

Getting a handle on Antarctic species

'SEAL BEARING 270 DEGREES, RANGE 3KM! CAN ANYONE identify it? Is it a crabeater?' This is a typical situation on the bridge of the *Aurora Australis* in the pack ice of the Antarctic. What happens to scientific observations such as this?

The international Antarctic science program collects an amazing amount of information about wildlife. Traditionally, this information has gone into field notebooks. Bits of information are then extracted to support a scientific paper and the notebooks are filled, filed, and have often ended up as landfill.

The amount of scientific data that has been lost over the last fifty years would probably defy the imagination. It is now recognised that the data that is 'filed' in notebooks, and more lately, Excel® spreadsheets, may be far more valuable than the publications it may have supported. For the value of information to be retained, the data needs to be stored in a widely accessible repository, described and indexed. This is one aspect of the new trend called Knowledge Management: capturing information and placing it in a form so that it can be used effectively by a broad audience and for a wide range of applications.

The Australian Antarctic Data Centre (AADC) was established in 1995 to fulfil one of Australia's obligations to the Antarctic Treaty, that "*scientific observations and results from Antarctica shall be exchanged and made freely available*" (Article III.1.c). This turned out to be a farsighted undertaking as it is beginning to raise the significance of information management to Antarctic science.

Simply having a data repository by itself is of some benefit. If the clients know where the data may be found, then the effort of locating and understanding it may be rewarded. Then, along came *metadata*; a standardised description of a block of information. A library that contains ten books is easy to browse. When the library contains thousands or millions of books and journals, an index is required to locate items of interest with any efficiency. Once a data repository grows beyond a trivial size, metadata fulfils this role for clients.

As far as scientific data is concerned, the whole is more than the sum of the parts. A dataset of seal sightings for one summer is a valuable historical and scientific record. Many years of observations of a range of flora and fauna may, however, facilitate answers to questions that could not be envisaged from a more limited perspective. For example, the relationship between plants, invertebrates and environmental conditions could lead to predictions of the environmental and economic effects of climate change.

Combining similar data into a database adds value to the data by enabling a broader array of questions

to be answered. The Biodiversity Database that is being developed in the AADC is just such a database. Information such as the observer, species, location, when, where, environmental conditions and a range of related data will be stored in the database. The database will be on-line on the Web for scientists to add observations to, and for *anyone* to interrogate.

The work on biological databases in the AADC started in 1995 when all known breeding locations of Antarctic penguins were placed into a database and enabled for Web searching on http://aadc-db.aad.gov.au/pls/dataaccess/fauna_search. Scanning a book containing these locations for information that you may need is far less flexible than searching the database. With the database, information can be searched by species, observation date and time, location, number of individuals and type and accuracy of survey. Over the past four years, many additional sightings of Antarctic birds and seals have been entered into this database.

A flora database was also constructed in 1996. The AADC recognised that the flora and fauna databases contained similar entries; a species was observed by someone at a particular time and location that had certain environmental characteristics. In 2000, the international science project called Regional Sensitivity to Climate Change (see previous article) was initiated. Scientists working on the RiSCC project wanted to be able to ask questions that related to any aspect of biological and environmental observations. The Biodiversity Database was born.

Observations of flora and fauna collected by the science programs of all Antarctic Treaty countries will be entered into the Biodiversity Database. The database will be publicly available on the Web to search, and to download any subset of observations.

Now, the single observation taken on the bridge of an icebreaker, or anywhere in the Antarctic, will hopefully result in a record of a species occurrence being entered to the Biodiversity Database. Who knows what information, knowledge and wisdom may then emerge!

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Searching for seabirds from the bridge wing of Polar Bird ERIC WOEHLE