



POLAR SCIENCE
FOR PLANET EARTH

Application of Standards in Antarctica

A Paul R Cooper



British
Antarctic Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL

Application of Standards in Antarctica

- Background to the Scientific Committee on Antarctic Research
- Why is SCAR interested in Standards?
- History of Standards in Antarctic Mapping
- Standards currently in use
- Demonstration
- Summary



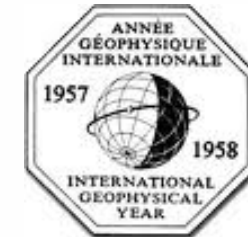
British
Antarctic Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL

POLAR SCIENCE
FOR PLANET EARTH

What is SCAR?

- Not the baddies in a 1960's TV series!
- The Scientific Committee on Antarctic Research
- A committee of ICSU, the International Council for Science
- Formed in 1957, during the International Geophysical Year
- Coordinates scientific work in Antarctica
- Advises the Antarctic Treaty system
- Has been involved in Antarctic Cartography since 1958



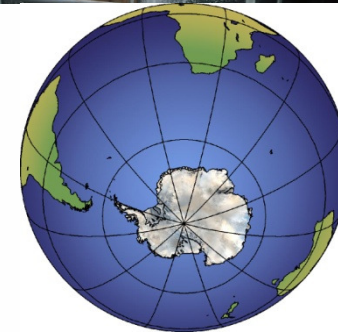
British
Antarctic Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL

POLAR SCIENCE
FOR PLANET EARTH

Geographic Information and SCAR

- Antarctica is a difficult place to map
 - Hostile climate
 - Remote
 - Vast distances (58 times as big as the UK, 1.4 times as big as the USA)
 - No infrastructure
- Combining different national resources is essential
- SCAR has coordinated cartography and geographic information since 1958.



British
Antarctic Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL

POLAR SCIENCE
FOR PLANET EARTH

Why is SCAR interested in Standards?

- Joined up mapping requires standards
- Since 1961, SCAR has promulgated standards
- Published a standard legend for Antarctic maps in 1961
- Made recommendations for Antarctic map projections in 1961
- Made recommendations for reference ellipsoids and datums:
 - 1961 - International Ellipsoid
 - 1972 – WGS 72
 - Now – WGS 84
- Standards make maps created by different agencies “interoperable”
- Since 1996, SCAR has encouraged the use of ISO TC211 standards
- SCAR has been a Class A liaison organization since May 2002



British
Antarctic Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL

POLAR SCIENCE
FOR PLANET EARTH

Why Standards?

- Everyone in my field/organization uses <insert data format>
- International standards allow data sharing between different disciplines, organizations and countries.
- GIS crosses disciplinary and organizational boundaries.
- GIS allows data from different disciplines and organizations to be brought together
- Discipline or organization specific formats do not promote data re-use.



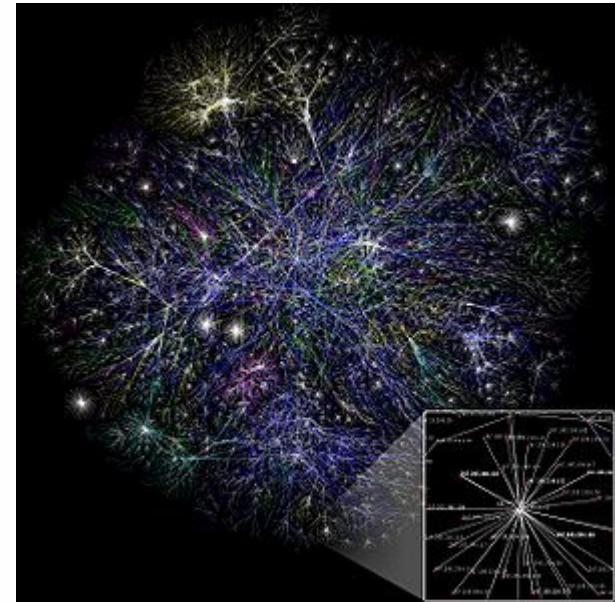
British
Antarctic Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL

POLAR SCIENCE
FOR PLANET EARTH

Why Standards? The Big picture

- Standards are vital for success
- THE Success story:
 - The Internet
 - Based on strong standards
 - Runs on diverse hardware and operating systems
 - Allows many suppliers to contribute.
- Failures too many to enumerate!
 - No standards, or poorly developed standards
 - OK while running in a well controlled hardware/software environment
 - Fail when exposed to the real world!



British
Antarctic Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL

POLAR SCIENCE
FOR PLANET EARTH

Standards used: ISO 19115 and ISO 19139 (Metadata)

- Most Antarctic data has a location
- ISO 19115 is the primary standard for Antarctic Data
- Global Change Master Directory uses a minimal implementation
 - Antarctic Master Directory is a sub-set
- Most Antarctic Datasets have a presence there
- Fuller implementations used in specific projects

The screenshot shows the Antarctic Master Directory website. The header includes the logo and the text "ANTARCTIC MASTER DIRECTORY" and "A Global Change Master Directory Portal". The navigation menu includes: HOME, DATA SEARCH, DATA SERVICES, AUTHORIZING TOOLS, NADC PORTALS, SCAR PROJECTS, and ASTROPHYSICS. The main content area is titled "Find Data Sets by Topic:" and lists various categories with icons and brief descriptions:

- Agriculture**: soils, agricultural plant science...
- Atmosphere**: atmospheric temperature, atmospheric winds...
- Biological Classification**: animals/vertebrates, animals/invertebrates...
- Biosphere**: aquatic ecosystems, ecological dynamics...
- Climate Indicators**: teleconnections, air temperature indices...
- Cryosphere**: snow/ice, glaciers/ice sheets...
- Human Dimensions**: environmental impacts, boundaries...
- Land Surface**: soils, topography...
- Oceans**: ocean temperature, ocean chemistry...
- Paleoclimate**: ocean/lake records, land records...
- Solid Earth**: rocks/minerals, geodetics/gravity...
- Spectral Engineering**: visible wavelengths, infrared wavelengths...
- Sun-Earth Interactions**: solar activity, ionosphere/magnetosphere dynamics...
- Terrestrial Hydrosphere**: surface water, water quality/water chemistry...
- Data Centers - Locations - Instruments/Sensors - Platforms/Sources - Projects**

At the bottom of the page, there is a NASA logo and a "NASA Privacy Policy and Important Notices" link. The footer text reads: "Responsible NASA Official: Lola Olsen" and "Webmaster: Monica Holland · Contact GCMD User Support for assistance".

Standards used: ISO 19110 (Feature Cataloguing)

- The Antarctic community is multi-lingual and multi-cultural
- The Antarctic treaty has four Official Languages – English, Russian, French and Spanish.
- The Antarctic Treaty is currently acceded to by 48 nations.
- Even people who speak English can have misunderstandings!
- ISO 19110 ensures we are all talking about the same thing.
- The SCAR Feature Catalogue is maintained by Australia
 - <http://data.aad.gov.au/aadc/ftc/>
- It covers topographic features with focussing on those peculiar to Antarctica.



British
Antarctic Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL

POLAR SCIENCE
FOR PLANET EARTH

Other (non-ISO) Standards

- OGC web services are widely used
- Antarctic Digital Database (www.add.scar.org)
- USGS
 - LIMA
- National Snow and Ice Data Centre
- Standards VITAL in all web-based applications!



British
Antarctic Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL

POLAR SCIENCE
FOR PLANET EARTH

Demonstration



British
Antarctic Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL

POLAR SCIENCE
FOR PLANET EARTH

Summary

- SCAR is an international community
- Standards are vital to make sharing data work
- Standards are vital to create services of use for all
- Standards are a basis for solutions working in diverse environments.



British
Antarctic Survey

NATURAL ENVIRONMENT RESEARCH COUNCIL

POLAR SCIENCE
FOR PLANET EARTH

Thank-you!



**British
Antarctic Survey**

NATURAL ENVIRONMENT RESEARCH COUNCIL

**POLAR SCIENCE
FOR PLANET EARTH**