United States Environmental Protection Agency
Office of Research and Development

FEGS- CS
A Classification System for Final Ecosystem Goods and Services

Wageningen Ecosystem (Services) Workshop - WEW

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FEGS-CS Key Design Features

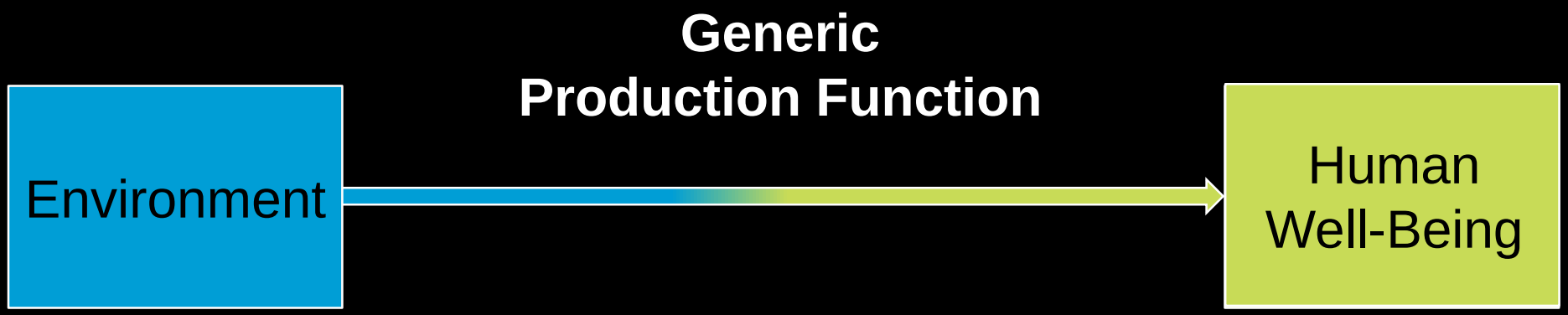
- Comprehensive
- Minimally Duplicative
- Identifies Potential Beneficiaries (users)
- Facilitates Metric Selection
- Works at Multiple Spatial Scales (with some minor adjustments)

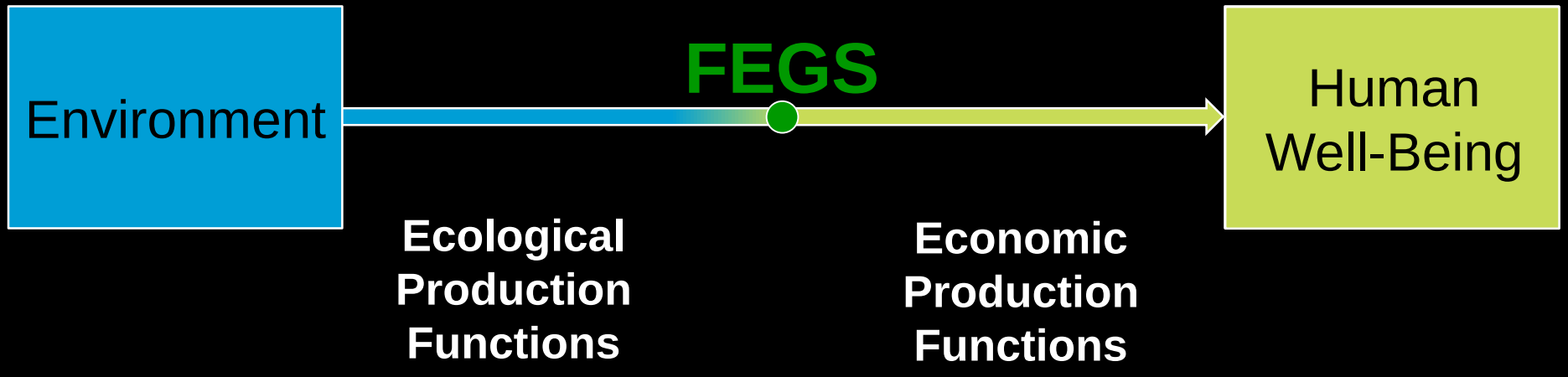
FINAL Services

"components of nature, directly enjoyed, consumed, or used to yield human well-being" *(Boyd & Banzhaf 2007)*

Environmental Class + Beneficiary → FEGS

- **Five Key Steps:**
  1. Clearly define the Environmental boundaries
  2. Identify Categories of Beneficiaries (users)
  3. For any Beneficiary and Environmental Class, hypothesize **POTENTIAL FEGS**
  4. Identify and Avoid "intermediate services" (generally processes and functions)
  5. Establish and "mind" Boundary Issues (corn and carrots…lithosphere, hydrosphere)


Generic
Production Function
Environment
Human
Well-Being


Environment
FEGS
Human
Well-Being
Ecological
Production
Functions
Economic
Production
Functions

Example 1: Recreational Fishing

Ecological Production Functions

Economic Production Functions

Environment

Processes/ Functions

FEGS

Input of Labor & Capital

Total Economic Value

FEGS Beneficiary

Intermediate Goods and Services

Example 2: Tree Plantations

Ecological Production Function

Economic Production Function

Environment

Processes/ Functions

FEGS

Input of Labor & Capital

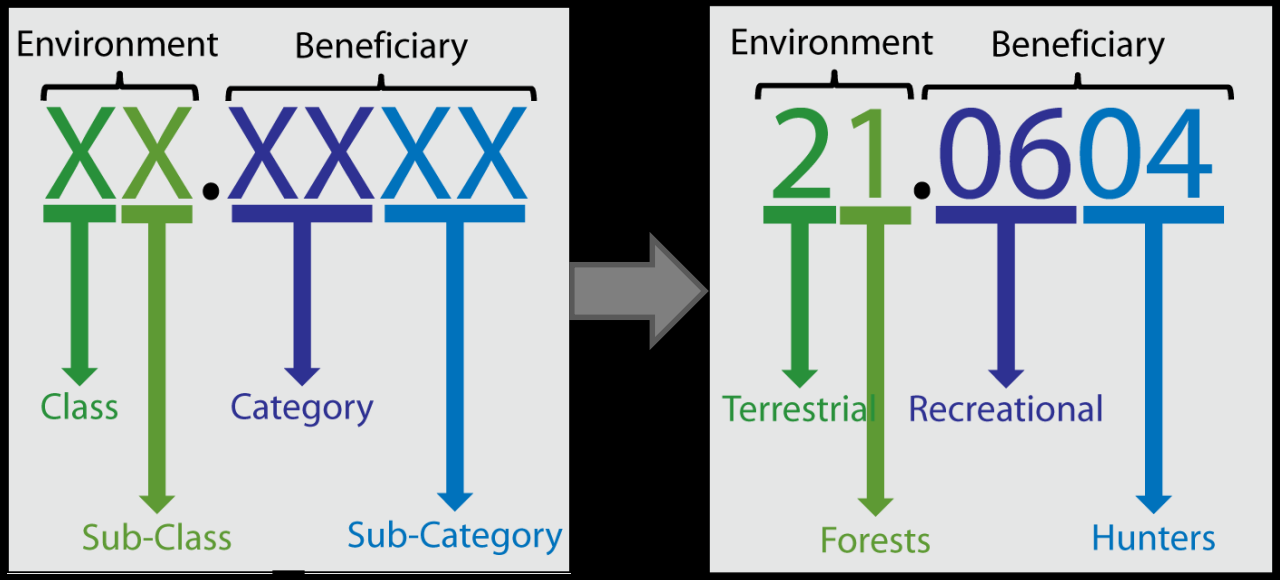
Total Economic Value

FEGS Beneficiary

Intermediate Goods and Services

Our Classification Scheme

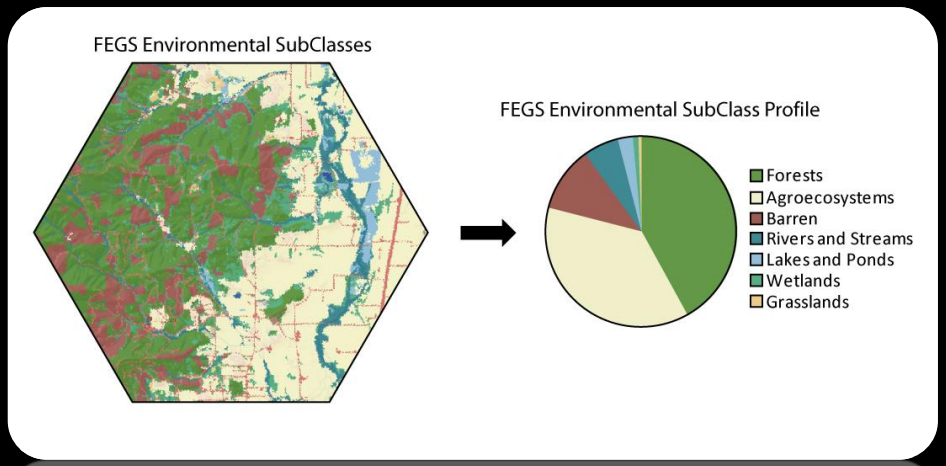
FEGS Classification Structure	
X	Environmental Class
XX.	Environmental Sub-Class
XX.XX	Beneficiary Category
XX.XXXX	Beneficiary Sub-Category



Environmental Classes

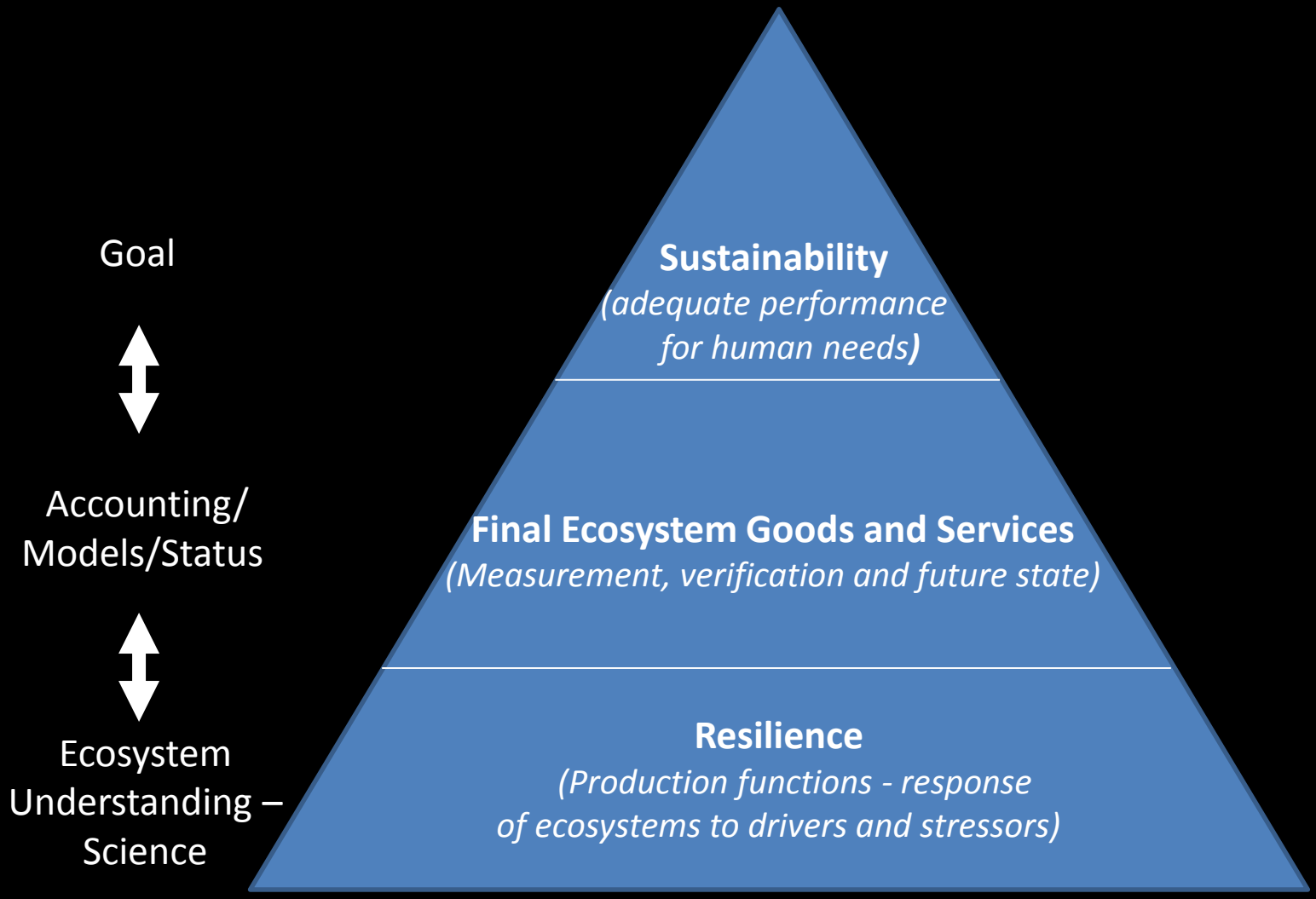
"components of nature, directly enjoyed, consumed, or used to yield human well-being" *(Boyd & Banzhaf 2007)*

Environmental Class



- 15 Environmental Sub-Classes
- Facilitate classification of any area in the world
- Boundaries can be identified and mapped using satellite

FEGS could well function as the *Environmental Currency* of the ecosystem component of sustainability.



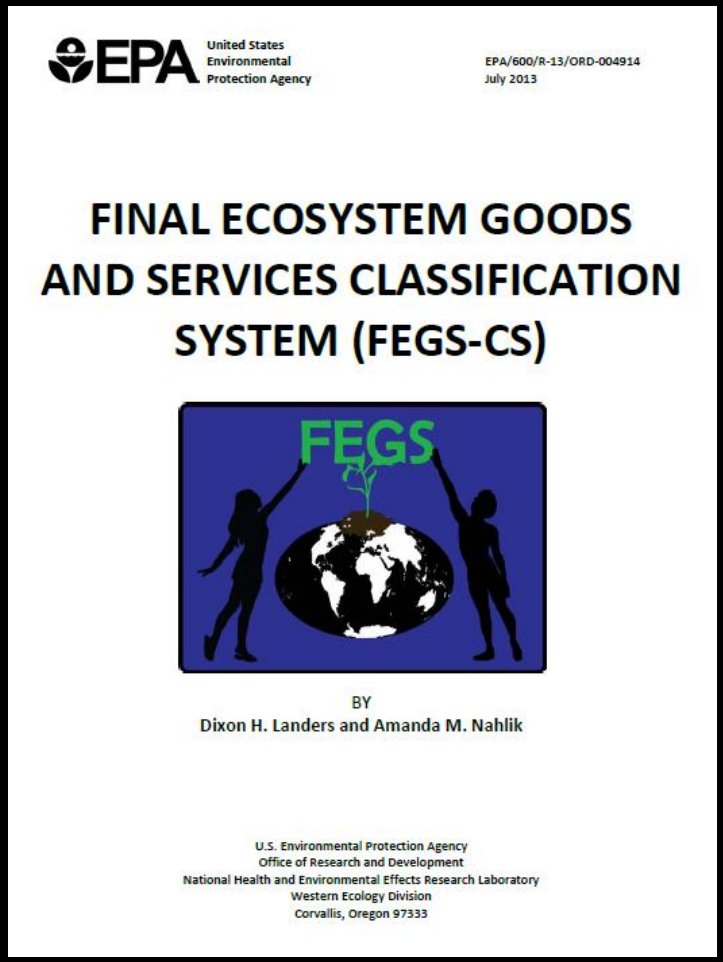
Identifying FEGS

- By using the FEGS approach, an infinite list of ecosystem services was pared down to ~500 FEGS

- FEGS-CS is an operational framework that standardizes identification of ecosystem services at multiple spatial scales

- Published EPA Report
  - *Available at* http://gispub4.epa.gov/FEGS
  - *EPA/600/R-13/ORD-004914*

- Interactive FEGS-CS website (developing…)
  - *Create and download custom checklists of potential FEGS*
  - *Link with Atlas, mapping and models*
  - *Provide comments to the authors*
  - *Participate in forum discussions*
  - *Web development currently in progress*


EPA United States Environmental Protection Agency

EPA/600/R-13/ORD-004914
July 2013

FINAL ECOSYSTEM GOODS AND SERVICES CLASSIFICATION SYSTEM (FEGS-CS)

FEGS

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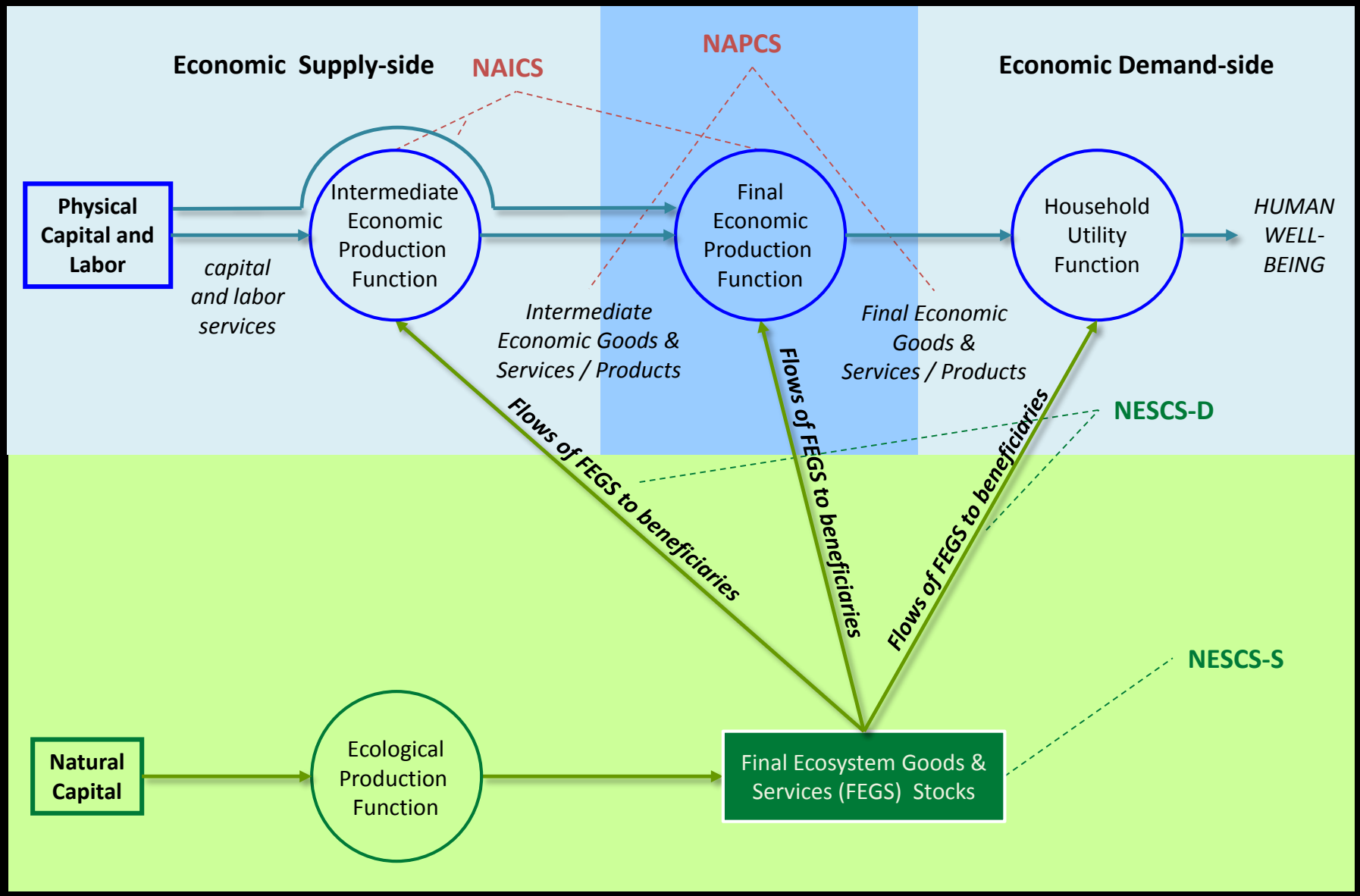
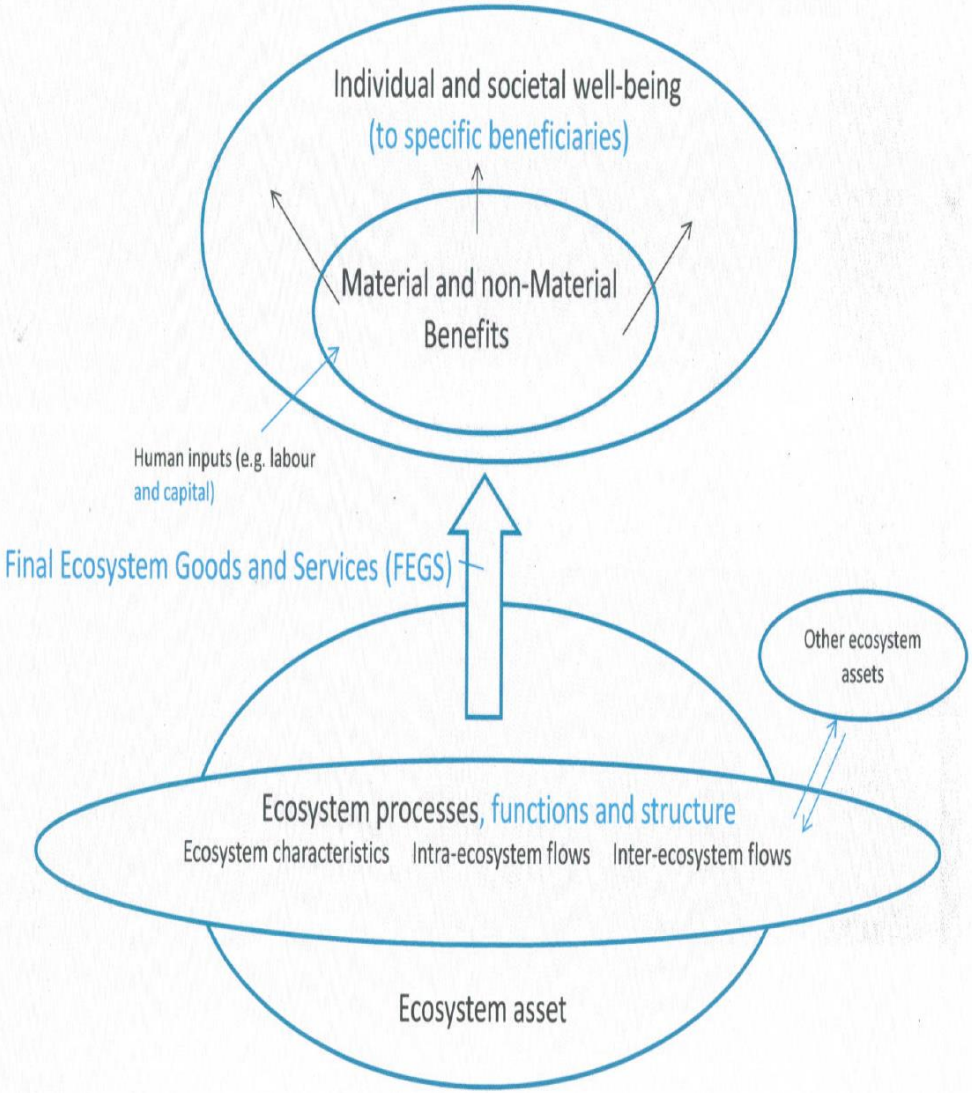
Relationships Among Nature and Economic Systems

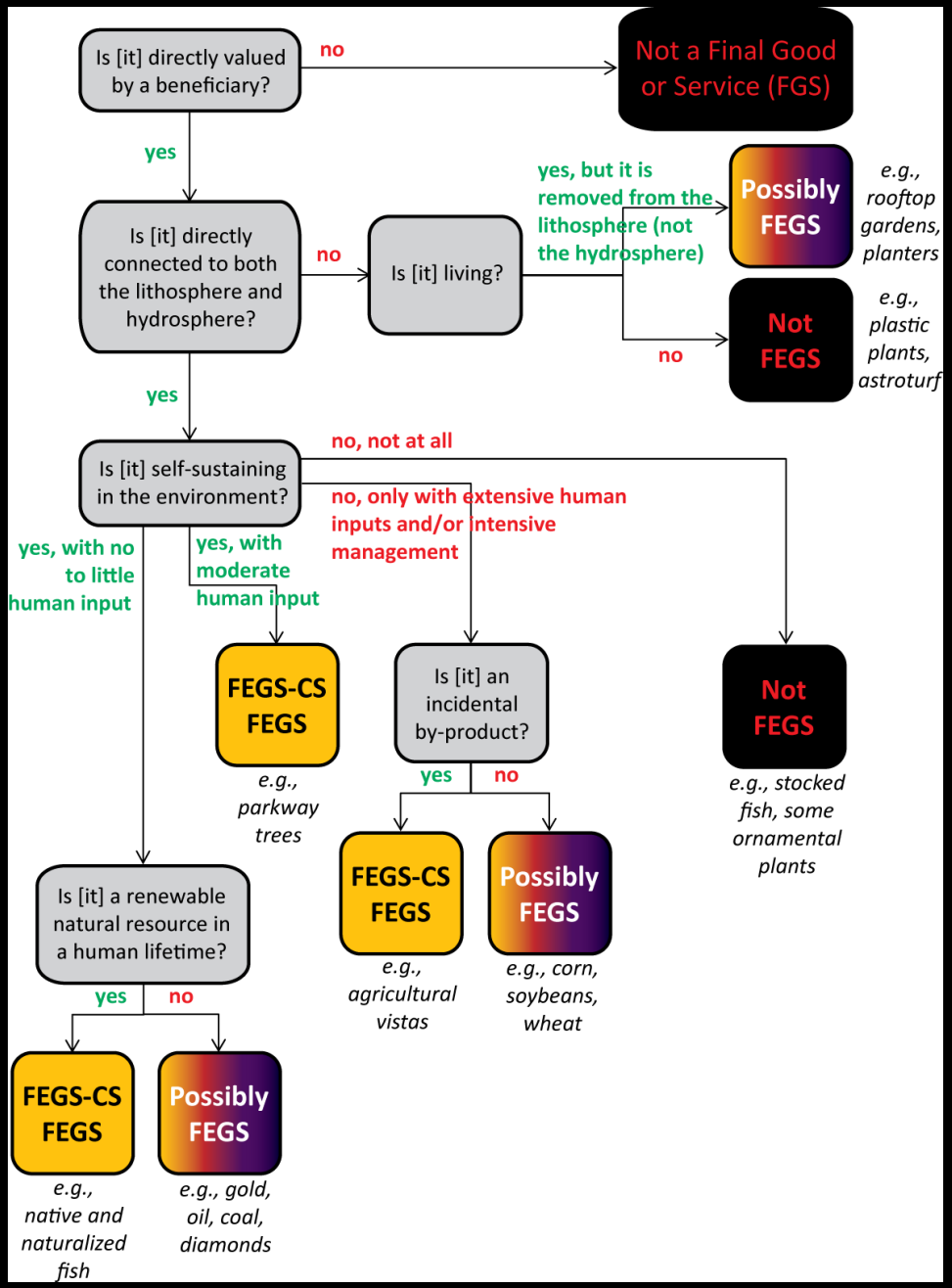


END

REVISED *Figure 1: General model of flows related to ecosystem services*



Modified from: ***System of Environmental –Economic Accounting 2012 Experimental Ecosystem Accounting***

Distinguishing FEGS from Non-FEGS

- We used rigid boundaries for FEGS, and made our boundary decisions explicit in FEGS-CS