Introducing the EcoService Models Library

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ACES 2014
Washington DC

ESML Development Team

- Science
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  - Ming Sheng, Student Contractor, US EPA Cincinnati OH
  - Ted DeWitt, US EPA Newport OR
  - Melissa Errend & Miranda Gray, Hatfield Marine Science Center, Newport OR
  - Jessica Moon, ORISE Postdoc Fellow, US EPA Newport OR
  - Gregg Lomnicky & John Wilson, Dynamac Corp Corvallis OR
- Software
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    SRA International Inc, Arlington VA

Outline

- Goal
- Objectives
- Key concepts and challenges
- Summary
- Status and availability

ESML Goal

- Accessible and searchable compilation of *ecological production functions**, for use by:
  - environmental analysts
  - decision support system developers
  - researchers

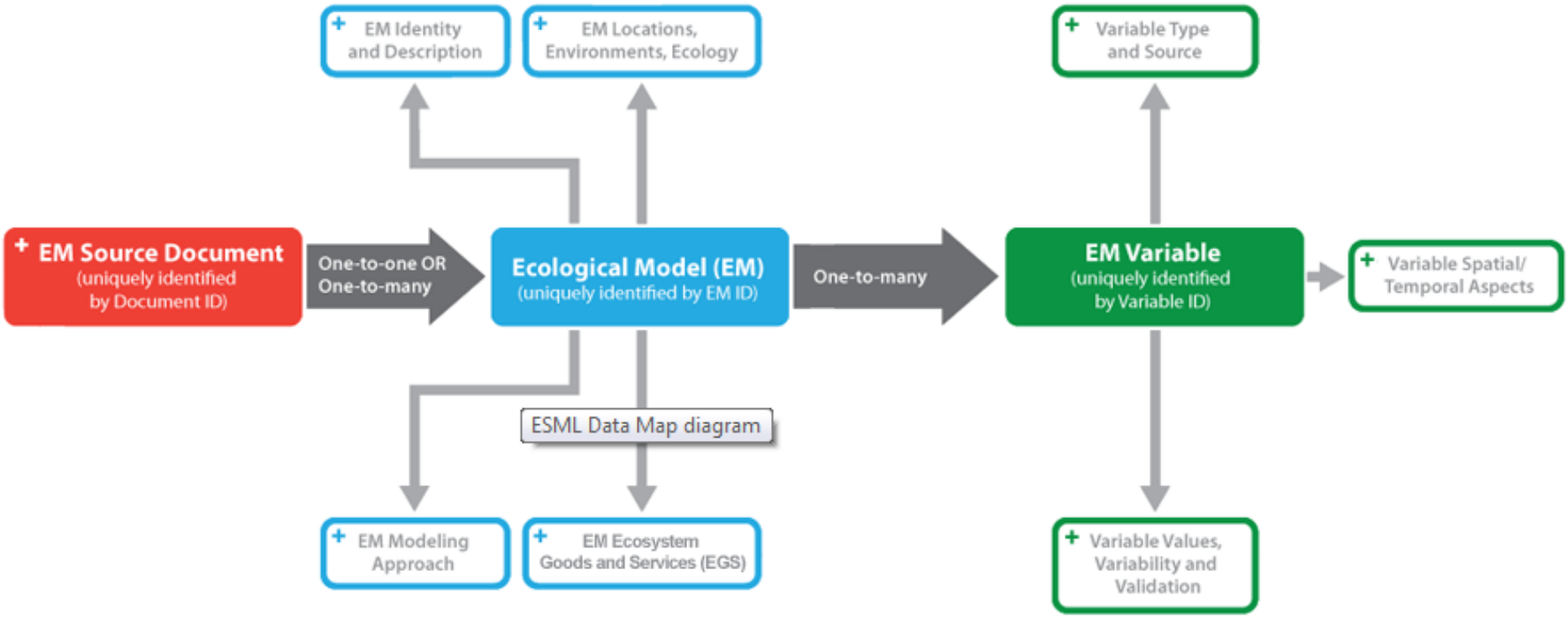
**Models useful for estimating the production of ecosystem goods and services*

ESML Objectives

- Informative model descriptions
  - for understanding, comparison, screening, research (transferability)

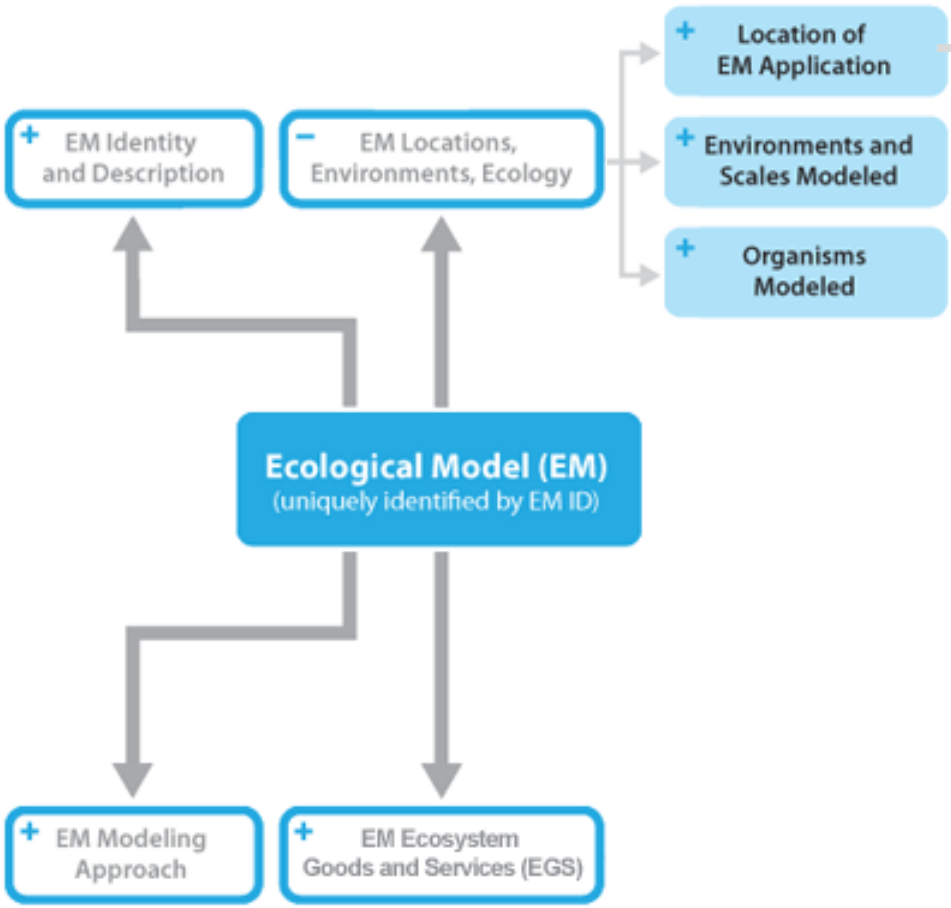
ESML Objectives

- Informative model descriptions - **Achieved**



ESML Objectives

- Informative model descriptions - **Ac**



Location of EM Application

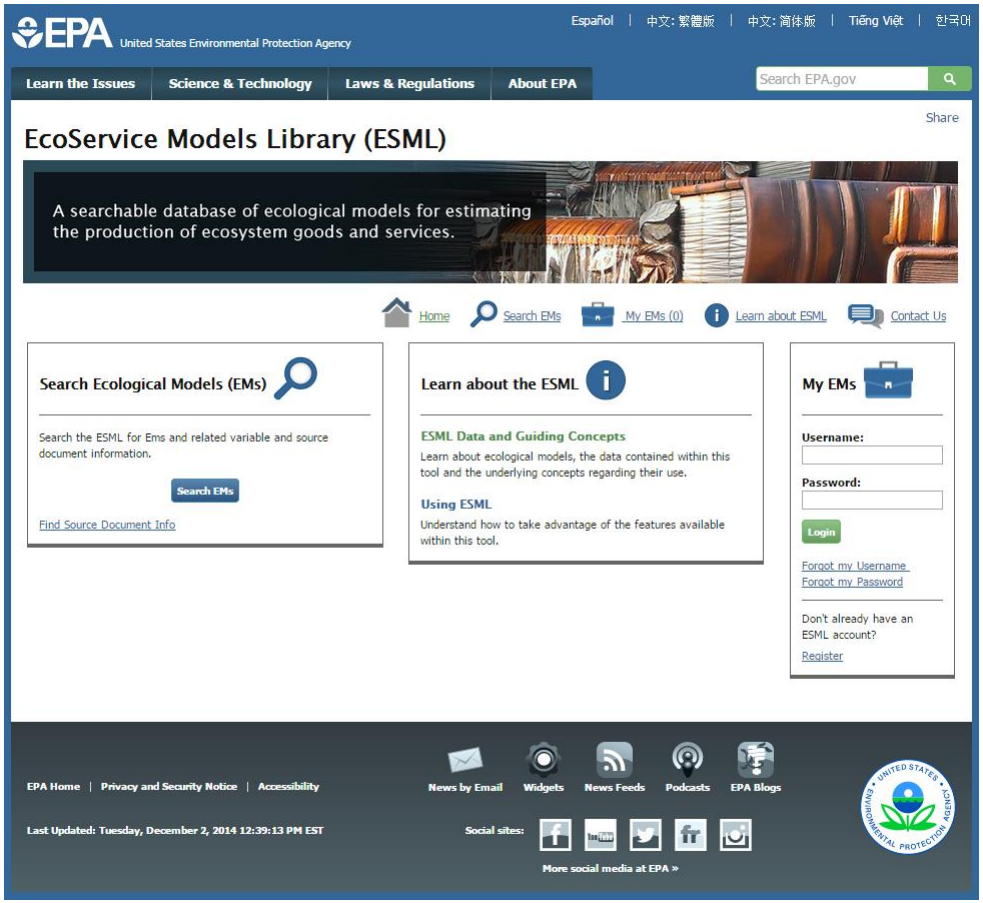
Select a descriptor to view more info

Terrestrial Location
Marine Location
Centroid Latitude
Centroid Longitude
Centroid Datum
Centroid Coordinate Status

ESML Objectives

- Informative model descriptions - **Achieved**
  - for understanding, comparison, screening, research (transferability)
- Easy to use
  - find, compare, 'link,' or export model descriptions

ESML Objectives

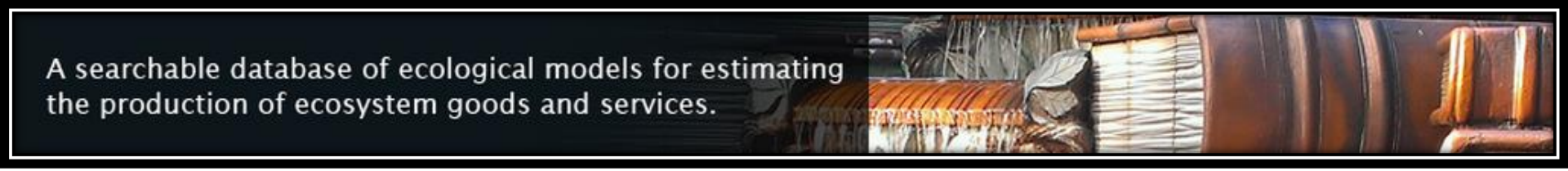


Designed to be user friendly, but feedback needed

- contact me for a demo
- contact me to become a beta user

ESML Objectives

- Informative model descriptions - **Achieved**
  - for understanding, comparison, screening, research (transferability)
- Easy to use – **Getting there, feedback needed**
  - find, compare, 'link,' or export model descriptions
- Adequate database content
  - prominent tools, EPA models, sufficient coverage of ecosystems & services, QA



ESML Objectives

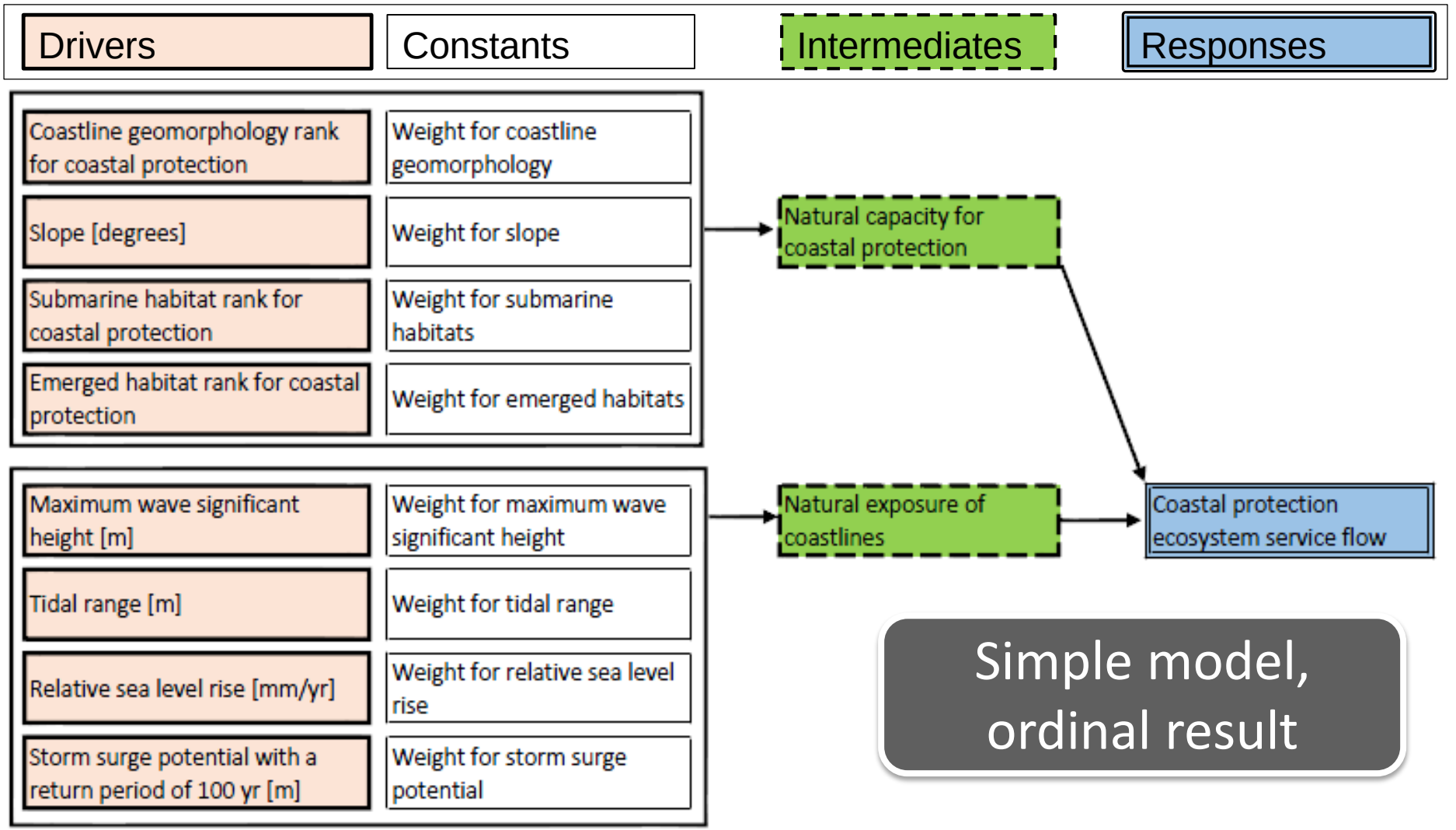
- Informative model descriptions - **Achieved**
  - for understanding, comparison, screening, research (transferability)
- Easy to use – **Getting there, feedback needed**
  - find, compare, 'link,' or export model descriptions
- Adequate content - **Not there yet** (~60 models)
  - prominent tools, EPA models, sufficient coverage of ecosystems & services, QA

Key Concepts and Challenges

- Focus on ecological models, not software
- Explain the variables
  - Role in model

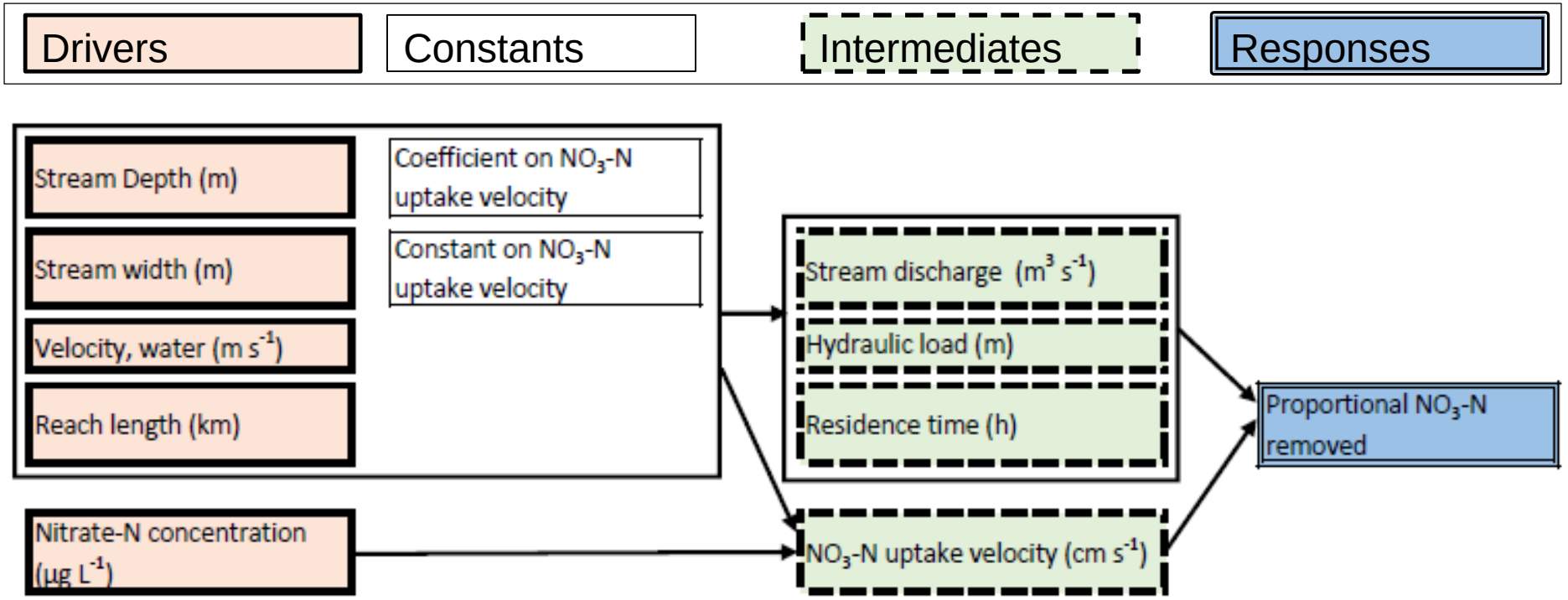
A searchable database of ecological models for estimating the production of ecosystem goods and services.

Coastal protection service mapped for Europe (Liquete et al. 2013)



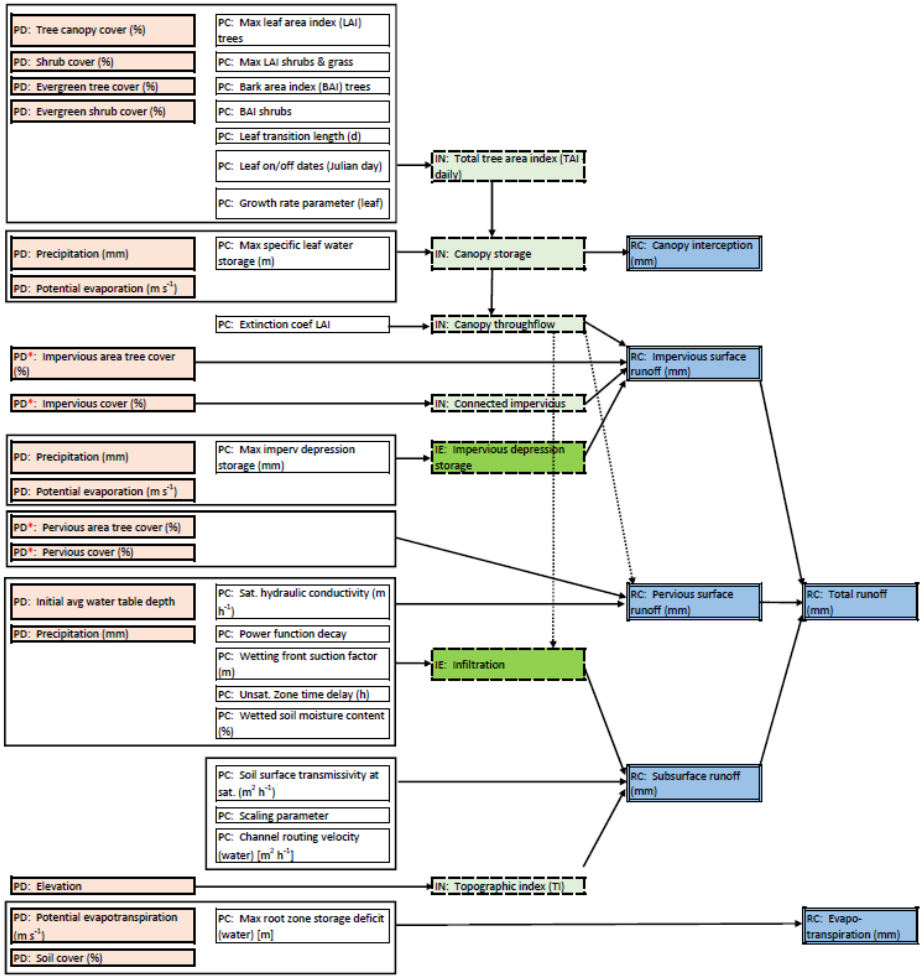
Simple model, ordinal result

Stream nitrogen removal, upper Mississippi Basin (Hill and Bolgrien 2011)



Simple model, cardinal result

UFORE-Hydro, Urban trees and storm runoff (Wang et al. 2008)



Complex model, cardinal result

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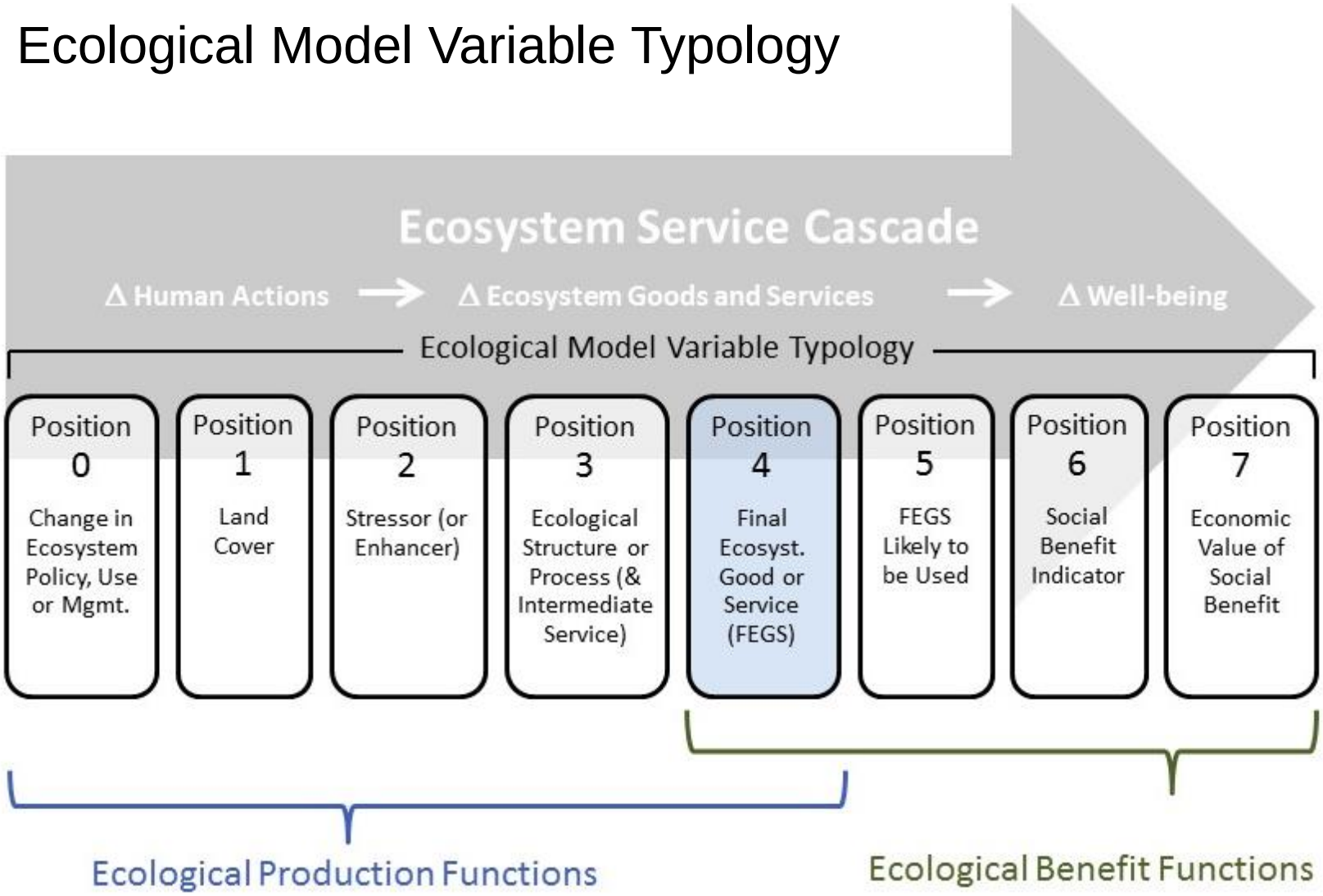
  - Position in variable typology based on ‘ecosystem service cascade’

Ecological Model Variable Typology



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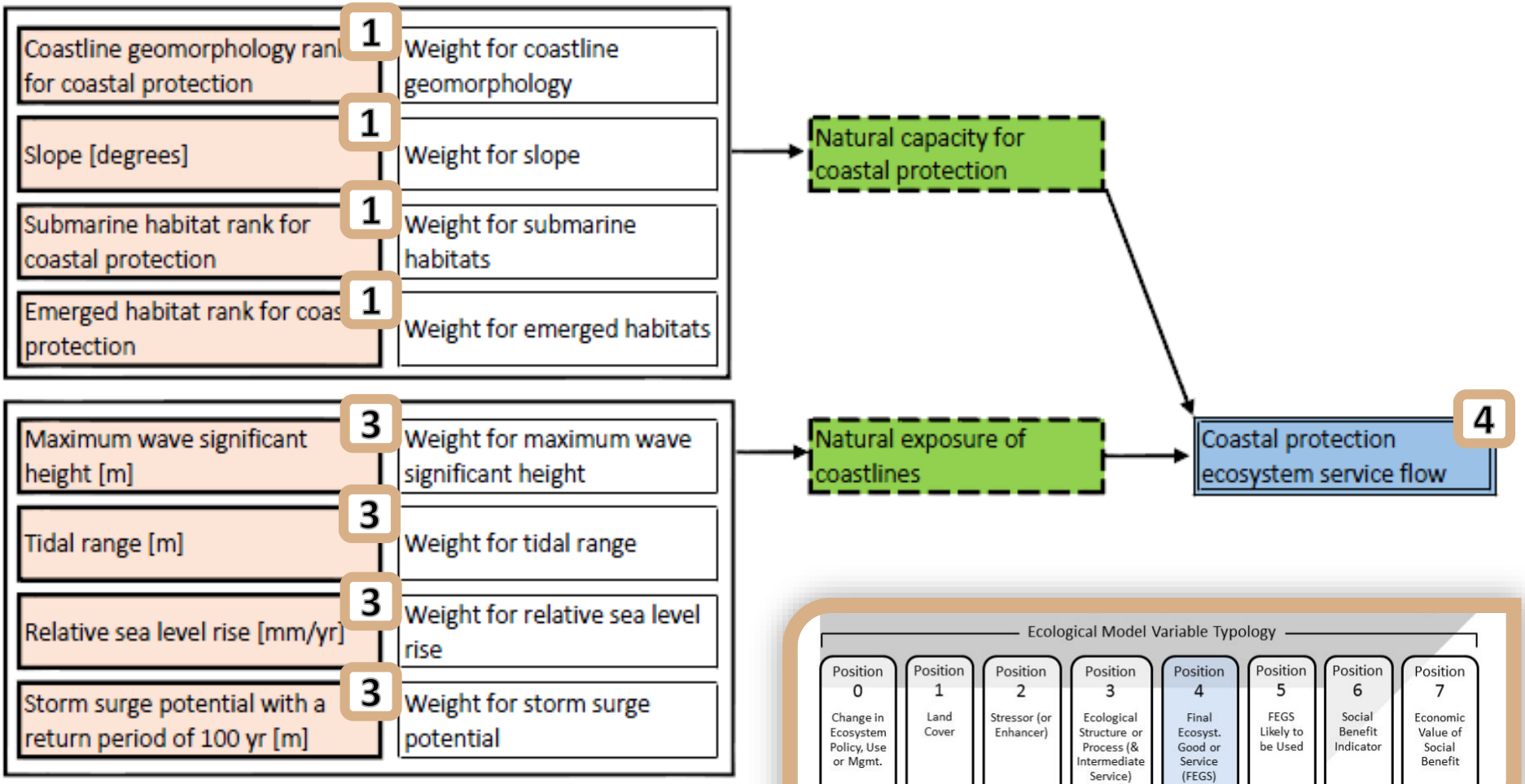


Key Concepts and Challenges

- Focus on models, not software
- Explain the variables
  - Role in model
  - Position in variable typology based on 'ecosystem service cascade'
- Link models to ecosystem services
  - Common International Classification of Ecosystem Services (CICES v 4.3), intermediate and final services
  - National Ecosystem Services Classification System (preliminary version), limited to final services

Ecosystem Service Classifications for modeled endpoint:
Coastal protection ecosystem service flow (Liquete et al. 2013)

CICES v. 4.3

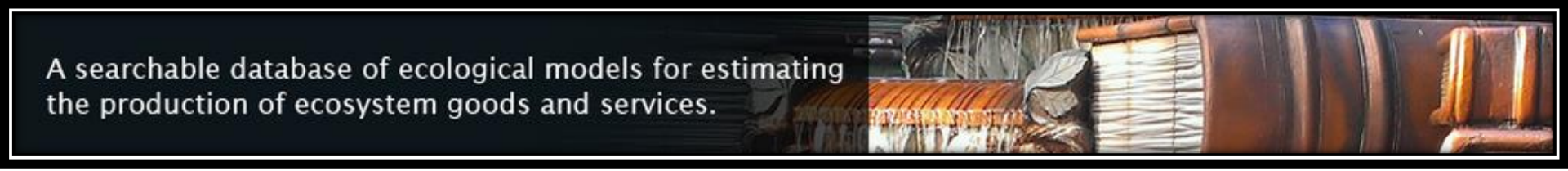
Section	• Regulation and maintenance
Division	• Mediation of flows
Group	• Gaseous/air flows
Class	• Storm protection

NESCS – preliminary version

Environ. Sub-Class	• Near coastal marine & estuaries
End-Product Category	• Combined end-products
End-Product Sub-Category	• Regulation of extreme events
Modifier	• Extreme event indicator

ESML Summary

- Detailed and rigorous descriptions of ecological models
- Special emphasis on categorizing variables
- Explicit links to ecosystem services via two classification systems
- User-friendly website
- User can rapidly find and assess model fit to specific context



ESML status and availability

- Beta release expected January 2015
  - –bruins.randy@epa.gov for access
- Content addition and research use ongoing
- Full availability expected 2016
- Integration with other decision support systems being explored