



Ecosystem services in the Central Interior: Marxan analysis integration

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Ecosystem Services

Ecosystem services are:

“the conditions and processes through which natural ecosystems, and the species that make them up, sustain and fulfill human life”

-Daily et al., 1997

“the benefits that people obtain from ecosystems”

-Millennium Ecosystem Assessment, 2005

Daily, G. C., Ed. 1997. Nature's Services: Societal Dependence on Natural Ecosystems. Washington, DC, Island Press.

Millennium Ecosystem Assessment (MA) 2005. Ecosystems and Human Well-being: Synthesis. Washington, DC, Island Press.

Ecosystem Services for the CI Project

- Carbon storage
- Timber production
- Water provision
- Flood mitigation
- Recreation

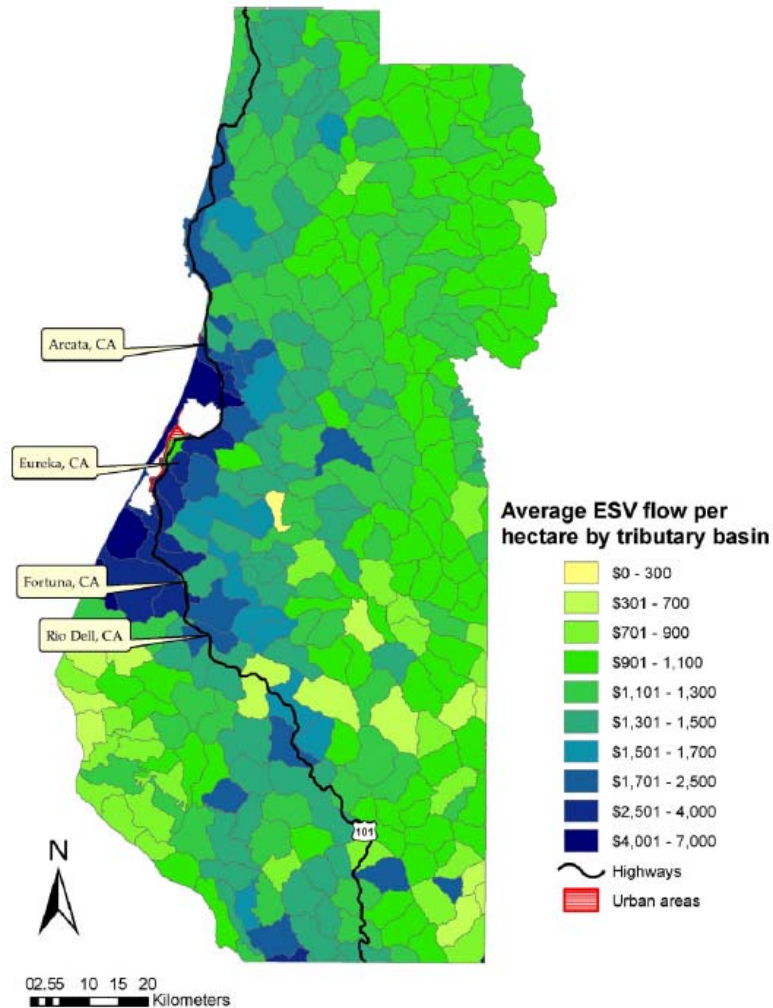


Current challenges



- How can we combine partially conflicting objectives?
- How can ecosystem services be incorporated within the CI's Marxan analysis?

ES have spatially variable values





Ecosystem service planning

- Ecosystem services values vary across the landscape.
- Planning for biodiversity and ecosystem services can be complementary... sometimes!
- Different approaches to a Marxan analysis are possible.



Options for Marxan incorporation

1. ES = Feature
Target represents at least a minimum demand
Assumes no substitution

Example: Water provision

Target(s) could be a proportion of water
used in downstream community.

Approach of Chan et al., 2006

Chan, K.M.A., M.R. Shaw, D.R. Cameron, E.C. Underwood, and G.C. Daily. 2006. Conservation planning for ecosystem services. *Public Library of Science Biology*. 4(11): 2138-2152.



Marxan incorporation cont.

2. ES = Feature

Arbitrary target

CFPF* increases with ES demand

Assumes possible substitution

Example: Flood mitigation

CFPF increases with greater population density within flood plain

* Conservation feature penalty factor



Marxan incorporation cont.

3. ES = Factor in Suitability Index

With the exception of timber production, the ES could be considered a “benefit” within the SI.

Assume multiple substitutes

Example: Carbon storage



Next steps

- Working with Dr. Rashid Sumaila (Fisheries Centre – UBC) on economic valuation methods.
- Collaboration with Climate Change team on ES adaptation strategy.
- Finalizing model needs for the creation of ES GIS layers.



Photo: sacredheadwaters.com