643	3
CHP	48.1	DEMA	Demay Point	-58.4191	-62.2137	10
CHP	48.1	DEPT	Devils Point	-61.1829	-62.6714	1
CHP	48.1	DESO	Desolation Island	-60.3468	-62.4578	1
CHP	48.1	DPOS	Decimal Point South	-54.709	-61.105	1
CHP	48.1	DREA	Dream Island	-64.2256	-64.7254	4
CHP	48.1	DREW	Dream Island West (Casey Islands)	-64.254	-64.7295	1
CHP	48.1	DUPT	Duthiers Point	-62.8179	-64.8049	5
CHP	48.1	DURO	Duroch Islands	-57.8903	-63.3033	1
CHP	48.1	EADI	Eadie Island	-55.929	-61.482	1
CHP	48.1	ECKE	Eckener Point	-61.6042	-64.4309	3
CHP	48.1	EDWA	Edwards Point	-59.4984	-62.4629	1
CHP	48.1	EGAR	East (2-3 km) of Cape Garry	-62.2131	-63.3555	1
CHP	48.1	EIN6	Elephant Island north coast Point 6	-55.057	-61.097	1
CHP	48.1	EIP0	Elephant Island north coast Point 0	-55.145	-61.077	1
CHP	48.1	EIP1	Elephant Island north coast Point 1	-55.113	-61.091	1
CHP	48.1	EIP2	Elephant Island north coast Point 2	-55.087	-61.093	1
CHP	48.1	EIP3	Elephant Island north coast Point 3	-55.074	-61.092	1
CHP	48.1	EIP5	Elephant Island north coast Point 5	-55.057	-61.094	1
CHP	48.1	ELPT	Elephant Point	-60.8573	-62.6924	1
CHP	48.1	EMER	Emerald Cove	-57.6822	-61.9062	2
CHP	48.1	EMPE	Emperor Island	-68.71	-67.8647	1
CHP	48.1	ENTR	Entrance Point	-60.5533	-62.9981	9
CHP	48.1	ENTW	Entrance Point West	-60.562	-63.008	1
CHP	48.1	FARE	Farewell Rock	-61.0183	-63.8678	4
CHP	48.1	FARI	False Ridge	-54.052	-61.283	1
CHP	48.1	FILD	Fildes Peninsula (Northwest side)	-58.97	-62.173	1
CHP	48.1	FORT	Fort Point (Greenwich Island)	-59.58	-62.542	6
CHP	48.1	FRPT	False Round Point	-57.9893	-61.8983	1
CHP	48.1	FURS	Fur Seal Point	-54.043	-61.218	1

CHP	48.1	GAMP	Gam Pt area	-57.9546	-61.9227	1
CHP	48.1	GARY	Cape Garry	-62.258	-63.361	1
CHP	48.1	GAST	Gaston Islands	-61.827	-64.4848	7
CHP	48.1	GEOR	Georges Point (Ronge Island)	-62.6696	-64.6694	22
CHP	48.1	GERL	Gerlache Island	-64.214	-64.601	1
CHP	48.1	GIBB	Gibbs Island	-55.6385	-61.471	1
CHP	48.1	GOLF	Golfcourse Point	-55.473	-61.128	1
CHP	48.1	GOUR	Gourdin Island	-57.3074	-63.1969	2
CHP	48.1	GREE	The Green Glen	-55.266	-61.271	1
CHP	48.1	GRIB	Georges Rib	-54.973	-61.157	1
CHP	48.1	GRIN	Grinder Rock	-61.4256	-63.966	1
CHP	48.1	HALF	Half Moon Island	-59.918	-62.596	15
CHP	48.1	HANN	Hannah Point	-60.6134	-62.6545	9
CHP	48.1	HARE	Harmony Point (East)	-59.229	-62.304	1
CHP	48.1	HARM	Harmony Point	-59.2425	-62.3064	4
CHP	48.1	HERO	Heroina Island	-54.6083	-63.3944	1
CHP	48.1	HEYW	Heywood Island	-59.6854	-62.3174	1
CHP	48.1	HOOK	Cape Hooker	-61.963	-63.334	1
CHP	48.1	HORS	Cape Hooker Rock (South)	-61.982	-63.345	1
CHP	48.1	HPNE	Hall Peninsula (North-East)	-61.241	-62.769	1
CHP	48.1	HPSW	Hall Peninsula (South-West)	-61.244	-62.775	2
CHP	48.1	HRSO	Hydrurga Rocks South	-61.626	-64.15	1
CHP	48.1	HUNT	Hunt Island	-62.117	-64.333	1
CHP	48.1	HUTB	Hut Bluff	-55.14	-61.219	1
CHP	48.1	HYDR	Hydrurga Rocks	-61.6259	-64.1454	6
CHP	48.1	INTE	Intercurrence Island	-61.416	-63.933	1
CHP	48.1	IOLB	Isles of Litwin Bay	-58.569	-61.99	1
CHP	48.1	JACO	Jacobs Ladder	-54.737	-61.152	1
CHP	48.1	JACP	Jacques Peak	-61.8342	-64.5152	5
CHP	48.1	JAME	Cape James	-62.6979	-63.0903	1
CHP	48.1	JAQU	Jaquinot Rocks	-58.421	-63.441	1
CHP	48.1	JING	Jingle Island	-65.3253	-65.4303	2
CHP	48.1	JORG	Jorge Island	-59.7607	-62.3798	1
CHP	48.1	JOUB	Joubin Islands	-64.3992	-64.7744	2
CHP	48.1	JPTI	Jameson Point Islands	-62.2622	-63.2944	1
CHP	48.1	JPTS	Jameson Point (South)	-62.2524	-63.3079	1
CHP	48.1	JPTV	Jameson Point (Vicinity)	-62.2583	-63.296	1
CHP	48.1	KELL	Kellick Island	-58.3928	-61.9186	2
CHP	48.1	KETL	Ketley Point	-62.7631	-64.7066	1
CHP	48.1	KITC	Kitchen Point	-59.347	-62.387	1
CHP	48.1	LAIR	Lair Point	-61.0353	-62.615	1
CHP	48.1	LAJA	Lajarte Island	-63.4752	-64.2357	1
CHP	48.1	LARK	Lafarge Rocks	-57.549	-63.209	1
CHP	48.1	LEPP	Islet South of Le Petit Prince	-58.021	-61.911	1
CHP	48.1	LION	Lions Rump	-58.1229	-62.1331	9
CHP	48.1	LITW	Litwin Bay (SW of Davey Point)	-58.565	-61.987	1

CHP	48.1	LLAN	Llano Point	-58.446	-62.176	14
CHP	48.1	LLOY	Cape Lloyd	-54.0103	-61.1298	1
CHP	48.1	LOBO	Lobodon Island	-61.6009	-64.086	1
CHP	48.1	LOOK	Cape Lookout	-55.205	-61.278	3
CHP	48.1	MBNE	Miers Bluff Cove (North-East)	-60.431	-62.716	1
CHP	48.1	MBNW	Miers Bluff (North-West)	-60.431	-62.716	1
CHP	48.1	MEGA	Megaptera Island	-60.806	-63.678	1
CHP	48.1	METC	Metchnikoff Point	-62.5747	-64.041	1
CHP	48.1	MIDA	Midas Island	-61.1008	-64.1685	4
CHP	48.1	MIER	Miers Bluff	-60.4282	-62.7167	3
CHP	48.1	MONU	Monument Rocks	-60.9433	-64.017	1
CHP	48.1	MOPT	Monroe Point	-61.5162	-62.8112	1
CHP	48.1	MPTE	Macaroni Point (East)	-60.543	-62.8987	1
CHP	48.1	MPTW	Macaroni Point (West)	-60.5833	-62.8991	2
CHP	48.1	MUCK	Muckle Bluff	-54.86	-61.157	1
CHP	48.1	NCOI	North of Cornwall Island	-59.702	-62.33	1
CHP	48.1	NEPT	Nelly Point	-54.775	-61.157	1
CHP	48.1	NEWE	Newell Point	-59.52	-62.3374	1
CHP	48.1	NFOR	North Foreland	-57.688	-61.8928	2
CHP	48.1	NPRO	Promontories on north-central coast	-62.075	-63.25	1
CHP	48.1	OBRI	O'Brien Island	-55.956	-61.507	1
CHP	48.1	ORCW	Offshore Rocks off Cape Wallace	-62.228	-63.235	1
CHP	48.1	ORNE	Orne Islands	-62.673	-64.662	21
CHP	48.1	ORRO	Ornen Rocks	-57.566	-62.009	1
CHP	48.1	OWEN	Owen Island	-58.3886	-61.9332	2
CHP	48.1	PALA	Palaver Point	-61.759	-64.1486	2
CHP	48.1	PAPT	Patelnia Point	-58.472	-62.235	11
CHP	48.1	PCHA	Port Charcot	-64.026	-65.067	15
CHP	48.1	PENG	Penguin Island	-57.9269	-62.102	10
CHP	48.1	PILL	Pillar Ridge	-54.222	-61.271	1
CHP	48.1	PING	Pinguino Island	-60.9857	-64.1435	10
CHP	48.1	PKUP	Pickup Point	-54.645	-61.116	1
CHP	48.1	PLDR	Penguin Ladder	-54.72	-61.143	1
CHP	48.1	POPO	Pottinger Point	-58.3582	-61.9325	2
CHP	48.1	PPPT	Pink Pool Point	-54.079	-61.309	1
CHP	48.1	PTHO	Point Thomas	-58.4615	-62.1631	10
CHP	48.1	PTWD	Point Wordie	-55.328	-61.245	1
CHP	48.1	PYRI	Pyrites Island	-57.9491	-61.9241	1
CHP	48.1	QPTN	Quinton Point (North)	-63.6367	-64.3144	1
CHP	48.1	QUPM	Quinton Point (Middle)	-63.683	-64.335	1
CHP	48.1	QUPS	Quinton Point (South)	-63.687	-64.345	1
CHP	48.1	QUPW	Quinton Point (West)	-63.699	-64.331	1
CHP	48.1	RENI	Renier Point	-59.81	-62.609	6
CHP	48.1	RIDL	Ridley Island	-58.016	-61.85	1
CHP	48.1	RIPP	Rip Point	-59.001	-62.235	1

CHP	48.1	ROBE	Robert Point (Robert Is)	-59.383	-62.45	4
CHP	48.1	ROME	Romeo Island	-59.9268	-62.3763	1
CHP	48.1	ROQU	Cape Roquemaurel	-58.9652	-63.5486	1
CHP	48.1	RUGG	Rugged Rocks	-59.816	-62.601	6
CHP	48.1	RZEP	Rzepeki Islands	-58.824	-62.099	1
CHP	48.1	SAPT	Saddleback Point	-54.901	-61.099	1
CHP	48.1	SEAL	Seal Islands	-55.393	-60.975	1
CHP	48.1	SEGI	Small island southeast on Gerlache Island	-64.2038	-64.6037	1
CHP	48.1	SELV	Selvick Cove	-62.5691	-64.6405	11
CHP	48.1	SEMP	Southeast of Monroe Point	-61.478	-62.83	1
CHP	48.1	SERA	Serac Point	-54.026	-61.177	1
CHP	48.1	SHIL	Shilling Shelf	-54.735	-61.097	1
CHP	48.1	SHIR	Cape Shirreff	-60.7874	-62.4575	15
CHP	48.1	SHIS	Shag Island	-58.297	-62.185	1
CHP	48.1	SMAL	Small Island	-61.4549	-64.0121	1
CHP	48.1	SMIG	Smiggers Island	-65.3514	-65.4597	2
CHP	48.1	SMIT	Cape Smith	-62.3	-62.8738	1
CHP	48.1	SPBL	South Point Bluff	-60.6347	-63.0158	2
CHP	48.1	SPIP	Spigot Peak Point	-62.558	-64.625	8
CHP	48.1	SPLI	Split Beach	-54.937	-61.156	1
CHP	48.1	SPNW	South Point Bluff (North-West)	-60.6702	-63.0138	2
CHP	48.1	SPRD	Spigot Peak Ridge	-62.554	-64.635	1
CHP	48.1	SPRI	Sprightly Islands Vicinity	-61.072	-64.283	4
CHP	48.1	SPTR	Spigot Peak Tripod	-62.5622	-64.6358	12
CHP	48.1	STIG	Stigant Point	-58.7185	-62.023	2
CHP	48.1	STIS	Stoker Island	-59.848	-62.397	1
CHP	48.1	STRA	Stranger Point	-58.6161	-62.26	7
CHP	48.1	TAIS	Tauton Island	-59.782	-62.384	1
CHP	48.1	TART	Tartar Point	-58.423	-61.937	2
CHP	48.1	TAYL	Taylor Point	-57.642	-61.933	2
CHP	48.1	TETR	Tetrad Islands	-60.734	-63.918	8
CHP	48.1	THUN	Thunder Bay	-54.117	-61.312	1
CHP	48.1	TIEA	Trinity I East	-60.683	-63.883	1
CHP	48.1	TINW	Trinity I North West	-60.749	-63.711	1
CHP	48.1	TISW	Trinity I South West	-60.879	-63.9	2
CHP	48.1	TIWE	Trinity I West	-60.829	-63.833	1
CHP	48.1	TOWE	Tower Island (East)	-59.779	-63.591	1
CHP	48.1	TOWW	Tower Island (West)	-59.876	-63.56	1
CHP	48.1	TPTN	Two Points North (of Hooker)	-61.951	-63.319	1
CHP	48.1	TRGR	Trident Glacier	-55.241	-61.278	1
CHP	48.1	TROW	Trowbridge Islands	-57.6304	-61.996	2
CHP	48.1	TRUN	Trundle Island	-65.2885	-65.3938	1
CHP	48.1	TTOE	The Toe	-59.1669	-62.3277	2
CHP	48.1	TUPI	Tupinier Island	-58.2669	-63.3702	1
CHP	48.1	TURR	Turret Point (King George Is)	-57.9514	-62.0875	10

CHP	48.1	TWGI	Three islands west of Gerlache Island	-64.2471	-64.5921	1
CHP	48.1	TWIN	Twintits Stack	-55.402	-61.18	1
CHP	48.1	UCHA	Uchatka Point	-58.439	-62.22	10
CHP	48.1	UICW	Unnamed Island off Cape Wallace	-62.1783	-63.2322	1
CHP	48.1	UIEL	Unnamed Island off Elephant Point	-60.502	-62.6	1
CHP	48.1	UNAI	Unnamed Island in Aitcho Islands	-59.785	-62.383	1
CHP	48.1	USEF	Useful Island	-62.864	-64.717	6
CHP	48.1	VALE	Cape Valentine	-54.651	-61.102	2
CHP	48.1	VAPO	Vapour Col (Deception Is)	-60.721	-62.992	2
CHP	48.1	VIET	Vietor Rock	-61.0981	-62.6831	1
CHP	48.1	VRNW	Vietor Rock (North-West)	-61.1021	-62.6746	1
CHP	48.1	WABL	Cape Wallace Bluff (South)	-62.2664	-63.2816	1
CHP	48.1	WALK	Walker Point	-54.697	-61.143	1
CHP	48.1	WALL	Cape Wallace	-62.209	-63.233	1
CHP	48.1	WATE	Waterboat Point	-62.8581	-64.8236	12
CHP	48.1	WDEI	Western Deception Island	-60.752	-62.952	1
CHP	48.1	WELC	Welcome Point	-55.429	-61.134	1
CHP	48.1	WIIS	Wideopen Islands	-55.849	-63.004	1
CHP	48.1	WILD	Point Wild	-54.861	-61.098	1
CHP	48.1	WINK	Winkle Island (actually 2 islets next to Winkle Island)	-65.686	-65.52	2
CHP	48.1	WINW	Window Island	-61.1237	-62.5654	1
CHP	48.1	WITH	Withem Island	-59.1381	-62.2352	1
CHP	48.1	WOOI	Wood Island	-60.3042	-62.4841	1
CHP	48.1	WORL	Worlds End	-57.996	-61.856	1
CHP	48.1	WSAD	West of Saddleback Point (Penguin Island)	-54.963	-61.106	1
CHP	48.1	ZAWA	Zawadski Stacks	-58.784	-62.079	1
CHP	48.1	ZEDI	Zed Island	-60.166	-62.433	1
CHP	48.1	ZIGZ	Zig Zag Island	-59.8419	-63.6123	1
CHP	48.2	ACUN	Acuna Island	-44.637	-60.7612	1
CHP	48.2	AILS	Ailsa Craig	-44.631	-60.78	1
CHP	48.2	AITK	Aitken Cove	-44.525	-60.738	1
CHP	48.2	AMPH	Amphibolite Point	-45.339	-60.684	1
CHP	48.2	ANDE	Cape Anderson	-44.601	-60.757	1
CHP	48.2	BENN	Cape Bennett	-45.236	-60.62	1
CHP	48.2	BRUC	Bruce Islands	-44.924	-60.683	1
CHP	48.2	BUCH	Buchanan Point	-44.465	-60.691	1
CHP	48.2	CHEA	Cheal Point	-45.994	-60.633	1
CHP	48.2	CHEC	Crown Head (East Coast)	-45.259	-60.627	1
CHP	48.2	COFF	Coffer Island	-45.138	-60.742	1
CHP	48.2	CONF	Confusion Island	-45.636	-60.738	1
CHP	48.2	CROB	Cape Robertson	-44.84	-60.714	1
CHP	48.2	CROW	Crown Head	-45.3269	-60.624	1
CHP	48.2	CVIK	Cape Vik	-45.663	-60.655	1
CHP	48.2	ECAP	East Cape	-45.201	-60.633	1

CHP	48.2	ELLI	Ellium Island	-44.871	-60.694	1
CHP	48.2	FERG	Ferguslie Peninsula	-44.567	-60.693	1
CHP	48.2	FERR	Ferrier Peninsula	-44.425	-60.715	1
CHP	48.2	FITC	Fitchie Bay	-44.494	-60.714	1
CHP	48.2	FLOR	Florence Rock	-44.622	-60.768	1
CHP	48.2	FRED	Fredriksen Island	-44.9901	-60.7326	1
CHP	48.2	FYRC	Fyr Channel	-45.673	-60.729	2
CHP	48.2	GEDD	Cape Geddes	-44.59	-60.685	1
CHP	48.2	GERD	Gerd Island	-45.7437	-60.6574	1
CHP	48.2	GIBA	Gibbon Bay	-45.214	-60.649	1
CHP	48.2	GOPT	Gourlay Point	-45.5863	-60.7309	1
CHP	48.2	GOSL	Gosling Islands	-45.9178	-60.6406	1
CHP	48.2	GOWC	Gosling Islands (West Coast)	-45.908	-60.64	1
CHP	48.2	GREY	Grey Island	-45.0149	-60.7487	1
CHP	48.2	INAC	Inaccessible Island	-46.7333	-60.5667	1
CHP	48.2	LARS	Larsen Island	-46.0777	-60.5955	1
CHP	48.2	LOPT	Lola Point	-44.742	-60.724	1
CHP	48.2	MABE	Mabel Island	-44.701	-60.675	1
CHP	48.2	MACO	Mackintosh Cove (East Coast)	-44.4912	-60.6851	1
CHP	48.2	MANS	Mansfield Point	-45.7333	-60.65	1
CHP	48.2	MARI	Mariholm	-45.693	-60.746	1
CHP	48.2	MARR	Marr Bay (East Coast)	-44.527	-60.678	1
CHP	48.2	MART	Point Martin	-44.7185	-60.7709	1
CHP	48.2	MATH	Matthews Island	-45.155	-60.745	1
CHP	48.2	MEPT	Meier Point	-45.896	-60.636	1
CHP	48.2	METH	Methuen Cove	-44.576	-60.751	1
CHP	48.2	MICH	Michelsen Island	-45.0233	-60.7324	1
CHP	48.2	MICV	Mill Cove	-44.614	-60.753	1
CHP	48.2	MLGE	McLeod Glacier (east)	-45.625	-60.721	1
CHP	48.2	MLGW	McLeod Glacier (west)	-45.6	-60.7	1
CHP	48.2	MOEI	Moe Island	-45.691	-60.734	1
CHP	48.2	MOSS	West coast of Mossman Peninsula	-44.753	-60.772	1
CHP	48.2	MOYE	Moyes	-45.66	-60.732	1
CHP	48.2	MURR	Murray Islands	-44.524	-60.773	1
CHP	48.2	NOPT	North Point	-45.626	-60.672	2
CHP	48.2	NORW	Norway Bight	-45.816	-60.616	1
CHP	48.2	OLIC	Oliphant Channel	-45.592	-60.729	1
CHP	48.2	OLII	Oliphant Islands	-45.594	-60.736	1
CHP	48.2	PAGE	Pageant Point	-45.5843	-60.7286	1
CHP	48.2	PAND	Pandemonium Point	-45.648	-60.736	2
CHP	48.2	PANT	Pantomime Point	-45.5833	-60.7266	1
CHP	48.2	PIRI	Pirie Peninsula	-44.662	-60.69	1
CHP	48.2	POWE	Powell Island	-45.029	-60.725	1
CHP	48.2	PRAE	Point Rae	-44.633	-60.757	1
CHP	48.2	PTCT	Point Cormorant	-44.732	-60.756	1
CHP	48.2	PTLA	Point Lola	-44.738	-60.724	1

CHP	48.2	PURD	Purdy Point	-45.4333	-60.5333	1
CHP	48.2	RAYN	Rayner Point	-45.191	-60.648	1
CHP	48.2	ROCA	Cape Roca	-44.8167	-60.75	1
CHP	48.2	RUDM	Rudmose Rocks	-44.602	-60.676	1
CHP	48.2	SADD	Saddle Island	-44.855	-60.617	1
CHP	48.2	SAND	Sandefjord Bay	-46.0367	-60.605	1
CHP	48.2	SHAG	Shagnasty Island	-45.618	-60.732	1
CHP	48.2	SHCV	Sheila Cove	-44.7883	-60.7364	1
CHP	48.2	SKIL	Skilling Island (North Coast)	-45.15	-60.7833	1
CHP	48.2	SMAT	Unnamed Islands (South of Matthews Island)	-45.154	-60.742	1
CHP	48.2	SPIN	Spine Island (Coronation Is)	-46.0202	-60.594	1
CHP	48.2	SPRO	Spindrift Rocks	-45.644	-60.683	2
CHP	48.2	SPUI	Spence Harbour & Unnamed Island	-45.169	-60.699	1
CHP	48.2	STEE	Steepholm Islands	-45.15	-60.7833	1
CHP	48.2	STEN	Stene Point	-45.707	-60.654	1
CHP	48.2	TTUR	The Turret	-45.166	-60.67	1
CHP	48.2	VAIS	Valette Island	-44.622	-60.758	1
CHP	48.2	WHIT	Cape Whitson	-44.544	-60.748	1
CHP	48.2	WPEC	Watson Peninsula (East Coast)	-44.5436	-60.6761	1
CHP	48.2	WPWC	Watson Peninsula (West Coast)	-44.551	-60.675	1
CHP	88.1	CHII	Chinstrap Islet, Balleny Islands	163.311	-66.925	2
CHP	88.1	SABR	Sabrina Island, Balleny Islands	163.309	-66.9171	4
EMP	48.1	SNOW	Snow Hill Island	-57.44	-64.52	1
EMP	48.5	DAWS	Dawson	-26.67	-76.02	1
EMP	48.5	DOLL	Dolleman	-60.43	-70.61	1
EMP	48.5	GOUL	Gould	-47.68	-77.71	1
EMP	48.5	HALY	Halley	-27.43	-75.54	1
EMP	48.5	LAIS	Larsen Ice Shelf	-60.6737	-66.0996	1
EMP	48.5	LUIT	Luitpold	-33.552	-77.271	1
EMP	48.5	SMTH	Smith	-60.83	-74.37	1
EMP	48.5	STCB	Stancomb	-23.089	-74.039	2
EMP	48.6	ASTD	Astrid	8.31	-69.95	1
EMP	48.6	ATKA	Atka	-8.13	-70.61	1
EMP	48.6	DRES	Drescher	-19.34	-72.83	1
EMP	48.6	LAZA	Lazarev	15.55	-69.75	1
EMP	48.6	RAGN	Ragnhild	27.15	-69.9	1
EMP	48.6	RIIS	Riiser	-15.11	-72.12	1
EMP	48.6	SANA	Sanae	-1.42	-70	1
EMP	88.1	BEAU	Beaufort Island	166.8978	-76.9694	13
EMP	88.1	COUL	Coulman Island	169.61	-73.35	8
EMP	88.1	CROZ	Cape Crozier	169.32	-77.46	11
EMP	88.1	DBAY	Davis Bay	158.49	-69.35	1
EMP	88.1	FRAN	Franklin Island	168.43	-76.18	11
EMP	88.1	ROGE	Cape Roget	170.59	-71.99	6
EMP	88.1	WASH	Cape Washington	165.37	-74.64	9

EMP	88.2	BEAR	Bear Peninsula	-110.192	-74.3922	1
EMP	88.2	CBEK	Cape Colbeck, Edward VII Peninsula	-157.7	-77.14	4
EMP	88.2	LEDD	Ledda Bay	-130.784	-74.228	1
EMP	88.2	RUPE	Rupert Coast	-143.3	-75.38	1
EMP	88.2	THUR	Thurston Glacier, Mount Siple	-125.621	-73.5	1
EMP	88.3	BRCO	Bryan Coast	-85.3477	-73.2491	1
EMP	88.3	BSON	Brownson Islands	-103.636	-74.1681	1
EMP	88.3	NOVI	Noville Peninsula	-98.45	-71.77	1
EMP	88.3	ROTI	Rotschild Island	-72.2293	-69.5209	1
EMP	88.3	SMYL	Smyley	-78.83	-72.3	1
EMP	58.4.1	BARB	Barrier Bay	81.39	-66.301	3
EMP	58.4.1	BOWM	Bowman Island	103.07	-65.16	2
EMP	58.4.1	BUIS	Burton Ice Shelf	89.69544	-66.2719	1
EMP	58.4.1	DIBB	Dibble Glacier	134.79	-66.01	1
EMP	58.4.1	HASW	Haswell Island	93.01	-66.52	3
EMP	58.4.1	MBOF	Mertz Break Off	145.8335	-67.3656	1
EMP	58.4.1	MERT	Mertz Glacier	146.62	-66.892	1
EMP	58.4.1	PGEO	Point Geologie	140.01	-66.67	3
EMP	58.4.1	PSON	Peterson Bank	110.23	-65.92	1
EMP	58.4.1	SACO	Sabrina Coast	121.136	-66.161	1
EMP	58.4.1	SHAC	Shackleton Ice Shelf	96.02	-64.86	2
EMP	58.4.1	WEIS	West Ice Shelf	81.93087	-67.225	1
EMP	58.4.2	AMAN	Amanda Bay	76.83	-69.27	2
EMP	58.4.2	AMUN	Amundsen Bay	50.55	-66.78	1
EMP	58.4.2	AUST	Auster Islands	63.98	-67.39	3
EMP	58.4.2	DARN	Cape Darnley	69.7	-67.88	2
EMP	58.4.2	FOLD	Fold Island	59.32	-67.32	1
EMP	58.4.2	GUNN	Gunnerus	34.38	-68.75	1
EMP	58.4.2	KLOA	Kloa Point	57.28	-66.64	1
EMP	58.4.2	TAYG	Taylor Glacier	60.88	-67.45	3
EMP	58.4.2	UMBE	Umbeashi	43.01	-68.05	1
GEP	48.1	AITC	Barrientos Island (Aitcho Islands)	-59.7517	-62.4071	13
GEP	48.1	ALMI	Brown Station	-62.8703	-64.8956	14
GEP	48.1	ARDL	Ardley Island	-58.933	-62.213	19
GEP	48.1	BARN	Barnard Point (Livingston Island)	-60.338	-62.758	2
GEP	48.1	BART	Barton Peninsula	-58.791	-62.224	16
GEP	48.1	BENE	Beneden Head	-62.701	-64.7671	6
GEP	48.1	BISC	Biscoe Point	-63.7775	-64.8114	18
GEP	48.1	BRAS	Brash Island	-54.9142	-63.3864	1
GEP	48.1	BRIT	Brittannia's Figleaf	-55.213	-61.278	2
GEP	48.1	BROW	Brown Bluff	-56.905	-63.5222	17
GEP	48.1	BRYE	Bryde Island East	-62.9272	-64.8897	13
GEP	48.1	BRYS	Bryde Island South	-62.9508	-64.9011	11
GEP	48.1	CHPT	Charles Point	-61	-64.236	4
GEP	48.1	CIER	Cierva Point	-60.96	-64.157	9

GEP	48.1	CONW	Cape Conway	-61.4224	-62.8415	1
GEP	48.1	CUVE	Cuverville Island	-62.626	-64.684	16
GEP	48.1	DAMO	Dorian Bay/Damoy Point	-63.4968	-64.8149	20
GEP	48.1	DANC	Danco Island	-62.5938	-64.734	15
GEP	48.1	DOBE	Dorian Beacon	-63.5114	-64.8111	12
GEP	48.1	DUND	Dundee Island	-55.966	-63.483	1
GEP	48.1	DUPT	Duthiers Point	-62.8179	-64.8049	4
GEP	48.1	DURV	d'Urville Monument	-56.2944	-63.4267	1
GEP	48.1	EARL	Earle Island	-54.7833	-63.4833	1
GEP	48.1	ELPT	Elephant Point	-60.8573	-62.6924	1
GEP	48.1	FORT	Fort Point (Greenwich Island)	-59.58	-62.542	5
GEP	48.1	GALE	Galindez Island East	-64.2399	-65.2476	4
GEP	48.1	GALS	Galindez Island South	-64.246	-65.252	2
GEP	48.1	GEOR	Georges Point (Ronge Island)	-62.6696	-64.6694	15
GEP	48.1	GERL	Gerlache Island	-64.214	-64.601	2
GEP	48.1	GLAN	Glandaz Point	-63.9591	-65.0911	6
GEP	48.1	GOUR	Gourdin Island	-57.3074	-63.1969	2
GEP	48.1	GREE	The Green Glen	-55.266	-61.271	1
GEP	48.1	GRIB	Georges Rib	-54.973	-61.157	1
GEP	48.1	HANN	Hannah Point	-60.6134	-62.6545	4
GEP	48.1	HARM	Harmony Point	-59.2425	-62.3064	2
GEP	48.1	HERO	Heroina Island	-54.6083	-63.3944	2
GEP	48.1	HOPE	Hope Bay	-56.9978	-63.3972	2
GEP	48.1	HOVG	Hovgaard Island	-64.1264	-65.1311	1
GEP	48.1	HUMP	Humphries Heights	-63.8637	-65.0557	7
GEP	48.1	HURE	Hurd Peninsula (east)	-60.379	-62.695	1
GEP	48.1	HURW	Hurd Peninsula (west)	-60.406	-62.674	2
GEP	48.1	HUTB	Hut Bluff	-55.14	-61.219	1
GEP	48.1	JADE	Jade Point	-57.5935	-63.6028	1
GEP	48.1	JOHN	Johnson's Dock	-60.3675	-62.6604	1
GEP	48.1	JONA	Jonassen Island	-56.6834	-63.5425	3
GEP	48.1	JOUB	Joubin Islands	-64.3992	-64.7744	4
GEP	48.1	JOUG	Jougla Point	-63.4932	-64.827	25
GEP	48.1	KETL	Ketley Point	-62.7631	-64.7066	1
GEP	48.1	KNOB	Knobble Head, Bransfield Island	-56.5694	-63.1619	1
GEP	48.1	LAUT	Lautaro Neck	-63.1027	-64.8285	1
GEP	48.1	LEGU	Cape Leguillou	-59.843	-63.5427	1
GEP	48.1	LION	Lions Rump	-58.1229	-62.1331	8
GEP	48.1	LLAN	Llano Point	-58.446	-62.176	28
GEP	48.1	LOCK	Port Lockroy	-63.484	-64.8231	19
GEP	48.1	LOOK	Cape Lookout	-55.205	-61.278	3
GEP	48.1	LOUB	Loubat Point	-63.9265	-65.0776	4
GEP	48.1	MADD	Madder Cliff (Joinville Island)	-56.4831	-63.2989	4
GEP	48.1	MADI	Madder Cliff Island	-56.499	-63.306	2
GEP	48.1	MIKK	Mikkelsen Harbor (Trinity Island)	-60.791	-63.9022	12

GEP	48.1	MONA	Cape Monaco	-64.2782	-64.7171	1
GEP	48.1	MOOT	Moot Point	-64.078	-65.2062	8
GEP	48.1	MUCK	Muckle Bluff	-54.86	-61.157	1
GEP	48.1	NEKO	Neko Harbor (Andvord Bay)	-62.5327	-64.8383	19
GEP	48.1	NOBL	Noble Rocks	-63.4335	-64.7849	4
GEP	48.1	ONEI	O'Neill Point	-63.0901	-64.8162	4
GEP	48.1	ORNE	Orne Islands	-62.673	-64.662	11
GEP	48.1	PABE	Paradise Harbor Beacon (Paradise Bay)	-62.9311	-64.9111	2
GEP	48.1	PATE	Patella Island	-55.5238	-63.1294	1
GEP	48.1	PCHA	Port Charcot	-64.026	-65.067	12
GEP	48.1	PEIN	Peine Island (Comb Island)	-54.717	-63.411	1
GEP	48.1	PETE	Petermann Island	-64.137	-65.176	13
GEP	48.1	PLAT	Plato Island (Platter Island)	-54.6742	-63.433	1
GEP	48.1	PLEN	Pleneau Island	-64.0556	-65.104	16
GEP	48.1	PRIM	Prime Head	-57.305	-63.2129	1
GEP	48.1	PRIN	Principal Point	-63.431	-64.9121	2
GEP	48.1	PTHO	Point Thomas	-58.4615	-62.1631	11
GEP	48.1	PTWD	Point Wordie	-55.328	-61.245	9
GEP	48.1	PYPT	Py Point	-63.5974	-64.8792	3
GEP	48.1	QPTN	Quinton Point (north)	-63.6367	-64.3144	1
GEP	48.1	RIPP	Rip Point	-59.001	-62.235	1
GEP	48.1	ROBE	Robert Point (Robert Island)	-59.383	-62.45	4
GEP	48.1	RONE	Ronge Island East	-62.6436	-64.6884	11
GEP	48.1	SANE	San Eliado Point	-63.1166	-64.844	3
GEP	48.1	SAXU	Saxum Nunatak	-56.0533	-63.1367	1
GEP	48.1	SELV	Selvick Cove	-62.5691	-64.6405	11
GEP	48.1	SHIR	Cape Shirreff	-60.7874	-62.4575	13
GEP	48.1	SKOT	Skottsberg Point	-60.8089	-63.9205	8
GEP	48.1	SPIP	Spigot Peak Point	-62.558	-64.625	4
GEP	48.1	SPTR	Spigot Peak Tripod	-62.5622	-64.6358	5
GEP	48.1	STAC	Stackpole Rocks	-60.9574	-62.678	1
GEP	48.1	STER	Sterneck Island	-60.9826	-64.201	4
GEP	48.1	STRA	Stranger Point	-58.6161	-62.26	5
GEP	48.1	TRIA	Triangle Point	-59.839	-62.522	1
GEP	48.1	TRUA	Truant Island	-63.407	-64.923	1
GEP	48.1	TUXE	Cape Tuxen	-64.1178	-65.2667	4
GEP	48.1	TXRX	Tuxen Rocks	-64.1334	-65.2549	1
GEP	48.1	USEF	Useful Island	-62.864	-64.717	5
GEP	48.1	VERN	Vernadsky Station	-64.2567	-65.2453	5
GEP	48.1	WATE	Waterboat Point	-62.8581	-64.8236	10
GEP	48.1	WILD	Point Wild	-54.861	-61.098	1
GEP	48.1	YALO	Yalour Islands	-64.1564	-65.2389	4
GEP	48.1	YANK	Yankee Harbor	-59.7687	-62.5257	10
GEP	48.2	CHRI	Christoffersen Island	-45.035	-60.728	1
GEP	48.2	GOSL	Gosling Islands	-45.9178	-60.6406	1
GEP	48.2	NOPT	North Point	-45.626	-60.672	3

GEP	48.2	POWE	Powell Island	-45.029	-60.725	1
GEP	48.2	WEDD	Weddell Island	-44.8479	-60.6359	1
GEP	48.2	WPEC	Watson Peninsula (east coast)	-44.5436	-60.6761	2

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