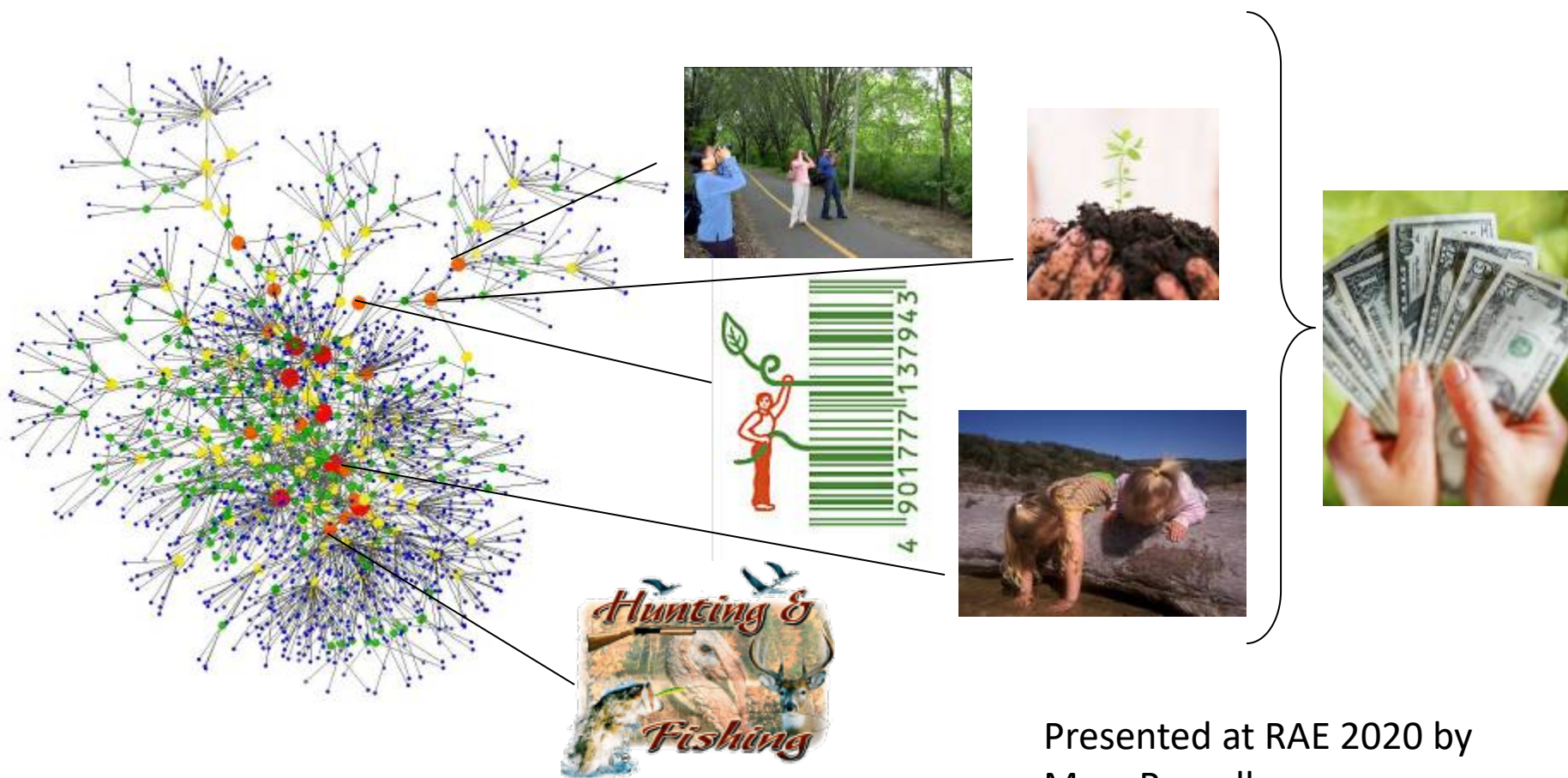


## We Have Come A Long Way Since The Tampa Bay Ecosystem Services Demonstration Project (2010-2014)



Presented at RAE 2020 by  
Marc Russell

## What is to be sustained in the Tampa region?

### >Quality of life, which depends on

*Economy (shipping, tourism, fishing, agriculture. . .)*

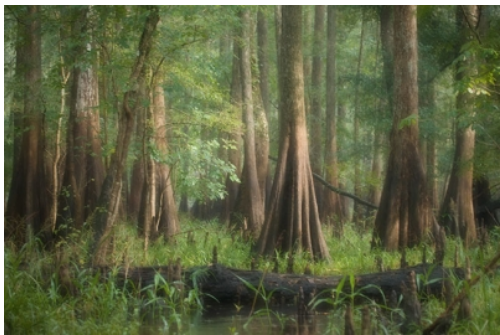
*Recreational values (fishing, boating . . .)*

*Aesthetic values (clear water and air, natural landscapes)*

*Health, happiness, cultural fulfillment. . .*

### >Which depend (in part) on

*Ecosystems; their functions and services*





**Background:** Tampa Bay is Florida's largest open-water estuary, supporting one of the world's most productive natural systems, and is home to a large and growing urban center.

**Problem:** Tampa Bay regional authorities want to balance urban growth with provision of valuable ecosystem services in Tampa Bay.

**Action:** US EPA partnered with local stakeholders to engage the public in recognizing and incorporating the value of ecosystem services in their decision-making process.

**Results:** **EPA Website** and **EPA H<sub>2</sub>O tool** are actively being used by regional planners to assess ecosystem benefits and has been incorporated into suite of community studies.

**Impact:** Decision makers recognize the importance of nature in human health and well-being and have a tool to consider these benefits in their decision-making processes.

**Added Value:** Transferable to other states and communities

[https://tbep.tech.org/TBEP\\_TECH\\_PUBS/2014/TBEP\\_04\\_14\\_%20FinalReport\\_Economic\\_Valuation\\_of\\_Tampa\\_Bay\\_Estuary.pdf](https://tbep.tech.org/TBEP_TECH_PUBS/2014/TBEP_04_14_%20FinalReport_Economic_Valuation_of_Tampa_Bay_Estuary.pdf)



Ecosystem services  
connect ecosystems  
to human well-being



Ecosystems

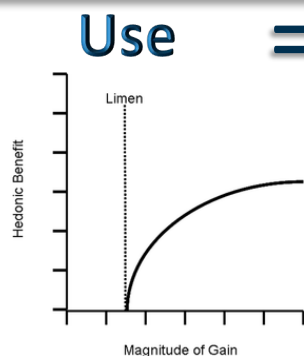
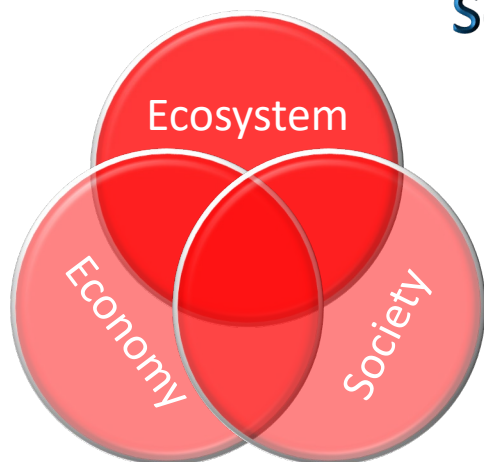


Produce

Final  
Services +




Well-being





# SUSTAINABLE and HEALTHY COMMUNITIES RESEARCH PROGRAM

<https://archive.epa.gov/ged/tbes/web/html/index.html>

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SEARCH

Ecological Research Program – Tampa Bay Ecosystem Services

Research on the large-scale physical, chemical, and biological dynamics of coastal wetlands and estuaries, with emphasis on the Gulf of Mexico.

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**TBES Home**

Biodiversity Support

Climate Regulation

Flood Protection

Air Quality

Water Quality

Culture

Food and Fiber Production


Water Supply

Tampa Bay Boundary

Contact us


You are here: EPA Home » NHEERL » Ecological Research Program

**Tampa Bay Ecosystem Services**




People consume the things that nature makes available – those life supporting services essential to human health and well being such as clean air, clean water, food, and materials for homes, clothing, and basic needs. These benefits we derive from nature are called ecosystem services. Ecosystem services come from natural renewable resources and processes that have served as the backdrop for human civilizations since the dawn of time. Examples include freshwater and timber, climate regulation, flood control, erosion control, recreation, and spiritual renewal


**Biodiversity Support**




**A Stable Climate**



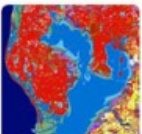
**Flood Protection**




**Usable Air**



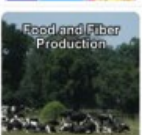
**Usable Water**




**Culture & Aesthetics**



**Food and Fiber Production**





**Available Water**





Unfortunately, humanity's need for ecosystem services (ecological footprint) currently is more than 23% larger than what the planet regenerates [Learn More](#). What this means is that modern humans consume more of nature's resources than can be produced; in short, our current way of life is not sustainable (World Resources Institute 2001 [Learn More](#)).


The value of ecosystem services is rarely considered in environmental decision-making, principally because these services are not well identified, quantified, or considered in economic terms. The Tampa Bay Estuary Program, Tampa Bay Regional Planning Council, the U.S. Environmental Protection Agency's Ecological Research Program (ESRP) and our research partners offer these web pages to engage the public and new partners to provide a common language and foundation for incorporating the value of, and risk of losing, ecosystem services into decision making. The following web pages will focus on Ecosystem Services research of interest to Tampa Bay area residents, including water supply and interesting facts about services provided by mangroves, seagrasses, and urban forests.

 News Feeds

 Podcasts


 EPA Mobile

 News by Email

 Widgets

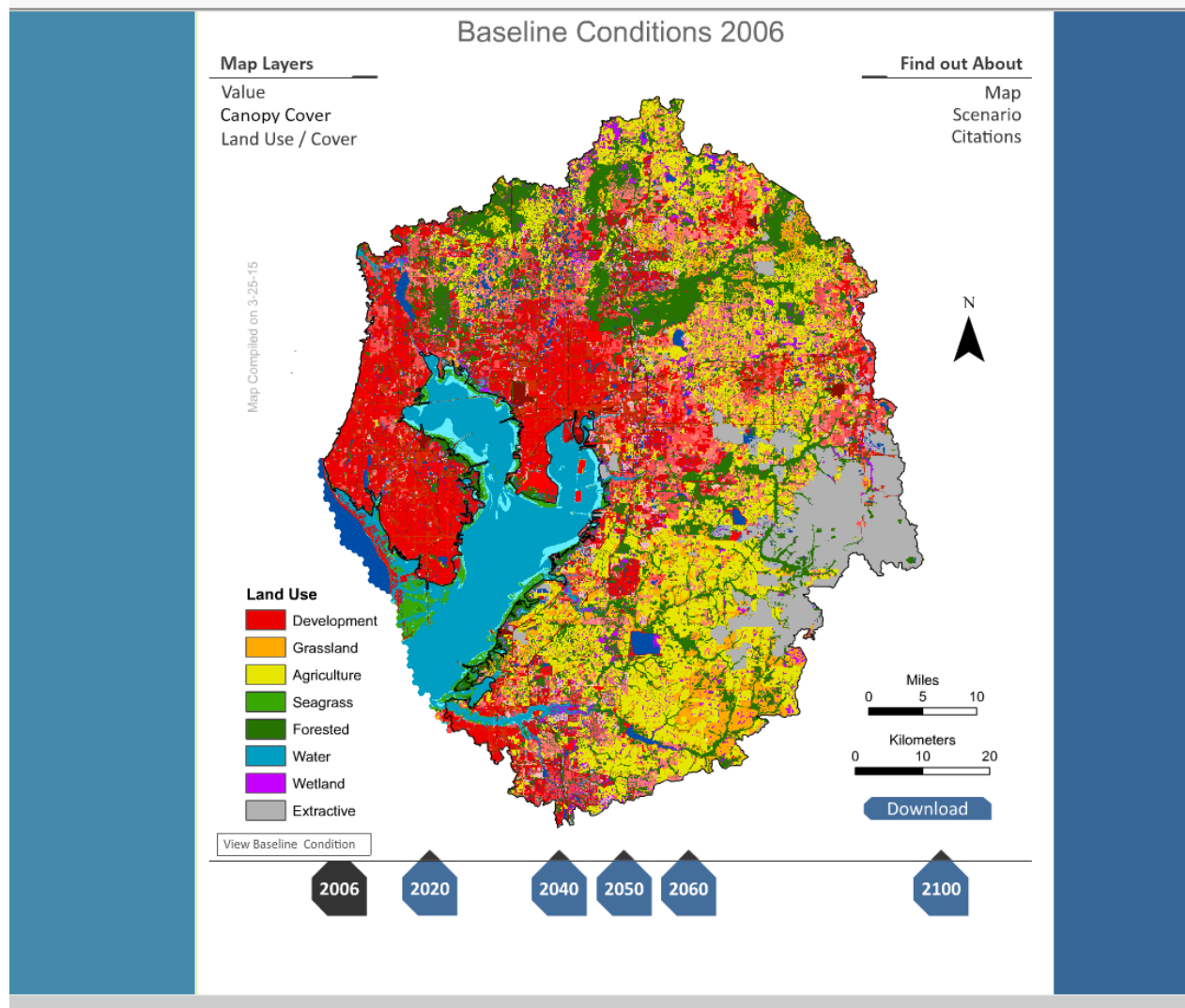
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Last updated on Tuesday, November 24th, 2009.



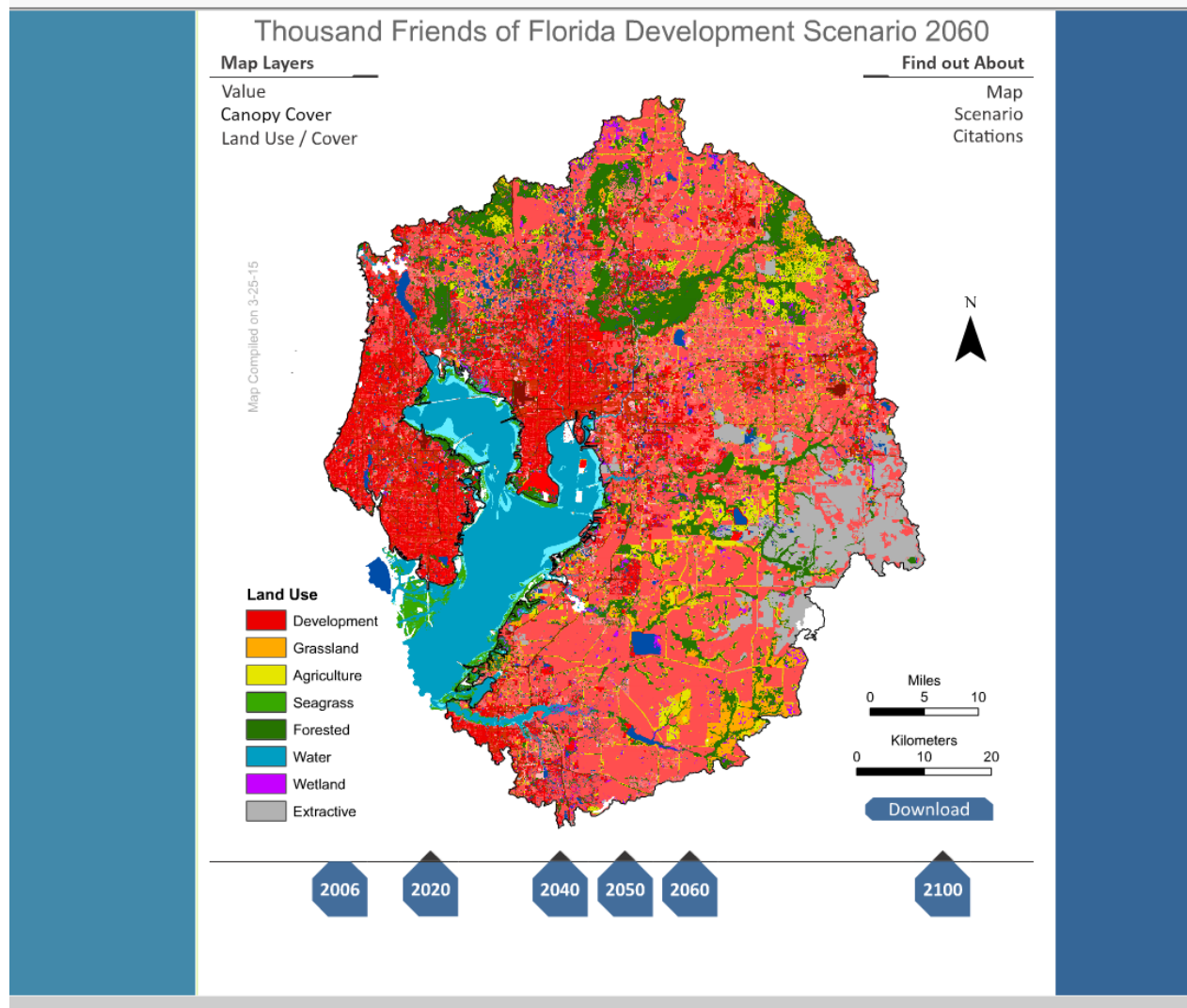


<https://archive.epa.gov/ged/tbes/web/html/index.html>

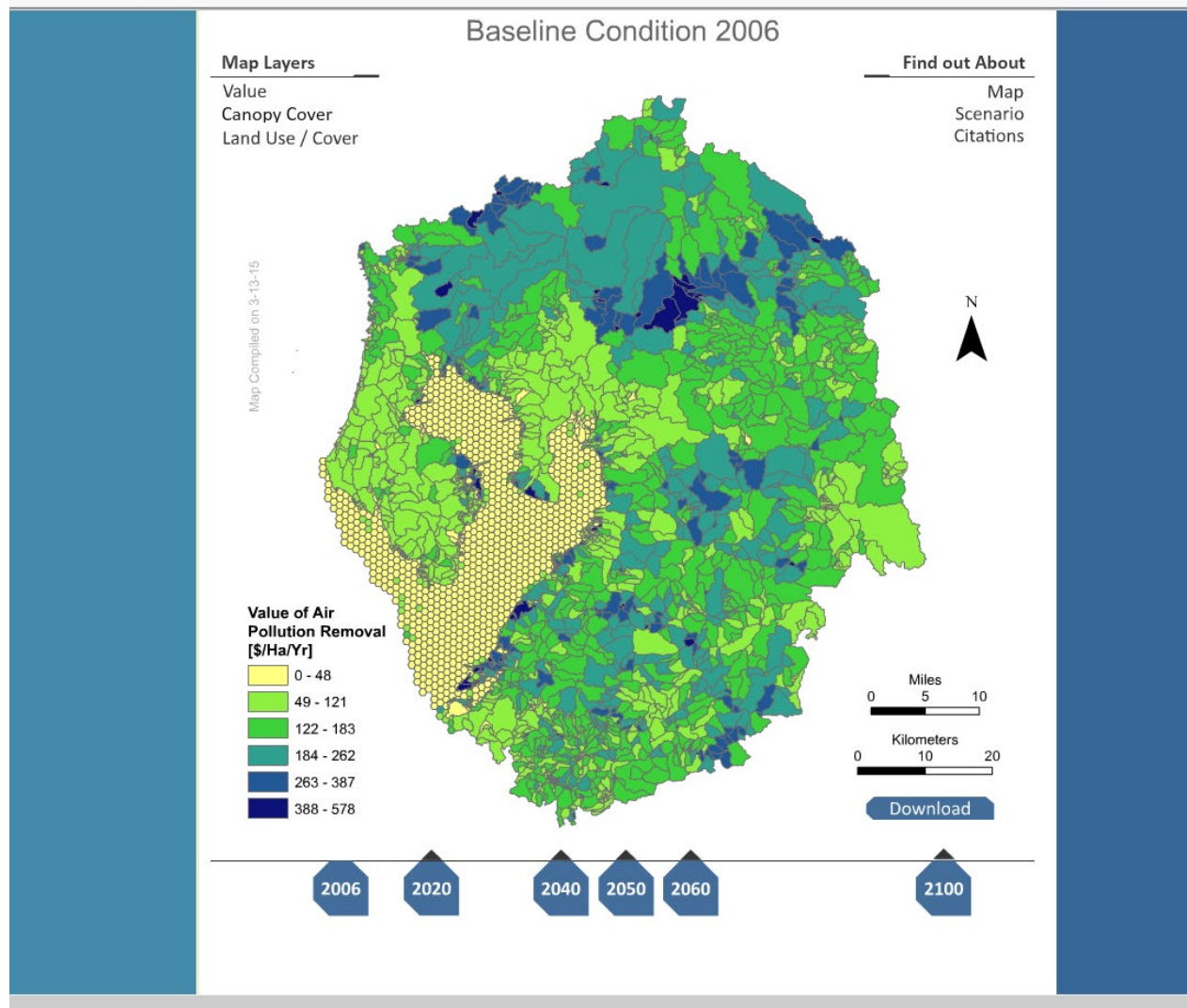




<https://archive.epa.gov/ged/tbes/web/html/index.html>



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## Tampa Bay Ecosystem Services


You are here: [EPA Home](#) » [Ecosystems](#) » [Ecosystem Services](#)

Bibliography

Ecosystem Goods & Services, Public Health, and Well-Being Relationship Browser

Topics: Human Well-being

Click a topic bubble or choose a topic from the dropdown list above.  
Hover over linkages (+) to view relationship between elements.



**Details**

**Describing Human Well-being**  
Human Well-being is a multidimensional phenomenon that describes the state of people's lives. It encompasses relationships, strong and healthy communities, meeting basic needs, good health, financial security, adequate free time, and the natural environment, employment, and the attainment of personal goals.

**The Human Well-being Index (HWBI)**  
The U.S. HWBI is a holistic measure of human well-being from eight domain scores. The HWBI is described by various objective measures.

**Utility of the HWBI**  
The HWBI provides a transparent point measure of well-being that can be used to assess the impact of decisions on the U.S. population. It ultimately will allow prediction and forecasting in relating economic and environmental decision support frameworks.

**Citations / Sources**  
Smith, Case, H. Smith, Summers, 2013.

You are here: Human Well-being

based on Moritz Steffaner's Relation Browser

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## Tampa Bay Ecosystem Services

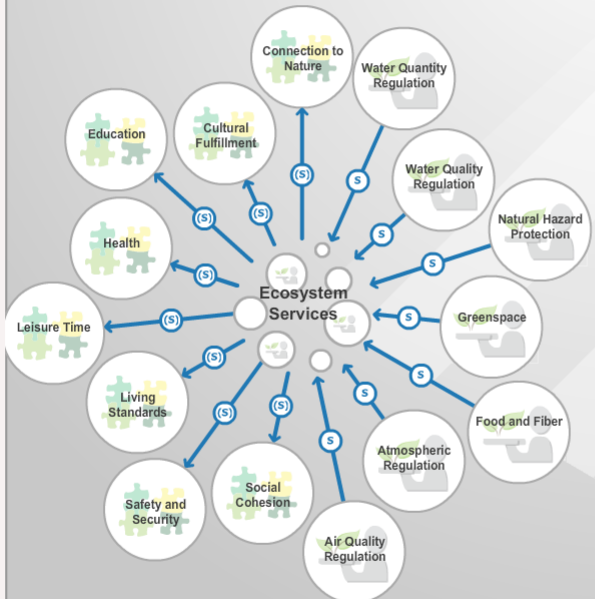
You are here: [EPA Home](#) » [Ecosystems](#) » [Ecosystem Services](#)

Bibliography

Ecosystem Goods & Services, Public Health, and Well-Being Relationship Browser

Topics: Ecosystem Services

Click a topic bubble or choose a topic from the dropdown list above.  
Hover over linkages (+) to view relationship between elements.



**Details**

**Description**  
Ecosystem Services are defined as the goods and services provided by ecosystem functions and processes that benefit humans or have the potential to do so in the future. There are seven core Ecosystem Services identified for this framework.

You are here: Leisure Time / Ecosystem Services

based on Moritz Steffaner's Relation Browser

EPA ORD has identified sustainable land use decisions as a common issue for communities.

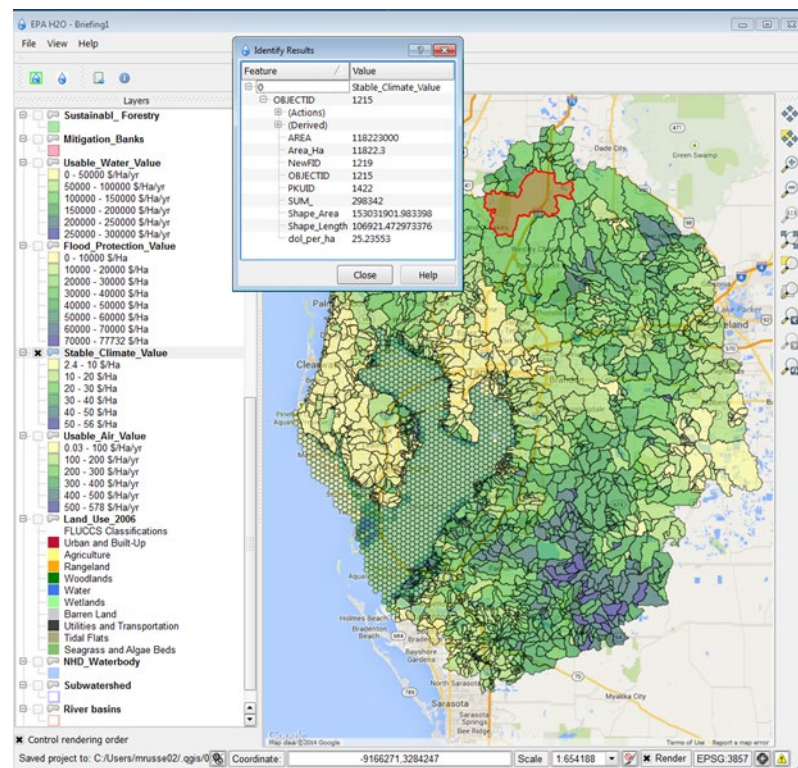
**EPA H<sub>2</sub>O** is a desktop tool to assess the delivery of ecosystem services (nature's benefits) from watersheds under different land use scenarios.

**EPA H<sub>2</sub>O** is an open-source GIS tool.

Users can:

- Explore the distribution of ecosystem goods and services at multiple spatial scales
- Ask questions about upstream connections with hydrologic network
- Generate reports for comparing alternatives

<https://www.epa.gov/water-research/ecosystem-services-scenario-assessment-using-epa-h2o>



NHD Sub-basin Carbon Sequestration Value

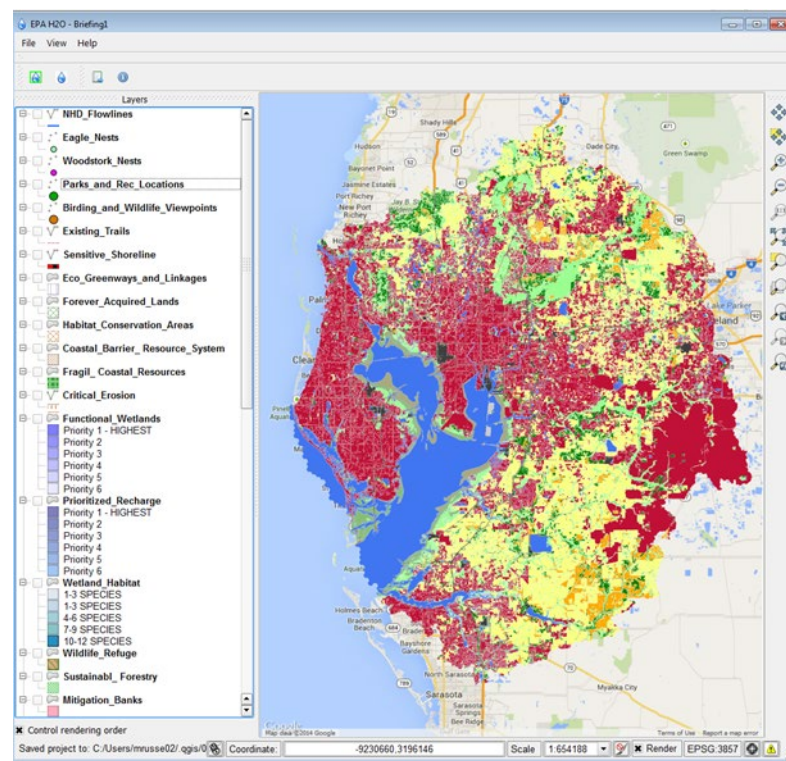


**EPA H<sub>2</sub>O** uses ecosystem goods and services, mapping approaches developed by ORD, and exploration and analysis tools to make information useful for decision makers.

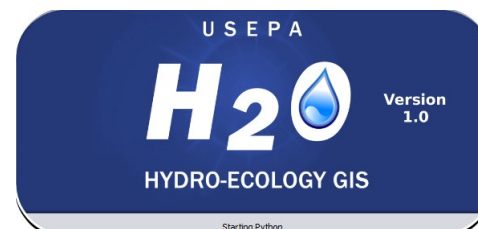
Although the tool was initially designed for the Tampa Bay region, the **EPA H<sub>2</sub>O** tool is transferrable to anywhere in the world if the data building blocks are available.

Current efforts are underway to test and enhance transferability of the tool to other locations and several aspects have been implemented within EPA's EnviroAtlas.

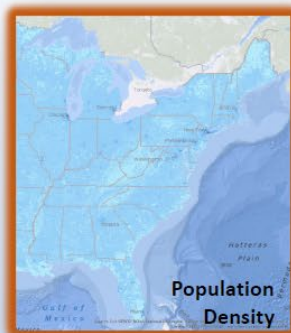
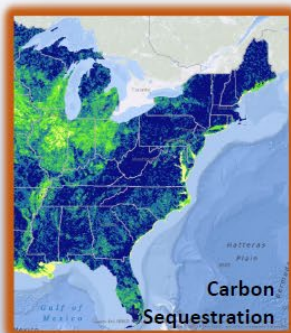
<https://www.epa.gov/water-research/ecosystem-services-scenario-assessment-using-epa-h2o>



Land Use in the Tampa Bay Watershed

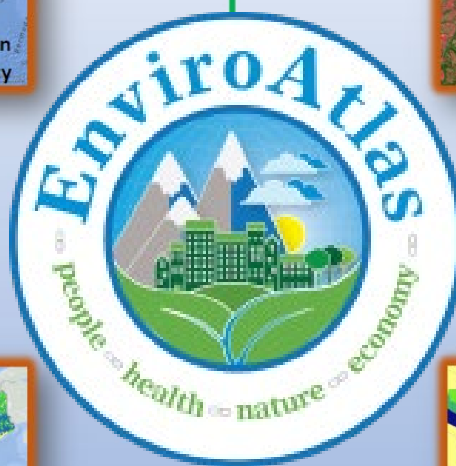
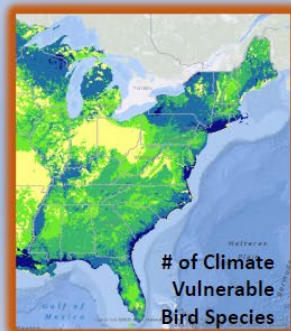






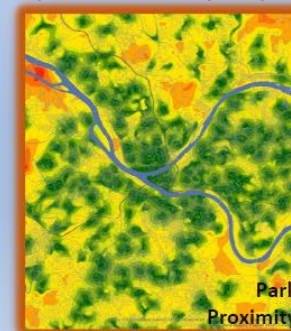
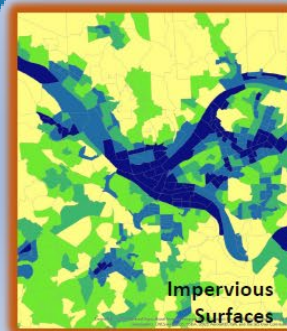
## National Data

30-meter land cover  
350+ unique data layers  
Consistent data for the  
conterminous U.S.



## Community Data

1-meter land cover  
100+ unique data layers  
30 metropolitan areas  
1450 cities & towns (65+ million people)

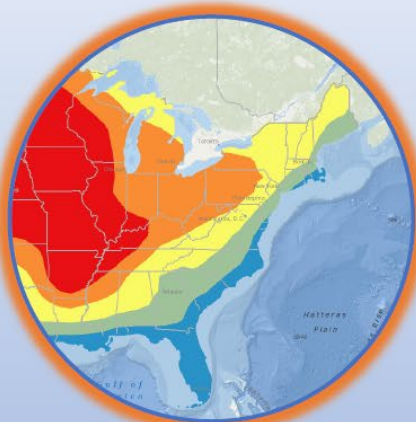


## EnviroAtlas Built-in Tools

### Watershed Navigator

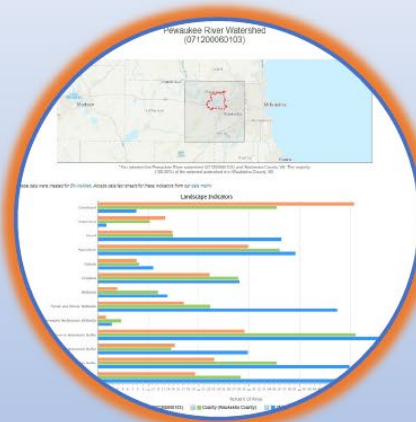


### Change Analysis & Time series Viewer



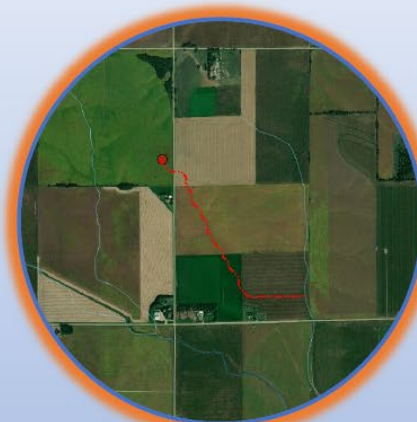
- Calculate precipitation, temperature, Potential Evapotranspiration (PET) difference between two time periods
- Animated view of 150 years of modeled climate data

### Compare My Area (New)



- Compare watershed or census tract to surrounding county or state values
- View demographics, national air toxics, or landscape characteristics

### Follow a Rain Drop



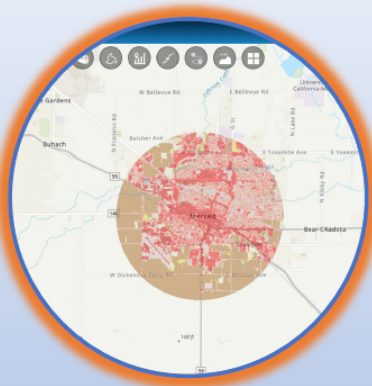
Find flowpath to nearest water feature



## EnviroAtlas Tools – Coming Soon

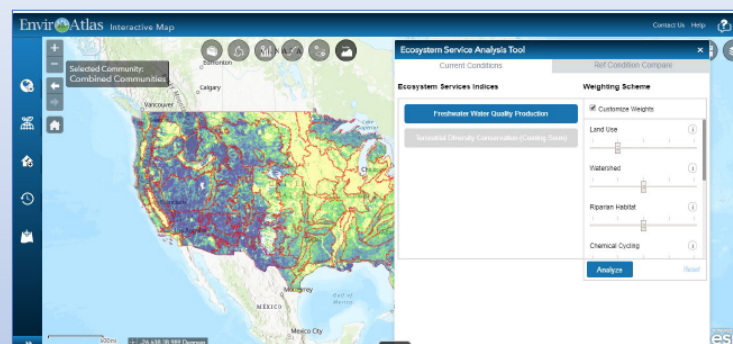
### Gridded Analysis Tool

- User can select watershed, county, congressional district
  - or create a varying-size circular buffer around a selected point
  - or draw a custom area
- Can then calculate land cover proportions for area selected
- Will be expanded to include other calculations in addition to land cover



Gridded Map Tool	
Select Area and Layer	Results
Draw Type	Buffer Distance
User Point	2.5 m
Attribute	Value
Area of Selection	38 mi <sup>2</sup>
Percent NLCD Developed	64.59 %
Percent NLCD Greenhouse	2.79 %
Percent NLCD Agriculture	32.38 %
Percent NLCD Water	0.24 %

### Screen and Prioritize Index Tool



- User can combine metrics to create screening or prioritization score for targeted questions
- First example will be related to provision of clean water
- User will be able to adjust importance of each element





# National Ecosystem Services Classification System (NESCS) Plus

## Overview: A Tool for Considering Ecosystem Services

EPA researchers are identifying and quantifying ways in which natural ecosystems contribute to healthy and sustainable communities. An explicit goal is to provide information and tools that help decision makers and local communities sustain such contributions, known as ecosystem services, to enhance aspects of human wellbeing, including economic growth and prosperity, public health, stability, and resiliency.



The National Ecosystems Classification System-Plus

(*NESCS Plus*, pronounced “nex-us plus”) is one such tool. EPA researchers developed it as a robust, step-by-step resource for tracing the links between natural ecosystems and human well-being.

The main purpose of *NESCS Plus* is to serve as a framework for analyzing how changes to ecosystems impact human welfare. This system can aid in the analysis of different types of environmental management actions, policies, and regulations. Potential applications include, but are not limited to, cost-benefit analysis of environmental programs, natural capital accounting, and measurement of “green” gross domestic product (green GDP). Though *NESCS Plus* is not a valuation or accounting system, it is designed to support systematic and comprehensive accounting of

## Related Content and Resources

- [Frequently Asked Questions \(FAQs\)](#)
- [Case Studies](#)
- [Query Tool](#)

<https://www.epa.gov/eco-research/national-ecosystem-services-classification-system-nescs-plus>



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## EcoService Models Library (ESML)

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

[Home](#)[Search EMs](#)[My EMs \(0\)](#)[Learn about ESML](#)[View ESML Data Map](#)

### Search Ecological Models (EMs)



Search the ESML for EMs and related variable and source document information.

[Search EMs](#)[Find Source Document Info](#)

### Learn about the ESML



#### ESML Data and Guiding Concepts

Learn about ecological models, the data contained within this tool and the underlying concepts regarding their use.

#### Using ESML

Understand how to take advantage of the features available within this tool.

### My EMs



Username:

Password:

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[View ESML Data Map](#)

### Variable Classification Hierarchy Top Level Categories

#### Category

1

Policy Regarding Use or Management of Ecosystem Resources

#### Category

2

Land Surface (or Water Body Bed) Cover, Use or Substrate

#### Category

3

Demographic Data

#### Category

4

Human-Produced Stressor or Enhancer of Ecosystem Goods and Services Production

#### Category

5

Ecosystem Attributes and Potential Supply of Ecosystem Services

#### Category

6

Non-monetary Indicators of Human Demand, Use or Benefit of Ecosystem Services

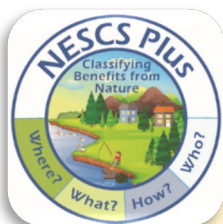
#### Category

7

Monetary Values



- Classification System
- Library for Coding & Searching FEGS



NESCS Plus

FEGS Scoping Tool



- FEGS Project Scoping
- Stakeholder Engagement

Coming soon

FEGS Metrics Report

Enviro Atlas



- Spatial datasets
- Visualizations

Eco Service Models Library

EcoService Models Library (ESML)

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

- Published models for estimating ES

- What to measure?
- FEGS Units



Coming soon

# More Information?

## Select Recent Publications

- Cochran, F., Daniel, J., Jackson, L. and Neale, A., 2020. Earth observation-based ecosystem services indicators for national and subnational reporting of the Sustainable Development Goals. Remote Sensing of Environment, 244, p.111796. <https://www.sciencedirect.com/science/article/pii/S0034425720301668>
- Pilant, A., Endres, K., Rosenbaum, D. and Gundersen, G., 2020. US EPA EnviroAtlas Meter-Scale Urban Land Cover (MULC): 1-m Pixel Land Cover Class Definitions and Guidance. Remote Sensing, 12(12), p.1909. <https://www.mdpi.com/2072-4292/12/12/1909>
- Warnell, K. J., Russell, M., Rhodes, C., Bagstad, K. J., Olander, L. P., Nowak, D. J., Poudel, R., Glynn, P. D., Hass, J. L., & Hirabayashi, S. 2020. Testing ecosystem accounting in the United States: A case study for the Southeast. Ecosystem Services, 43, 101099. [https://www.fs.fed.us/nrs/pubs/jrnl/2020/nrs\\_2020\\_warnell\\_001.pdf](https://www.fs.fed.us/nrs/pubs/jrnl/2020/nrs_2020_warnell_001.pdf)
- Yee, S., A. Sullivan, K. Williams, AND K. Winters. 2019. Who Benefits from National Estuaries? Applying the FEGS Classification System to Identify Ecosystem Services and their Beneficiaries. IJERPH 16: 2351 (2019). <https://www.mdpi.com/1660-4601/16/13/2351>