"EcoBase" and "Biodiversity Ecologies Application" Workshop

Presenters

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Hosted by Nelson City Council & Tasman District Council

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Introduction
Nelson City Council and Tasman District Council hosted a one day workshop on 11 May to learn more about the Environment Bay of Plenty **Biodiversity Ecologies Application** and Auckland Regional Council **EcoBase** software.

Both database systems were developed to deal with the storage and management of ecological data and associated environmental information and showcased at the national Dataversity meeting in March 2009.

The workshop was primarily aimed at Biodiversity and Information Managers who require more from their current data management system and are interested in sharing an existing application as part of a collaborative system (user group).

The purpose of the workshop was to:-

Learn more about the data management, applications, tools, deliverables and support for each system.

Compare the two systems by working through use cases (data management scenarios).

Assimilate sufficient information to determine whether either application will meet the user requirements.

Build relationships that will be useful for ongoing collaboration.

Programme
10:00 Meet in Council Chamber
Refreshments

10:15 Introductions
10:30 **EcoBase** Presentation
11:30 **Biodiversity Ecologies Application** Presentation

12:30 Lunch

13:00 Discussion

14:30 Refreshments

14:45 Reflections / Opportunities
TFBIS – Alan White

16:00 Finish

Presentations
A description of the two data base applications is provided, based on the workshop presentations by Mike McMurtry, Malcolm Barr, Jim Fretwell and summary provided by Dan Randow on the Dataversity web forum (www.dataversity.org.nz). Other key discussion points and opportunities from the workshop are summarised below.

EcoBase
EcoBase is a site-based biodiversity data management system, residing on a SQL server, designed to manage marine and freshwater data. It allows administrators to configure the system to suit the organisation's requirements.

Data quality assurance is an integral component of the system design. Data is checked during import and validated in an archive, before being approved by authorised users. EcoBase tracks all changes, logs all actions that users take on data, providing rigorous audit trails.

The import and export template can be configured to suit standard formats that provide an efficient and simple method of managing data, which can be readily used by other applications. Further development of templates may include a pull-down menu system to control what fields are available.

The site hierarchy is flexible and can be designed to reflect sampling methodologies for core and peripheral data.

The taxa list is managed by the database administrator and independently peer reviewed. Biological records can be assigned to any level of taxa, on a phylogenetic tree, to accommodate species that may be difficult to identify without reference to a collection and reflect the level of identification. EcoBase is currently used for marine and freshwater data, but ARC is exploring its use for terrestrial taxa. Data queries can be undertaken at any node on the taxa tree.

EcoBase publishes data to the ARC web via an indices table that links to Hydrotel, supported by iQuest. The original system brief included a mapping tool such as GIS, which could be incorporated if required.

EcoBase is well supported by iQuest. The extensible structure of the application enables further development and refinement should other users wish additional tools.

Biodiversity Interface (BDI)
The Environment Bay of Plenty's Biodiversity Interface and databases (BDI) programme is the first phase of a single web interface to access all information stored within the Biodiversity Ecologies Application toolset, for managing, monitoring and reporting on biodiversity sites.

The Biodiversity Ecologies Application (BEA) toolset is a suite of ecology modules designed in Microsoft.net that are capable of running stand-alone or integrated with other applications using web services. The database resides on a SQL server that reports XMLT to HTML form, which is saved to a local cache to maintain operation if the web service is unavailable. The extensible modular structure and interoperability of the .net platform ensures that future modifications and development of the application is possible whilst maintaining the integrity of the data and components of the system.

The Windows front end of the Biodiversity Interface allows data input, record selection and reporting across the modules and integration with other systems in the organisation. The SQL server can also be accessed via a GIS mapping tool, to populate the database, produce distribution maps, analysis for extent mapping and other reporting.

The following ecology modules are live: Terrestrial, Wetlands, Estuaries, Geothermal; with Marine, Lakes, Rivers and Streams and Underground under development. The estimated build time is up to nine months per module.

Each of these modules could potentially be used alone, and integrated with other stand-alone systems such as EcoBase and CADDIS.

Web services currently enable taxa list updates and data exchange with national database custodians Landcare Research.

With links to a host of applications, the system provides a one-stop shop for managing work programmes, site-based records, meta-data, biodiversity, biosecurity and resource consent issues.

A data quality (depreciation) model provides an index used to prioritise data that is based on the method of data collection and when the data was originally collected. A Database Administrator is assigned to ensure quality assurance checks are undertaken. There was some discussion during the workshop whether the data depreciation model was a useful feature and not counter intuitive, because records deemed to be from an unreliable source were rare and unlikely to be incorporated in significant work programmes.

The application integrates well with GIS providing a powerful analysis and reporting tool. Distribution maps can be used intuitively to check for gaps in survey coverage, data quality, presence/absence of a species, and describe observations in reports.

The GIS interface is also used as a predictive trigger by EBOP for biodiversity issues including resource consents, where ecological information within a

buffer (zone of effects) is presented to resource planners during the consent application process. Ecologists are also notified when consent applications are being processed near an area they are working on.

Further information

Web services enabled
There was a general consensus that the desired data management system should be web services enabled, to facilitate connectivity between applications (intranet) and potential data exchange between organisations (extranet) for a variety of uses including updating species lists, software upgrades and importing / exporting data.

GIS
GIS is a powerful analysis tool, providing the potential to validate, prioritise and report on data for all of the Use Cases prepared. The desired data management system should incorporate GIS as a reporting and data importing tool.

Species lists and common variables
The NZ Organisms Register is an ongoing project managed by Landcare Research with deliverables in 3-4 years. The Register will link existing national taxa lists to provide the definitive NZ taxa list for native and introduced species. The suggested interim solution is to incorporate web linked taxa lists from national data providers or use independently peer reviewed taxa lists.

Database management
The capacity to archive data will grow over time with increased functionality and use, which will require management across departments and organisations that may not currently exist. In most cases, more resources (staff time) will be required to compile an inventory of data, prioritise data sets, populate and maintain the new data management system.

Service agreements
EcoBase is a stand alone software package that can be purchased from iQuest with an annual license fee. The license entitles the user to remote software support and free updates. The license fee is used to cover future software development, agreed by users.

EBOP has completed four Biodiversity Ecologies Application modules that are effectively free to other users. EBOP are investigating options to provide software support.

Whilst not discussed in detail at the workshop, it is evident that any client (Council) should ensure that their long term interests are protected, such that the software code is available if the designated service provider is unable to provide support.

Opportunities

Evaluation software

One of the original aims of the workshop was to provide a 'hands on session' of each application for prospective users. Workshop participants were unable to see a live demo of the EBOP BDI application because the NCC firewall prevented access to the BDI remote desktop via a VPN. This prompted post workshop discussions to investigate the feasibility of a stand alone BDI application that will operate on any platform.

Collaborative Systems

The workshop provided the opportunity to compare two data management systems designed for different applications. This resulted in discussion exploring what tools each system could contribute to the other. Further development of the EcoBase software by iQuest/ARC might include incorporating GIS mapping and expanding the taxa list to include terrestrial species. There was also informal discussion about the potential to use EcoBase as the model for the freshwater and marine component of BDI. iQuest have a considerable amount of knowledge and experience developing and supporting environmental software applications. Online Forum Groups for iQuest software already exist and could be launched for EcoBase if the interest was met.

EBOP have four modules to complete the BDI development programme. Jim Fretwell has initiated discussion with his CEO to develop the framework for a collaborative Council led business Trust to service stakeholders in the BDI application. Long term software support and development could be provided by the Trust employing a computer scientist or software developer.

TFBIS and Envirolink can provide support and advice toward pilot programmes, scoping reports and biodiversity tools that involve collaborative initiatives between Council Managers.

The workshop highlighted the willingness to find solutions to gaps in knowledge, common problems and build relationships between software developers and users.

Feedback forms

Of the fifteen workshop participants who provided the feedback, fourteen participants agreed that they had learned more about the databases that were demonstrated, and thirteen agreed that they had built relationships that will be useful for ongoing collaboration. When asked what was most valuable about the workshop, most participants responded that it was gaining greater understanding of what other organisations are doing.

Participants

Presenters
EcoBase
Mike McMurtry of Auckland Regional Council
Malcolm Barr of iQuest

Biodiversity Ecologies Application
Jim Fretwell of Environment Bay of Plenty

Alan White of Terrestrial and Freshwater Biodiversity Information System Programme

Dan Randow of Dataversity (Facilitator)
Paul Fisher of Nelson City Council (Host)

Lesley Bolton-Richie of Environment Canterbury
Jonny Horrox of West Coast Regional Council
Liz Garson of Christchurch City Council
Gary Tibble of Christchurch City Council
Peter Hamill of Marlborough District Council
Pedro Jensen of Greater Wellington City Council
Sara Moylan of Greater Wellington City Council
Paul McArthur of Nelson City Council
Paul Sheldon of Nelson City Council
Lindsay Vaughan of Tasman District Council
Kay Anderson of Tasman District Council
Sue Greatrex of Tasman District Council
Paul Barter of Cawthron Institute
Simon Moore of Dept. of Conservation Nelson
Don Robertson of National Institute for Water & Atmospheric Research
Alastair Suren of National Institute for Water & Atmospheric Research

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Appendix 1: Use Cases

1. Set Biodiversity Management Priorities

Adrienne, a Senior Policy Analyst, has been asked to report to Council on progress with regional biodiversity management priorities, and to suggest any changes that should be made to those priorities. Adrienne asks Brian, the Biodiversity Manager, for some data to use in this report. Brian sets out to find data that shows what species and habitats exist in the region, how important they are, and where effort is likely to make the most difference.

2. Measure Biodiversity Management Impacts

Sharon, the Operations Manager for Hinterland Unitary Council (HUC), has initiated a review of HUC's operations around biodiversity. The review is intended to identify opportunities to cost-effectively improve biodiversity management. Sharon has asked Brian, the Biodiversity Manager, to provide data to show the changes in the region's biodiversity that have occurred since the last baseline inventory of biodiversity was conducted. She asks Brian to work with Jean, the Biosecurity Manager, to assess the direct and indirect effect of actions that have been taken in both of their areas. Jean offers to provide data on pest management efforts, organised geospatially. Brian sets out to find baseline and monitoring data for key native species and habitats in the region, that he can overlay onto Jean's maps.

3. Prepare a State of the Environment Report

Each year, under the Resource Management Act, the HUC is required to provide a State of the Environment report. Brian, the Biodiversity Manager, has been asked to contribute to this year's report, which focuses on biodiversity and fresh water. Brian's role is to provide data about native land cover, indicator species and freshwater macroinvertebrates.

4. Inform a Resource Consent Process

Three Circle Supermarkets (TCS) applies to the HUC for a Resource Consent application to build a supermarket that may have some biodiversity impacts. HUC staff process and approve the application, and monitor compliance with its conditions.

4.1. Prepare a Resource Consent Application

Three Circle Supermarkets (TCS) is applying for a resource consent to build a new supermarket. To support their application, TCS seeks biodiversity data relevant to the location of a proposed supermarket.
They want to load these data into their own information systems to test various scenarios before lodging the consent.

4.2. Process a Resource Consent Application

As part of their resource consent application, TCS is to provide their proposal with relevant data and information to the HUC for consideration. Trevor, the Planning Manager, has asked Brian to provide some data about the ecosystems and species that might be affected by the proposed development. Brian needs to integrate the applicant's data into data and information already within the Council's systems to expedite consideration and public consultation.

4.3. Monitor Impacts of a Resource Consent

The resource consent for the TCS supermarket is granted but conditions include the requirement that TCS regularly monitor the state of the biodiversity. TCS must report to HUC so that the Council and the public can see the trends and that the effects are being appropriately avoided, remedied or mitigated.

5. Support Community Biodiversity Management

Simon, a volunteer on a community restoration project, wants to foster a suitable habitat for kereru. He decides to try to learn about this by looking at sites that already have kereru populations. He tries to find out which sites in his region have kereru populations.