A free and easy spatial decision–support tool that improves research uptake

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In a nutshell...

Want greater research impact? Then consider MCAS–S: a decision support tool that makes your spatial data more accessible to end–users not familiar with combining large datasets from different disciplines. By including research outputs in a readily available and easy–to–use tool, our data are more accessible, relevant and used by land managers.

A means to an end — our aim

- The health or condition of aquatic ecosystems is a combined result of processes occurring within the ecosystem and in the surrounding terrestrial environment (the catchment).
- Making decisions about how to manage aquatic ecosystems in a changing climate is thus challenging because variation in climate can influence aquatic ecosystem condition via multiple pathways many of which are poorly understood and indirect.
- We used MCAS–S to develop two models that explore spatial variability in threats to two aquatic ecosystems.
- We integrated our research results with existing data and various future scenarios, including climate change, irrigation development and invasive species distributions. Our approach to model development was similar for both ecosystems (Figure 1), but tailored to answer different research questions.
- Each datapack consists of spatial data and a guide to show how the data can be combined to support decision–making.

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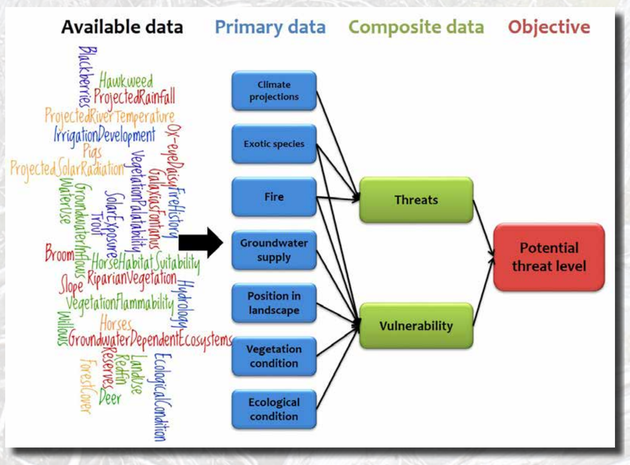

Figure 1: Simple means–to–end diagrams helped us to identify the data we needed to achieve our objectives.

MCAS–S — the tool

- The Multi–Criteria Analysis Shell for Spatial Decision Support (MCAS–S; Figure 2), developed by the Australian Bureau of Agricultural and Resource Economics and Sciences, is a decision support tool designed for non–GIS users to integrate spatial data — www.abares.gov.au/mcass
- Using the tool needs little training. Users can combine maps and instantly see the results of alternative management scenarios to inform policy decisions and management quandaries.
- In ecosystem management, it has the potential to be very useful, particularly in workshop situations where decision–making is by consensus.
- We've made great inroads into getting our data used by the Australian Alps Liaison Committee and the Tasmanian Government, thanks to MCAS–S.

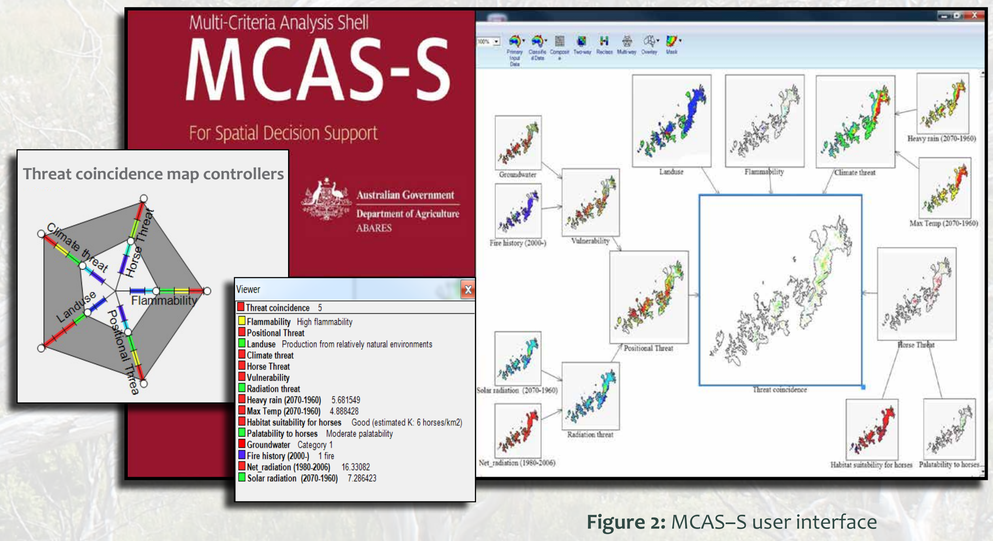

Figure 2: MCAS–S user interface

Australian Alps

The Alpine Bogs MCAS–S Datapack can be used to identify where threats coincide with alpine bogs most vulnerable to their impacts (Figure 3).

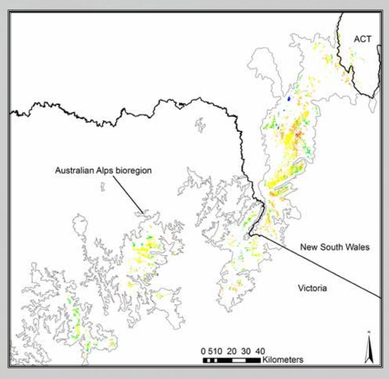

Figure 3: Threat coincidence
(*low to high: blue–green–yellow–orange–red*)

The Alpine Sphagnum Bogs and Associated Fens Community occurs throughout the Australian Alps bioregion and is protected under federal legislation. While the community is abundant (>12,000 bogs identified) and most examples are situated on conserved land, the community is at risk because of its restricted geographical extent, small size (<1 ha), vulnerability to fire and invasive species and dependency on water.

Tasmanian Midlands

The Midlands Aquatic Refuge MCAS–S Datapack can be used to identify potential climate refuges by integrating geographic information on topographical features, groundwater, tree cover, solar radiation and enhanced flows associated with climate change or irrigation (Figure 4).

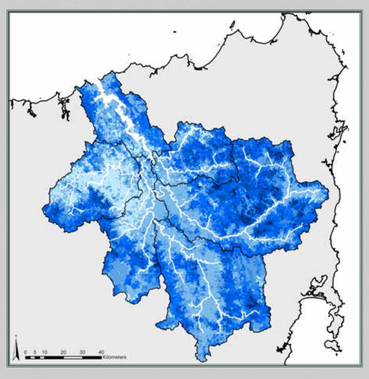

Figure 4: Potential refuges
(*darker blue = higher potential*)

Climate projections from the Climate Futures for Tasmania project suggest that Tasmanian rivers are likely to experience summer temperature maximums that will severely impact aquatic biota. Local–scale and catchment–scale features may create locations protected from these short–term temperature peaks and act as refuge for aquatic organisms.

Reg Magierowski is a freshwater ecologist contributing to the multi–disciplinary research hub: the Landscapes and Policy Hub — developing tools, techniques and policy pathways that enable managers and policy makers to integrate biodiversity conservation into regional–scale planning and assessment. The hub is supported through funding from the Australian Government's National Environmental Research Program and involves researchers from the University of Tasmania (UTAS), The Australian National University (ANU), Murdoch University, the Antarctic Climate & Ecosystems Cooperative Research Centre (ACE CRC), Griffith University and Charles Sturt University (CSU).

National Environmental Research Program

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Prepared for the 2014 Ecological Society of Australia (ESA) Conference, Alice Springs.