

Attachment B. Available Science Outputs

This is not intended to be a comprehensive list of relevant data sources – rather it is a compilation of information that was identified and/or discussed during the course of the workshop.

Existing published research on the current system of Antarctic Specially Protected Areas

Hughes, K. A., Perterra, L. R., & Walton, D. W. H. (2013). Area protection in Antarctica: How can conservation and scientific research goals be managed compatibly?. *Environmental science & policy*, 31, 120-132. <http://dx.doi.org/10.1016/j.envsci.2013.03.012>

Shaw, J. D., Terauds, A., Riddle, M. J., Possingham, H. P., & Chown, S. L. (2014). Antarctica's protected areas are inadequate, unrepresentative, and at risk. *PLoS Biology*, 12(6), e1001888. <http://dx.doi.org/10.1371/journal.pbio.1001888>

Hughes, K. A., Ireland, L. C., Convey, P., & Fleming, A. H. (2016). Assessing the effectiveness of specially protected areas for conservation of Antarctica's botanical diversity. *Conservation Biology*, 30(1), 113-120. <http://dx.doi.org/10.1111/cobi.12592>

Chown, S.L., Brooks, C.M., Terauds, A., Le Bohec, C., van Klaveren-Impagliazzo, C., Whittington, J.D., Butchart, S.H., Coetzee, B.W., Collen, B., Convey, P. and Gaston, K.J (2017). Antarctica and the strategic plan for biodiversity. *PLoS biology*, 15(3), e2001656. <https://doi.org/10.1371/journal.pbio.2001656>

Coetzee, B. W., Convey, P., & Chown, S. L. (2017). Expanding the protected area network in Antarctica is urgent and readily achievable. *Conservation Letters*, 10(6), 670-680. <https://doi.org/10.1111/conl.12342>

Hughes, K. A., & Grant, S. M. (2017). The spatial distribution of Antarctica's protected areas: A product of pragmatism, geopolitics or conservation need?. *Environmental science & policy*, 72, 41-51. <https://doi.org/10.1016/j.envsci.2017.02.009>

Wauchope, H. S., Shaw, J. D., & Terauds, A. (2019). A snapshot of biodiversity protection in Antarctica. *Nature communications*, 10(1), 946. <https://doi.org/10.1038/s41467-019-08915-6>

Specific Data sets - Values

- i. Antarctic Treaty Secretariat Protected Antarctic Protected Areas Database (https://ats.aq/devPH/apa/ep_protected.aspx?lang=e)
- ii. Environmental Domains Analysis (Morgan et al. 2007)
- iii. Antarctic Conservation Biogeographic Regions (Terauds et al 2012, Terauds and Lee 2016)
- iv. Important Bird Areas (https://documents.ats.aq/ATCM38/att/ATCM38_att097_e.pdf)
- v. Updated ASPA spatial layers (Wauchope et al. 2019; <https://doi.org/10.26179/5c1b10c534c19>)
- vi. Retrospective Analysis of Antarctic Tracking Data (<https://researchdata.ands.org.au/filtered-retrospective-analysis-antarctic-research/1330226?fl>)
- vii. Biogeographic Atlas of the Southern Ocean (<https://core.ac.uk/download/pdf/33450314.pdf>)
- viii. Marine benthic classifications (Douglass et al. 2014)
- ix. Retrospective Analysis of Antarctic Tracking Data (<https://researchdata.ands.org.au/filtered-retrospective-analysis-antarctic-research/1330226?fl>)
- x. Biodiversity predictions through SDMs and habitat suitability models (emerging)
- xi. SCAR Terrestrial biodiversity database (emerging)
- xii. Continent wide habitat delineations (emerging)

- xiii. Type locality data on Antarctic species (emerging)
- xiv. Inviolate (wilderness) areas (emerging – see <http://dx.doi.org/10.1101/527010>)
- xv. Red-listing of species and ecosystems (emerging)
- xvi. Geological frameworks outstanding geo-sites (emerging)

Specific data sets – Other data

- i. Climate change layers (IPPC RCP 2.5, 4, 8.5 temperature, precipitation, ice-free expansion e.g Lee et al. 2017)
- ii. Non-native species risks and predictions (e.g. Chown et al. 2012, Duffy et al. 2017)
- iii. National Antarctic Program infrastructure locations
- iv. Footprint studies and analyses (e.g. Brooks et al. 2019, Pertierra et al. 2017)
- v. IAATO visit /site information (<https://iaato.org/tourism-statistics>)

Data portals

- i. Antarctic and Southern Ocean Biodiversity (biodiversity.aq)
- ii. Antarctic Environments Portal (environments.aq)
- iii. Mapping Applications for Penguin Population and Projected Dynamics (www.penguinmap.com)
- iv. microbial Antarctic Resources (MARS) http://mars.biodiversity.aq/site_pages/datasets

Monitoring

SCAR (through the Monaco Assessment II) is in the process of identifying Essential Biodiversity Variables for Antarctica to help capture biodiversity change – relevant to informing monitoring strategies associated with ASPAs

References

Brooks, S. T., Jabour, J., Van Den Hoff, J., & Bergstrom, D. M. (2019). Our footprint on Antarctica competes with nature for rare ice-free land. *Nature Sustainability*. <https://doi.org/10.1038/s41893-019-0237-y>

Chown, S.L., Huiskes, A.H., Gremmen, N.J., Lee, J.E., Terauds, A., Crosbie, K., Frenot, Y., Hughes, K.A., Imura, S., Kiefer, K. and Lebouvier, M. (2012). Continent-wide risk assessment for the establishment of nonindigenous species in Antarctica. *Proceedings of the National Academy of Sciences*, 109(13), pp.4938-4943. <https://doi.org/10.1073/pnas.1119787109>

Douglass, L.L., Turner, J., Grantham, H.S., Kaiser, S., Constable, A., Nicoll, R., Raymond, B., Post, A., Brandt, A. and Beaver, D. (2014). A hierarchical classification of benthic biodiversity and assessment of protected areas in the Southern Ocean. *PloS one*, 9(7), p.e100551.

Duffy, G. A., Coetsee, B. W., Latombe, G., Akerman, A. H., McGeoch, M. A., & Chown, S. L. (2017). Barriers to globally invasive species are weakening across the Antarctic. *Diversity and Distributions*, 23(9), 982-996. <https://doi.org/10.1111/ddi.12593>

Lee, J. R., Raymond, B., Bracegirdle, T. J., Chades, I., Fuller, R. A., Shaw, J. D., & Terauds, A. (2017). Climate change drives expansion of Antarctic ice-free habitat. *Nature*, 547(7661), 49-54. doi:10.1038/nature22996

Morgan, F., Barker, G., Briggs, C., Price, R. & Keys, H. 2007. Environmental domains of Antarctica Version 2.0 Final Report. Manaaki Whenua Landcare Research New Zealand Ltd. https://www.landcareresearch.co.nz/publications/researchpubs/eda_v2_final_report.pdf

Pertierra, L. R., Hughes, K. A., Vega, G. C., & Olalla-Tárraga, M. Á. (2017). High resolution spatial mapping of human footprint across Antarctica and its implications for the strategic conservation of avifauna. *PloS one*, 12(1), e0168280.

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<https://doi.org/10.1371/journal.pbio.1001888>

Terauds, A., Chown, S.L., Morgan, F., Peat, H.J., Watts, D.J., Keys, H., Convey, P., and Bergstrom, D.M. (2012). Conservation biogeography of the Antarctic. *Diversity and Distributions*: 18, 726– 741.
<https://doi.org/10.1111/j.1472-4642.2012.00925.x>

Terauds, A., and Lee, J.R. (2016). Antarctic biogeography revisited: updating the Antarctic Conservation Biogeographic Regions. *Diversity and Distribution* 22: 836–840.
<https://onlinelibrary.wiley.com/doi/full/10.1111/ddi.12453>

Wauchope, H., Shaw, J.D., and Terauds, A. 2019. A snapshot of biodiversity protection in Antarctica. *Nature Communications* 10, Article Number 946. <https://www.nature.com/articles/s41467-019-08915-6>