



MARXAN

conservation solutions

Marxan is the most widely used conservation planning software in the world - managing more than 5 per cent of the Earth's surface.



Free and open source

Marxan empowers planners to make better conservation decisions.



Used by NGOs, universities and governments in more than 180 countries

The free software is used by government agencies, NGOs and corporations to design networks of protected areas (nature reserves) on the land and in the sea.



Supported by an international team of conservation experts

Marxan makes it easy to balance complex environmental factors such as commercial and recreation interests, social and cultural requirements and biological conservation.

www.uq.edu.au/marxan

WHAT MARXAN CAN DO

Marxan allows policy makers and planners to design the most effective conservation measures.

The software takes into account the costs and benefits of complex environmental decisions, rather than just focussing on the size of a proposed protected area.

It can map complex information such as waterways, vegetation types, bird and threatened species habitats, drought refuges as well as socio-economic factors.

Marxan uses a mix of maths, economics and ecology to equip users with clear, repeatable

and auditable planning options to design or prioritise protected areas.

Developed by teams at The University of Queensland and The University of Adelaide, led by Professor Hugh Possingham, Marxan is the result of PhD research into how mathematical algorithms can support conservation planning.



Photo: Restoration work in Kalimantan, World Resources Institute, Flickr CC BY-NC-SA 2.0 (<https://flic.kr/p/nE2wU3>)

CREATING CHANGE

Balancing priorities in East Kalimantan rainforest

Tropical rainforest habitat has many uses ranging from protecting animals to producing timber, with each making a different contribution to biodiversity conservation.

The degree of protection offered can vary, with production forests sometimes offering more safety than protected forests. The sensitivity of species to habitat modification and degradation determines how much protection is offered to them by different land uses.

Marxan allowed planners to prioritise their conservation investment by:

- Accounting for relative costs and benefits of a range of land uses
- Reflecting the sensitivity of many mammal species to these uses
- Incorporating species-specific conservation objectives across this range of uses.

Planners were able to determine not only where to act, but how to act for the most effective and efficient conservation, which is being used to inform land use decisions across this megadiverse island.

MARXAN FAST FACTS

- » Used by 7000+ environmental professionals
- » Used in more than 180 countries (out of 196)
- » Used to manage 5% of the earth's surface
- » Usage up by 25% in 2014
- » Downloaded 12,000+ times since 2011

WHO IS USING MARXAN

Marxan is used by biologists, resource managers and industry.

More than 1100 users across 660 organisations have used Marxan to inform the management of more than 5 per cent of the Earth's surface.

Australia's Federal Government recently used the software to zone its Commonwealth waters, creating the biggest marine park system in the world and the most profound conservation effort in history.

It was used in the rezoning of the Great Barrier Reef, which led to the largest and most equitable systematic conservation rezoning in the world, declared in 2004.

Many major international non-governmental organisations have used Marxan including The

Nature Conservancy, and it is a major part of the planning tools being used in the Global Marine Initiative.

The World Wildlife Fund used Marxan to define a global set of marine protected areas, the Roadmap to Recovery, which they used to petition the UN about the creation of open ocean marine reserve networks.

The software has been used to support the designation or evaluate some of the world's most significant marine conservation areas including those in the Channel Islands of California, Gulf of Mexico, Galapagos Islands, South Australia, British Columbia, Connecticut/New York, Central Coast of California, South Africa, Gabon and the Baltic Sea.



Protecting lemurs in Madagascar

Madagascar has been designated the world's single highest priority for primate conservation - 94 per cent of its species are at risk of extinction. Lemurs, one of the world's most endangered species, are only found in Madagascar.

Conservation planners used Marxan to assess the protected area network for lemur conservation in Madagascar, predict lemur distribution across the island and design an optimal reserve network.

By working out the minimum expansion scenario necessary to meet lemur conservation targets, Marxan helped to prioritise the most crucial areas to be protected, and highlight where political targets were insufficient.

Rezoning Pacific Islands

Meeting the international standard of conserving 20 per cent of habitats by 2012 was complex in the Pacific Islands, due to their small size and heavy reliance on fishing and resources from the coral reefs. Marxan was used to work out the optimal balance between conservation and economic activities.



BECOME A PARTNER

We invite you to become a partner.

Between \$500,000 and \$10 million is required for Marxan to continue protecting the world's most vulnerable natural areas.

It will also provide significant software enhancements, and keep Marxan open source and free for all to use.

Investing in Marxan will deliver a:

- Dedicated expert to manage the program from the University of Queensland

- Number of new functions to make Marxan more powerful and easier to use
- Spatial planning database for users across the globe regardless of their resources or technical expertise
- Web application which is available when high speed networks are not
- Suite of training and support materials.

We need your help.

PRAISE FOR MARXAN

“In my opinion, the research and development encapsulated in the software package Marxan is the most significant contribution to conservation biology to emerge from Australia's research community.”

- Mark Burgman, Editor in Chief, *Conservation Biology*



In 2009 Marxan was recognised with *The Sherman Eureka Prize for Environmental Research*.

The award highlights outstanding environmental research being undertaken in Australia to improve the natural environment, both locally and internationally.

Photo: Eureka Prize recipient Professor Hugh Possingham, with Mr Brian Sherman AM (Sherman Foundation), and Her Excellency Quentin Bryce AC, Governor-General, and fellow recipients Dr Ian Ball and Mr Matt Watts.

(<https://www.uq.edu.au/news/article/2009/08/uq-scientists-awarded-eureka-prize>)



CONTACT

Prof Hugh Possingham FAA

Director of CEED, ARC Laureate Fellow

Professor of Mathematics, Professor of Ecology, The University of Queensland, Australia

Chair of Conservation Decisions, Imperial College London, United Kingdom

E: h.possingham@uq.edu.au

M: +61 (0) 434 079 061

P: +61 (07) 3365 2527

For more information, visit: www.uq.edu.au/marxan