Outcomes Estimation Tools Training Webinar Series

Model My Watershed (water quality tool)

Michelle Perez, PhD
Water Initiative Director

Aysha Tapp Ross
Water & Soil Health Scientist

Kinzie Reiss
Ag Conservation Innovations Program & Communications Manager

June 7, 2023

American Farmland Trust

Agenda

- Welcome, Reminders, Poll
- Recap
- Model My Watershed Presentation
- Model My Watershed Demonstration
- Q&A

Michelle

Zoom Webinar Reminders

- Use Q&A Box - last 15 minutes (Vote up!)
- Use Zoom Direct Message feature to Kinzie if having technical difficulties
- Email with resources to follow each webinar
- Recordings posted on the webinar series site the following Monday
- Evaluation survey in the Chat Box

Kinzie

American Farmland Trust

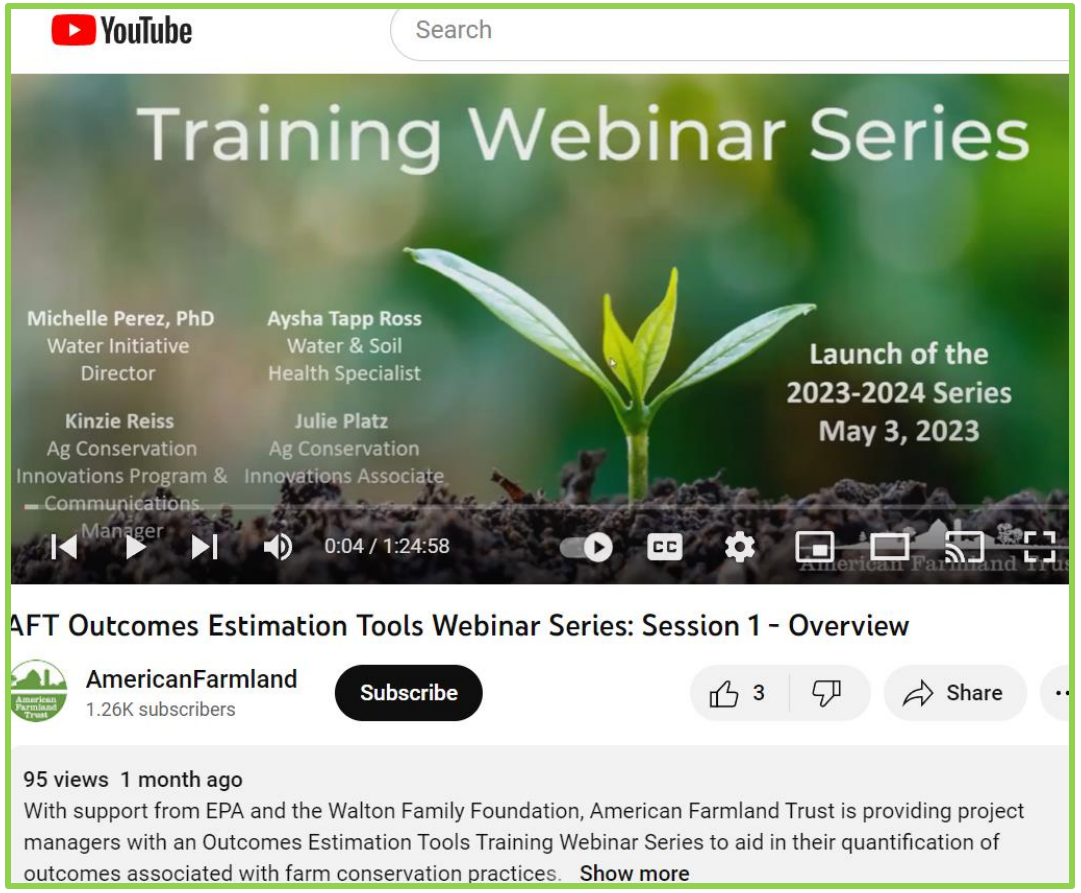
Time for 3 polls!

Kinzie

American Farmland Trust

Recap May 3 Webinar

- Reviewed the results of the Needs Assessment
- Presented the Outcomes Estimation Tools Guide
- Debuted the simple Projects by County Outcomes Calculator (PCOC) Tool
- Recording: Outcomes Estimation Tools Training Webinar Series - FIC (farmlandinfo.org)



Michelle

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Tools in 2023 Trainings*

May 3: Webinar Launch & PCOC (recording)

June 7: Model My Watershed (water quality)

July 12: Nutrient Tracking Tool (NTT) (water quality)

August 2: NRCS Cover Crop Economics Tool (economic)

September 6: FieldPrint Platform (climate & water quality)

October 4: AFT Retrospective-Soil Health Economics (R-SHEC) Tool (economic)

November 1: PTMApp Web Tool (water quality)

December 6: EPA PLET (water quality)

Tools in 2024 Trainings*

January 10: SIPES Method/SIDMA Tool (social)

February 7: Fast-GHG (climate)

March 6: Cool Farm Tool (climate)

April 3: Cropping Systems Calculator (economic)

May 1: COMET-Farm & COMET-Planner (climate)

June 5: CAST Tool (water quality)

July 3: TBD

*Subject to change

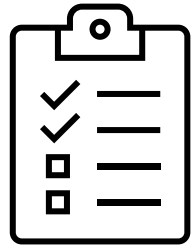
:19

Michelle

American Farmland Trust

Next steps in our outcomes estimation journey

- ❑ Remember the NTT July webinar is on Wed, July 12!
- ❑ Fill out a 6-question (2-min) online evaluation survey
- ❑ Schedule a free "coaching" session with us
  - ❑ **Email atappross@farmland.org, RE: Coaching Request**
- ❑ Order a free print copy of the OET Guide
  - ❑ Keyword: "AFT outcomes tools"



Please keep in touch:
outcomestools@farmland.org

Aysha

American Farmland Trust

Model My Watershed®

An online water quality modeling app

Matt Ehrhart, MSAE
Director of Watershed Restoration,

Dave Arscott, Ph.D.
Executive Director, Research Scientist

STROUD WATER RESEARCH CENTER

Anthony Aufdenkampe, Ph.D.
Senior Environmental Scientist

LimnoTech
Water Environment | Scientists Engineers

Outcomes Estimation Tools Webinar Series
7 June, 2023

hosted by American Farmland Trust

Model My Watershed® WikiWatershed®

A Team Effort

David Arscott, Steve Kerlin, Melinda Daniels,
Matt Ehrhart, Scott Ensign, Shannon Hicks,
Sara Damiano, Susan E. Gill (retired)…

Anthony Aufdenkampe, LimnoTech
Barry Evans, Penn State U., Stroud Center
David Tarboton, Utah State U.
Jeffrey S. Horsburgh, Utah State U.
Scott Haag, formerly at Academy Nat. Sci., Drexel U.
Lin Perez, Academy Nat. Sci., Drexel U.
Robert Cheetham, Azavea
Emilio Mayorga, U. Washington

Nanette Marcum-Dietrich, Millersville U.
Carolyn Staudt, Concord Consortium

STROUD WATER RESEARCH CENTER

LimnoTech

Water Environment | Scientists Engineers

azavea

THE ACADEMY OF NATURAL SCIENCES of DREXEL UNIVERSITY

UNIVERSITY of WASHINGTON

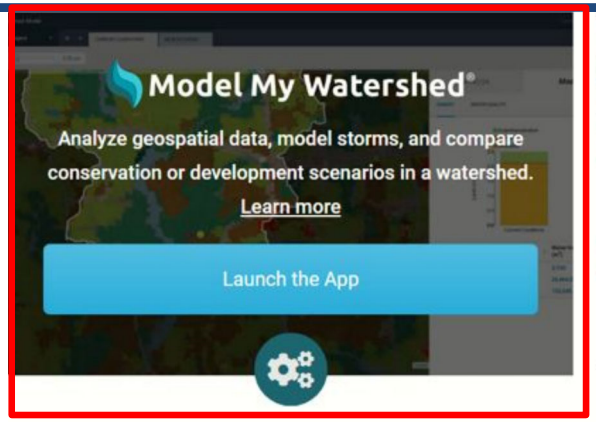
UtahState University

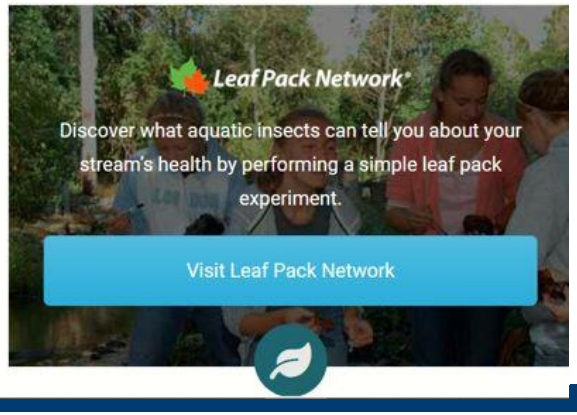
Millersville University
SEIZE THE OPPORTUNITY

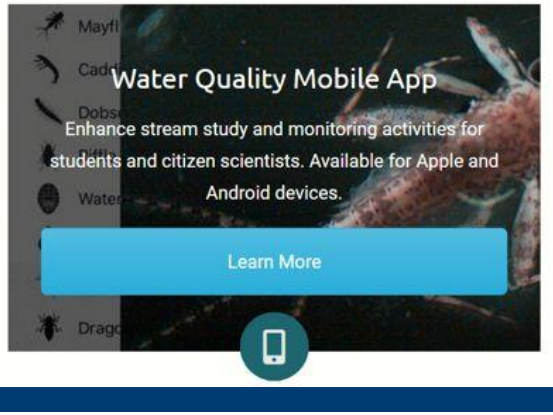
The Concord Consortium

WikiWatershed®

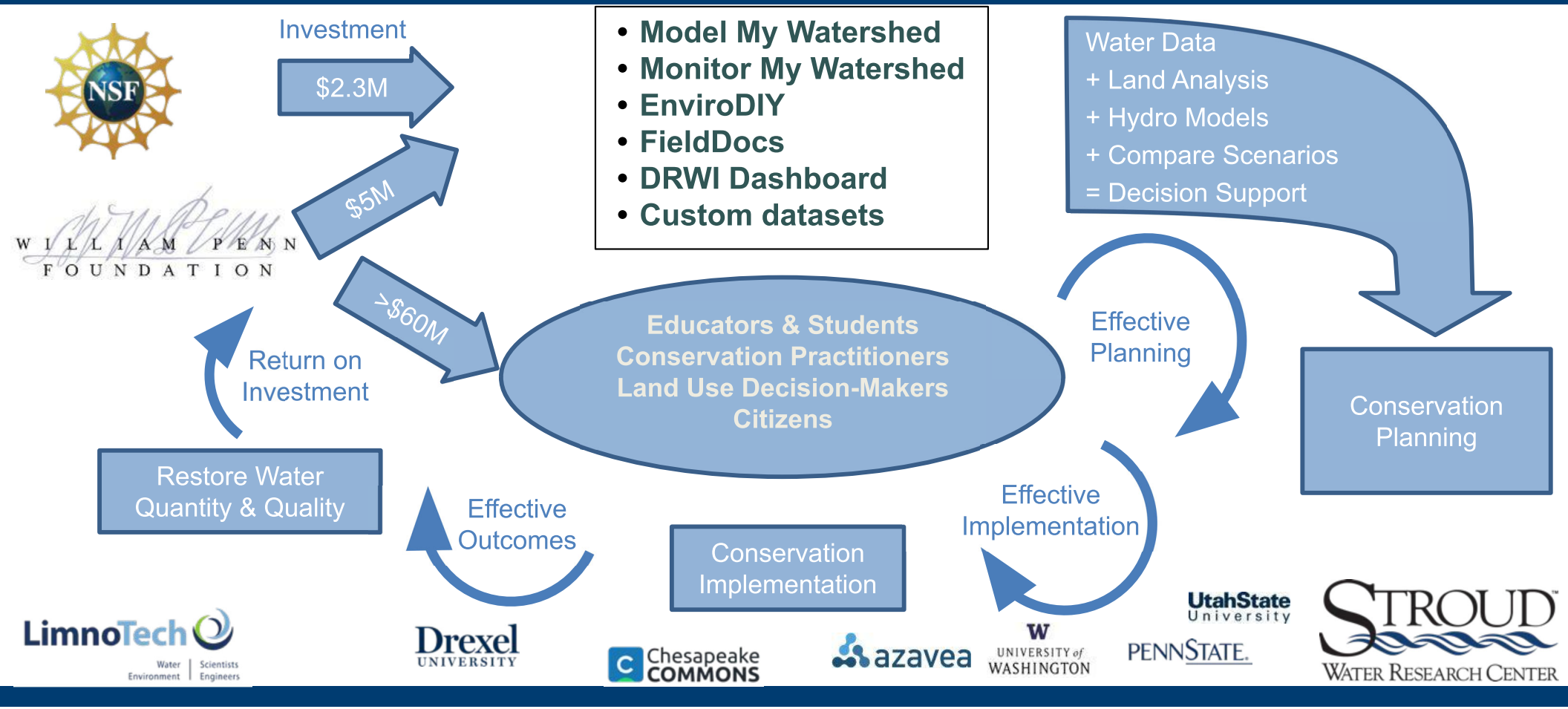
https://WikiWatershed.org/







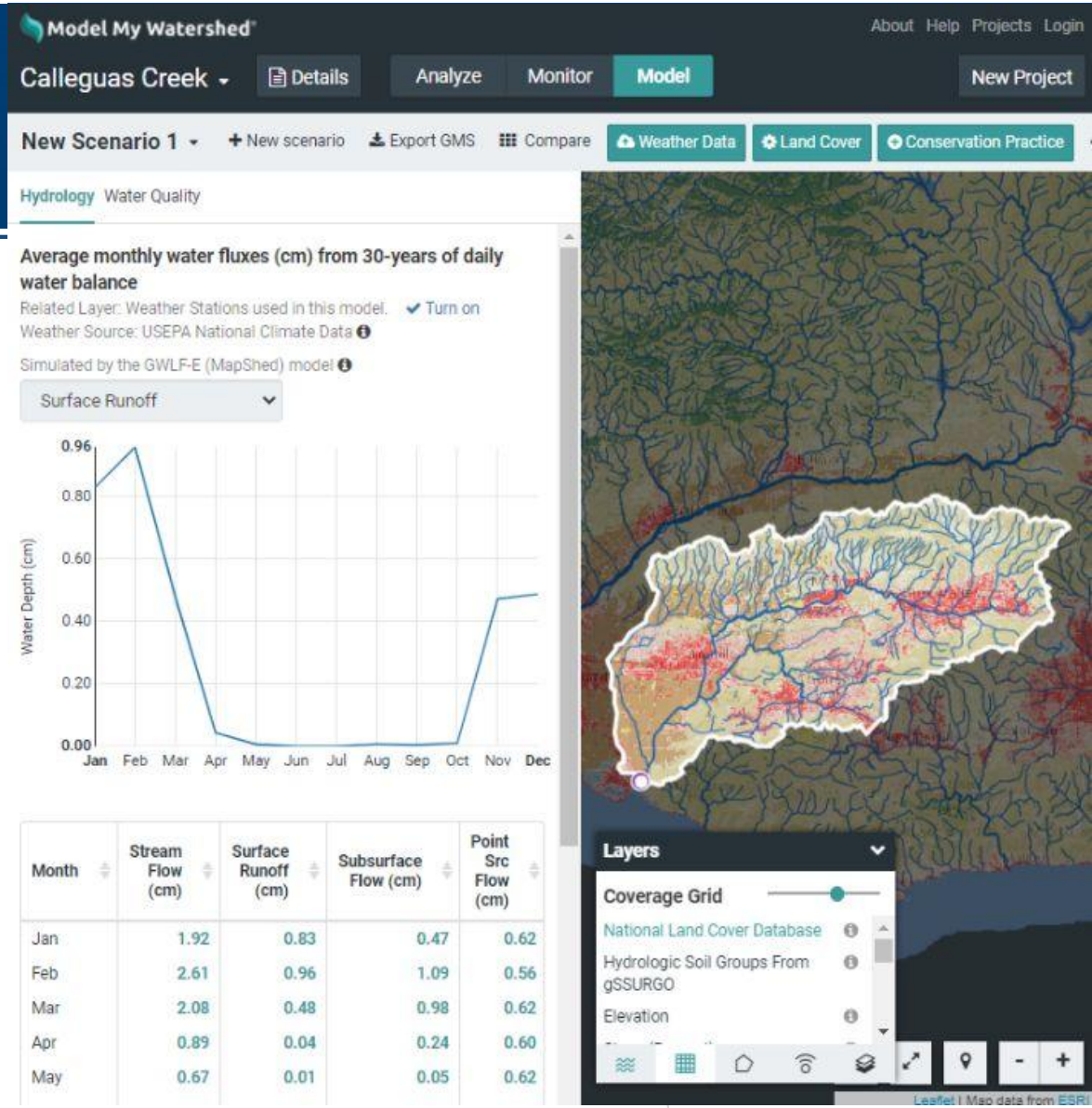
History of Model My Watershed® Development



What is Model My Watershed®

https://modelmywatershed.org

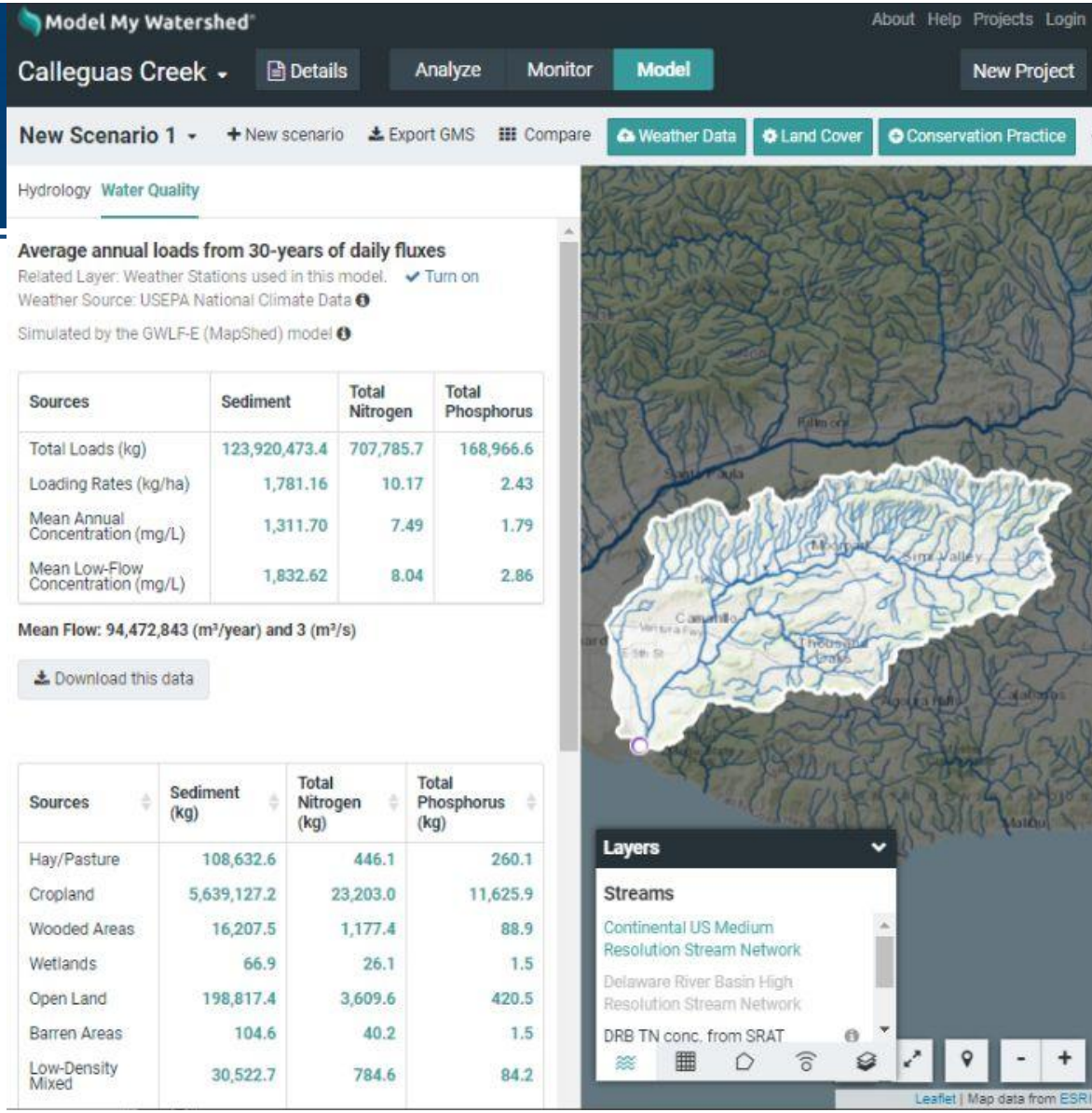
- Web app for conservation decision support
  - Automated watershed modeling
    - 30-y daily water balance
  - Quantifies benefits of different conservation & climate scenarios
- Widely used:
  - 15,000 registered users
  - 40,000 uses per month
  - 4 awards
  - Preferred tool by Pennsylvania for TMDLs & MS4 permits.



What is Model My Watershed®

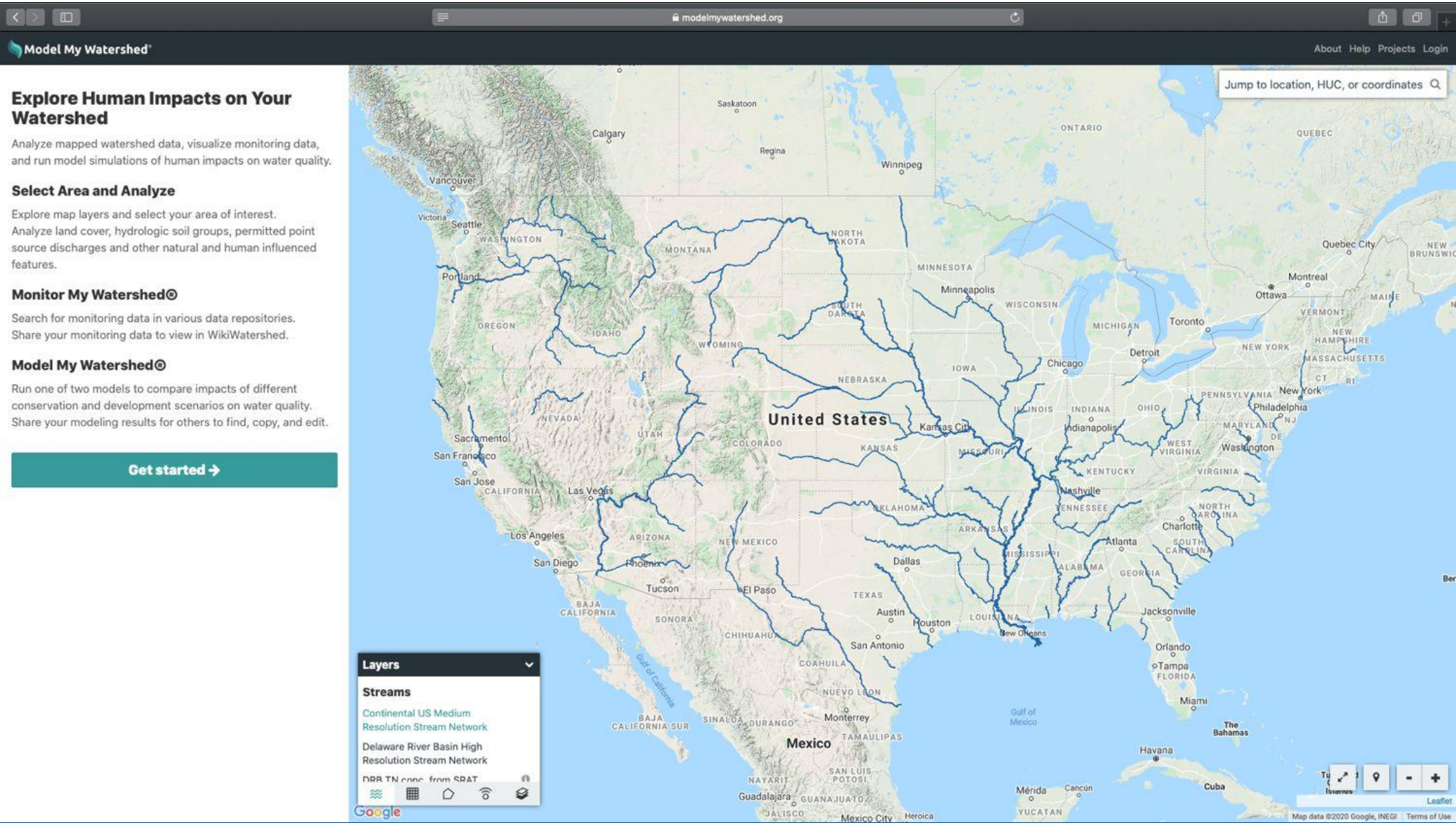
https://github.com/WikiWatershed

- High-performance Features:
  - Automatic watershed delineation
  - Models runoff and water quality to find hotspots
  - Calculates and compares benefits of protection & restoration projects
- Open-Source & Expandable:
  - API to integrate with other apps
  - Modular models for expansion
  - Continental USA, but could go global



What is Model My Watershed®?

- Watershed analyses within the Conterminous U.S. (CONUS), that include:
  Land cover (2001, '06, '11, '16, '19), protected areas, soil, weather, elevation & slope, agric. animals, point sources, active river area (NE & Mid Atlantic)
- Water quality models:
  - Site Storm Model (use at scales ≤ 1-2 sq. mi)
    - *Runoff* from TR55 + Robert Pitts' urban small storm algorithms in WinSLAMM
    - *Water Quality* from EPA STEP-L
  - Watershed Multi-year Model (use at scales ≥ 1-2 sq. mi)
    - *Hydrology & Water Quality* modeling using MapShed model (a.k.a., GWLF-E)
- Ability to create, compare, & save scenarios of modeled changes to land cover and conservation practices; Connect and save to https://www.hydroshare.org/


modelmywatershed.org
Model My Watershed
About Help Projects Login
Explore Human Impacts on Your Watershed
Analyze mapped watershed data, visualize monitoring data, and run model simulations of human impacts on water quality.
Select Area and Analyze
Explore map layers and select your area of interest. Analyze land cover, hydrologic soil groups, permitted point source discharges and other natural and human influenced features.
Monitor My Watershed®
Search for monitoring data in various data repositories. Share your monitoring data to view in WikiWatershed.
Model My Watershed®
Run one of two models to compare impacts of different conservation and development scenarios on water quality. Share your modeling results for others to find, copy, and edit.
Get started →
Jump to location, HUC, or coordinates
Layers
Streams
Continental US Medium Resolution Stream Network
Delaware River Basin High Resolution Stream Network
United States
Mexico
Google
Leaflet
Map data ©2020 Google, INEGI
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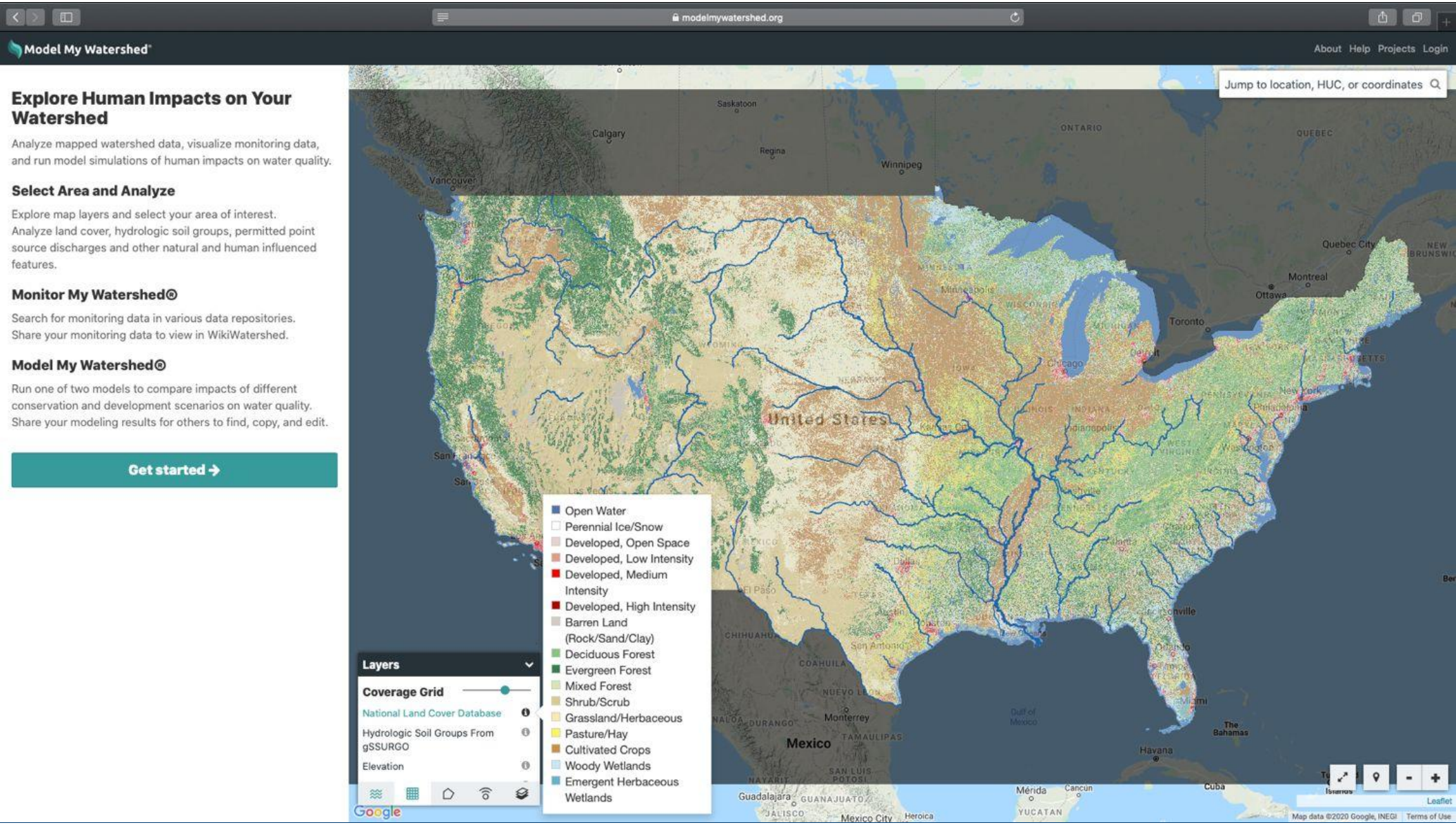
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Jump to location, HUC, or coordinates
Open Water
Perennial Ice/Snow
Developed, Open Space
Developed, Low Intensity
Developed, Medium Intensity
Developed, High Intensity
Barren Land (Rock/Sand/Clay)
Deciduous Forest
Evergreen Forest
Mixed Forest
Shrub/Scrub
Grassland/Herbaceous
Pasture/Hay
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands
Layers
Coverage Grid
National Land Cover Database
Hydrologic Soil Groups From gSSURGO
Elevation
United States
Mexico
Saskatoon
Calgary
Regina
Winnipeg
Vancouver
Quebec City
Montreal
Ottawa
Toronto
Chicago
Monterrey
Havana
Guadalajara
Mexico City
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Map data ©2020 Google, INEGI
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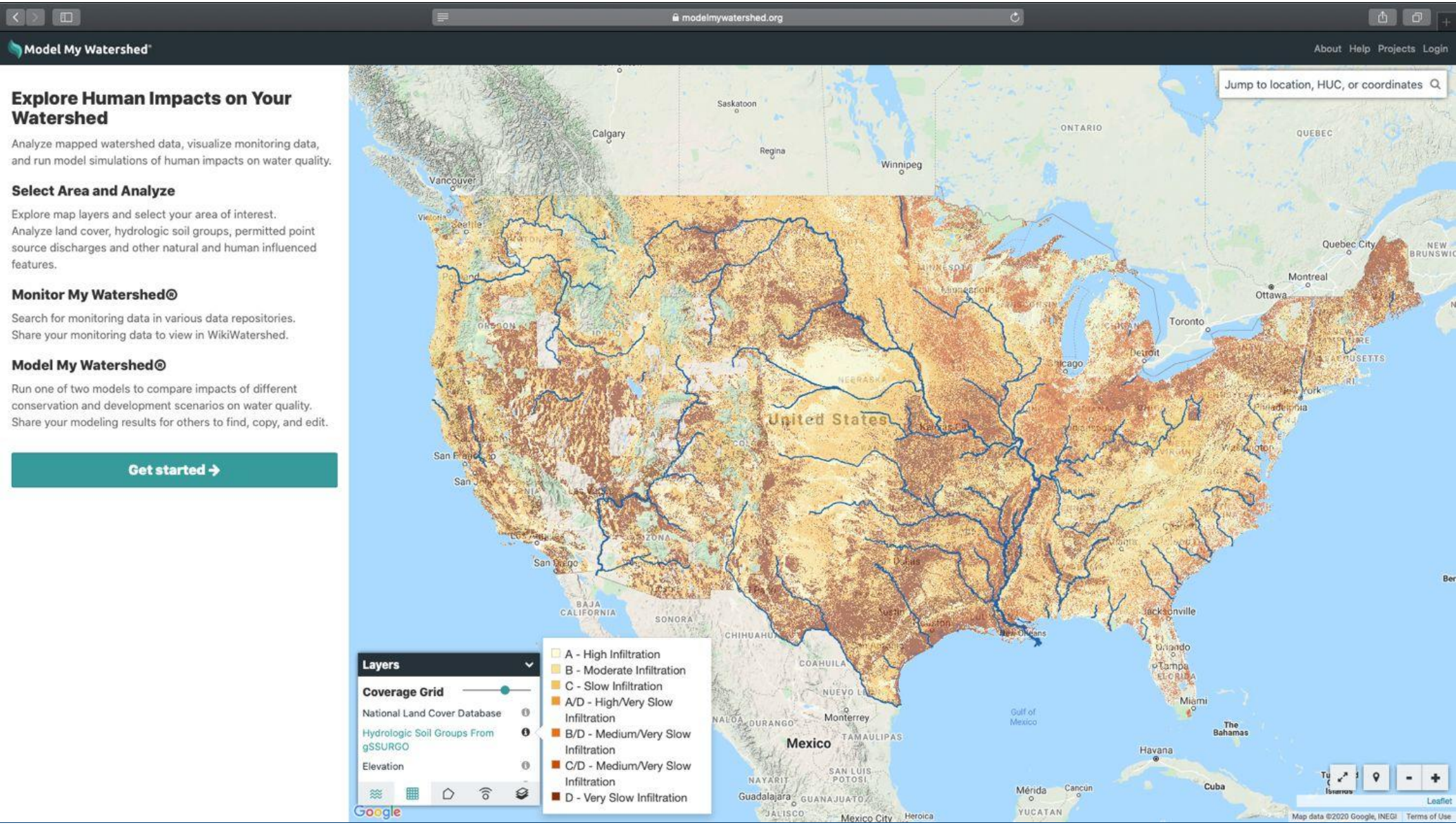
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Jump to location, HUC, or coordinates
Layers
Coverage Grid
National Land Cover Database
Hydrologic Soil Groups From gSSURGO
Elevation
A - High Infiltration
B - Moderate Infiltration
C - Slow Infiltration
A/D - High/Very Slow Infiltration
B/D - Medium/Very Slow Infiltration
C/D - Medium/Very Slow Infiltration
D - Very Slow Infiltration
United States
Mexico
Saskatoon
Calgary
Regina
Winnipeg
Vancouver
Seattle
Quebec City
Montreal
Ottawa
Toronto
Detroit
New York
Philadelphia
Jacksonville
Orlando
Tampa
Miami
The Bahamas
Havana
Cuba
Gulf of Mexico
Monterrey
Guadalajara
Mexico City
Mérida
Cancún
San Diego
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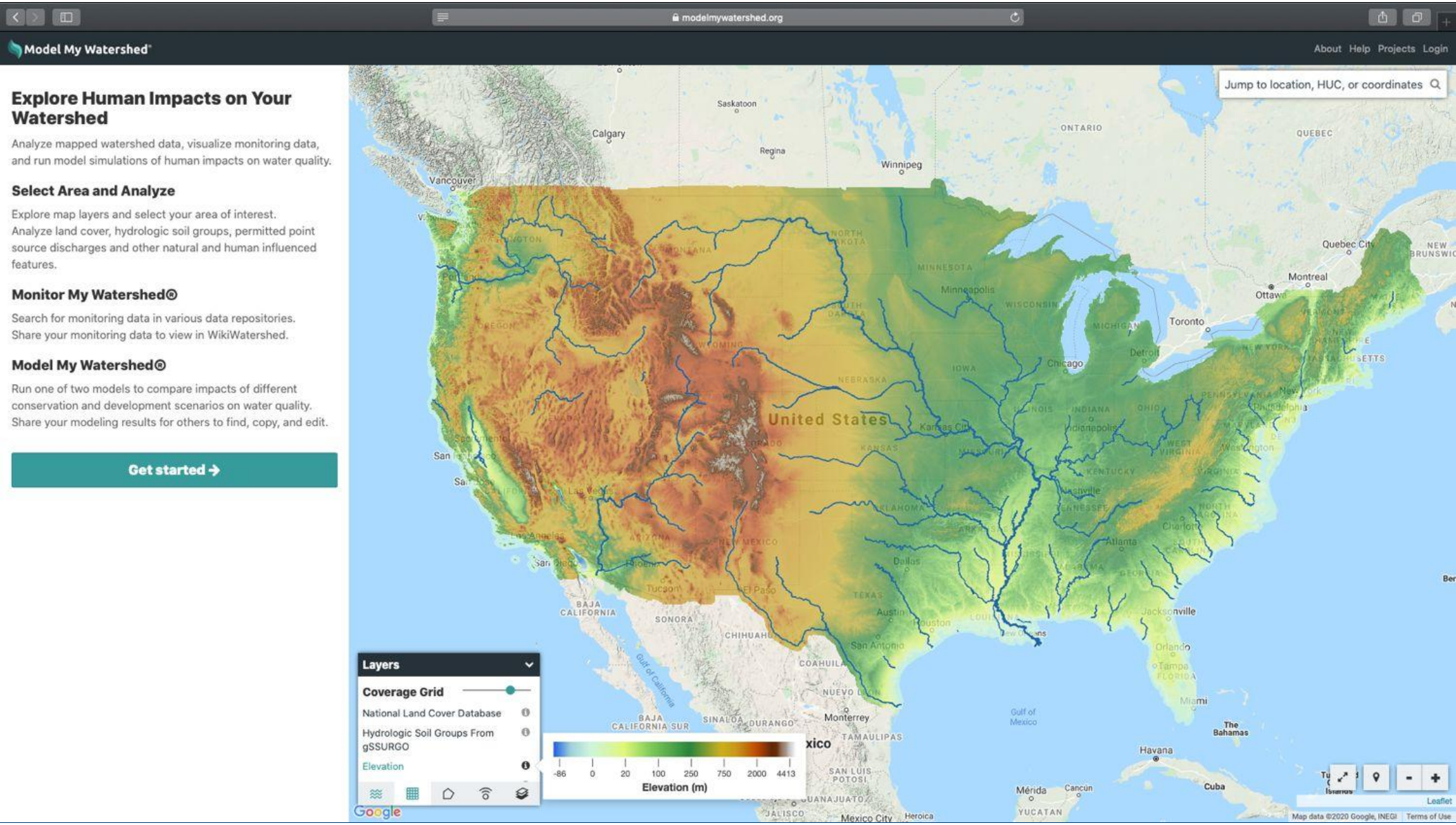
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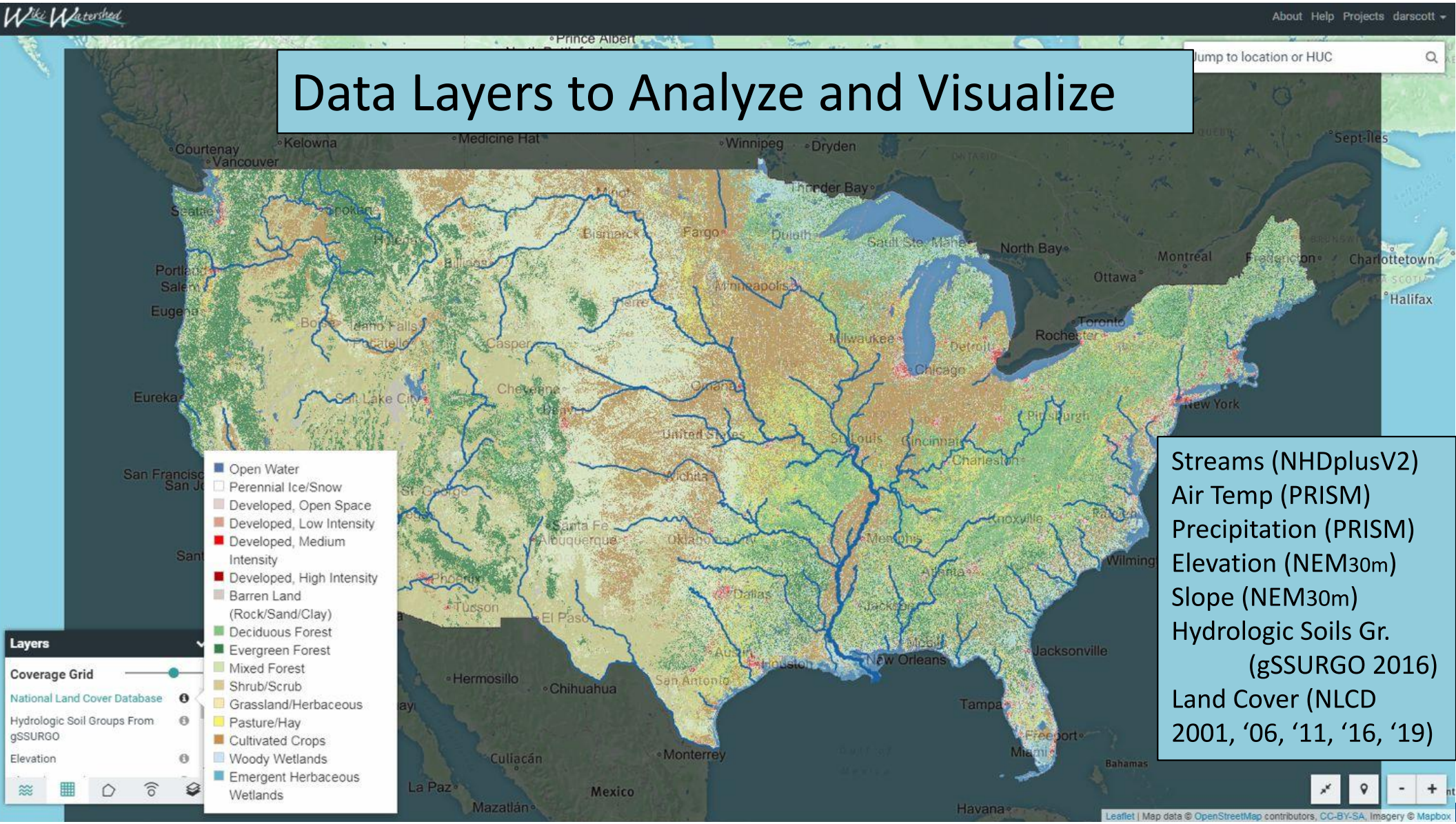
National Land Cover Database
Hydrologic Soil Groups From gSSURGO
Elevation
-86 0 20 100 250 750 2000 4413
Elevation (m)
United States
Google
Leaflet
Map data ©2020 Google, INEGI Terms of Use


Data Layers to Analyze and Visualize
About Help Projects darscott
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Evergreen Forest
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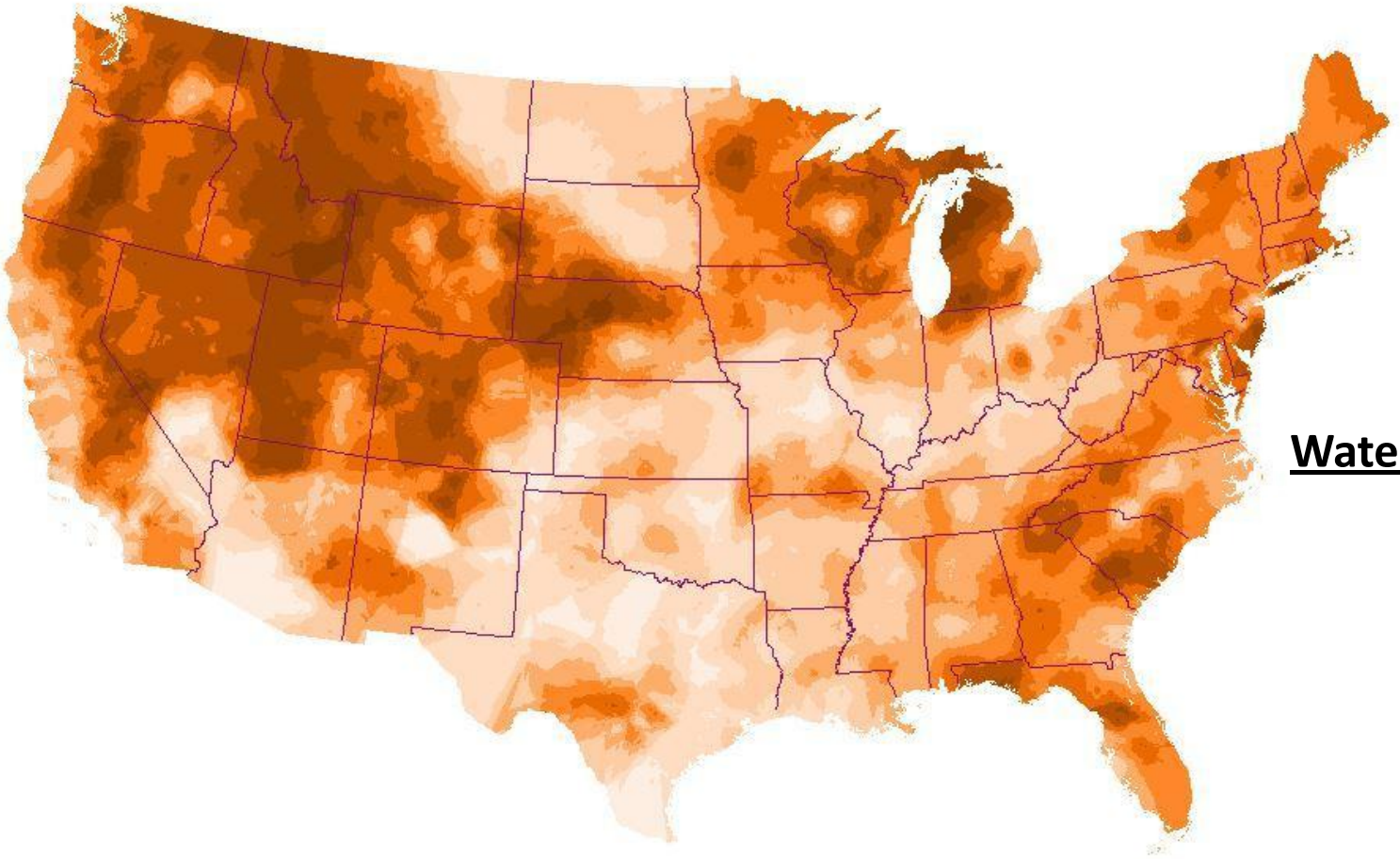
Grassland/Herbaceous
Pasture/Hay
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands
Streams (NHDplusV2)
Air Temp (PRISM)
Precipitation (PRISM)
Elevation (NEM30m)
Slope (NEM30m)
Hydrologic Soils Gr. (gSSURGO 2016)
Land Cover (NLCD 2001, ‘06, ‘11, ‘16, ‘19)
Leaflet | Map data © OpenStreetMap contributors, CC-BY-SA, Imagery © Mapbox

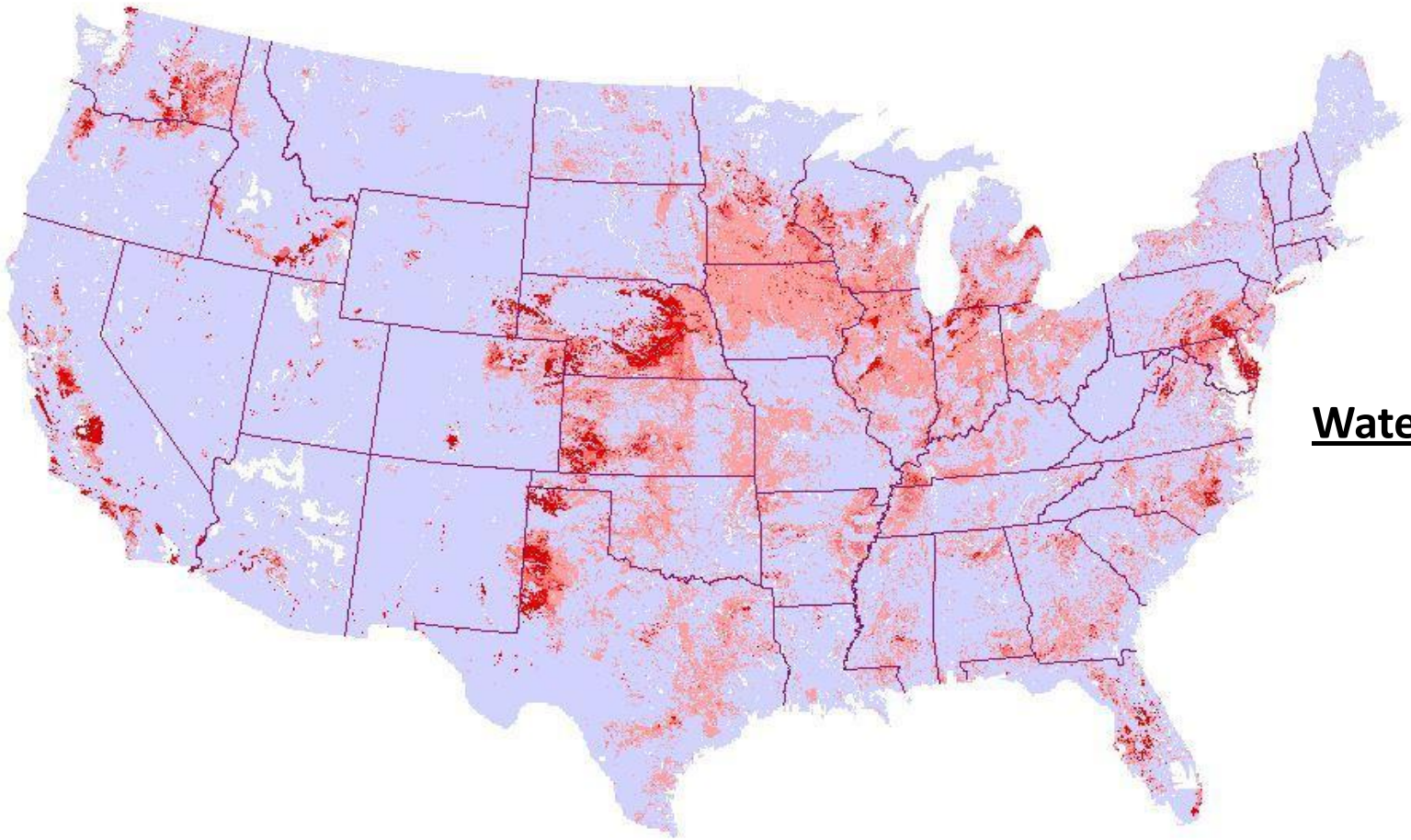
USGS Baseflow Estimates



<u>Input layers for</u>
<u>Watershed Multi-Year Model</u>
(not visualized)

STROUD WATER RESEARCH CENTER

Groundwater Nitrogen Estimates



<u>Input layers for</u>
<u>Watershed Multi-Year Model</u>
(not visualized)

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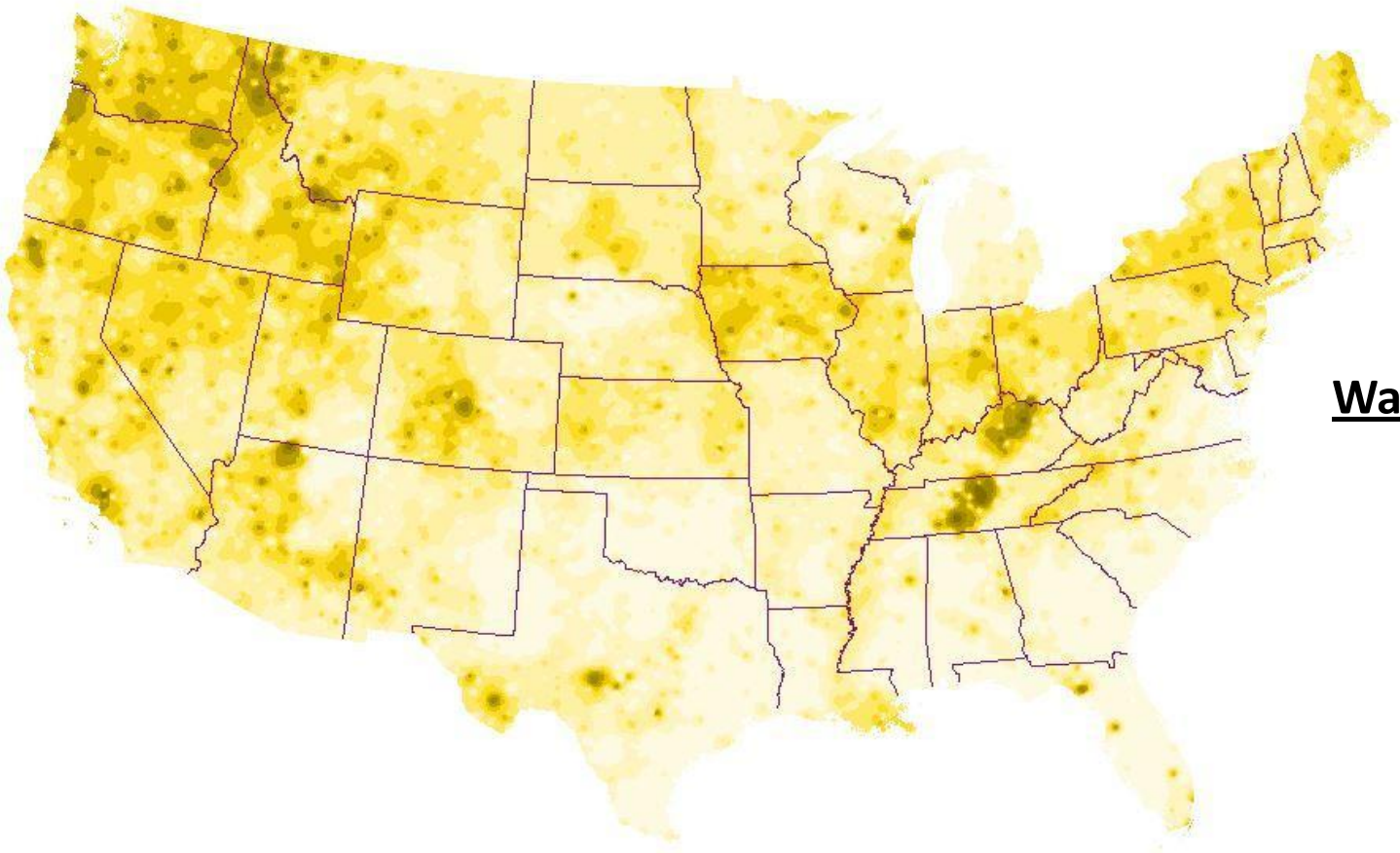
Soil Phosphorus Estimates



<u>Input layers for</u>
<u>Watershed Multi-Year Model</u>
(not visualized)

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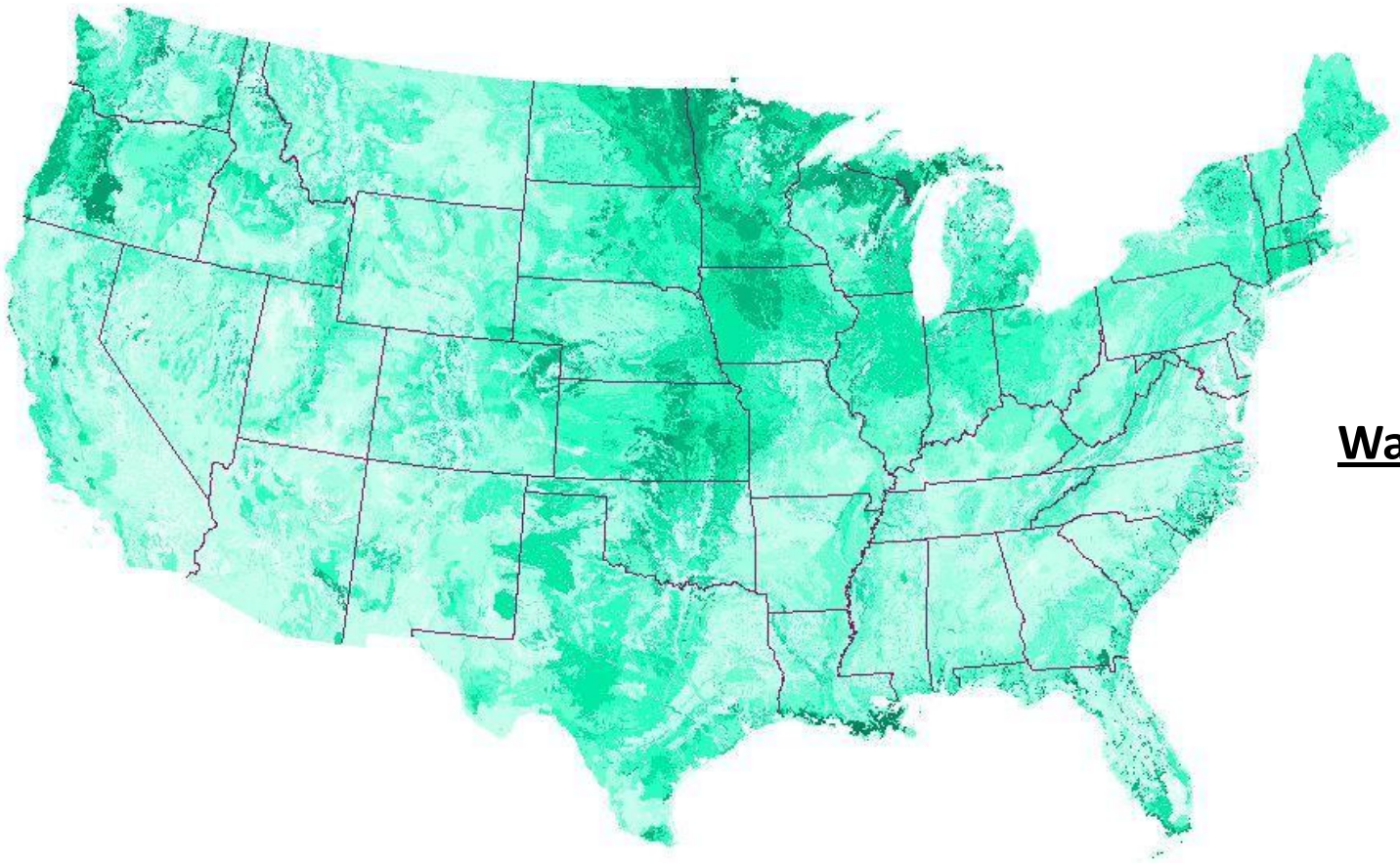
Soil Nitrogen Estimates



<u>Input layers for</u>
<u>Watershed Multi-Year Model</u>
(not visualized)

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Weather Station Network for Precipitation Input

Input layers for Watershed Multi-Year Model

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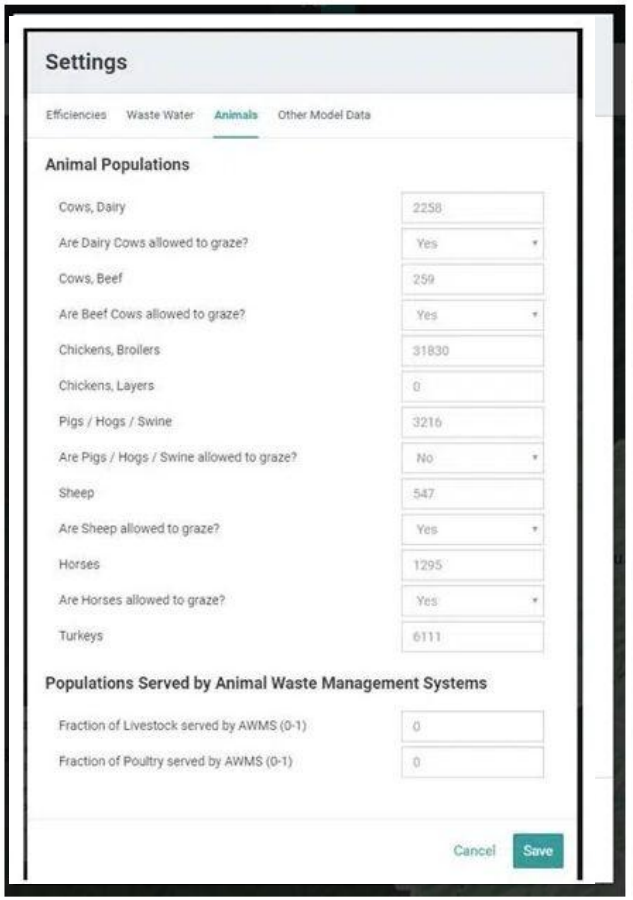
Demo Model My Watershed®.

Watershed Multi-Year Model

- The appropriate size (total area/acreage) of your Area of Interest when using the Watershed Multi-Year Model is from several hundred acres to ~1,500 square miles (HUC 8 scale; although modeling larger areas are possible)
- Utilizes daily temperature and precipitation data (1960-90 is provided; custom weather is possible) and is designed to estimate average monthly and annual values for water quality and quantity, specifically:
  - Quantity: stream flow, subsurface flow, evapotranspiration, point source flow (if in your area)
  - Quality: total sediment, total nitrogen, total phosphorus
- Add BMPs, change land cover, and modify "settings" offer customization of your project
- 5 minutes to a couple of hours, no extra data needed, easy to use

Technical Documentation - https://wikiwatershed.org/kbcategories/mmw-tech/



Help? and Resources

Online HELP?

- https://wikiwatershed.org/help/model-help/
- Contact for questions/requests https://wikiwatershed.org/contact/

Technical Documentation

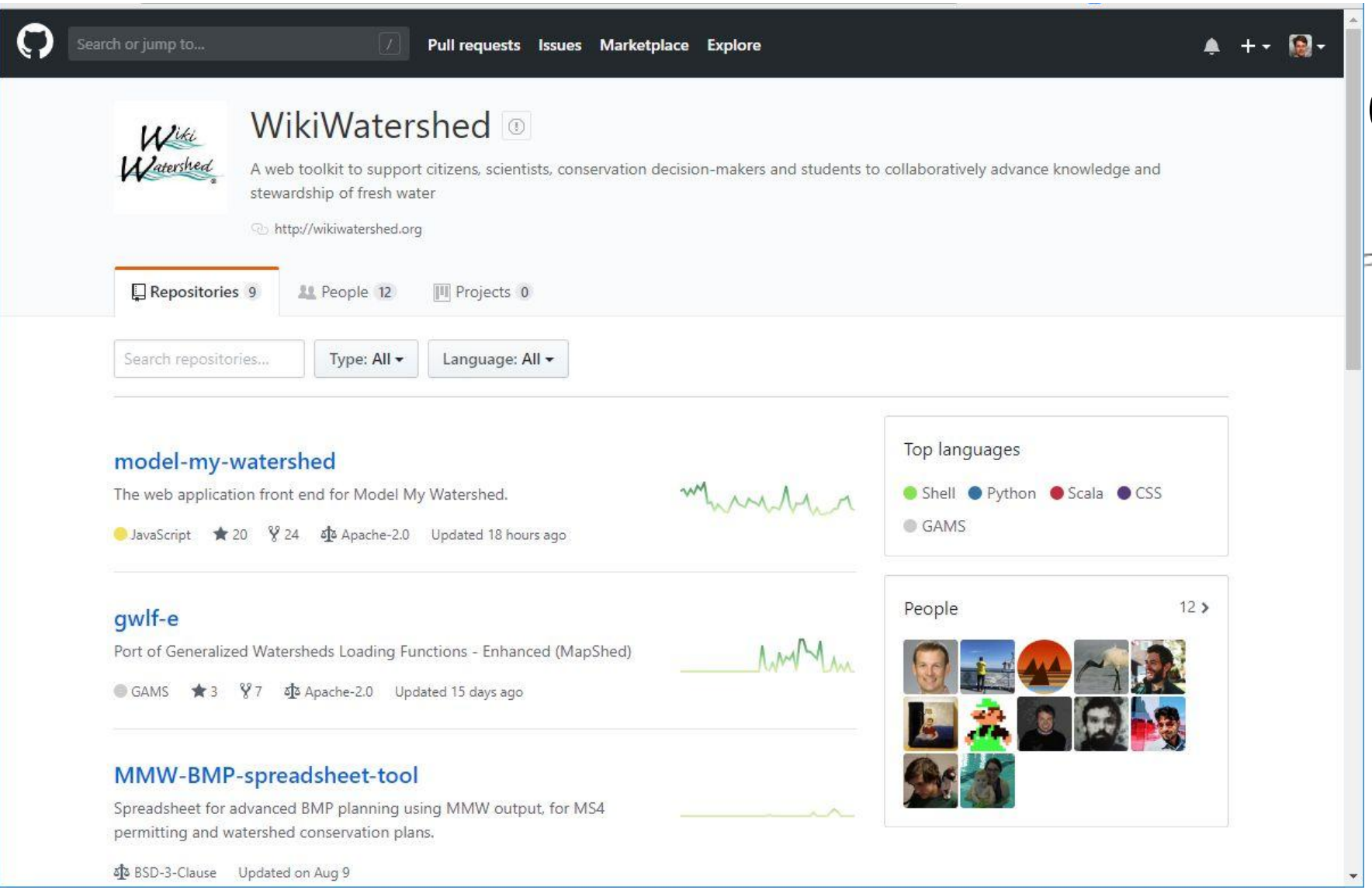
- https://wikiwatershed.org/help/model-help/

Resources

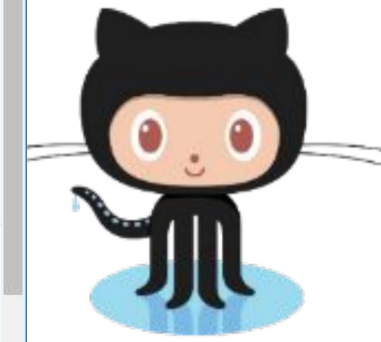
- https://WikiWatershed.org
- https://ModelMyWatershed.org
- https://github.com/WikiWatershed

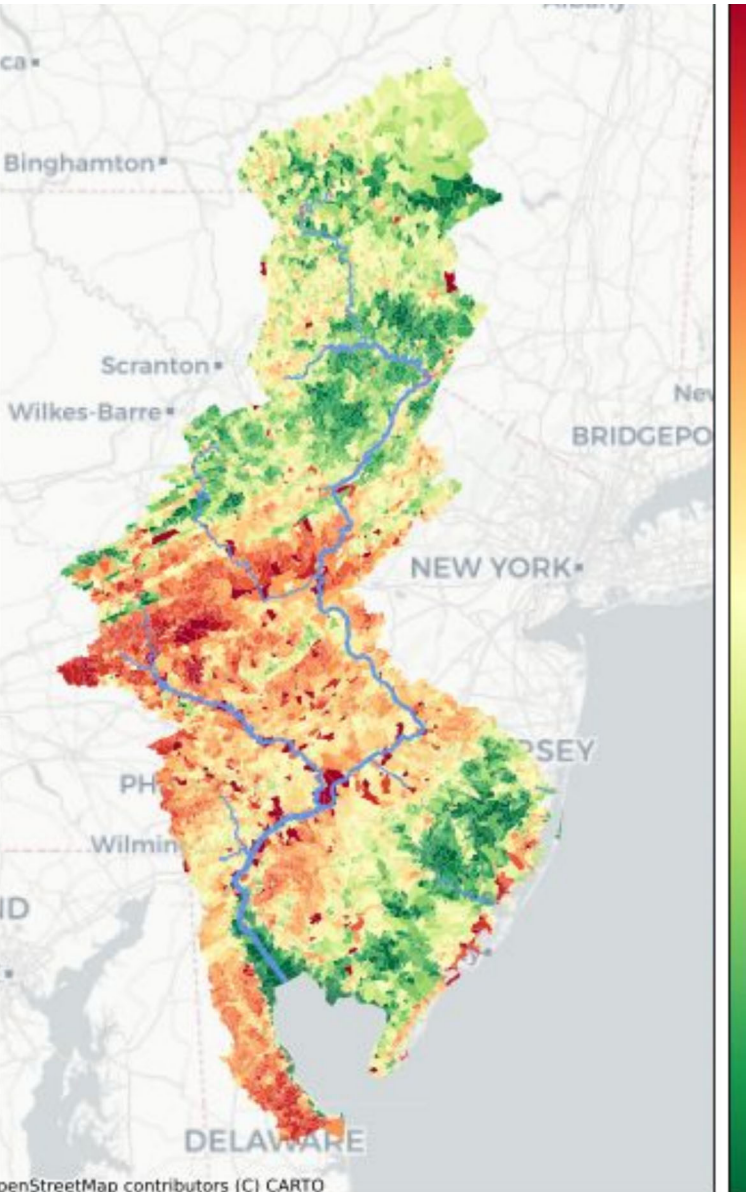
Open Source Project Documentation

- https://github.com/WikiWatershed


Search or jump to...
Pull requests
Issues
Marketplace
Explore
WikiWatershed
A web toolkit to support citizens, scientists, conservation decision-makers and students to collaboratively advance knowledge and stewardship of fresh water
http://wikiwatershed.org
Repositories 9
People 12
Projects 0
Search repositories...
Type: All
Language: All
model-my-watershed
The web application front end for Model My Watershed.
JavaScript 20 24 Apache-2.0 Updated 18 hours ago
gwlf-e
Port of Generalized Watersheds Loading Functions - Enhanced (MapShed)
GAMS 3 7 Apache-2.0 Updated 15 days ago
MMW-BMP-spreadsheet-tool
Spreadsheet for advanced BMP planning using MMW output, for MS4 permitting and watershed conservation plans.
BSD-3-Clause Updated on Aug 9
Top languages
Shell Python Scala CSS
GAMS
People
12 >

GitHub





DELAWARE RIVER WATERSHED INITIATIVE
POLLUTION ASSESSMENT

Project Update

May 10, 2023

Anthony Aufdenkampe

Dave Arscott, Sara Damiano

Lin Perez, Barry Evans, Mike Campagna

Caitlin Lulay, Sarah Jordan

LimnoTech
Water Environment | Scientists Engineers

Stroud Water Research Center

Drexel University

Utilization of the Tool?

- >15,000 registered users
  - conservation practitioners/planners, state and federal government, university/academic, k-12 students and teachers
- Agricultural BMP planners (e.g., Delaware River Watershed Initiative)
- Restoration project impact tracking and assessment (William Penn Foundation and NFWF)
- Estimating Water-Related Benefits of Open Space Protection
  - Chester, Delaware, and Montgomery County's (PA), Mercer Co. (NJ)
- Optional tool for PA DEP MS4 planning, WIPs (also utilized by DEC/DEPs in NY, MA, ME,...)
- Environmental consultants to municipalities

FEATURE

Data and Models Help Define Effective Strategies In The Delaware River Watershed Initiative

Paul Freedman, David B. Arscott, Scott Haag and Kathy Hall

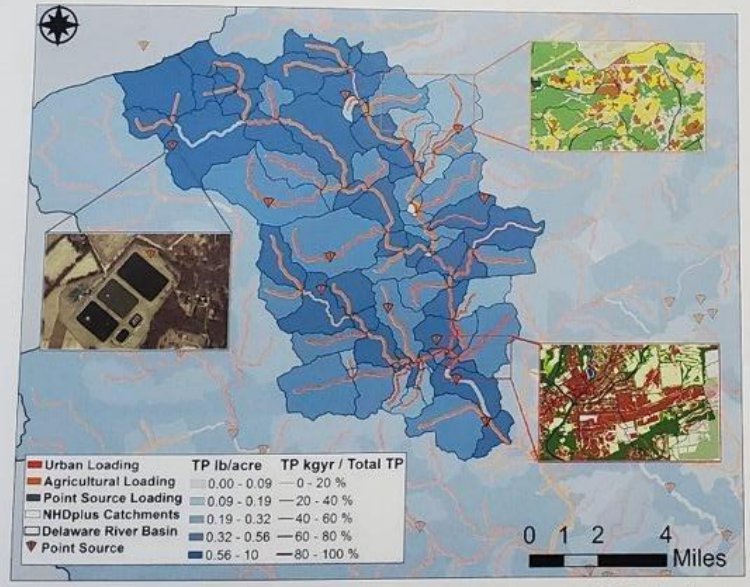


Figure 1: An example of the output from the Stream Reach Assessment Tool SRAT showing Phosphorus Loading from Urban, Agricultural and Point Sources.

he Delaware River Watershed Initiative (DRWI) was

As a first step, DRWI selected eight smaller areas within the basin, termed clusters, where analysis indicated that investment could deliver significant returns, and where there was sufficient non-governmental organization (NGO) capacity to implement actions. Within these targeted clusters, more than 60 NGOs were brought together by the William Penn Foundation to develop plans to implement agricultural best management practices (BMPs), protect forested land in sensitive landscapes and work in partnership with municipalities to implement urban stormwater BMPs. However, each of these NGOs had its own historical emphasis and priorities that needed to be coordinated to help achieve the DRWI vision. Initial efforts to establish goals, develop plans and select projects were challenging.

To address these challenges, DRWI, working with a team of scientists and planners, developed a science-informed approach to prioritize investments, guide cluster plans and facilitate the

Water Resources Impact
Sept 2018 v20(5)

American Water Resources Association periodical

Example project abstract from 2023 NWQMC:

Linking Nutrient Management to Receiving Water Quality Improvements and Ecological Responses

P. Aron[1], J. Weiss[1], S. Kumar[2], Abbey Johnson[3], S. Palmate[3], and C. Owen[4]

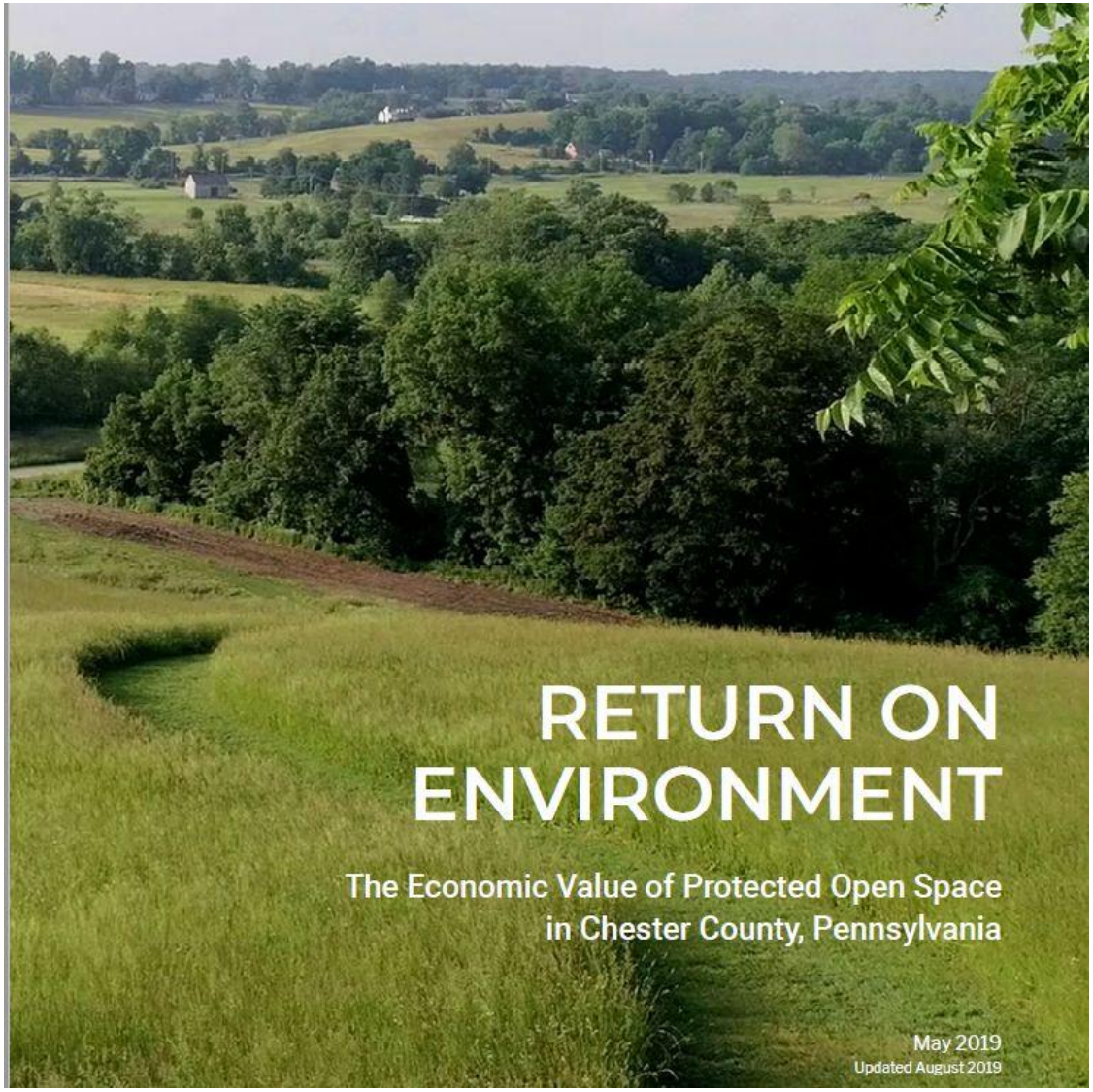
1- Hazen and Sawyer, Baltimore, Maryland; 2 -Arizona State University, Tempe, Arizona; 3-Texas A&M, El Paso, Texas 4 - Hazen and Sawyer, Tampa, Florida

Water Research Foundation Funded Project #5078

Project will develop 1) an online database of case studies in nutrient reductions and receiving water responses and 2) an interactive tool to explore common drivers associated with successful nutrient management.

Excessive nutrient loadings to natural waters cause numerous challenges to water resource managers, from aesthetic, ecological, and recreational issues to public health impacts associated with harmful algal blooms and costly drinking water treatment. The traditional approach to manage nutrient loading consists of establishing water quality impacts and linkages to sources, evaluating costs and benefits of management actions, implementing controls, and assessing improvements in water quality and ecosystem outcomes. However, in practice it can be exceedingly difficult to link watershed and source water nutrient control actions to specific water quality and ecosystem responses because we often lack monitoring data to evaluate nutrient management actions or calibrate models that can support quantitative assessment of management alternatives….

https://whova.com/portal/webapp/nmc_202303/Agenda/2956534



Avoided Stormwater Impacts and Costs from Open Space Protection in the Brandywine Creek Watershed – Return on Environment

Chester County Water Resources Authority

DELAWARE VALLEY dvrpc REGIONAL PLANNING COMMISSION

STROUD WATER RESEARCH CENTER

Report and related materials are available online at: http://chescoplanning.org/openspace/roe.cfm

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About News Research Education Restoration Events Support Shop

Amazon Names the Stroud Center's Model My Watershed a "City on a Cloud Innovation Challenge" Winner

ress Releases » Amazon Names the Stroud Center's Model My Watershed a "City on a Cloud Innovation Challenge" Winner

The Stroud Center was one of three winners in the Partners in Innovation category, along with Utility Associates and University of Münster. Stroud Center Assistant Director Scott Ensign (left) and Simon Araya from Utility Associates are shown accepting the award on behalf of their institutions.

Amazon Web Services has announced Stroud Water Research Center — a global leader in the advancement of

https://stroudcenter.org/press/watershed-model-amazon-challenge-winner/

WikiWatershed®

Funding from:

- William Penn Foundation
- NSF DRK12 Grant No. DRL- 1418133 “Teaching Environmental Sustainability - Model My Watershed” 4-year Project
- Pennsylvania Dept. of Environmental Protection
- Past NSF Grant: DRL #0929763
- Stroud Water Research Center
- Virginia Wellington Cabot Foundation
- The Dansko® Foundation
- Generous donations from Peter Kjellerup and Mandy Cabot

STROUD WATER RESEARCH CENTER

WILLIAM PENN FOUNDATION

NSF National Science Foundation WHERE DISCOVERIES BEGIN

FUTURE OF MODEL MY WATERSHED

- Our vision real-time decision support platform
- Collective of many technical and funding partners

Future Developments: Other Projects?

- Add new, enhanced or local datasets?
  - Recent / Future Climate Drivers (i.e. daily precipitation and temperature)?
  - Localized data?, Global data?
  - Future land-cover forecasts?
- Add new modeling features?
  - Localized BMPs; BMP cost estimates & tracking
  - Detailed site design?
- Add new models?
  - HSPF?, SWAT?, SWMM?
  - Water Temperature?, Flooding?
  - Ecosystem services? / natural capital?
- Add model output viewers/explorers?
  - Calibrated model results from TMDL studies?
  - National Water Model?

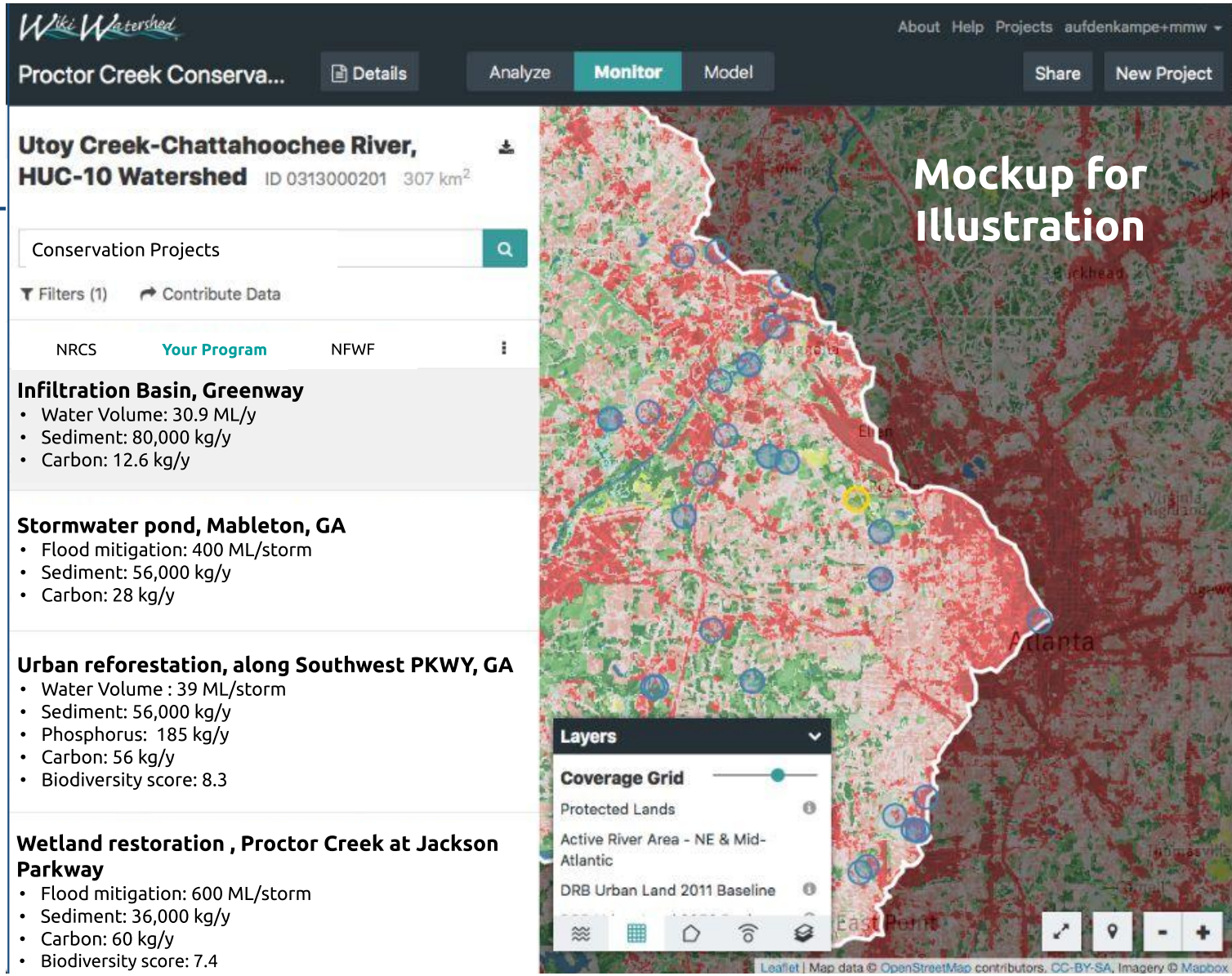
Hydrological Simulation Program in Python (HSP2, HSPsquared)

- Identical results as Hydrological Simulation Program - FORTRAN (HSPF)
  - HSPF is one of the most widely used and respected models for watershed management
  - Used by VA DEQ
- HSP2 is built on modern software stack for cloud computing
  - Python 3.7
  - OS: Windows, Linux, Mac
  - Compute performance via Pandas & Numba
    - Parallel processing
  - Storage performance via HDF5

https://github.com/respec/HSPsquared
AGPL-3.0 License

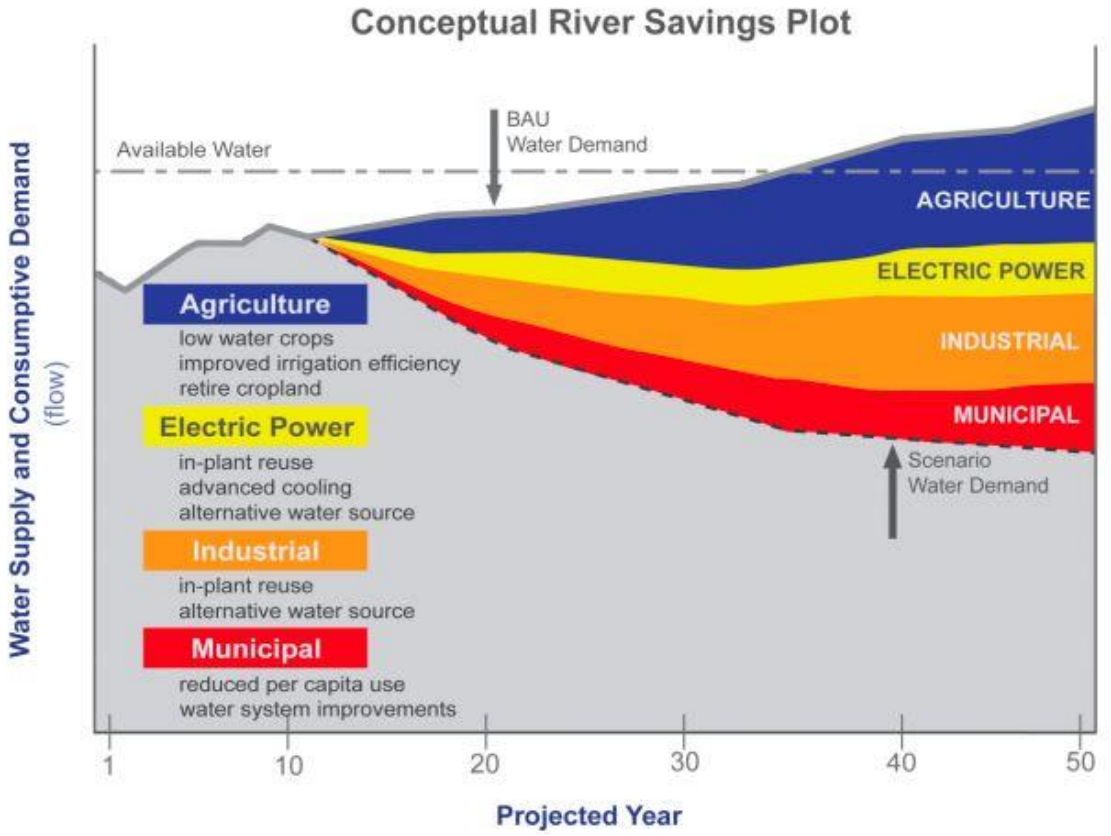
Enhance MMW: Project Tracking

- Open-source foundation for web apps
  - rebrand or not
- Add model modules for decision support on:
  - Water security & risk
  - Crop sustainability
  - Climate change resiliency
  - Carbon sequestration
  - Biodiversity
  - Etc.
- Expandable to anywhere in the world



Real-Time Decision Support for Water Risk

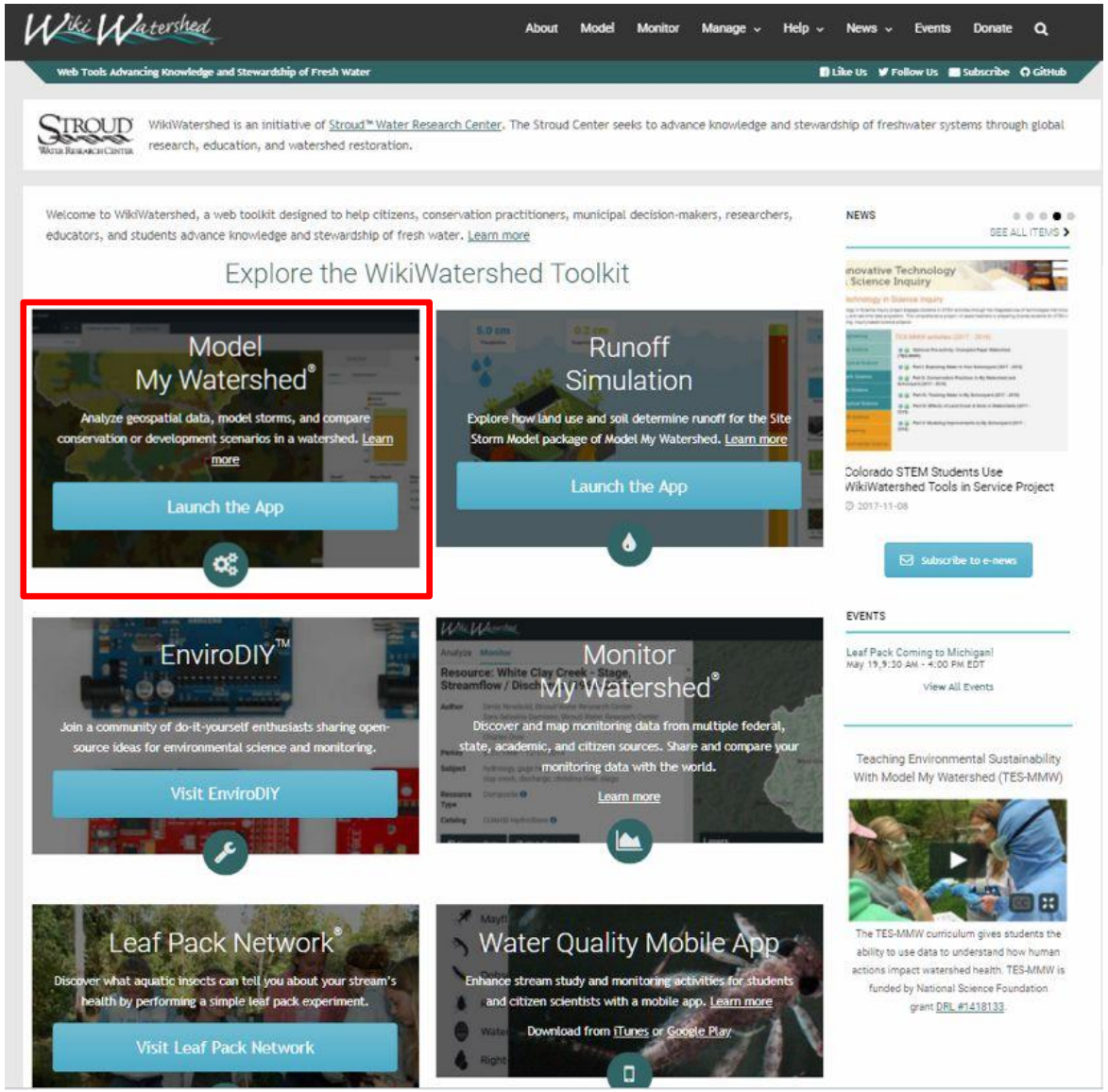
- Water availability forecasting
  - Changing consumption
  - Changing climate
  - Considering environmental flow limits
- Water quality forecasting
  - Drinking water inlets
  - Source watershed protection
  - Recreational use
  - Community sustainability
- Flood risk forecasting
  - Requires real-time data & HPC modeling
- Investment Risks
  - Synthesis of all types of risk!



Weintraub, Laura H.Z., Hua Tao, and Todd M. Redder, 2017. *Water Prism: A Tool to Assess Water Availability Risk and Investigate Water Management Strategies*. Journal of the American Water Resources Association (JAWRA) 1-21. DOI: 10.1111/1752-1688.12519

Many Other Oportunities, and growing!

- Visualize outputs from Federal Modeling & Data Systems?
  - NOAA National Water Model
  - USGS Water Services (REST APIs for flow, water quality data)
  - USGS Hydro Network-Linked Data Index (NLDI)
  - USEPA Water Quality Data Portal (WQP) and Exchange (WQX)
  - NASA N. American Land Data Assimilation Systems (NLDAS) & Data Rod API
  - Many others
- Visualize outputs from other sources?
  - Amazon Open Data on AWS S3 storage
  - Google Earth Engine & Earth Map
  - Academia



Web Demo and Related Resources

- http://WikiWatershed.org
- https://ModelMyWatershed.org

THANK YOU

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Matt Ehrhart
mehrhart@stroudcenter.org

https://wikiwatershed.org

LimnoTech
Water Environment | Scientists Engineers

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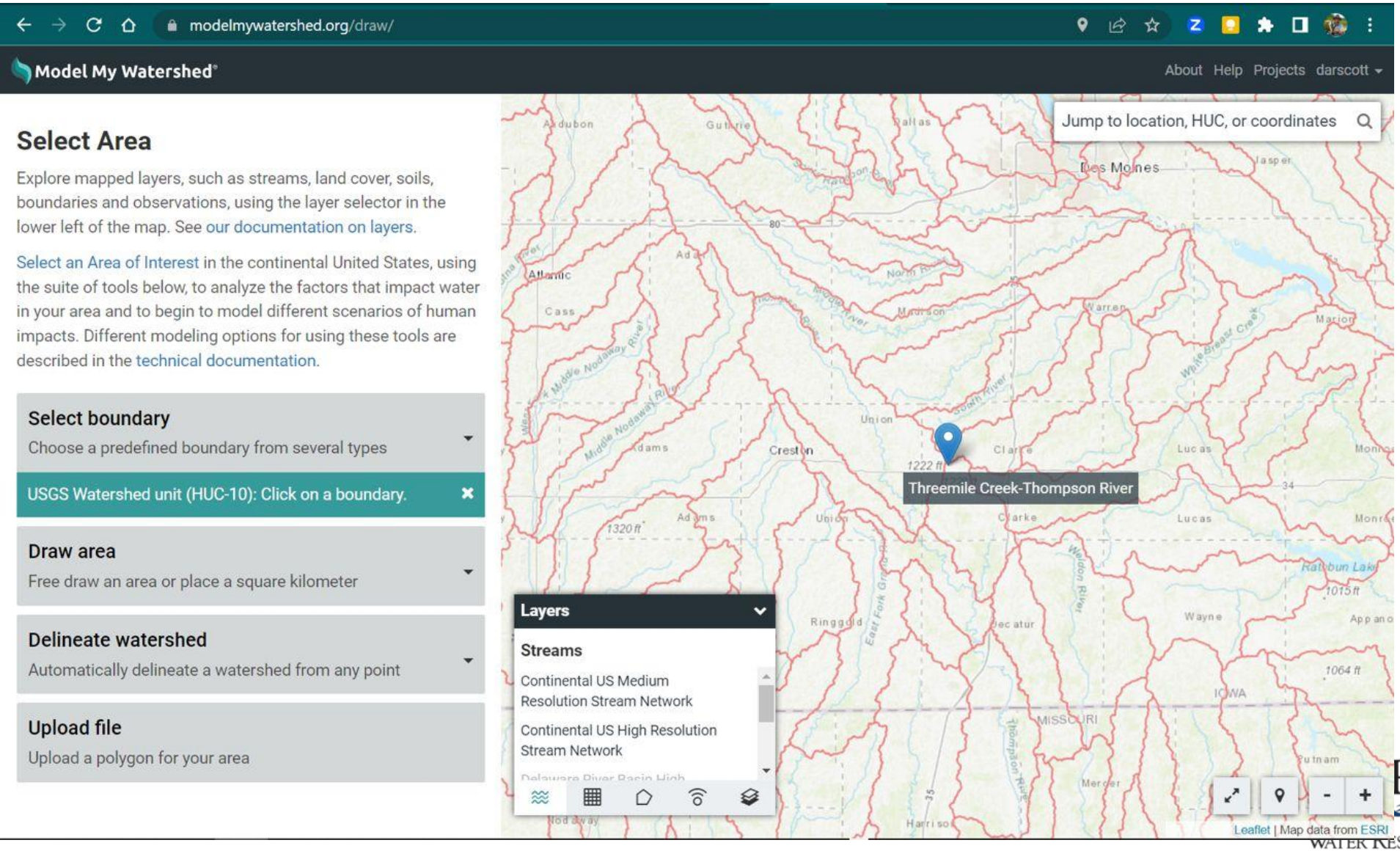
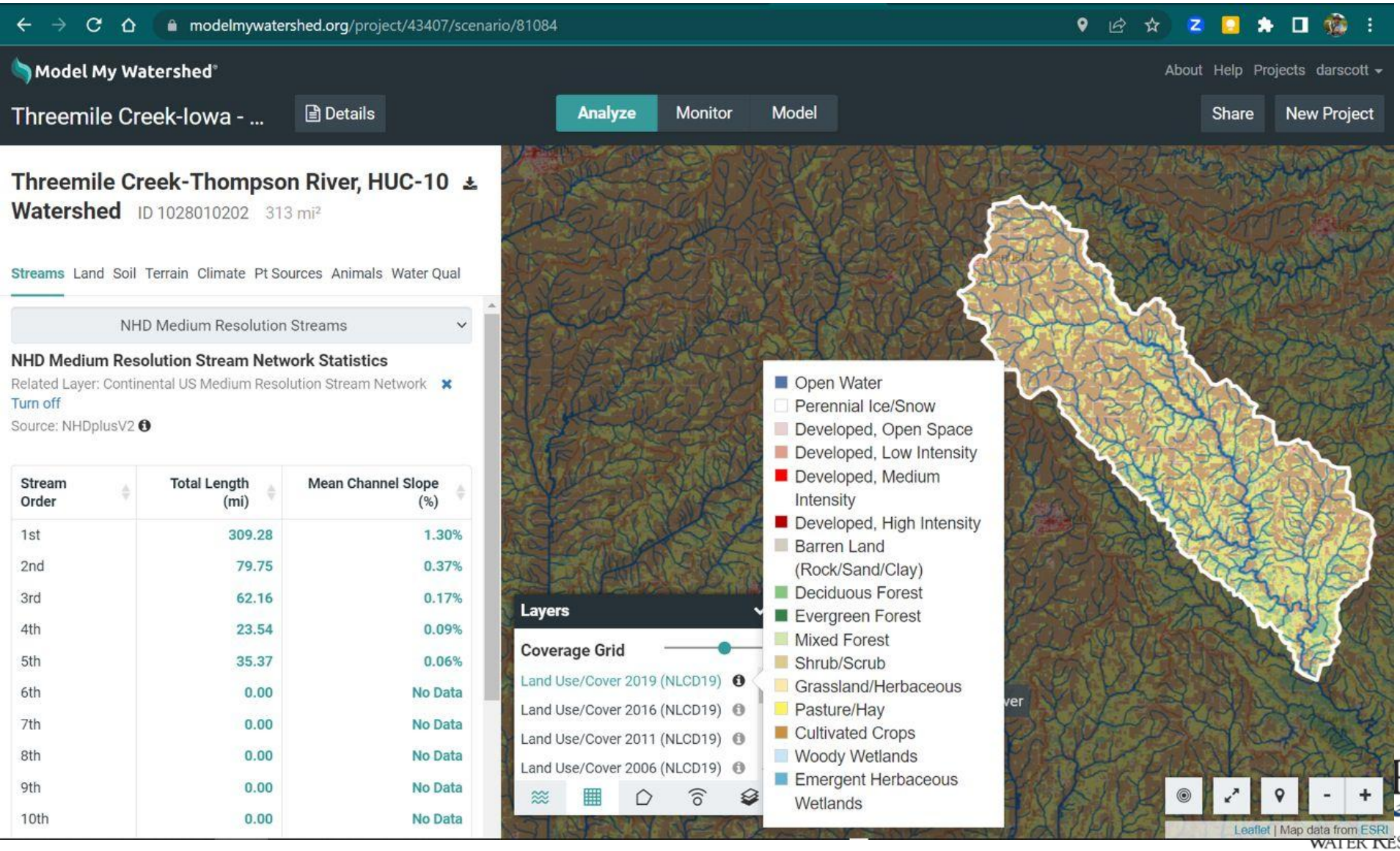
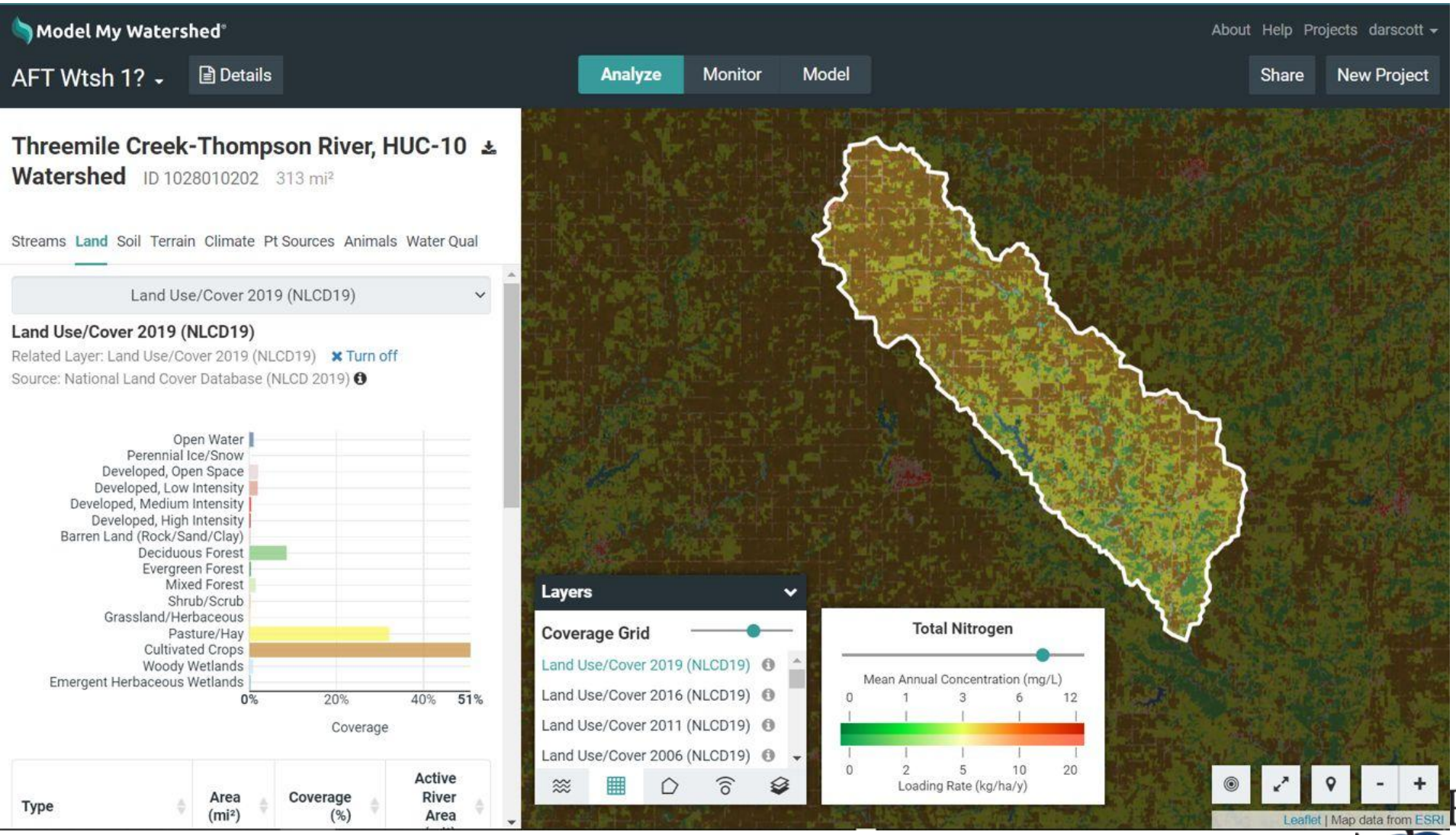
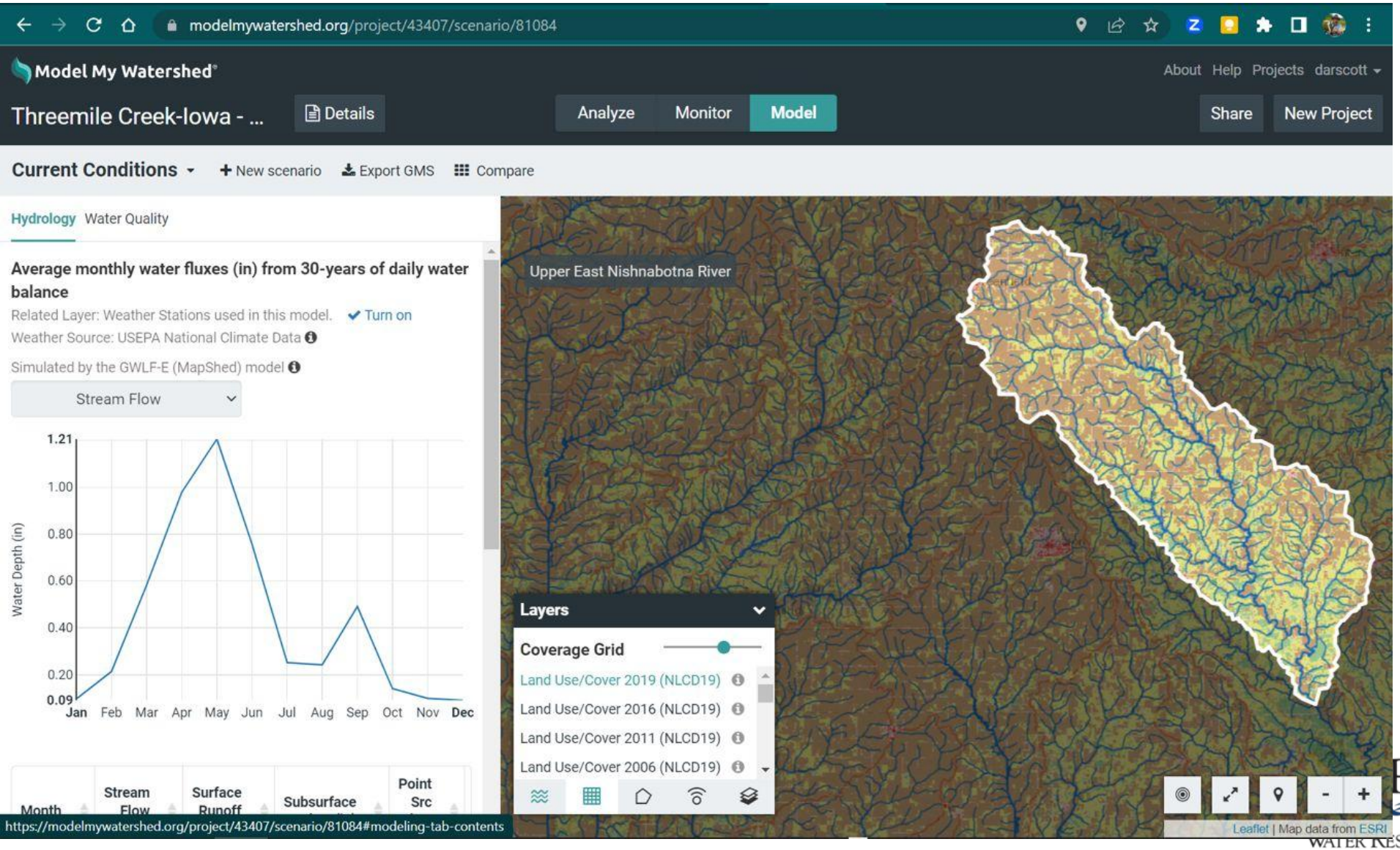
Backup Slides below, if ModelMW doesn't function properly


modelmywatershed.org/draw/
Model My Watershed
About
Help
Projects
darscott
Select Area
Explore mapped layers, such as streams, land cover, soils, boundaries and observations, using the layer selector in the lower left of the map. See our documentation on layers.
Select an Area of Interest in the continental United States, using the suite of tools below, to analyze the factors that impact water in your area and to begin to model different scenarios of human impacts. Different modeling options for using these tools are described in the technical documentation.
Select boundary
Choose a predefined boundary from several types
USGS Watershed unit (HUC-10): Click on a boundary.
Draw area
Free draw an area or place a square kilometer
Delineate watershed
Automatically delineate a watershed from any point
Upload file
Upload a polygon for your area
Jump to location, HUC, or coordinates
Threemile Creek-Thompson River
1222 ft
Layers
Streams
Continental US Medium Resolution Stream Network
Continental US High Resolution Stream Network
Leaflet | Map data from ESRI


modelmywatershed.org/project/43407/scenario/81084
Model My Watershed
About Help Projects darscott
Threemile Creek-Iowa - ...
Details
Analyze Monitor Model
Share New Project
Threemile Creek-Thompson River, HUC-10 Watershed
ID 1028010202 313 mi²
Streams Land Soil Terrain Climate Pt Sources Animals Water Qual
NHD Medium Resolution Streams
NHD Medium Resolution Stream Network Statistics
Related Layer: Continental US Medium Resolution Stream Network
Turn off
Source: NHDplusV2
Stream Order | Total Length (mi) | Mean Channel Slope (%)
1st 309.28 1.30%
2nd 79.75 0.37%
3rd 62.16 0.17%
4th 23.54 0.09%
5th 35.37 0.06%
6th 0.00 No Data
7th 0.00 No Data
8th 0.00 No Data
9th 0.00 No Data
10th 0.00 No Data
Layers
Coverage Grid
Land Use/Cover 2019 (NLCD19)
Land Use/Cover 2016 (NLCD19)
Land Use/Cover 2011 (NLCD19)
Land Use/Cover 2006 (NLCD19)
Open Water
Perennial Ice/Snow
Developed, Open Space
Developed, Low Intensity
Developed, Medium Intensity
Developed, High Intensity
Barren Land (Rock/Sand/Clay)
Deciduous Forest
Evergreen Forest
Mixed Forest
Shrub/Scrub
Grassland/Herbaceous
Pasture/Hay
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands
Leaflet | Map data from ESRI



WATER RESEARCH CENTER



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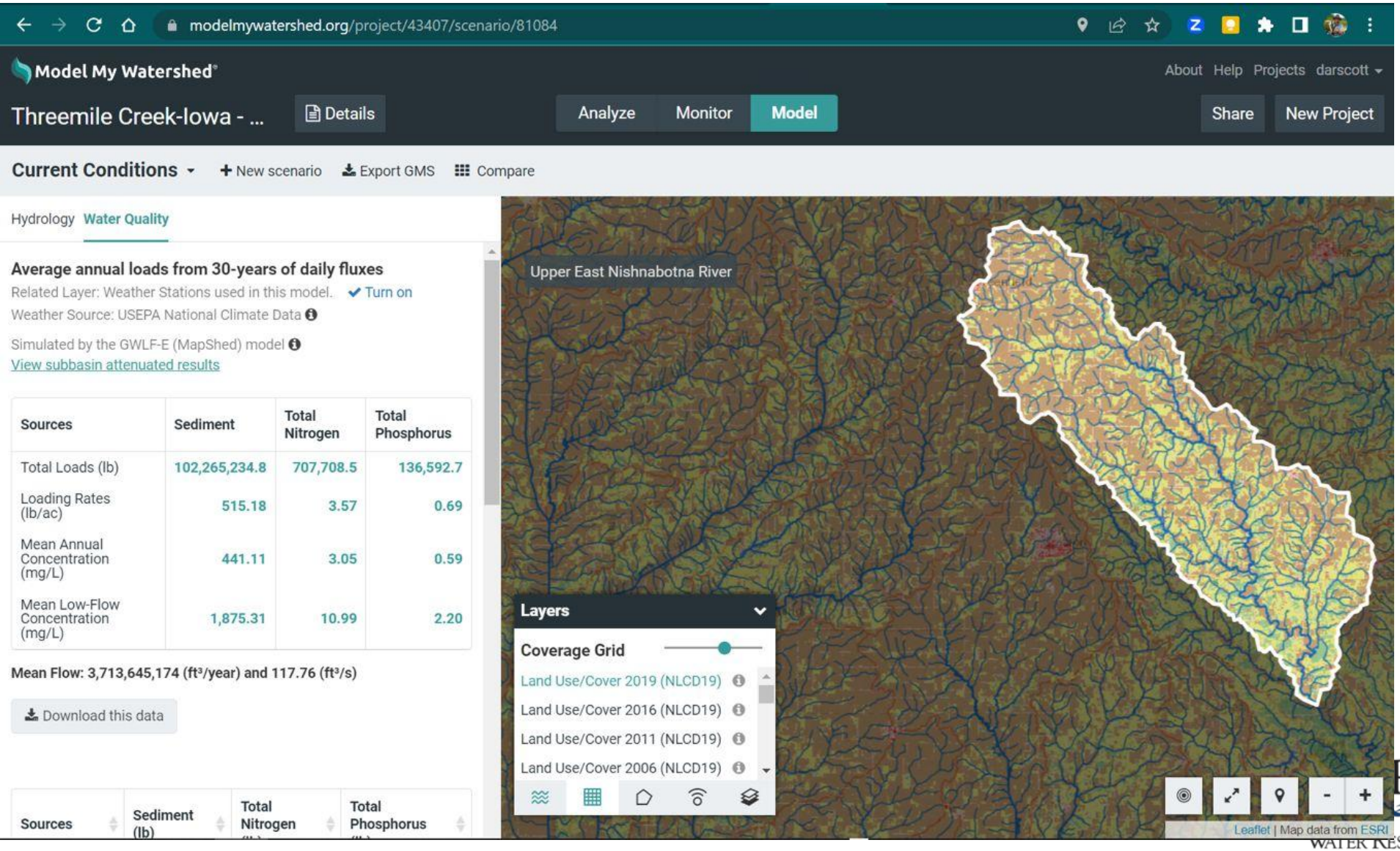
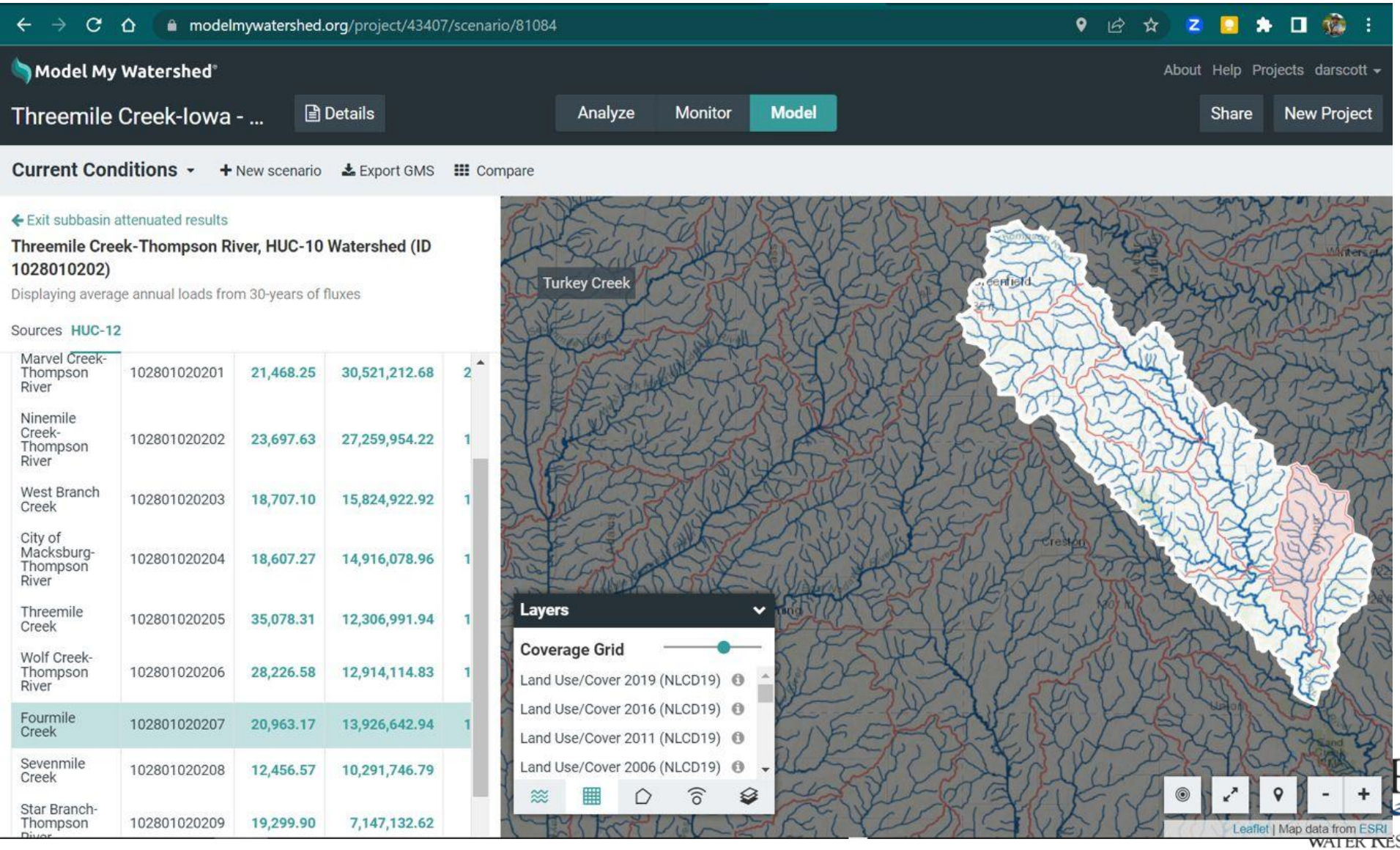
WATER RESEARCH CENTER


modelmywatershed.org/project/43407/scenario/81084
Model My Watershed
About Help Projects darscott
Threemile Creek-Iowa - ...
Details
Analyze Monitor Model
Share New Project
Current Conditions
+ New scenario
Export GMS
Compare
Hydrology Water Quality
Average annual loads from 30-years of daily fluxes
Related Layer: Weather Stations used in this model. Turn on
Weather Source: USEPA National Climate Data
Simulated by the GWLF-E (MapShed) model
View subbasin attenuated results
Sources | Sediment | Total Nitrogen | Total Phosphorus
Total Loads (lb) | 102,265,234.8 | 707,708.5 | 136,592.7
Loading Rates (lb/ac) | 515.18 | 3.57 | 0.69
Mean Annual Concentration (mg/L) | 441.11 | 3.05 | 0.59
Mean Low-Flow Concentration (mg/L) | 1,875.31 | 10.99 | 2.20
Mean Flow: 3,713,645,174 (ft³/year) and 117.76 (ft³/s)
Download this data
Sources | Sediment (lb) | Total Nitrogen | Total Phosphorus
Upper East Nishnabotna River
Layers
Coverage Grid
Land Use/Cover 2019 (NLCD19)
Land Use/Cover 2016 (NLCD19)
Land Use/Cover 2011 (NLCD19)
Land Use/Cover 2006 (NLCD19)
Leaflet | Map data from ESRI



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WATER RESEARCH CENTER

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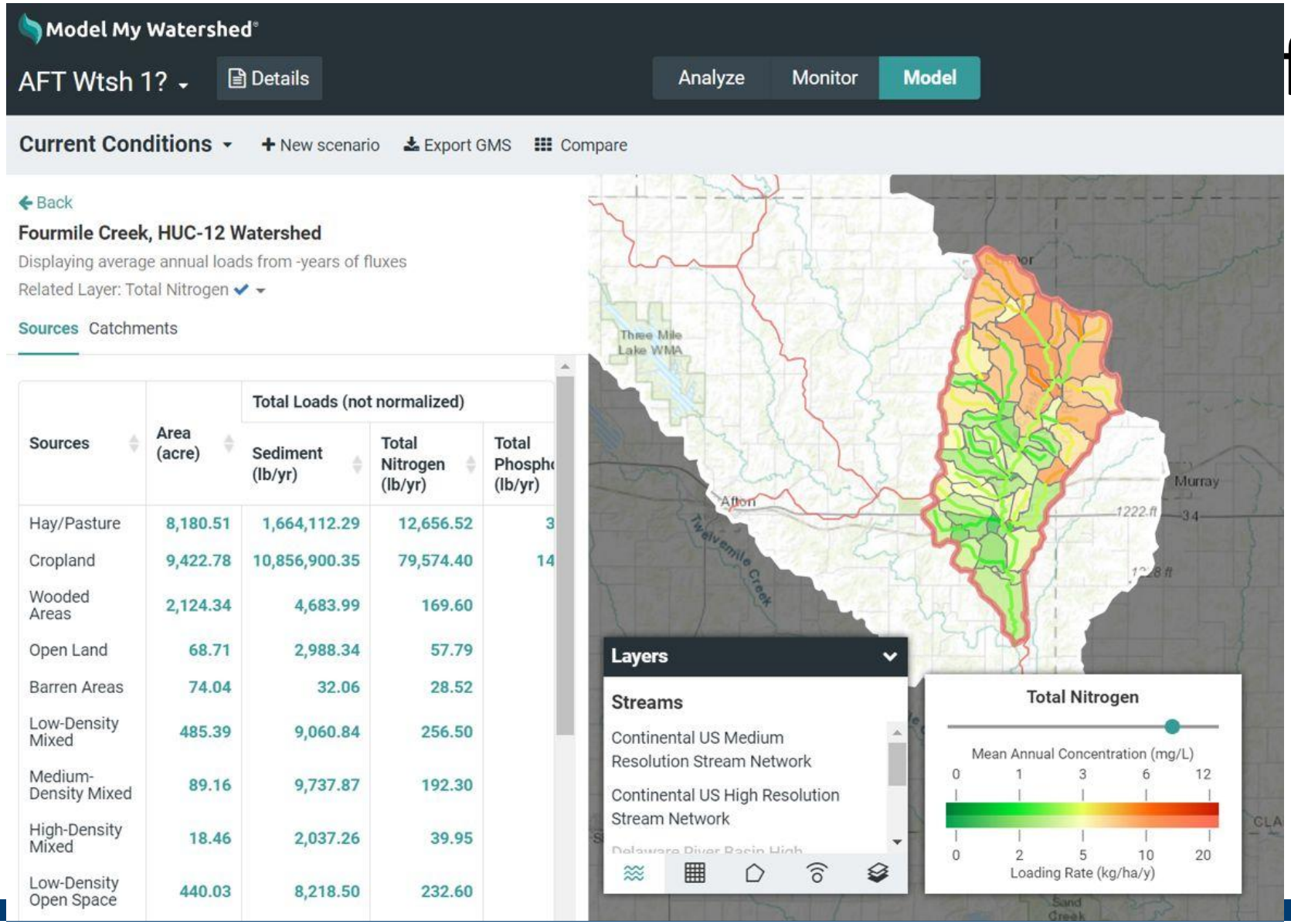

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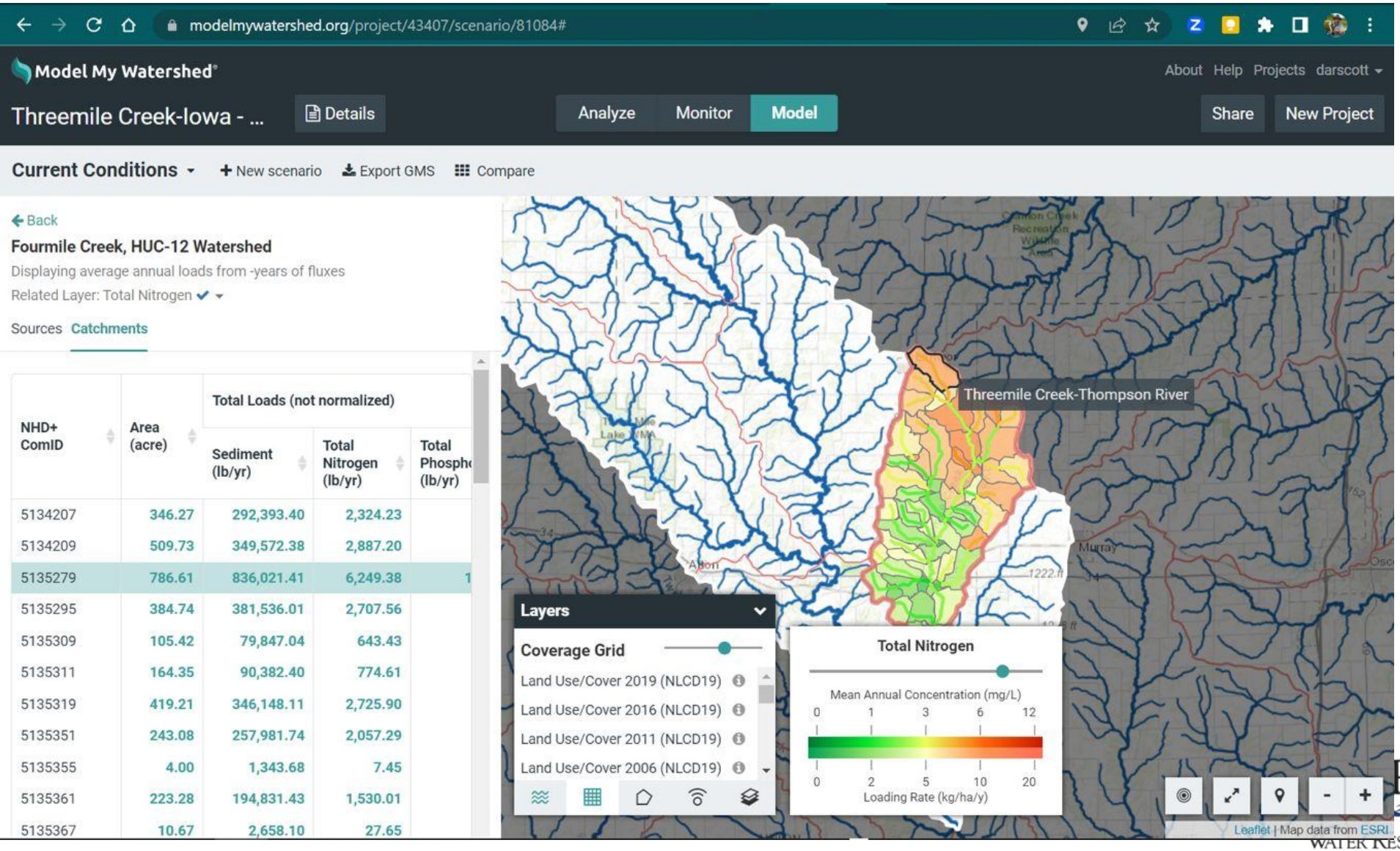
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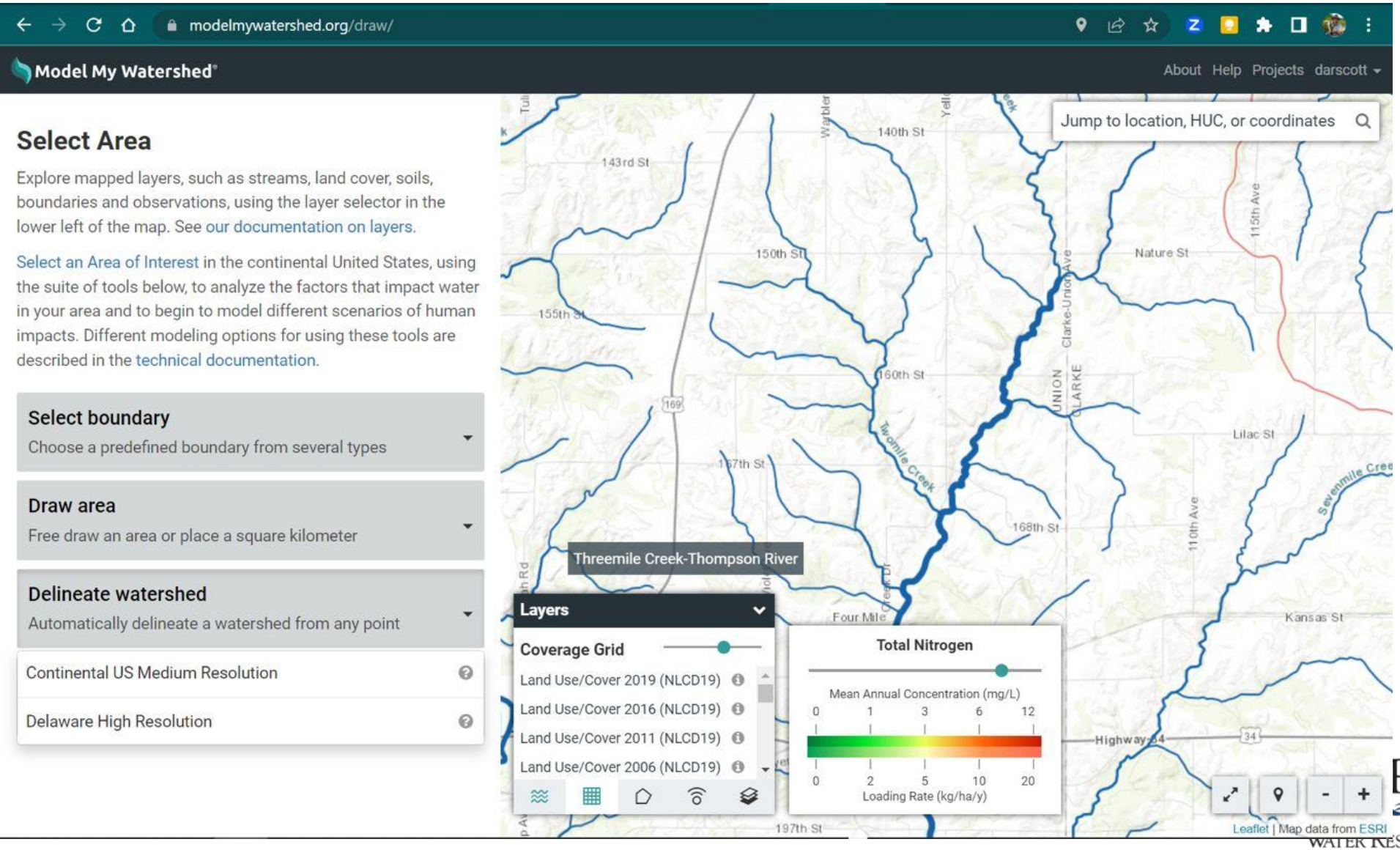
Model My Watershed
About Help Projects darscott
Threemile Creek-Iowa - ...
Details
Analyze Monitor Model
Share New Project
Current Conditions
+ New scenario
Export GMS
Compare
Back
Fourmile Creek, HUC-12 Watershed
Displaying average annual loads from -years of fluxes
Related Layer: Total Nitrogen
Sources Catchments
NHD+ ComID
Area (acre)
Total Loads (not normalized)
Sediment (lb/yr)
Total Nitrogen (lb/yr)
Total Phosph (lb/yr)
5134207 346.27 292,393.40 2,324.23
5134209 509.73 349,572.38 2,887.20
5135279 786.61 836,021.41 6,249.38
5135295 384.74 381,536.01 2,707.56
5135309 105.42 79,847.04 643.43
5135311 164.35 90,382.40 774.61
5135319 419.21 346,148.11 2,725.90
5135351 243.08 257,981.74 2,057.29
5135355 4.00 1,343.68 7.45
5135361 223.28 194,831.43 1,530.01
5135367 10.67 2,658.10 27.65
Threemile Creek-Thompson River
Layers
Coverage Grid
Land Use/Cover 2019 (NLCD19)
Land Use/Cover 2016 (NLCD19)
Land Use/Cover 2011 (NLCD19)
Land Use/Cover 2006 (NLCD19)
Total Nitrogen
Mean Annual Concentration (mg/L)
0 1 3 6 12
0 2 5 10 20
Loading Rate (kg/ha/y)
Leaflet | Map data from ESRI



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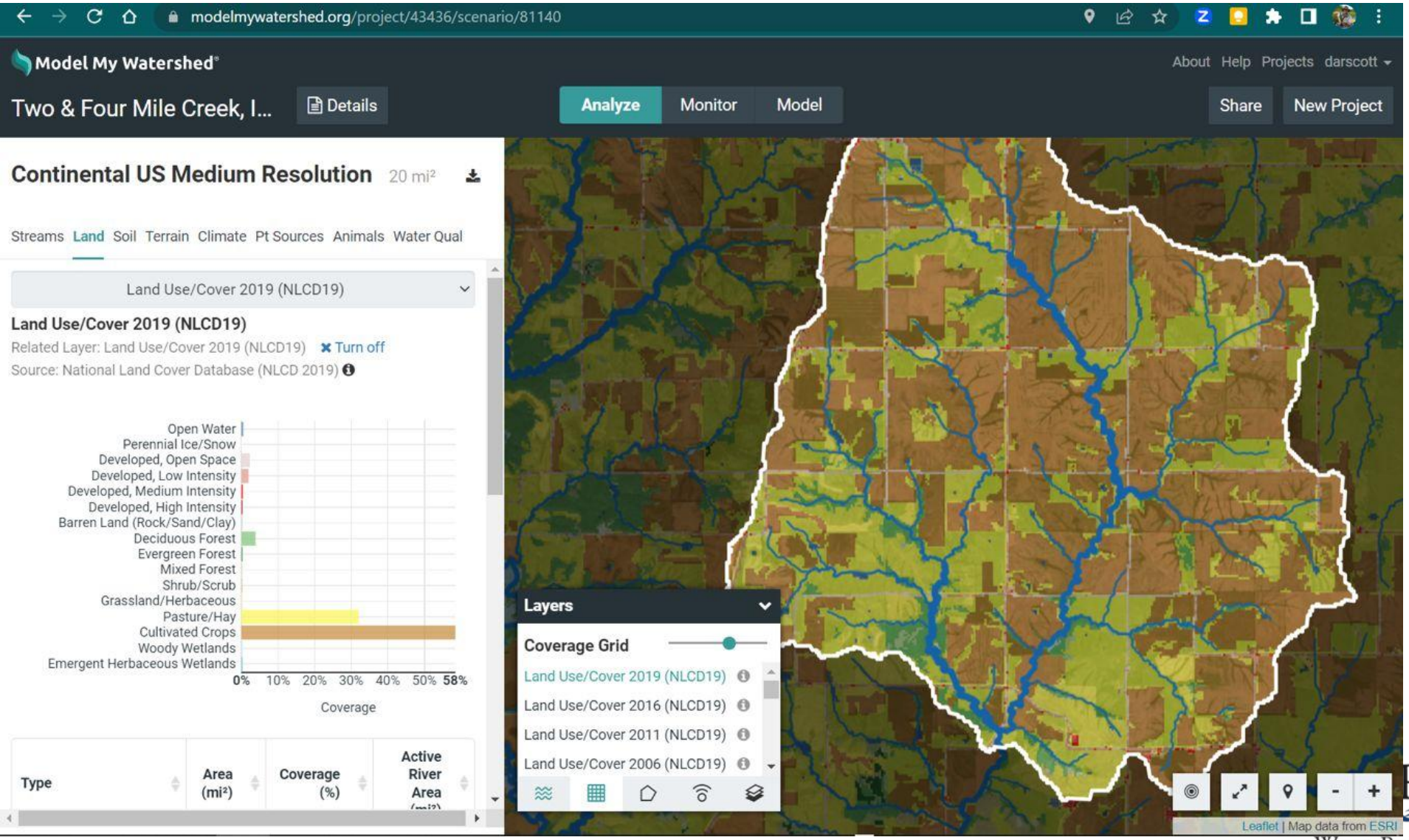

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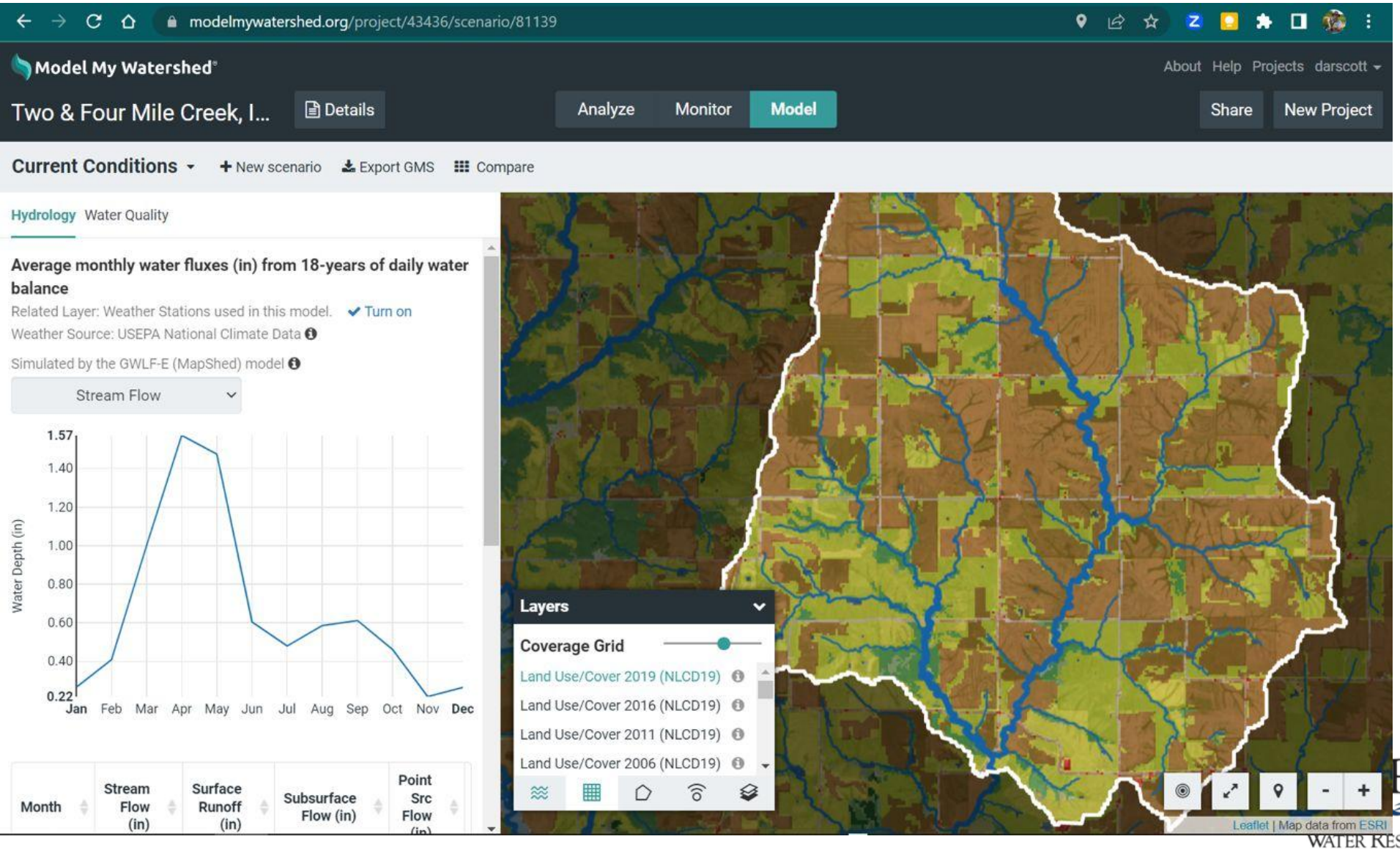
WATER RESEARCH CENTER



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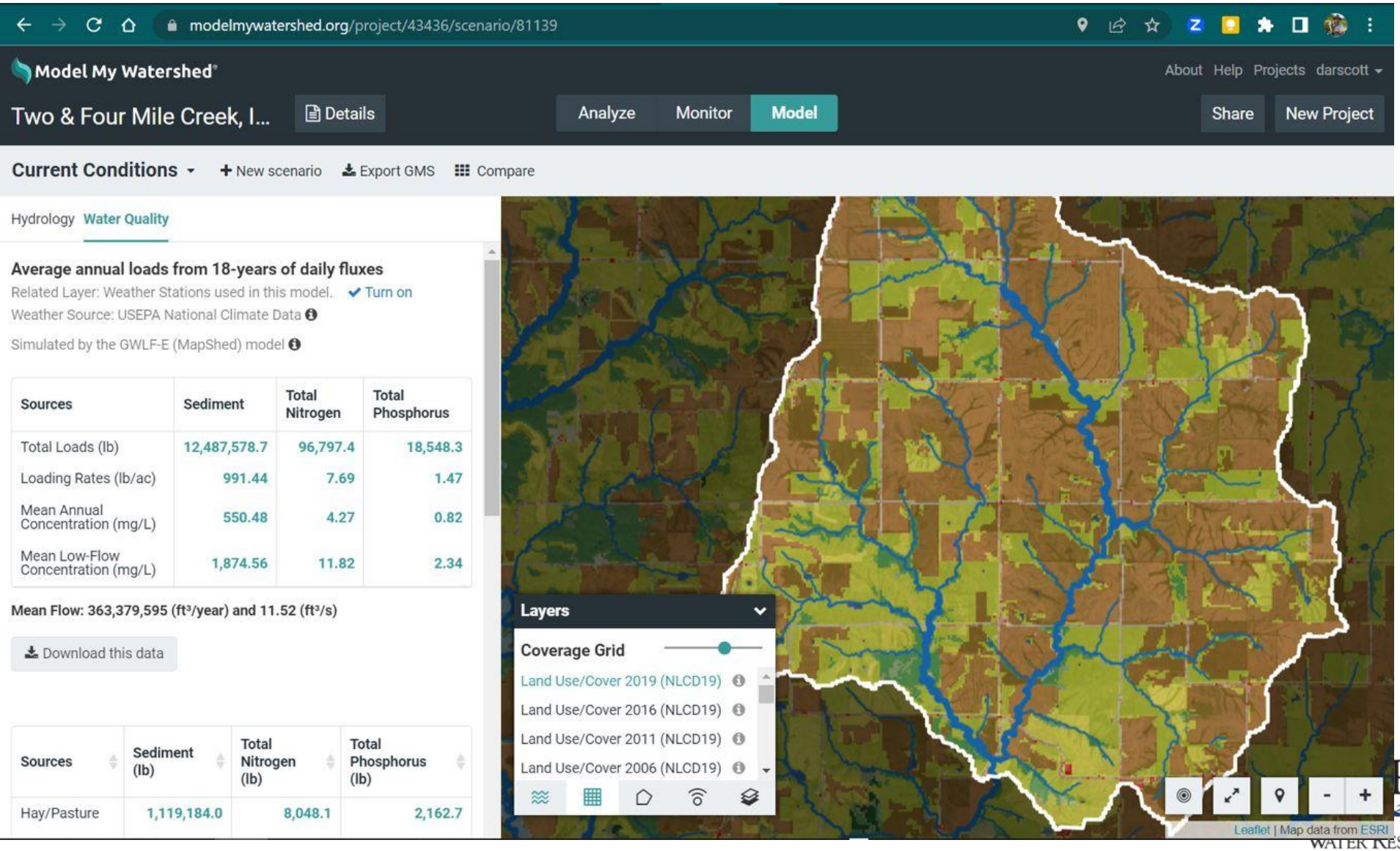
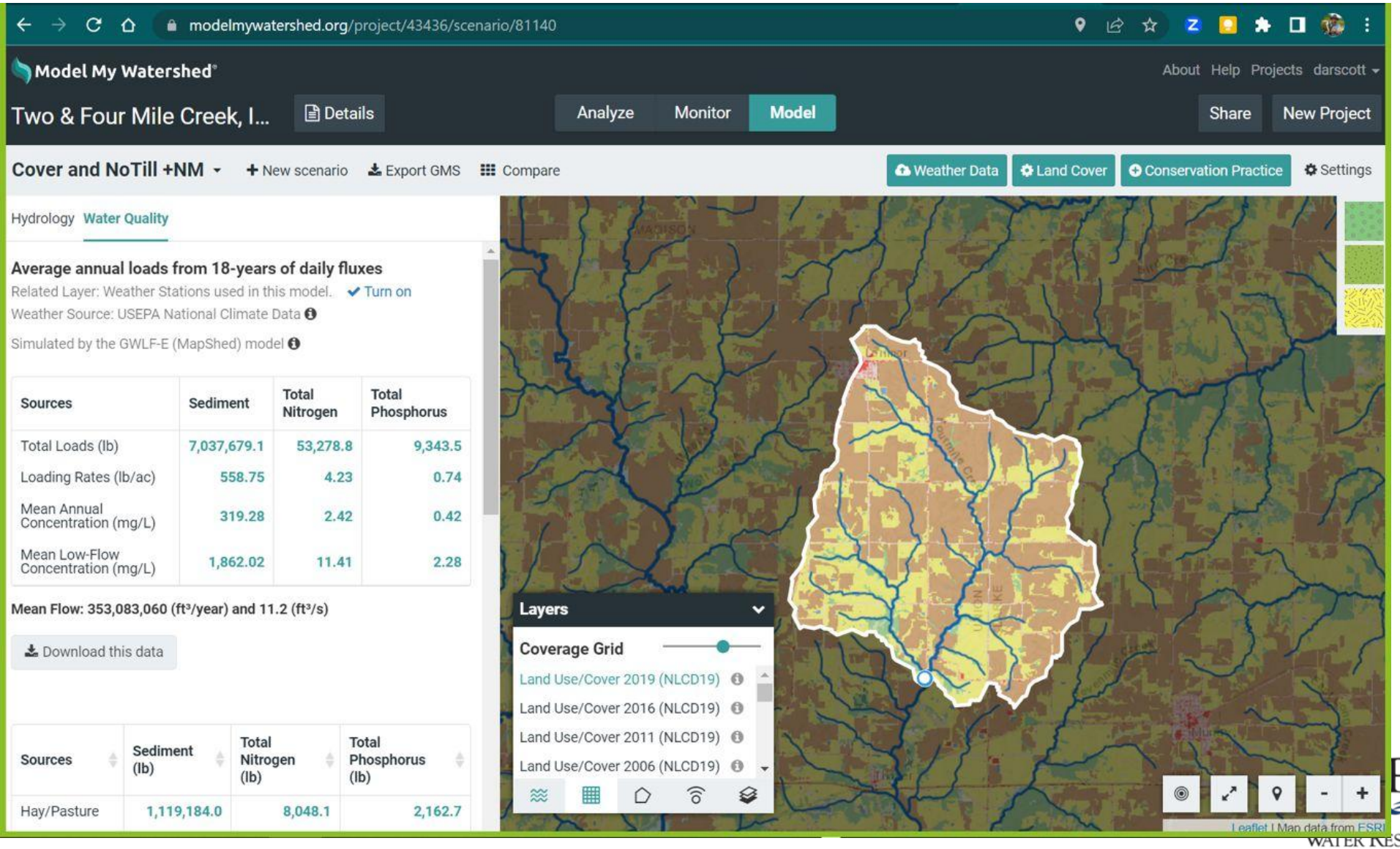
WATER RESEARCH CENTER


modelmywatershed.org/project/43436/scenario/81139
Model My Watershed
About Help Projects darscott
Two & Four Mile Creek, I...
Details
Analyze Monitor Model
Share New Project
Current Conditions
+ New scenario
Export GMS
Compare
Hydrology Water Quality
Average annual loads from 18-years of daily fluxes
Related Layer: Weather Stations used in this model. Turn on
Weather Source: USEPA National Climate Data
Simulated by the GWLF-E (MapShed) model
Sources | Sediment | Total Nitrogen | Total Phosphorus
Total Loads (lb) | 12,487,578.7 | 96,797.4 | 18,548.3
Loading Rates (lb/ac) | 991.44 | 7.69 | 1.47
Mean Annual Concentration (mg/L) | 550.48 | 4.27 | 0.82
Mean Low-Flow Concentration (mg/L) | 1,874.56 | 11.82 | 2.34
Mean Flow: 363,379,595 (ft³/year) and 11.52 (ft³/s)
Download this data
Sources | Sediment (lb) | Total Nitrogen (lb) | Total Phosphorus (lb)
Hay/Pasture | 1,119,184.0 | 8,048.1 | 2,162.7
Layers
Coverage Grid
Land Use/Cover 2019 (NLCD19)
Land Use/Cover 2016 (NLCD19)
Land Use/Cover 2011 (NLCD19)
Land Use/Cover 2006 (NLCD19)
Leaflet | Map data from ESRI



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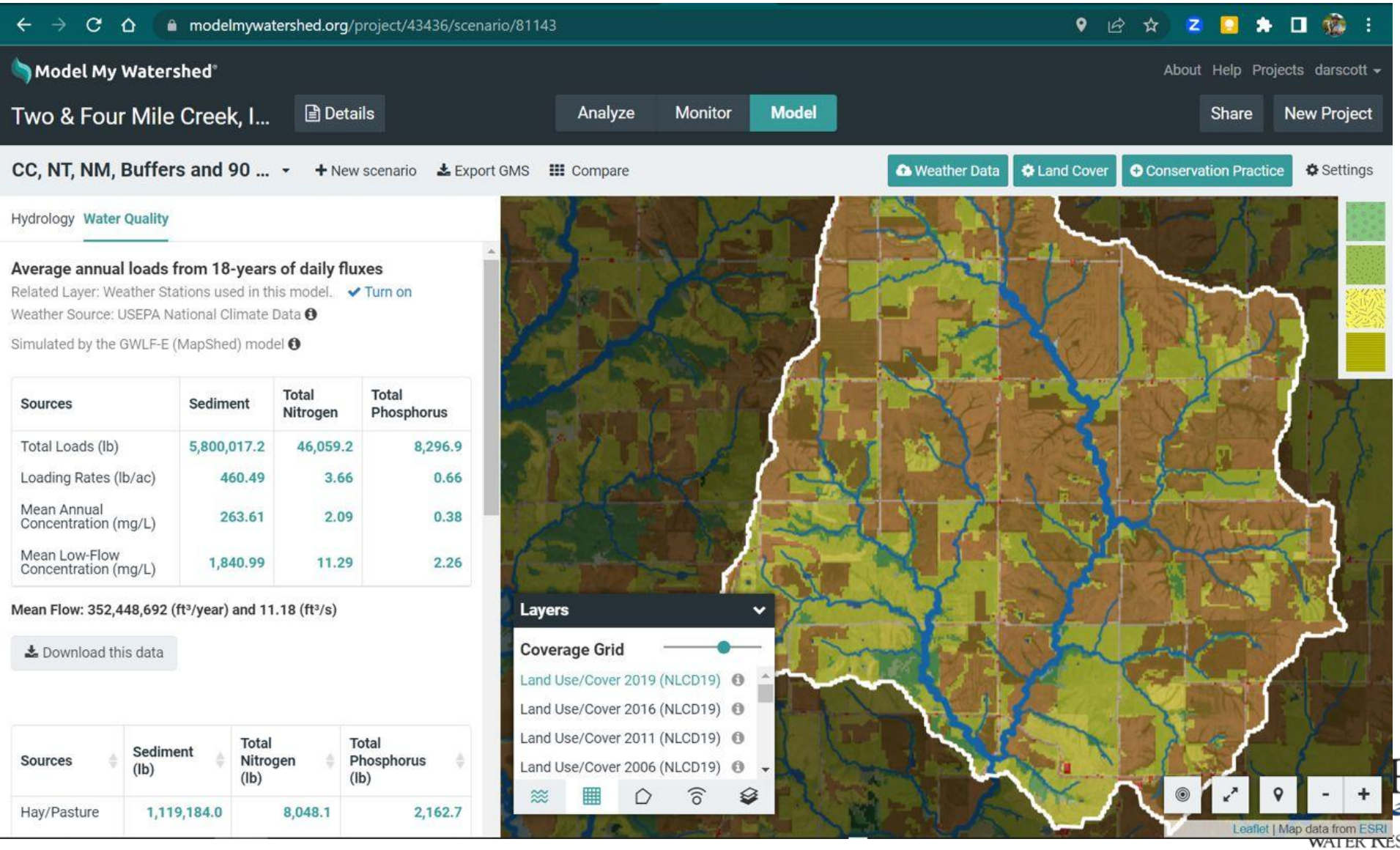

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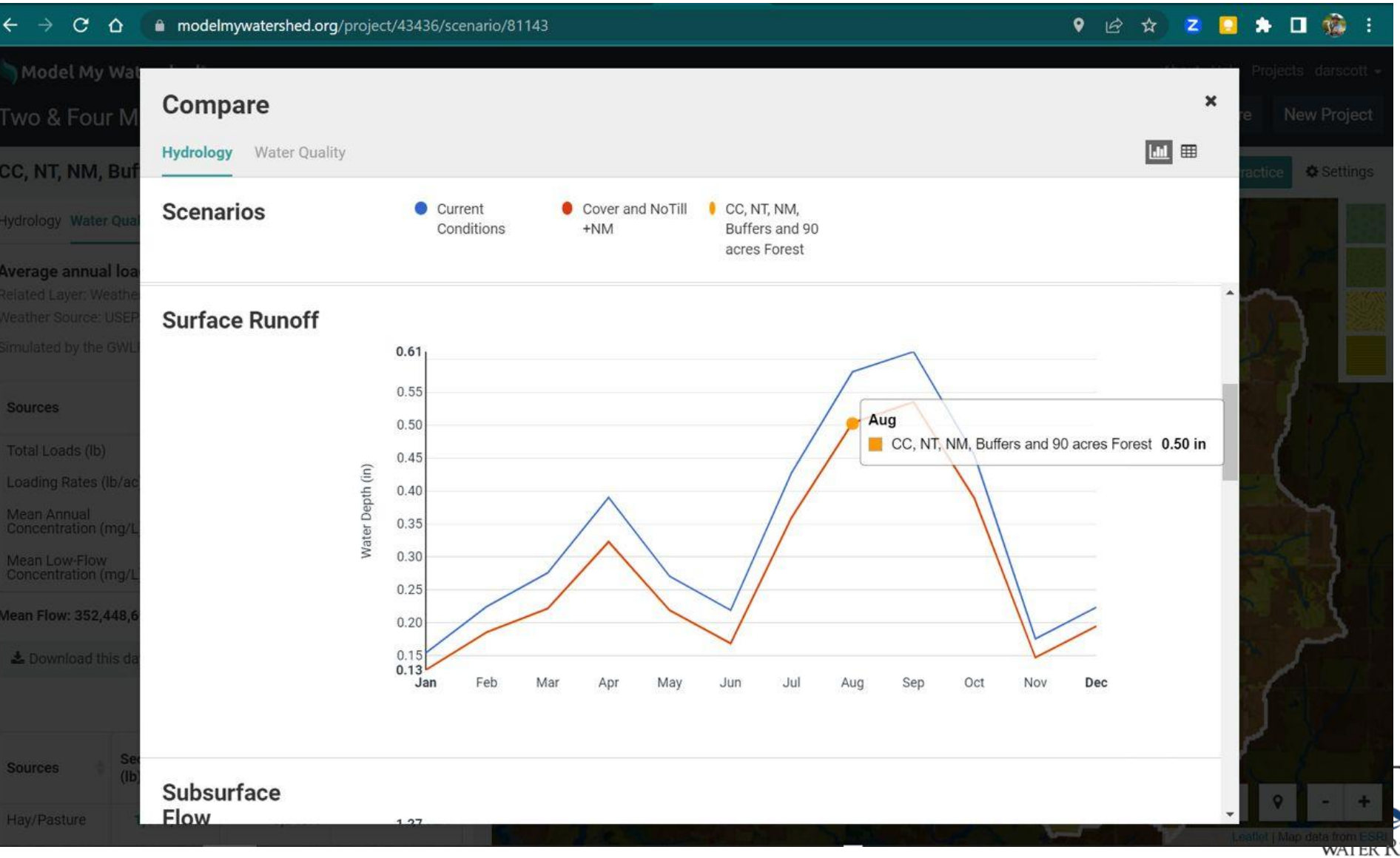
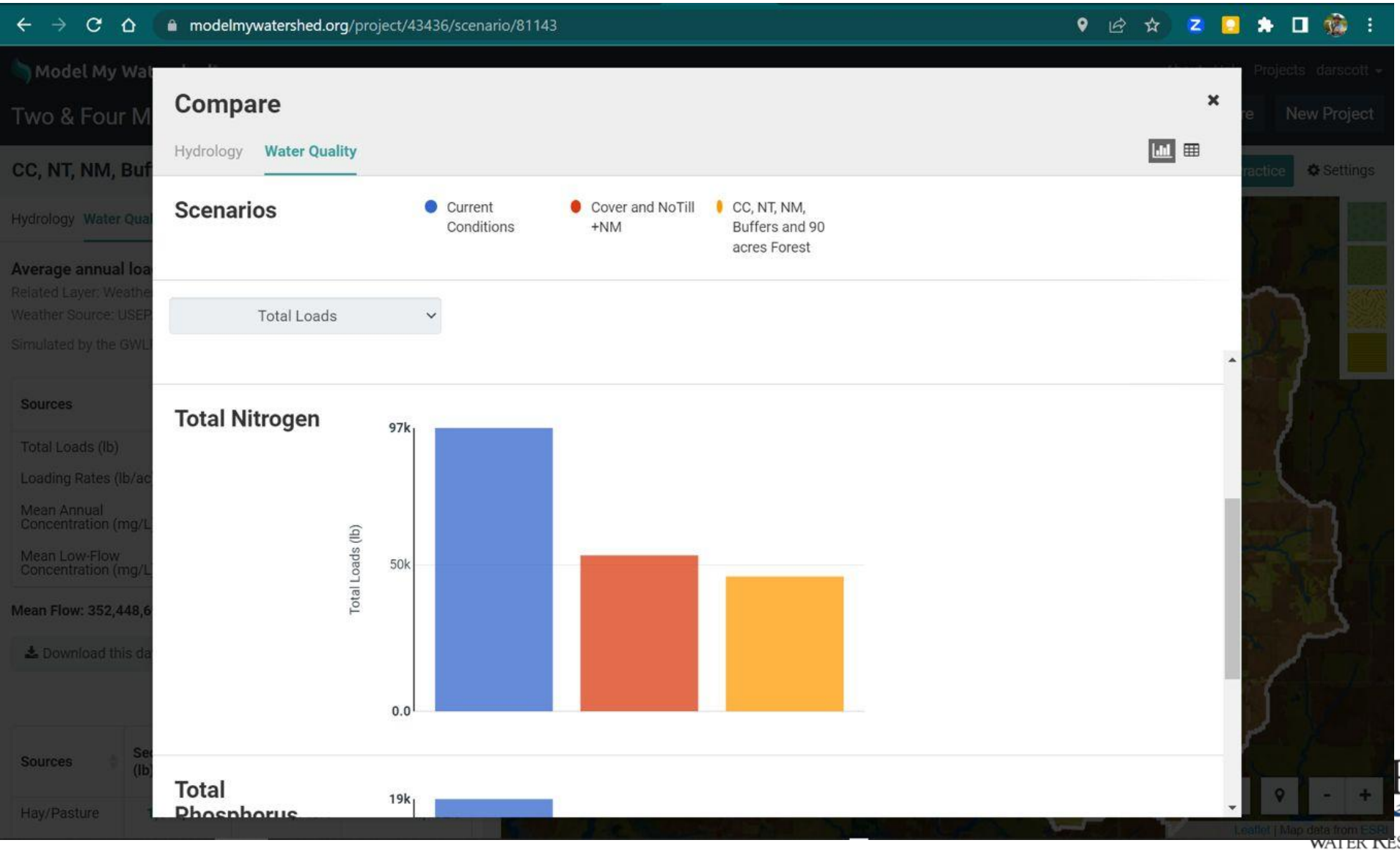


TROUD
WATER RESEARCH CENTER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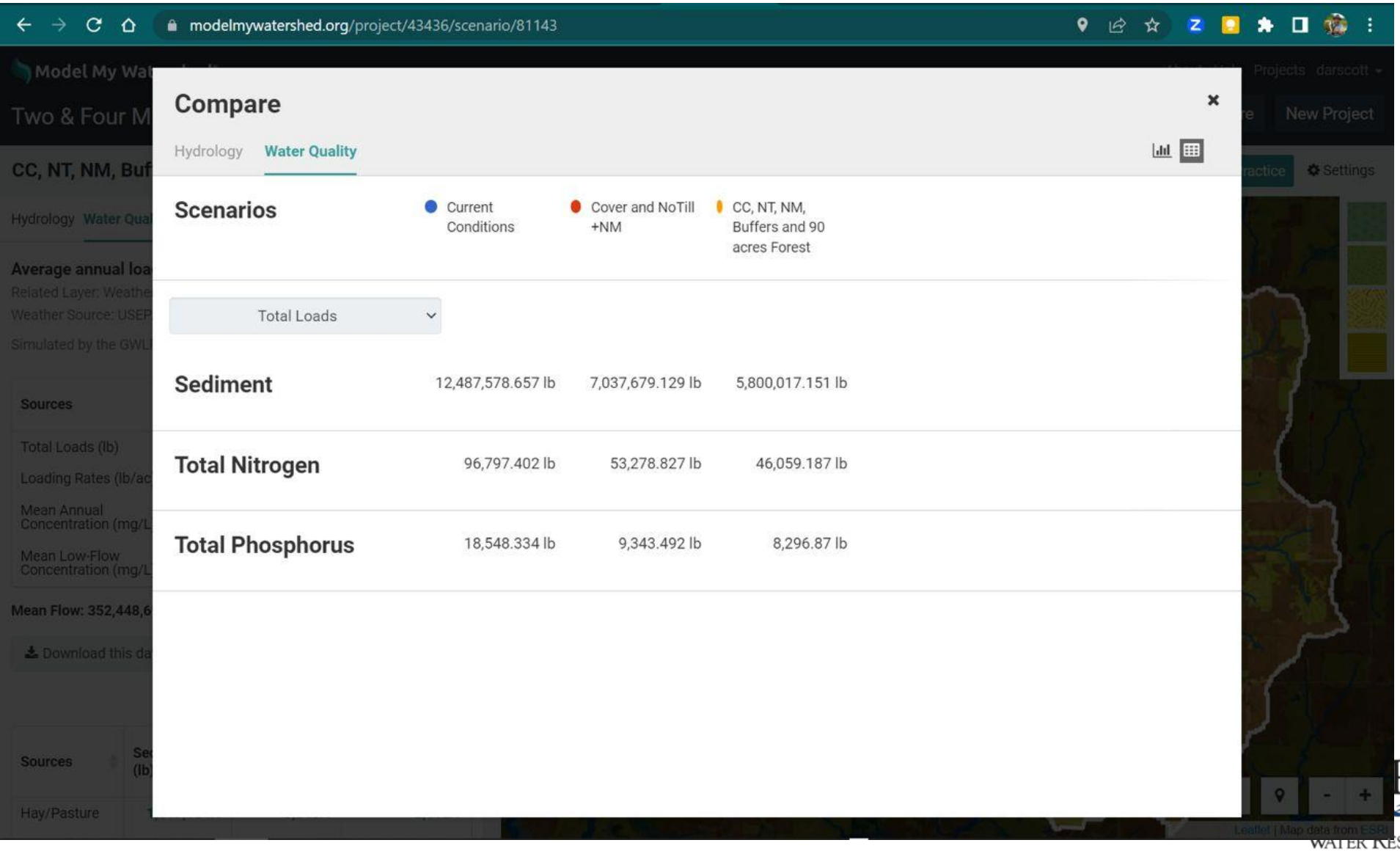
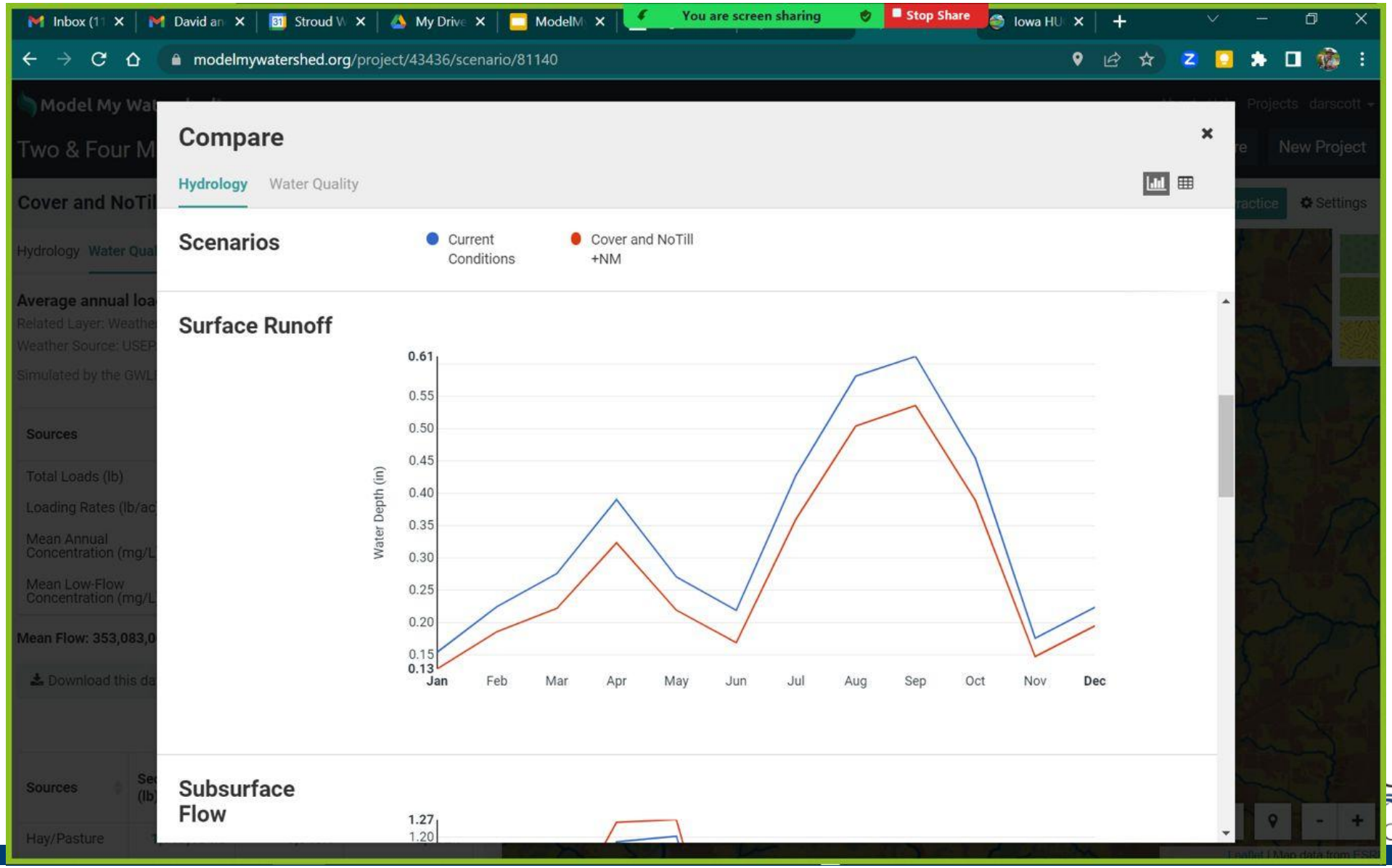
Compare
Hydrology
Water Quality
Scenarios
Current Conditions
Cover and NoTill +NM
CC, NT, NM, Buffers and 90 acres Forest
Total Loads
Total Nitrogen
97k
50k
0.0
Total Loads (lb)
Total Phosphorus
19k
New Project
Settings
Sources
Total Loads (lb)
Loading Rates (lb/ac
Mean Annual Concentration (mg/L
Mean Low-Flow Concentration (mg/L
Mean Flow: 352,448,6
Download this da
Hay/Pasture
Leaflet | Map data from ESRI


modelmywatershed.org/project/43436/scenario/81143
Compare
Hydrology
Water Quality
Scenarios
Current Conditions
Cover and NoTill +NM
CC, NT, NM, Buffers and 90 acres Forest
Total Loads
Sediment
12,487,578.657 lb
7,037,679.129 lb
5,800,017.151 lb
Total Nitrogen
96,797.402 lb
53,278.827 lb
46,059.187 lb
Total Phosphorus
18,548.334 lb
9,343.492 lb
8,296.87 lb
New Project
Settings
Sources
Total Loads (lb)
Loading Rates (lb/ac
Mean Annual Concentration (mg/L
Mean Low-Flow Concentration (mg/L
Mean Flow: 352,448,6
Download this da
Hay/Pasture
Leaflet | Map data from ESRI


You are screen sharing
Stop Share
modelmywatershed.org/project/43436/scenario/81140
Compare
Hydrology
Water Quality
Scenarios
Current Conditions
Cover and NoTill +NM
Surface Runoff
Water Depth (in)
0.61
0.55
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.13
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Subsurface Flow
1.27
1.20

Compare

Hydrology | **Water Quality**

Scenarios	Current Conditions	Cover and NoTill +NM
Total Loads		
Sediment	12,487,578.657 lb	7,037,679.129 lb
Total Nitrogen	96,797.402 lb	53,278.827 lb
Total Phosphorus	18,548.334 lb	9,343.492 lb

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Ending Demo here

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