

Developing best practice guidelines for geospatial data and mapping within the South African polar sciences

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Keywords: ISO, mapping guidelines, SANAP, SANS, SAPRI

Abstract:

The Standing Committee on Antarctic Geographic Information (SCAGI) of the Scientific Committee on Antarctic Research (SCAR) are responsible for a consistent geographic framework for all activities in Antarctica. South Africa is an original signatory to the Antarctic Treaty and has maintained representation in Antarctica and an Antarctic research station via the South African National Antarctic Program (SANAP) ever since. The South African Polar Research Infrastructure (SAPRI) was further established in 2021 to ensure coordination of South African marine and Antarctic research as a national Big Science programme, providing seamless access to existing and new research infrastructure required to develop and enhance long-term observations of South Africa's polar region. South African infrastructure related to research within Antarctica and the sub-Antarctic is thus well-established. However, the management and representation of geospatial data lack conformity and the application of local and international standards is lacking. This is even though the representation of geographic information is crucial for understanding geospatial phenomena.

This paper provides an overview of best practices regarding geospatial data, information representation, and mapping of areas that are researched and visited by South African scientists in the Antarctic and sub-Antarctic, as provided in the SCAR International Principles and Procedures for Antarctic Place Names. Further information on national standards relevant to mapping activities of South Africans in the Antarctic and sub-Antarctic, including South African National Standards (SANS, such as SANS 1877:2004, SANS 1878-1:2005, SANS 19162:2016), as well as ISO standards with relevance (e.g., ISO 19162:2015) are discussed. An overview of the South African Gazetteer, and the South African National Names Council Act 118 of 1998 (Republic of South Africa, 1998) is also provided. Finally, best practices and guidelines are presented that aim to simplify the management and representation of geospatial data of South African scientists in polar research, including step-by-step instructions manuals and geospatial layer files to simplify symbolisations for those adept at cartography and the geospatial sciences, and facilitating correct mapping practises to those new to these. This aligns with FAIR data usage principles (Findable, Accessible, Interoperable, and Reusable), and speaks to interoperability. Methods and best practices presented here aim to ensure South African researchers conform to not only SCAR and SCAGI, but also national and international standards when representing their geospatial information in maps and open-access geospatial layers.