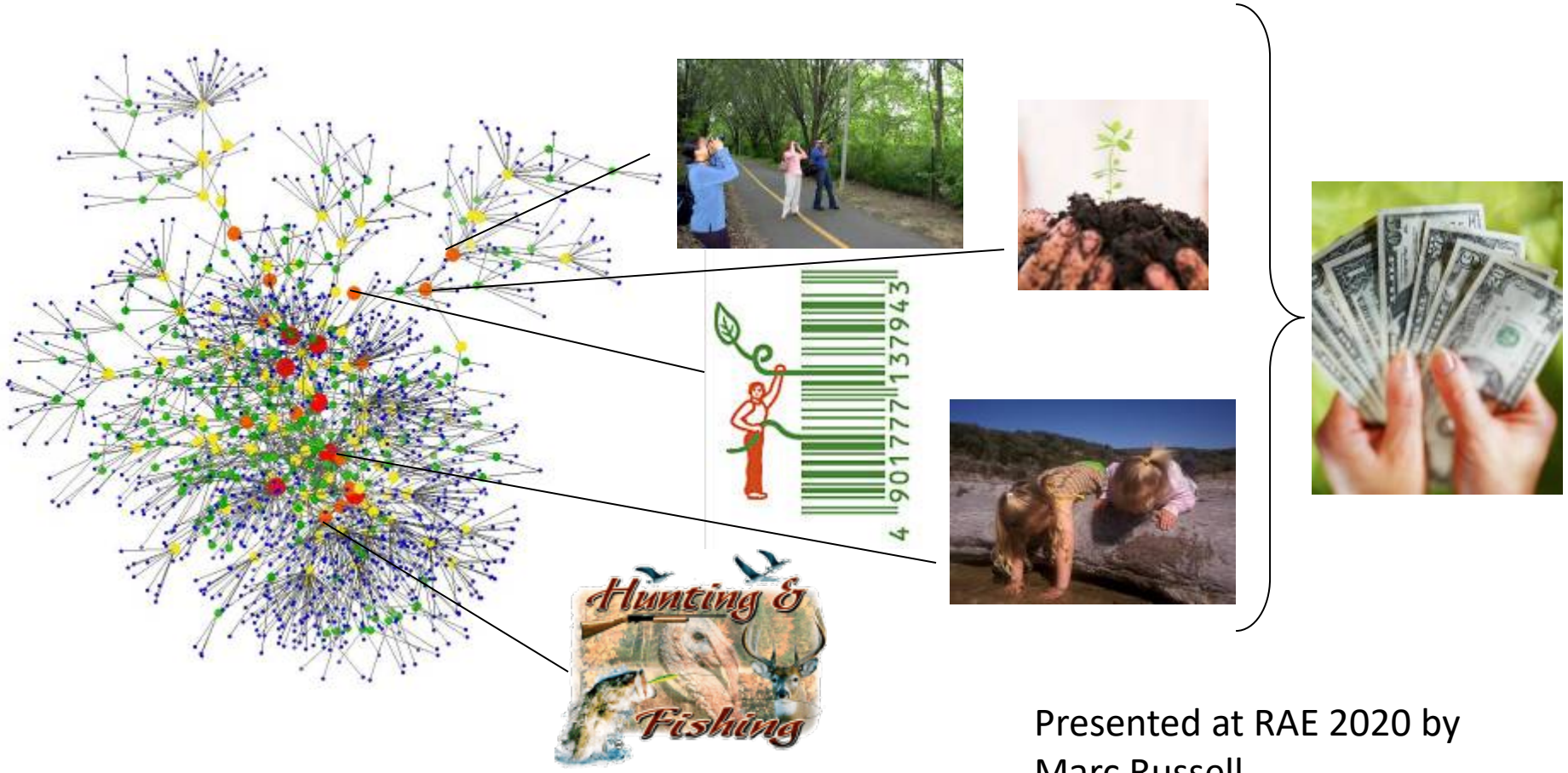
We Have Come A Long Way Since The Tampa Bay Ecosystem Services Demonstration Project (2010-2014)



Presented at RAE 2020 by
Marc Russell

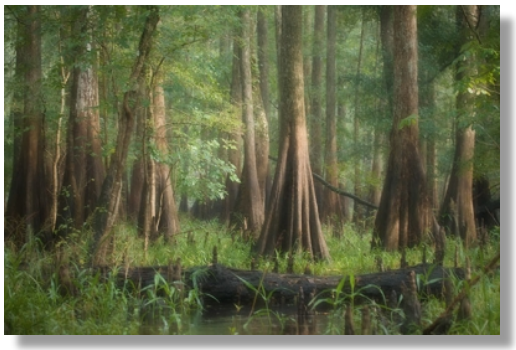
What is to be sustained in the Tampa region?

>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_2O 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://tbeptech.org/TBEP_TECH_PUBS/2014/TBEP_04_14_%20FinalReport_Economic_Valuation_of_Tampa_Bay_Estuary.pdf

Ecosystem services connect ecosystems to human well-being

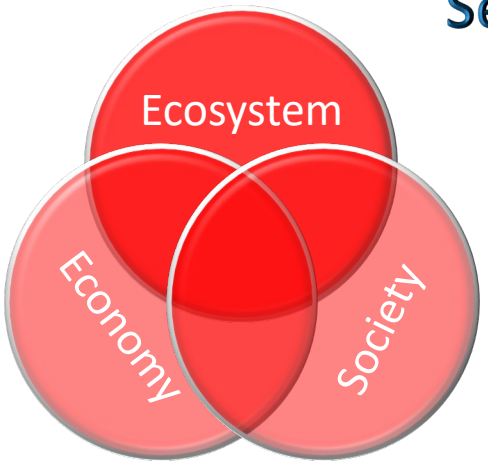
Ecosystems

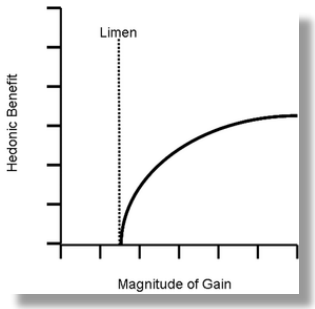
Produce

Final Services +

Use =

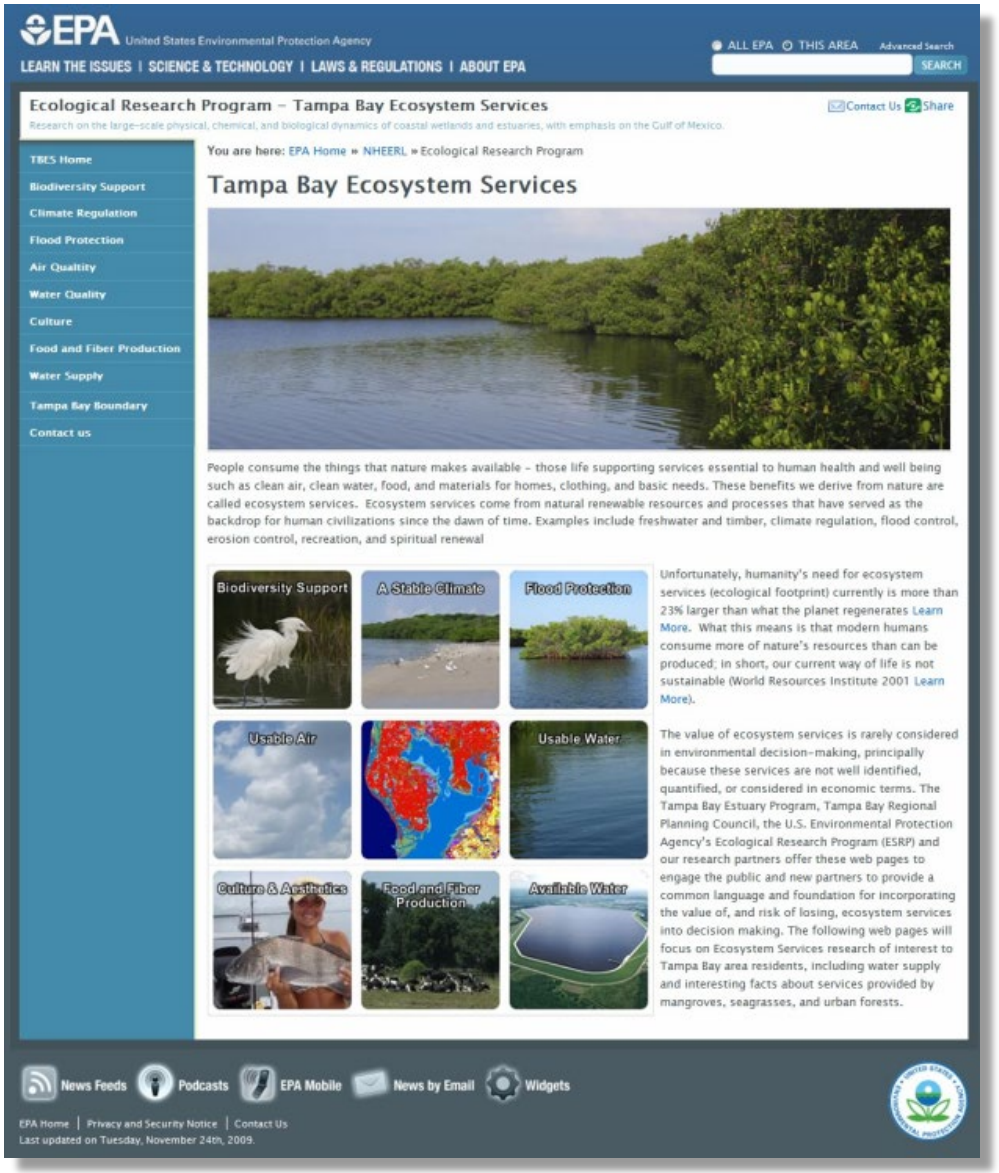
Well-being

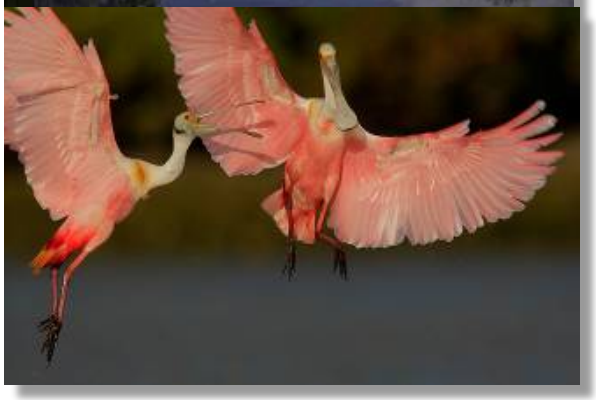




SUSTAINABLE and HEALTHY COMMUNITIES RESEARCH PROGRAM

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





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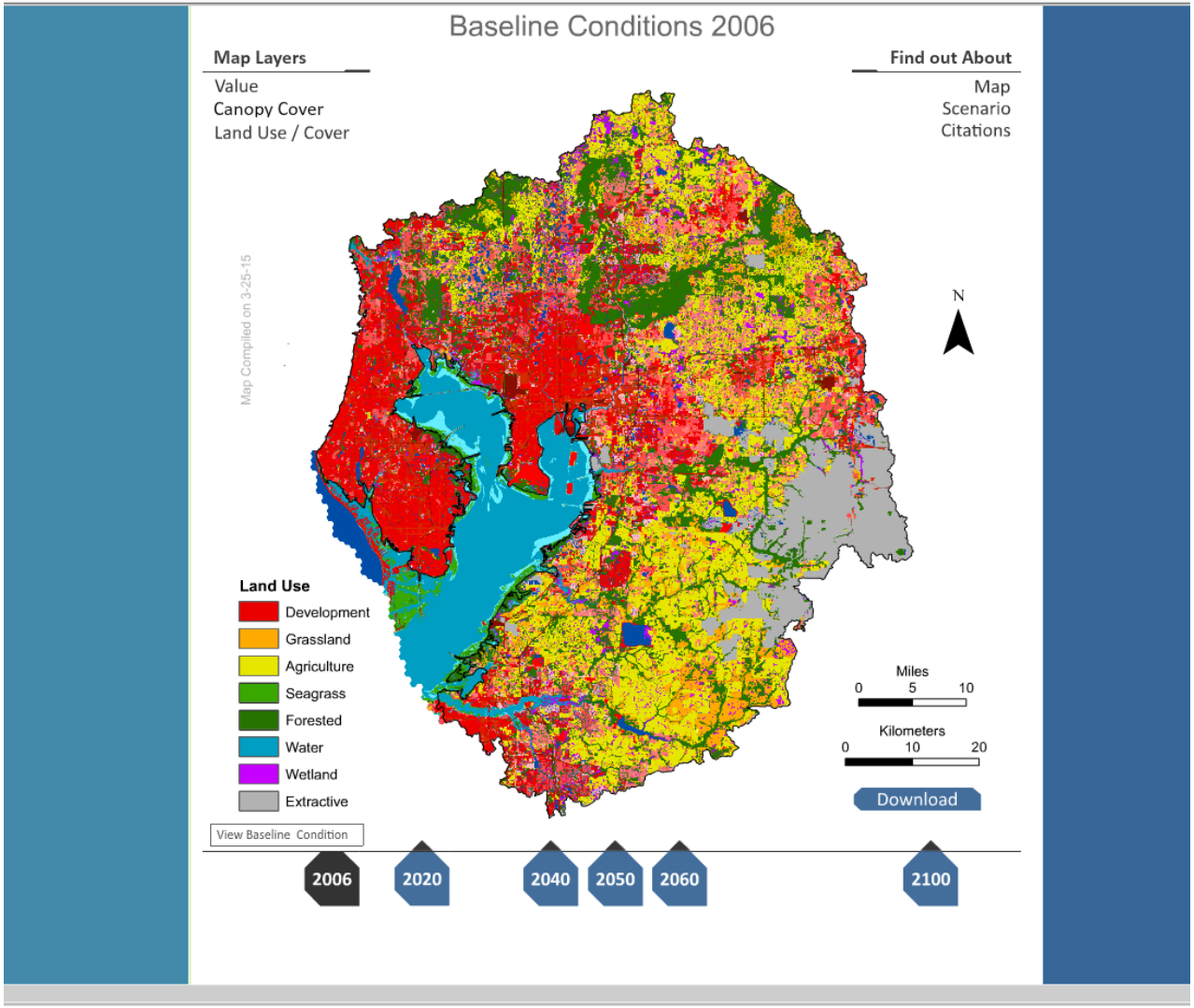

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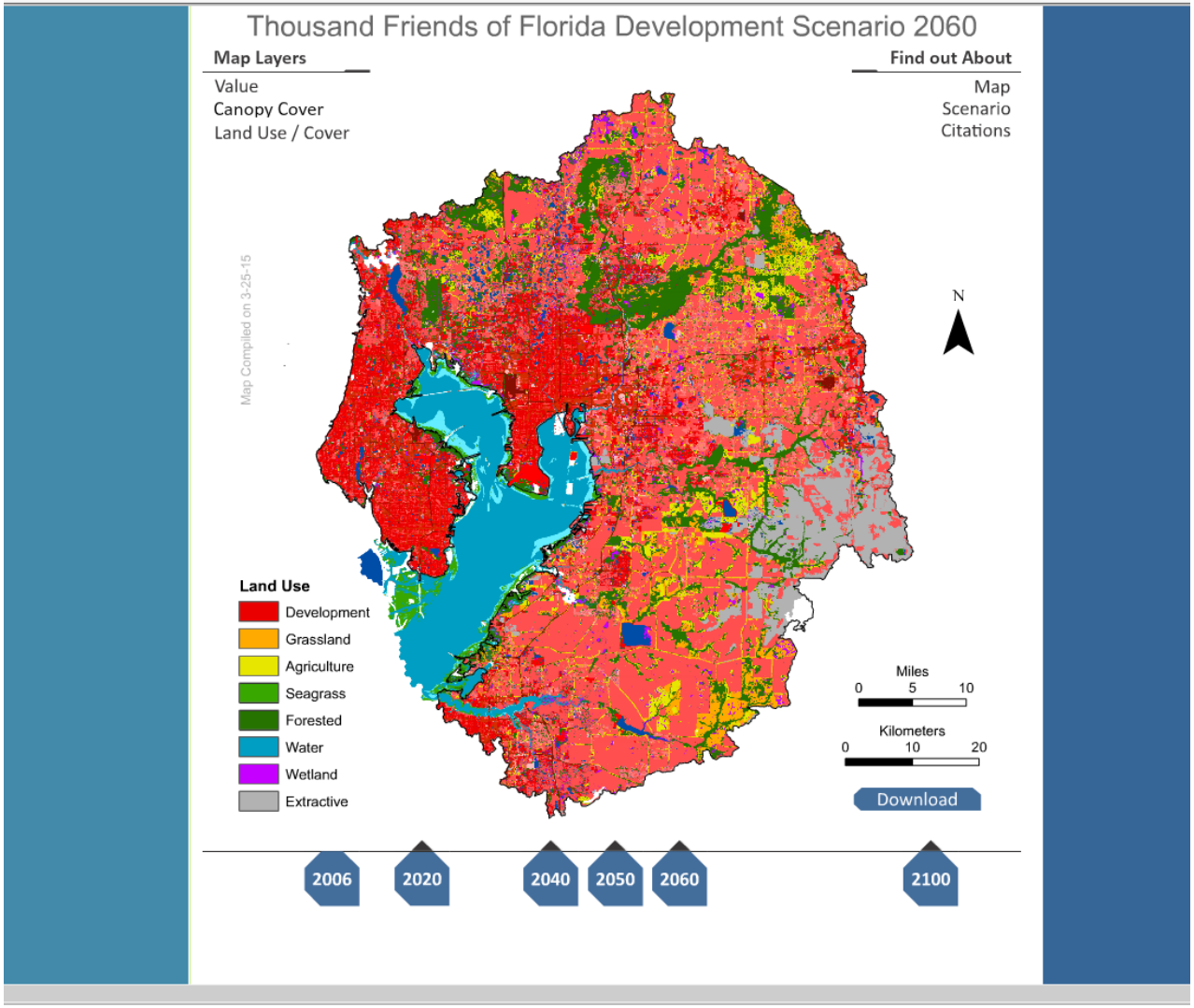

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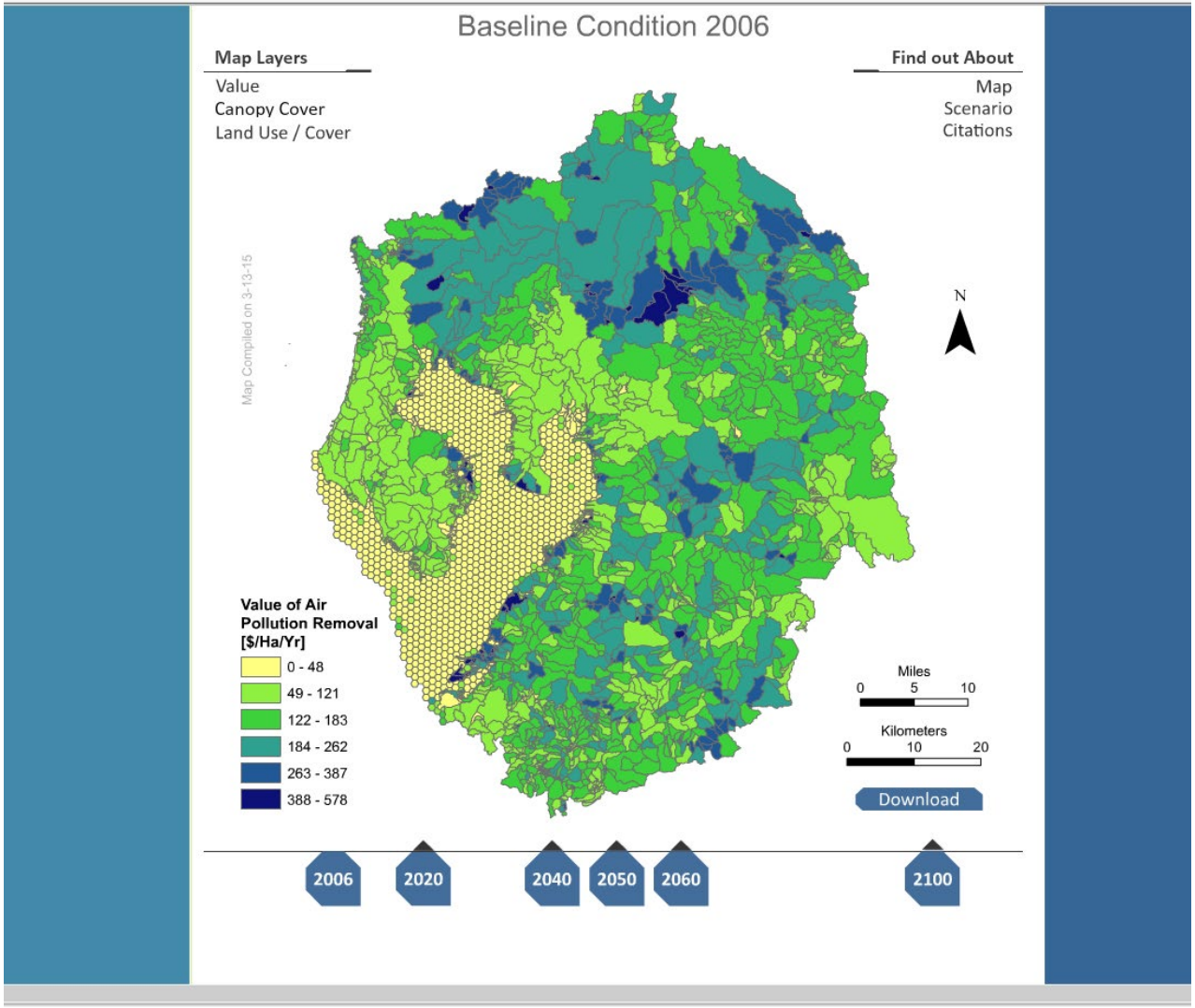
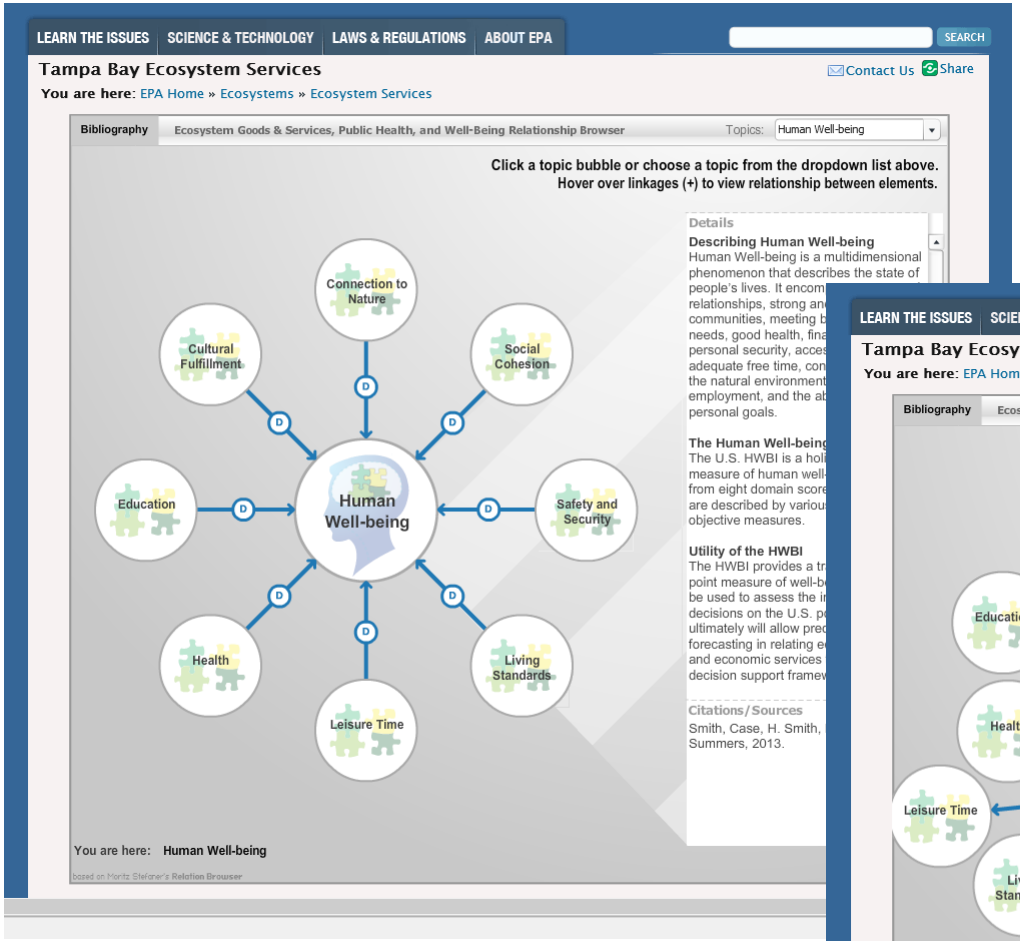
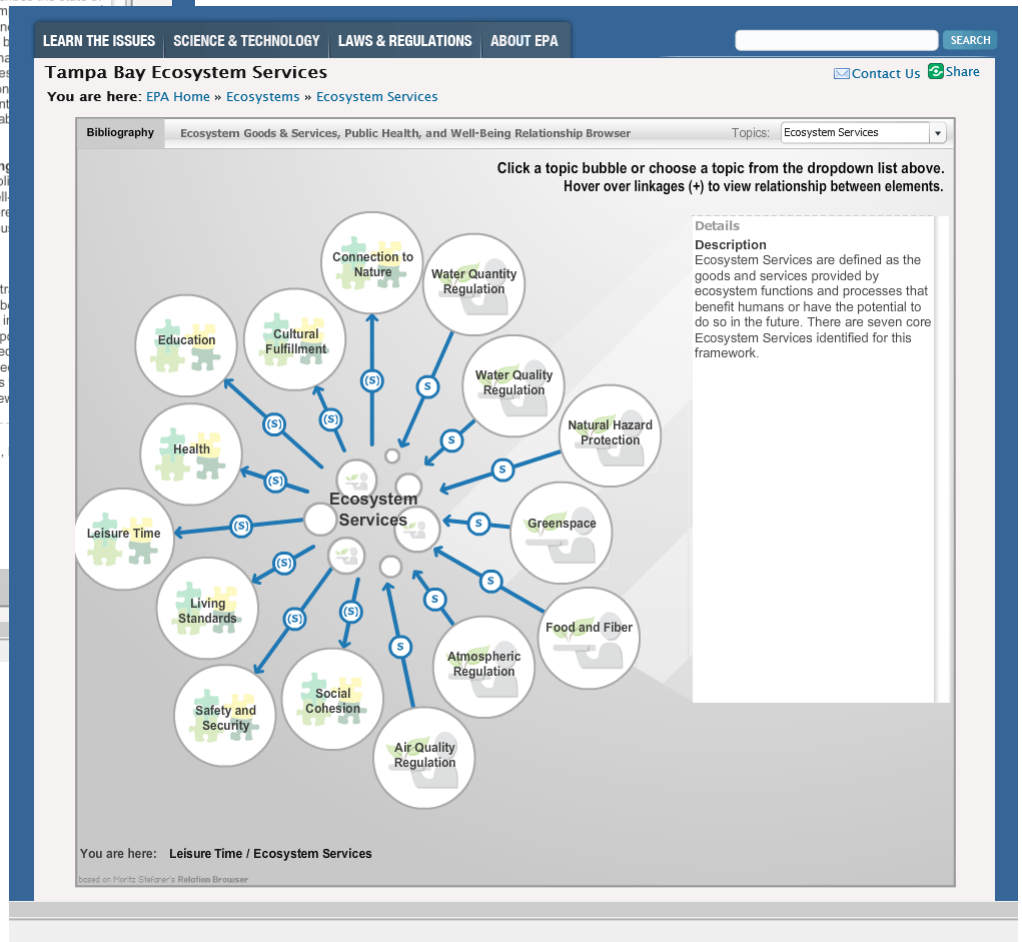


SUSTAINABLE and HEALTHY COMMUNITIES RESEARCH PROGRAM





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

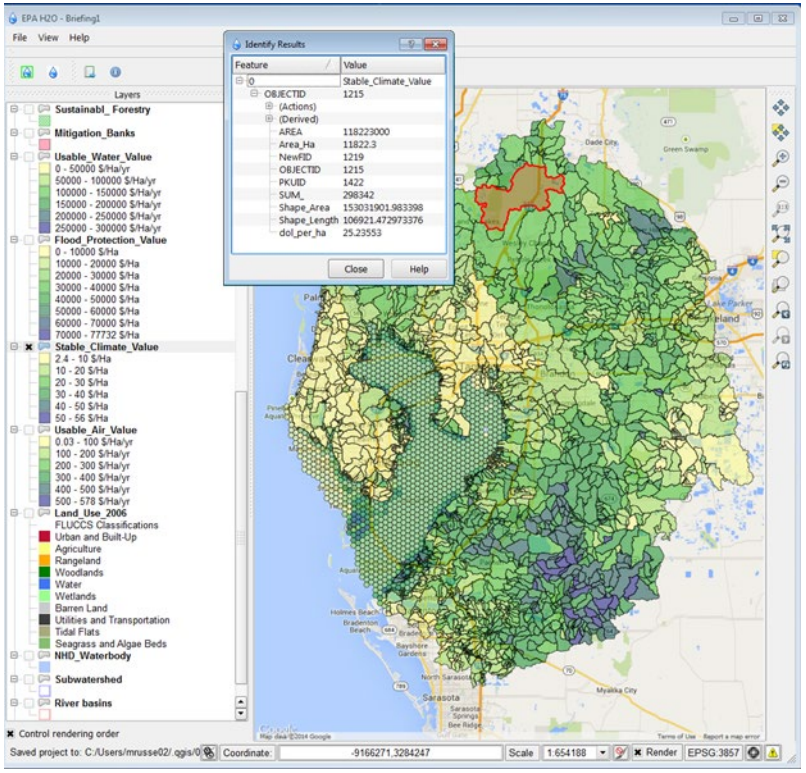
EPA H_2O is a desktop tool to assess the delivery of ecosystem services (nature's benefits) from watersheds under different land use scenarios.

EPA H_2O 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

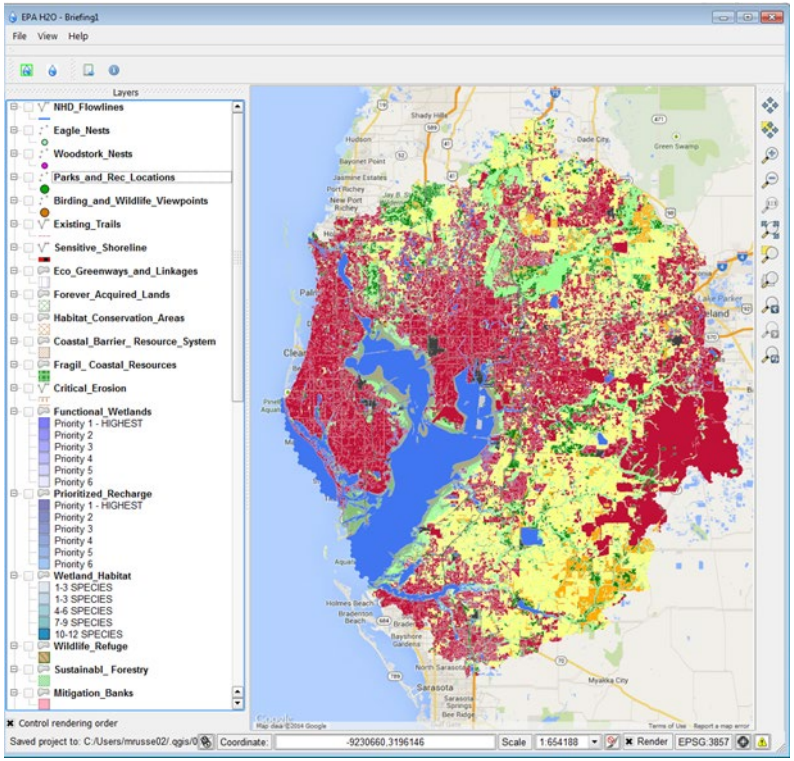
USEPA H2O Version 1.0 HYDRO-ECOLOGY GIS

EPA H_2O uses ecosystem goods and services, mapping approaches developed by ORD, and exploration and analysis tools to make information useful for decision makers.

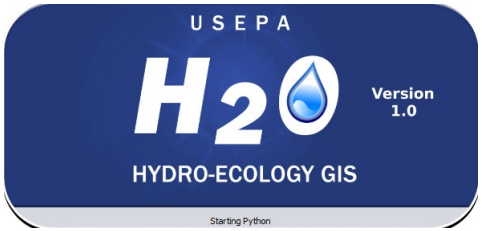
Although the tool was initially designed for the Tampa Bay region, the **EPA H_2O** tool is transferrable to anywhere in the world if the data building blocks are available.

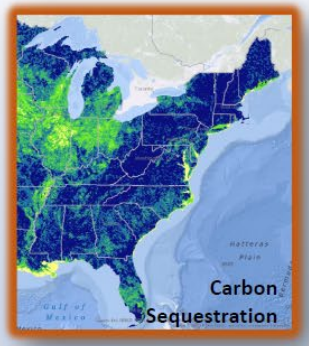
Current efforts are underway to test and enhance transferability of the tool to other locations and several aspects have been implemented within EPA's EnviroAtlas.

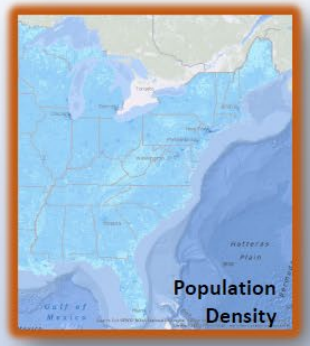
https://www.epa.gov/water-research/ecosystem-services-scenario-assessment-using-epa-h2o



Land Use in the Tampa Bay Watershed

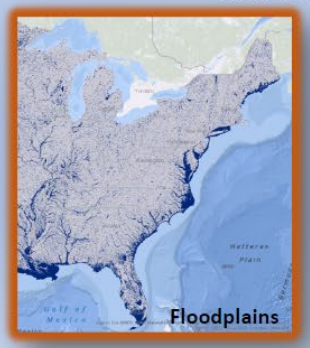


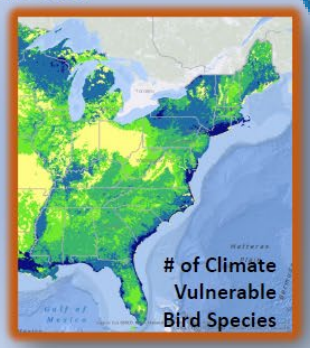




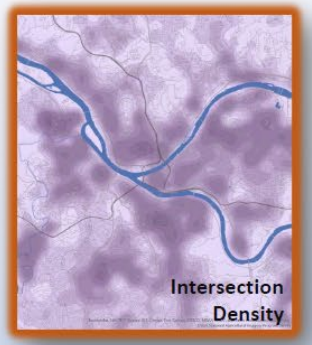
National Data

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





EnviroAtlas
people health nature economy



Community Data

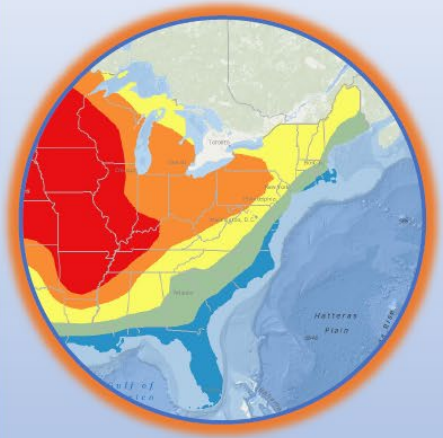
1-meter land cover
100+ unique data layers
30 metropolitan areas
1450 cities & towns (65+ million people)

https://www.epa.gov/enviroatlas

EnviroAtlas Built-in Tools

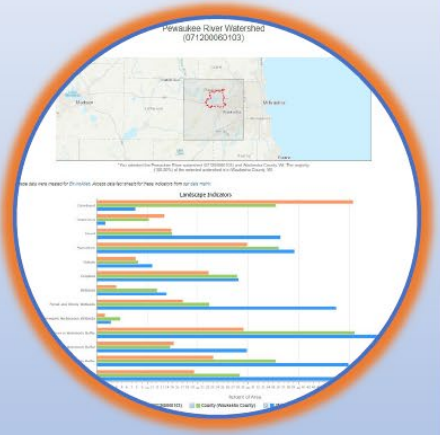
Watershed Navigator

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

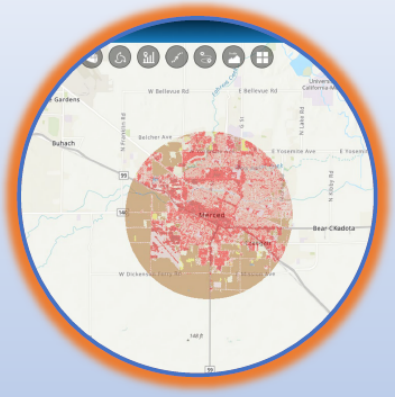
Follow a Rain Drop

Find flowpath to nearest water feature

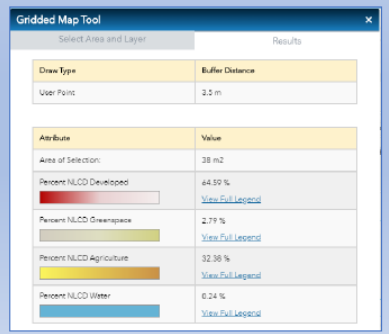
https://www.epa.gov/enviroatlas

EnviroAtlas Tools – Coming Soon

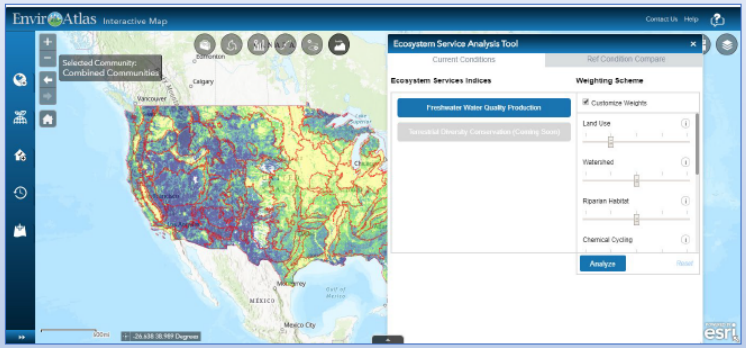
Gridded Analysis Tool



- 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



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

https://www.epa.gov/enviroatlas

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.

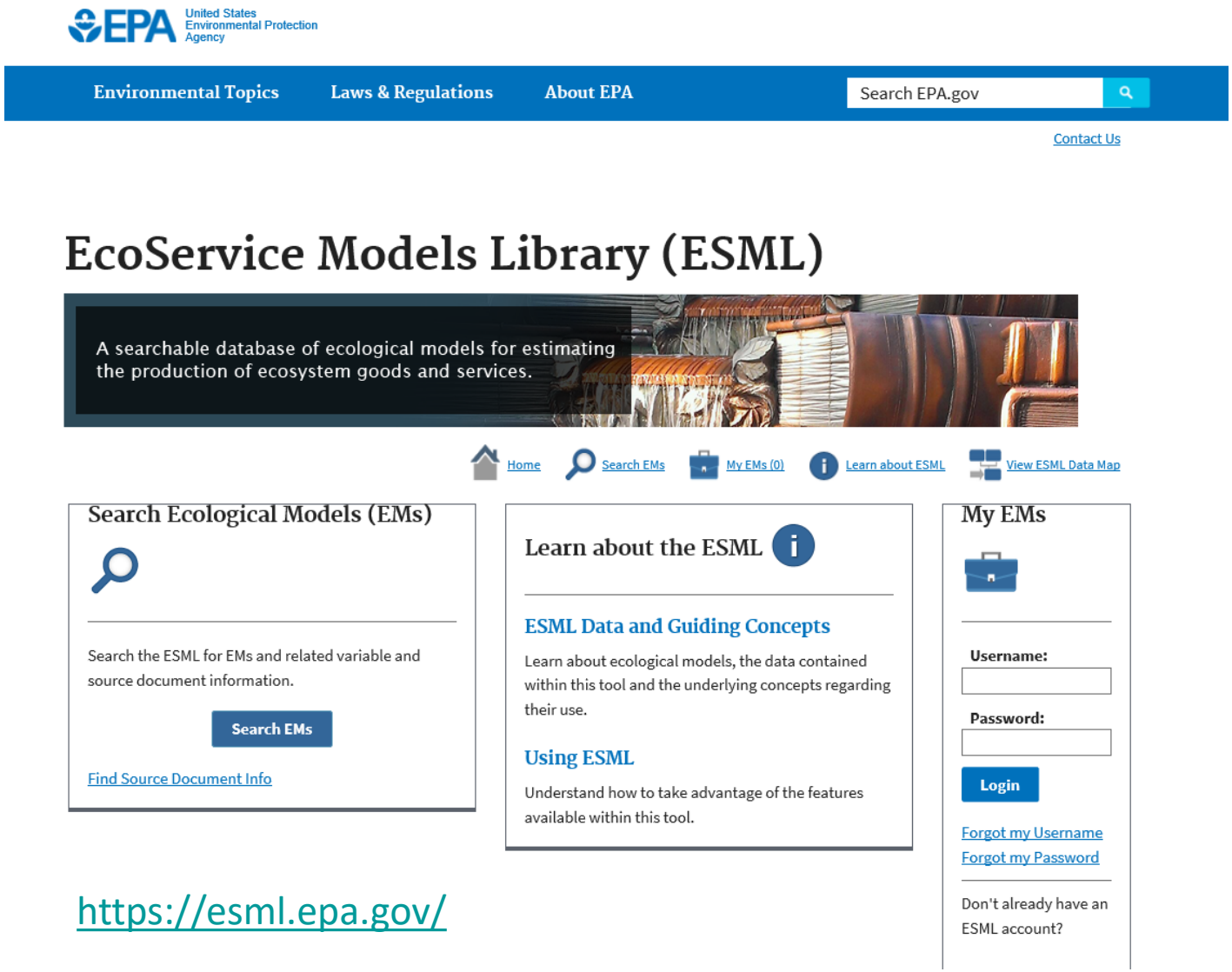
Related Content and Resources

- Frequently Asked Questions (FAQs)
- Case Studies
- Query Tool

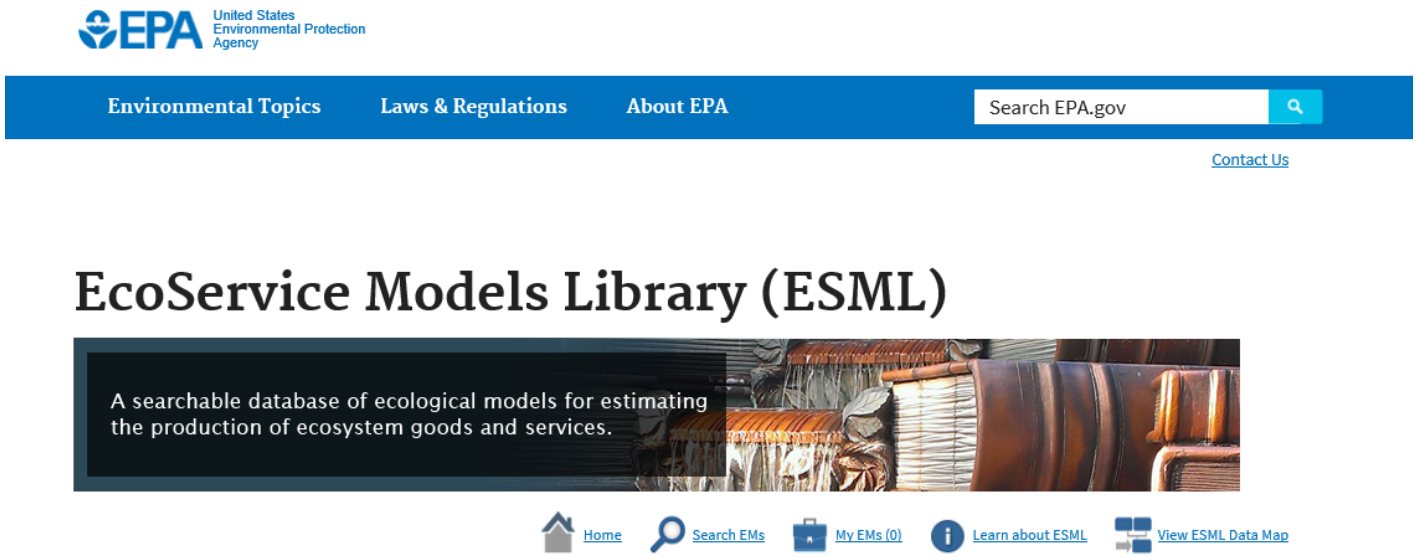
https://www.epa.gov/eco-research/national-ecosystem-services-classification-system-nescs-plus

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



https://esml.epa.gov/



Variable Classification Hierarchy Top Level Categories

Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Category 7
Policy Regarding Use or Management of Ecosystem Resources	Land Surface (or Water Body Bed) Cover, Use or Substrate	Demographic Data	Human-Produced Stressor or Enhancer of Ecosystem Goods and Services Production	Ecosystem Attributes and Potential Supply of Ecosystem Services	Non-monetary Indicators of Human Demand, Use or Benefit of Ecosystem Services	Monetary Values

- Classification System
- Library for Coding & Searching FEGS

NESCS Plus

FEGS Scoping Tool

- FEGS Project Scoping
- Stakeholder Engagement

Coming soon

Enviro Atlas

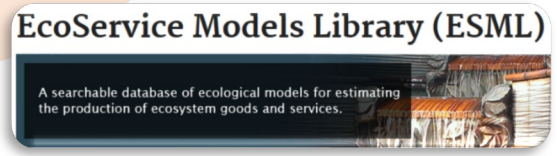
- Spatial datasets
- Visualizations

FEGS Metrics Report

- What to measure?
- FEGS Units

Coming soon

Eco Service Models Library



- Published models for estimating ES

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

- 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