

# Contribution of Ecosystem Services to Human Well-being Collaborations with the EPA

Susan Lovelace, Ph.D.

Charleston, SC

April 16, 2010





## Ecosystem Services

*Healthy coastal ecosystems provide food and fiber, regulation of climate, water and disease, cultural opportunities and supporting services such as primary production and soil formation, all vital to human health and well-being.*

→ Approach the study of coasts, estuaries and oceans in a holistic manner, recognizing that humans and their social systems are an integral part of these ecosystems.

→ Understand and forecast relationships between coastal ecosystems and human health and well-being.





where quality of life meets the water

Welcome to Hunley Waters, a new gated community leading to the Cooper River in North Charleston, South Carolina. The development includes 36 quality-built coastal cottages on 17 acres, the Noisette community and the new Riverfront. The neighborhood features a thriving Park Circle shopping district, the Noisette community and the new Riverfront. Hunley Waters is a sustainable, eco-friendly neighborhood featuring "green" homes and plenty of green spaces. The development is EarthCraft certified, efficient and technologically advanced. Residents will enjoy access to water, a pavilion, and a fishing and kayaking dock, which leads directly out to the Cooper River.

Situated in the heart of Noisette's multi-billion dollar revitalization project, Hunley Waters' residents will enjoy Lowcountry living and close proximity to downtown Charleston, the rapidly growing North Charleston area, and surrounding beaches. Don't miss out on the opportunity to be a part of this amazing community. Over 50% of the construction has already sold, so call us today and find out why Hunley Waters is right for you!

Business Journal's story:  
[-Read the story here](#)  
 Post & Courier's story:  
[-Read the story here](#)

For more information, please contact us at  
 phone 843.906.1159  
 or

WHAT DID YOU SEE FROM YOUR TERRACE TODAY?

LUXURY WATERFRONT CONDOMINIUMS  
 SPECIAL PRE-CONSTRUCTION PRICES  
 STARTING AT \$950,000  
 FOR INFORMATION CONTACT:  
 JOHN HASSELL  
 843.416.1195 OR 843.270.8495

COMING SOON ON THE LAST UNDEVELOPED WATERFRONT PROPERTY ON THE HISTORIC CHARLESTON PENINSULA, 46 LUXURIOUS CONDOMINIUMS. WALK TO YOUR BOAT MOORED NEXT DOOR AT THE ASHLEY MARINA, STROLL TO THE CHARLESTON SHOPPING DISTRICT OR JUST RELAX WHILE OVERLOOKING THE SCENIC ASHLEY RIVER. TOUGH CHOICES. LIFE IS EASY AT INDIGO.

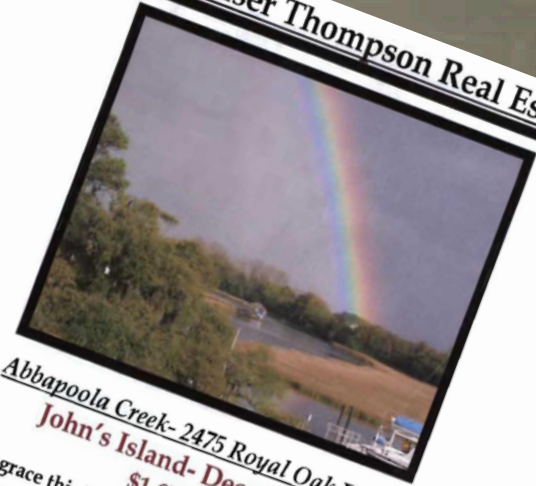
TWO AND THREE BEDROOM SPACIOUS HOMES WITH WATER VIEWS AND PORCHES.

CONCIERGE, FITNESS CENTER WITH SAUNA AND STEAM, POOL AND ROOF TOP GARDEN TERRACE.

INDIGO  
 Charleston Let Your View  
 The Ladies Let Your Winden  
 WWW.INDIGOCHARLESTON.COM

Belser Thompson Real Estate

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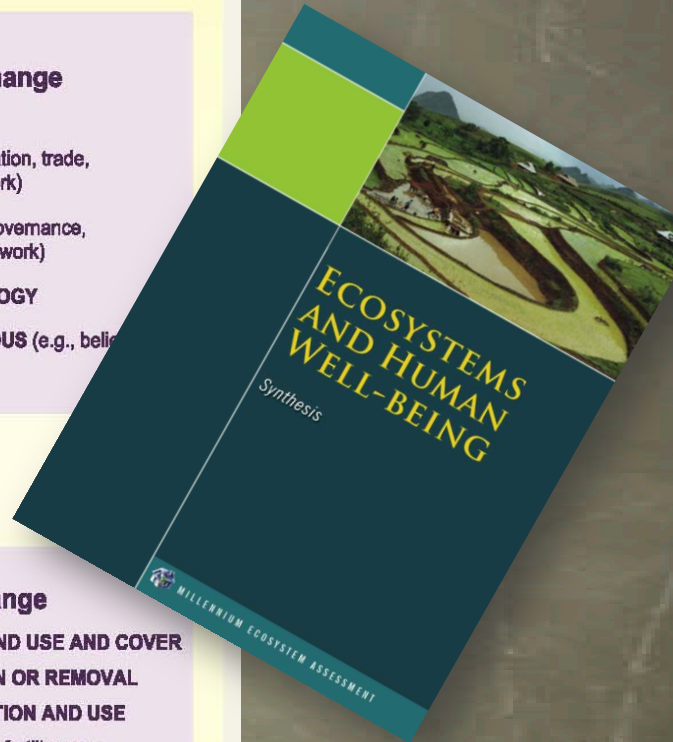
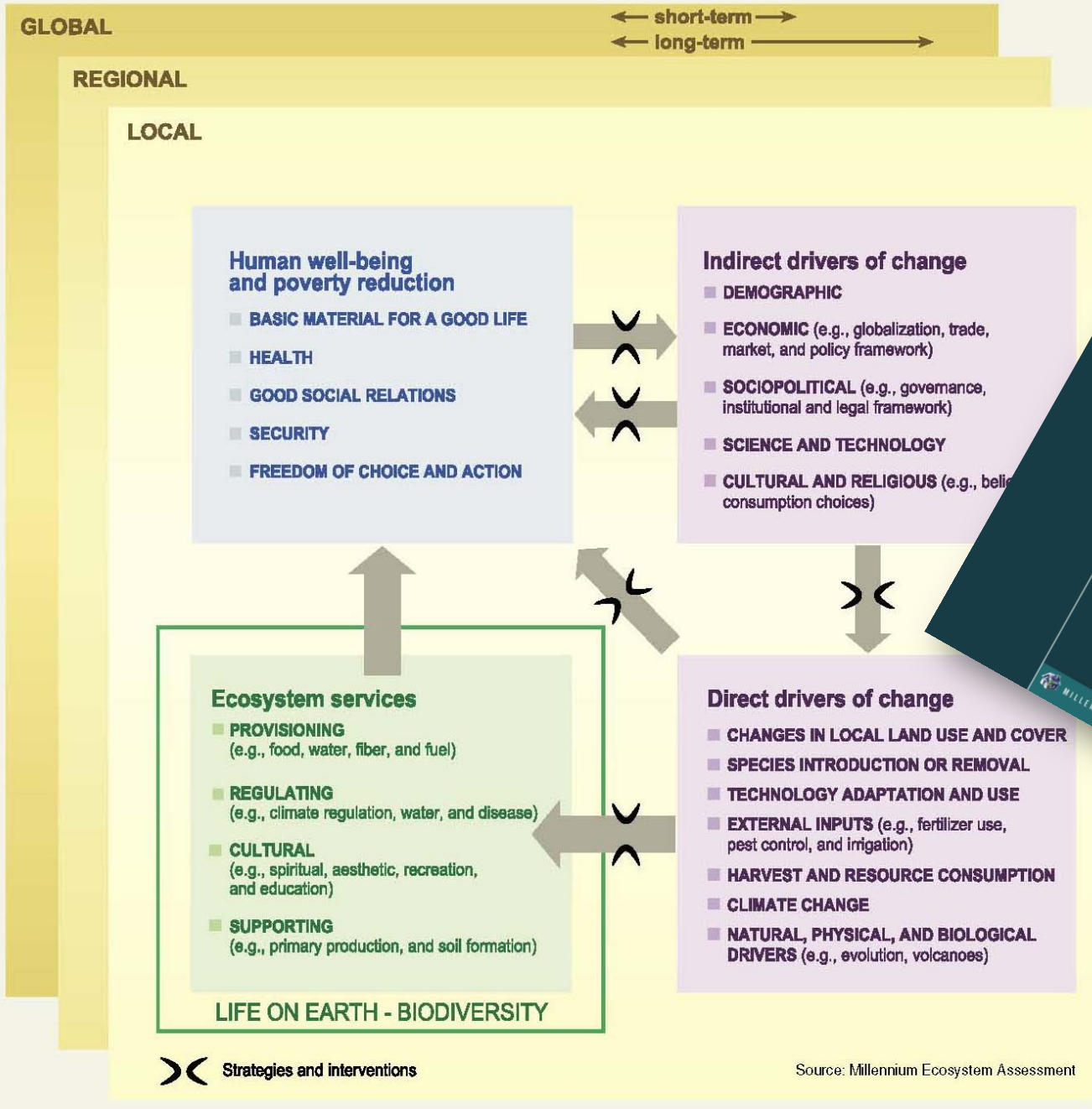


Abbapoola Creek- 2475 Royal Oak Drive  
 John's Island- Deep Water  
 \$1,650,000.00

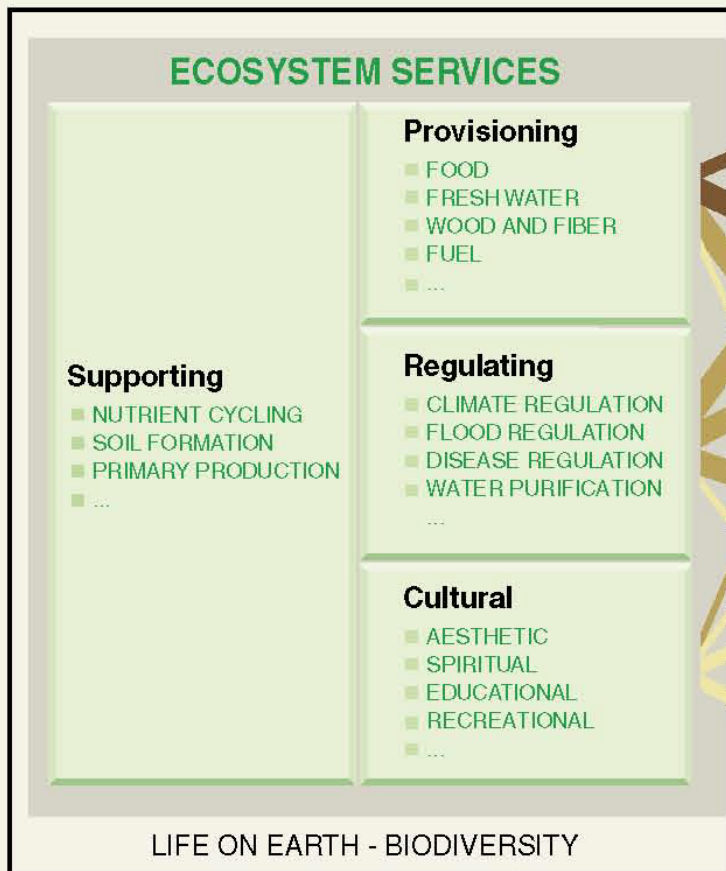
netos grace this Lowcountry jewel with gorgeous views overlooking the water. Easy To Show!  
 ked away on 3.2 acres on Johns Island in a very private setting with over 1000 sq ft of the home and creek fishing on the other!!! A fisherman's dream.....  
 tch redfish, trout, sheephead, flounder and crab in your own back yard.  
 of Edisto Banks is 42 Miles! The wonderful dock includes a 10,000 lb  
 ill hold any boat 33 foot or less, 10 x 30 floater, 15 x 15 Covered Pier  
 plenty of lighting, electricity and water.

The value we place on ecosystem services can be measured through both market and non-market assessment.





Source: Millennium Ecosystem Assessment



## CONSTITUENTS OF WELL-BEING

### Security

- PERSONAL SAFETY
- SECURE RESOURCE ACCESS
- SECURITY FROM DISASTERS

### Basic material for good life

- ADEQUATE LIVELIHOODS
- SUFFICIENT NUTRITIOUS FOOD
- SHELTER
- ACCESS TO GOODS

### Health

- STRENGTH
- FEELING WELL
- ACCESS TO CLEAN AIR AND WATER

### Good social relations

- SOCIAL COHESION
- MUTUAL RESPECT
- ABILITY TO HELP OTHERS

### Freedom of choice and action

OPPORTUNITY TO BE ABLE TO ACHIEVE WHAT AN INDIVIDUAL VALUES DOING AND BEING

Source: Millennium Ecosystem Assessment

**ARROW'S COLOR**  
Potential for mediation by socioeconomic factors

- Low
- Medium
- High

**ARROW'S WIDTH**  
Intensity of linkages between ecosystem services and human well-being

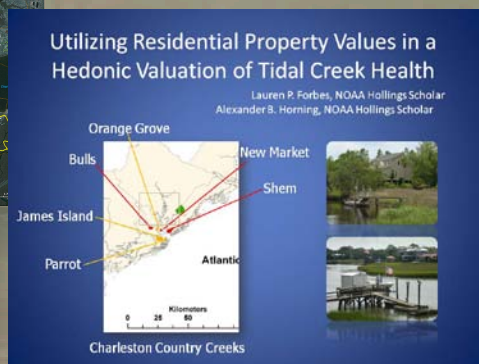
- Weak
- Medium
- Strong



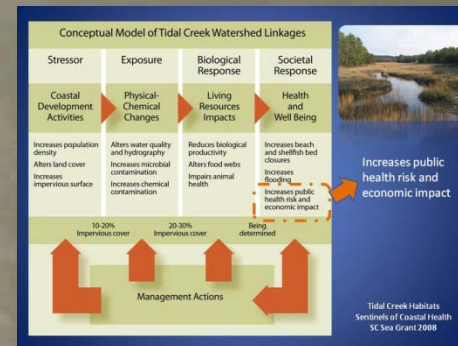
# National Centers for Coastal Ocean Science

## Quality of Place

A place-base framework for analyzing a good place to live that provides optimal ecosystem services that are conducive to a healthy environment, good social relations and secure personal economics.

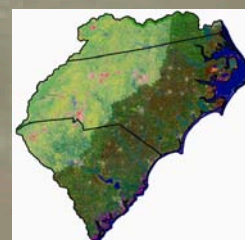


Sustainable Estuarine Shoreline Stabilization in North Carolina:  
 Providing managers alternative approaches to shoreline management that emphasizes ecosystem services and economic costs and benefits.



## Sentinel Habitats/Sentinel Species

Provides a first indicator of environmental change due to large influences such as climate or local influences such as small scale change in land use.



EPA Coastal Carolinas  
 Identifying and characterizing the services that ecosystems provide and identifying the value that these services represent to human health and wellbeing

# Memorandum of Agreement

## EPA, Office of Research and Development Ecosystem Services Research Program Human Health and Well-being

**Purpose:** to provide a framework for sharing information and coordinating programs within NOAA and EPA to support the development of an ecosystems services and human well-being partnership.

**Valuing ecosystem services and their links to human health and well-being is critical to implementing NOAA science planning.**

- 2010 NOAA Annual Guidance Memorandum
- Interagency Ocean Policy Task Force
- Next Generation Strategic Planning
- Interim Framework for Effective Coastal and Marine Spatial Planning



# National Index of Well-being

## Ecosystem Services Research Program Human Health and Well-being

Lisa Smith and Kevin Summers, Gulf Breeze Division, FI



To develop, test and implement an index of well-being applicable to multiple ecosystems, stressor scenarios and geographic initiatives to help decision makers better understand the vital link between ecosystem service provision and the constitutes to well-being.

- Evaluating how changes in ecosystem services effect the domains of human well-being
- Establish the human value placed on services
- Will provide decision-makers with a valuation of benefits and loss to be used in making land use decisions.





Method

Concept

Literature Review

Expert Opinion

Validation

← NOAA MOA

Development of Indicators

Determine the relationship between services and indicators

### Accounting for Natural Resources and Environmental Sustainability: Linking Ecosystem Services to Human Well-Being

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Received August 27, 2009. Revised manuscript received December 22, 2009. Accepted January 5, 2010.

One of society's greatest challenges is to sustain natural resources while promoting economic growth and quality of life. In the face of this challenge, society must measure the effectiveness of programs established to safeguard the environment. The impetus for demonstrating positive results from government-sponsored research and regulation in the United States comes from Congress (General Accountability Office; GAO) and the Executive Branch (Office of Management and Budget; OMB). The message is: regulatory and research programs must demonstrate outcomes that justify their costs. Although the concept is simple, it is a complex problem to demonstrate that environmental research, policies, and regulations cause measurable changes in environmental quality. Even where changes in environmental quality can be tracked reliably, the connections between government actions and environmental outcomes seldom are direct or straightforward. In this article, we describe emerging efforts (with emphasis on the role of the U.S. Environmental Protection Agency, EPA) to frame and measure environmental outcomes in terms of ecosystem services and values—societally and ecologically meaningful metrics for gauging how well we manage environmental resources. As examples of accounting for outcomes and values, we present a novel, low-cost method for determining relative values of multiple ecosystem services, and describe emerging research on indicators of human well-being.

#### Introduction

We measure our nation's economic performance with indicators such as the Gross Domestic Product (GDP), indices of stock and commodity markets, and many others. The reliability, utility, and popularity of these indicators are rooted in what they have in common: units that are easily measured, understandable to anyone, and comparable across sectors—typically dollars. In contrast, we lack a broadly accepted suite of

indicators for environmental performance, and those we employ are measured in a menagerie of units ranging from acres (e.g., extent of forests and wetlands) to µg/L (contaminant concentrations in water), and scales ranging from a single point in space to continental and global. Moreover, indicators of quantity do not translate directly or intuitively into indicators of quality. Everyone knows the worth of a dollar, but how does the value of one wetland or coral reef compare to another? It is even more challenging to compare values across ecosystems; what are the relative values of forests, prairies, estuaries, etc.? Taking the question another step, if a quantity goal (e.g., no net loss of wetlands) is achieved, what is gained in terms of environmental quality and value to society? These are difficult questions, for both science and society. We propose a structured approach to environmental accountability, pointing out the needs and challenges along the way. The simple model has four major components: policy, goals, measures (metrics, indicators, values), and monitoring (Figure 1). Most of our emphasis is on developing appropriate measures, including (1) a novel, efficient approach to combining magnitudes and values of ecosystem services into a comparative index, and (2) the concept of an integrative indicator of human well-being. This work arises from the goals of EPA's Ecosystem Services Research Program (ESRP): to quantify the values of ecosystem services and provide resource managers, planners, government decision-makers, and others with information such as a national atlas of ecosystem services, interactive maps, and predictive models that will help them to (a) assess management options, costs, and constraints in the context of ecological benefits, (b) sustain, enhance, and be accountable for valuable ecosystem services, and (c) measure the worth of ecosystem services to human health and well-being (1).

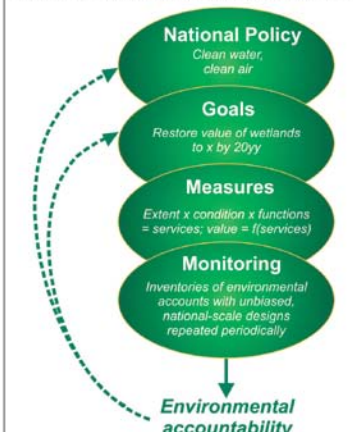
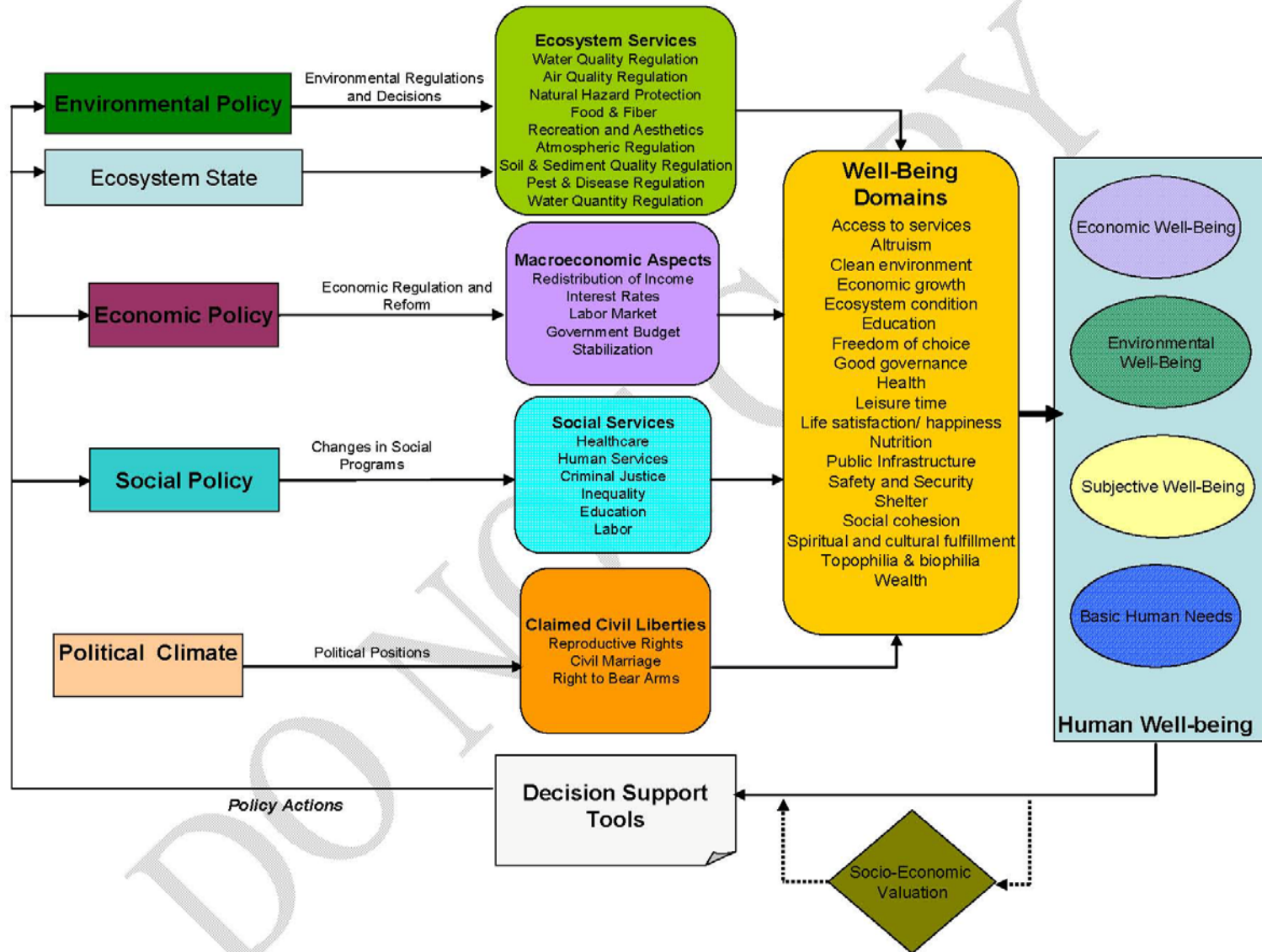


FIGURE 1. A conceptual model of environmental accountability, showing the relationships among policy, goals, indicators of ecosystem services, and monitoring.

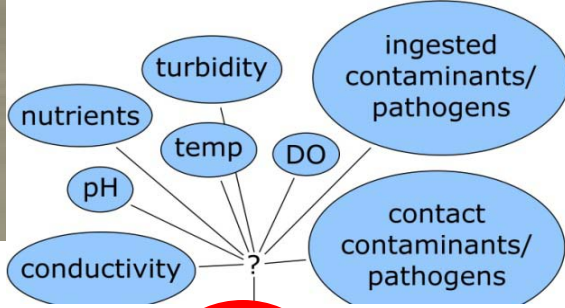
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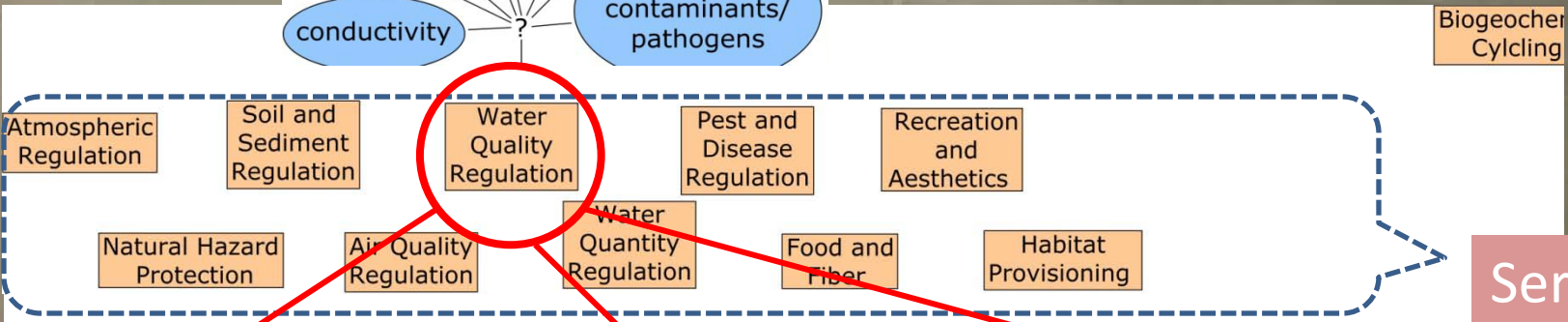


This conceptual framework is a preliminary product of the USEPA ESRP Well-being project. Do not cite or circulate.

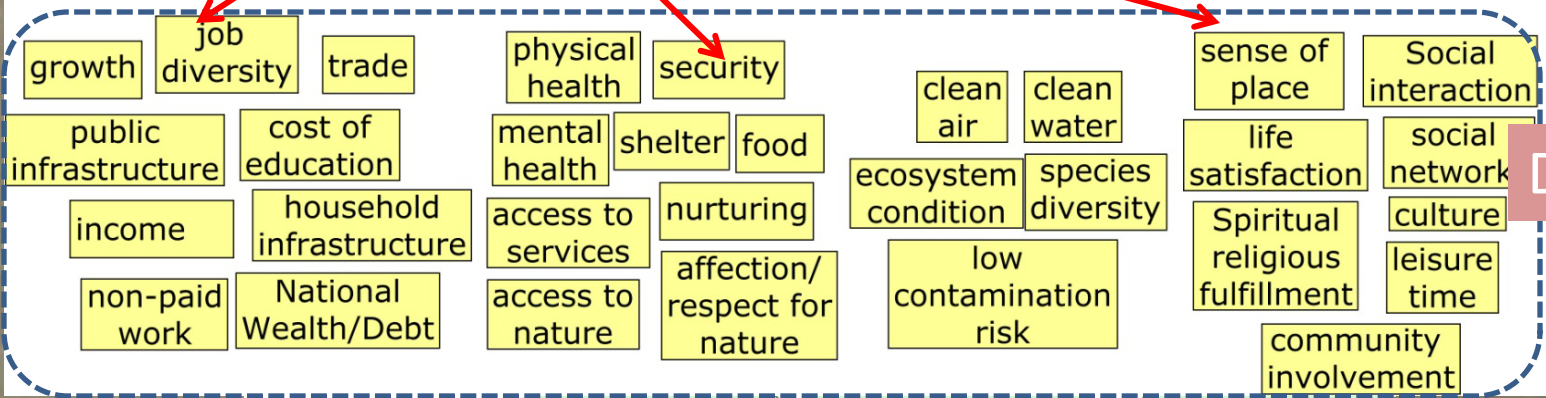
# Process



# Scope of Service



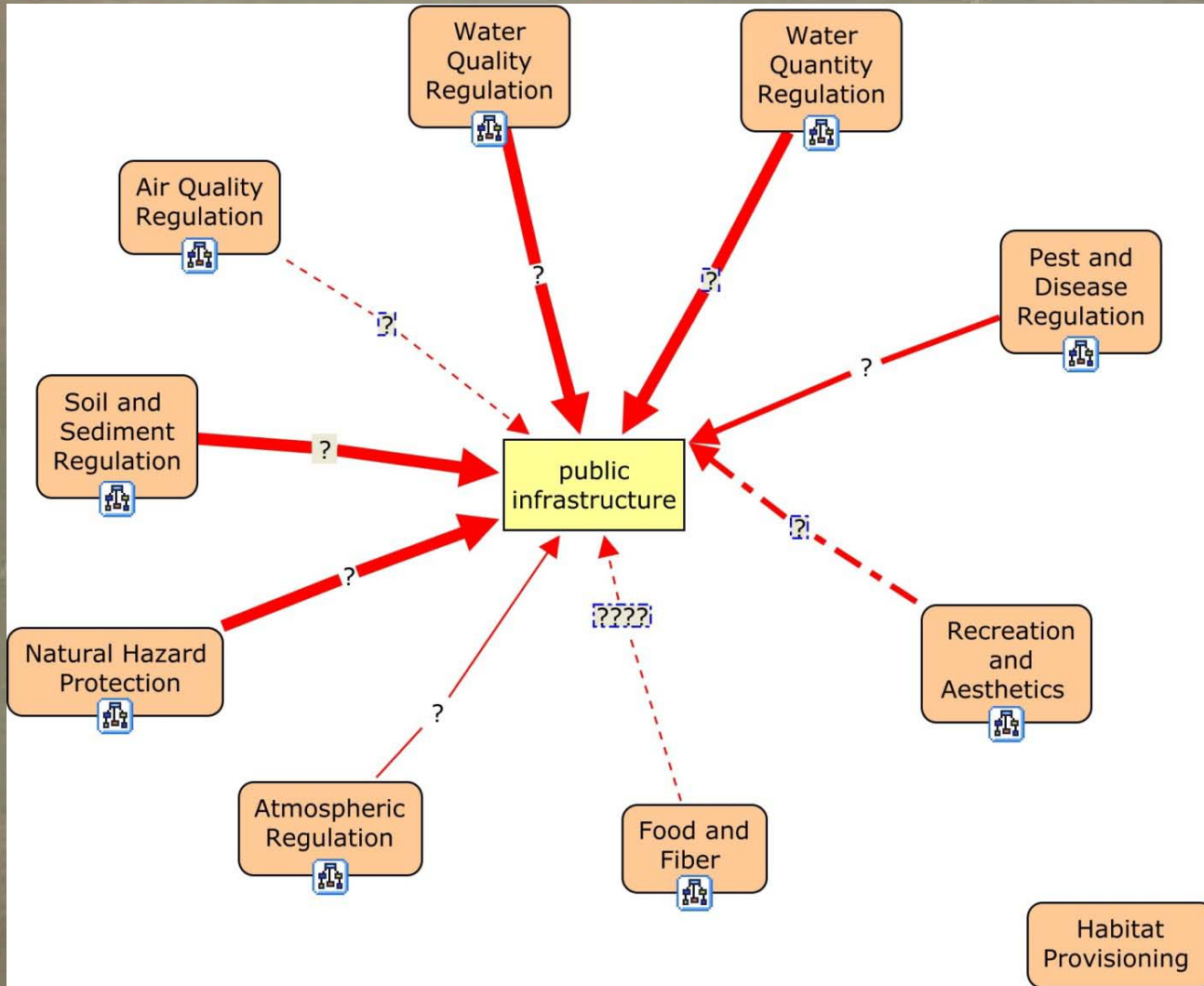
# Services



# Domains



# The Relative Impacts of Changing Ecosystem Services on Elements of Well-being



Next Steps include adding value



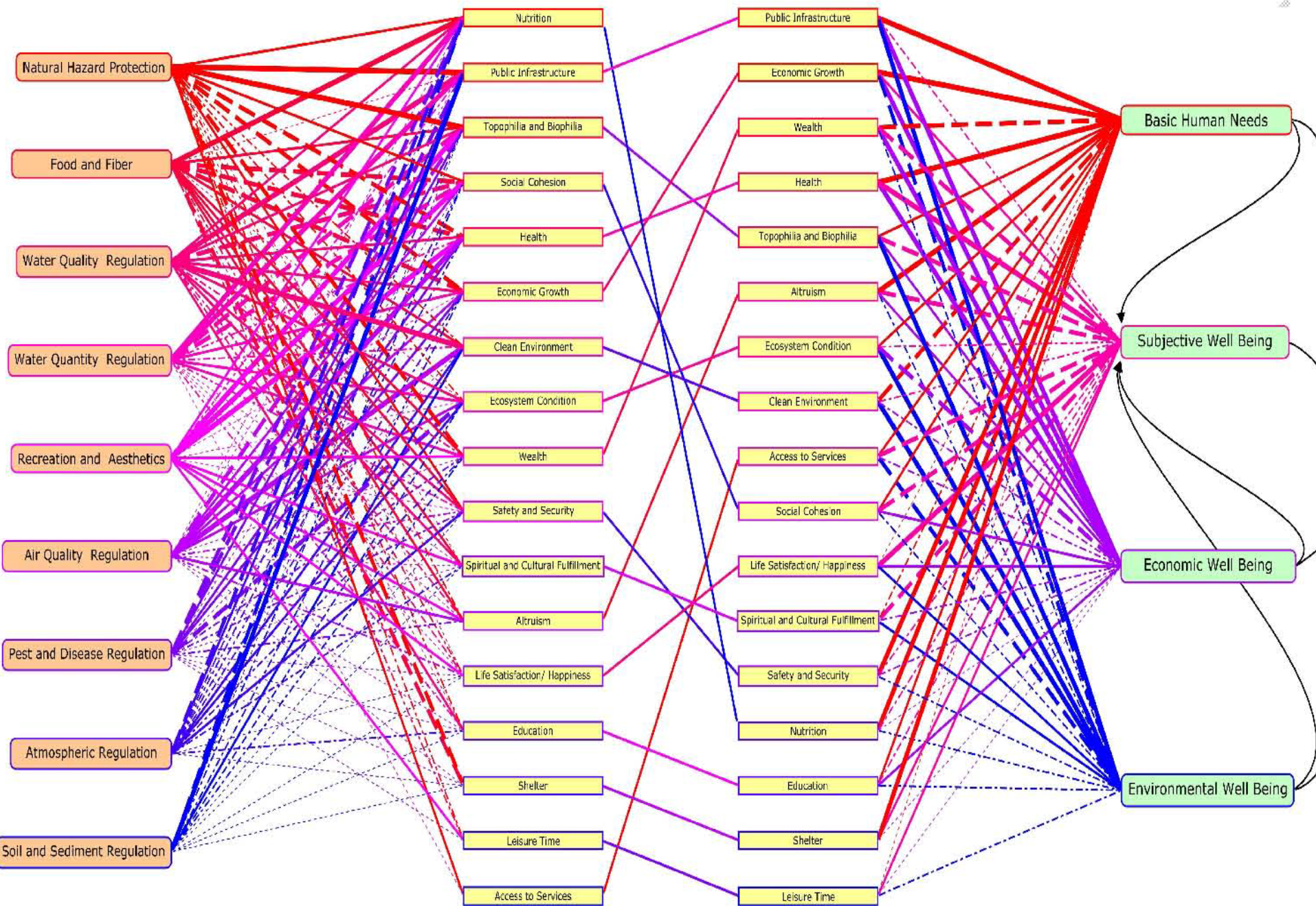
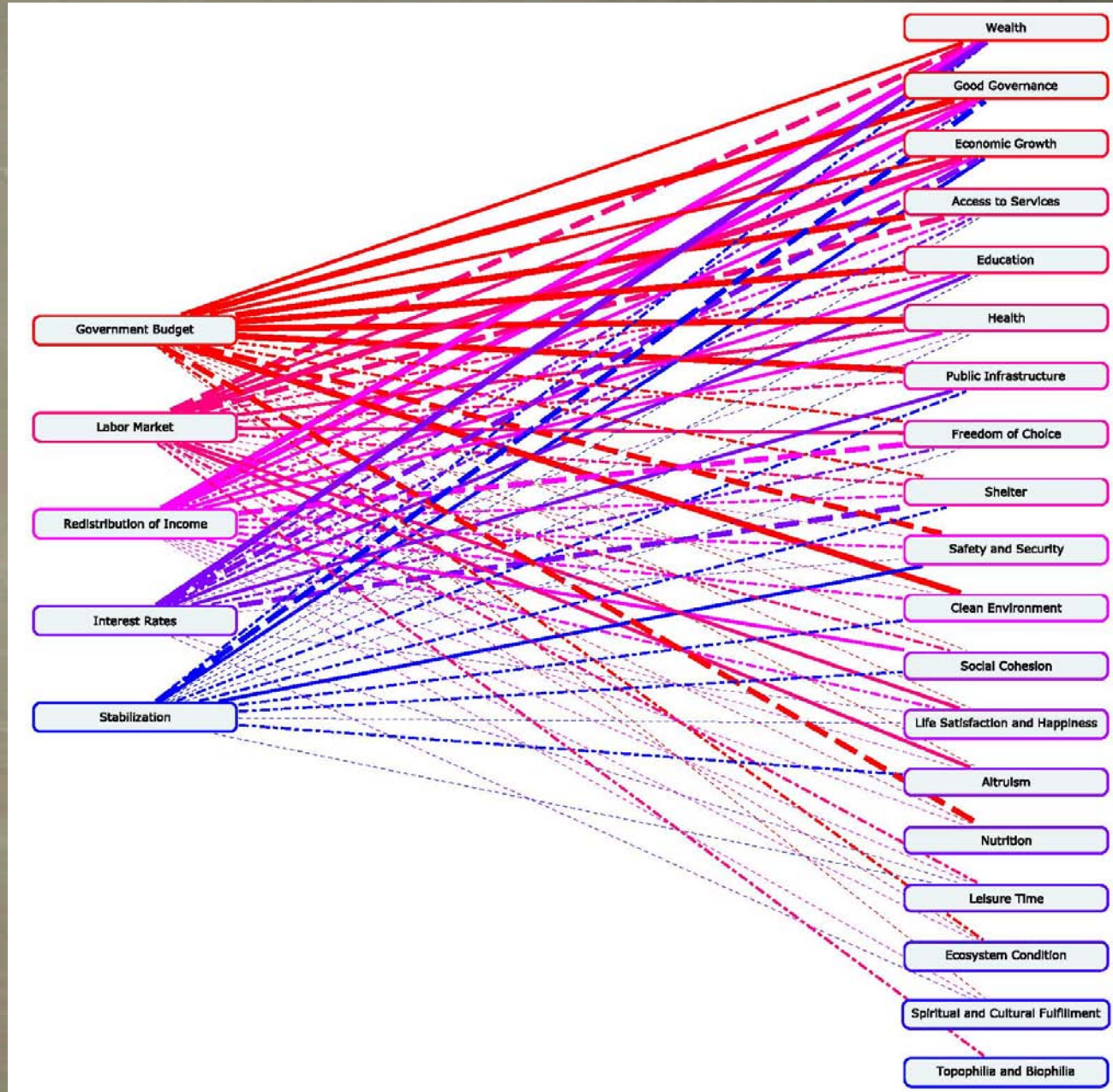


Figure 2. (a) Conceptual model of the relationship between ecosystem services and human well-being illustrating the complexities of the linkages. Do not cite or circulate.

What we need.....

Collaboration in developing social, political and economic links with human well-being.

Discussion of surveying NOAA employees to validate ecosystem service linkages with well-being.



**What we need.....**

**Collaboration in developing social, political and economic links with human well-being.**

- **1/2 day work session to evaluate economic links.**

- **1/2 day work session to evaluate social links.**

- **1/2 day work session to evaluate political links.**

- **Feedback on ecosystem work.**

- **Review**

**Discussion of surveying NOAA employees to validate ecosystem service linkages with well-being.**



