

Tacoma Watershed Insights

Main Components



Map Explorer

Visualize the existing state of the stormwater BMP system. Search for specific facilities, and explore subbasins, pollutant heat maps, and reference imagery.



WQ Results Viewer

Evaluate BMP performance, pinpoint potential retrofit sites, identify viable approaches to treat stormwater and improve Tacoma's receiving waters.



Decision Support

Prioritize investments and allocate resources more effectively through an understanding of life-cycle costs and project benefits.



Scenario Builder

Ensure decisions help improve watershed conditions for all community members. Help promote equitable and sustainable outcomes in stormwater project and enhance neighborhoods for everybody.

System Administration

Enroll New User

- Navigate to site
- Click Login
- Click Register
- Click Submit
- Check Email & Click through Verification

The screenshot displays the Tacoma Watershed Insights website. At the top, a blue header contains the site name and a 'LOGIN' button, which is highlighted by an orange arrow. The main content area features the site title and a tagline. Below this, a white modal window titled 'Welcome to the Tacoma Watershed Insights Tool' is shown. It contains fields for 'username *' and 'password *', and buttons for 'REGISTER' (highlighted by an orange arrow) and 'LOGIN'. To the right, another white modal window titled 'Enter Your New Account Information' is visible, containing fields for 'Email *', 'First Name *', 'Last Name *', 'Password *', and 'Confirm Password *', with a 'SUBMIT' button (highlighted by an orange arrow) at the bottom. Below the registration modal, an email verification message is shown, containing a warning, a welcome message, and a verification link (highlighted by an orange arrow). The link is: <https://dev.tacomawatersheds.com/app/verify?token=eyJhbGciOiJIUzI1NiIsInR5cCI6IkpzZW50b3R5IiwiaWF0Ij0iMTY0MzQ5OTY0IiwiaXN0Ij0iIn0%3D&email=tw@tacomawatersheds.com>

Modify User Roles

Role	Permission
Public	None
Read-only	Read access to data via site and via token
User/Editor	All of the above + access to scenarios and editing data
User Admin	All of the above + access to user manager + access to application settings
System Admin	All of the above + direct api access

- Ask a User Admin to change your role
- Click on Profile
- Click Manage Users
- Click the pen to edit
- Select Role
- Save or cancel

Tacoma Watershed Insights Home

admin@geosyntec.com ✓

- Profile
- Manage Users
- Settings
- Logout

Email	Role	Full name	Is Verified
shansen2@cityoftacoma.o...	User/Editor	Shauna Hansen	true
lnokes@cityoftacoma.org	User/Editor	Laura Nokes	true
aang@geosyntec.com	System Admin	Adrian Ang	true
ddeleon@cityoftacoma.org	Public	Dana de Leon	true
cnilsen@geosyntec.com	System Admin	Christian Nilsen	true
admin@geosyntec.com	System Admin		true
datastudio@geosyntec.com	Read-only		false
aorr@geosyntec.com	Public	Austin Orr	true

Public

Read-only

User/Editor

User Admin

System Admin

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Cost Module Settings

Modify Global Settings

lacoma Watershed Insights Home

Austin Orr
aorr@geosyntec.com ✓

- Profile
- Manage Users
- Settings
- Logout

Cost Settings

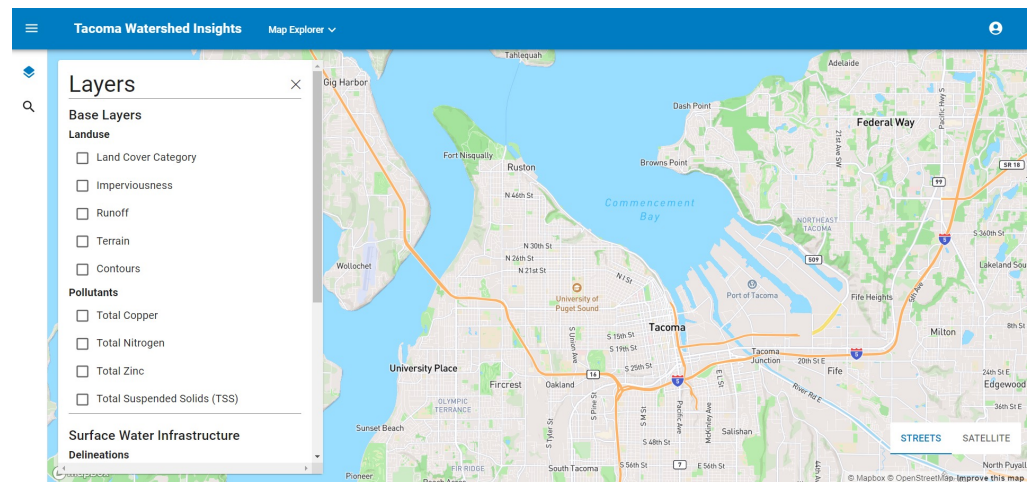
Variable	Value	Actions
discount_rate	0.042	
inflation_rate	0.022	
planning_horizon_yrs	50	
cost_basis_year	2023	

Rows per page: 100 1-4 of 4

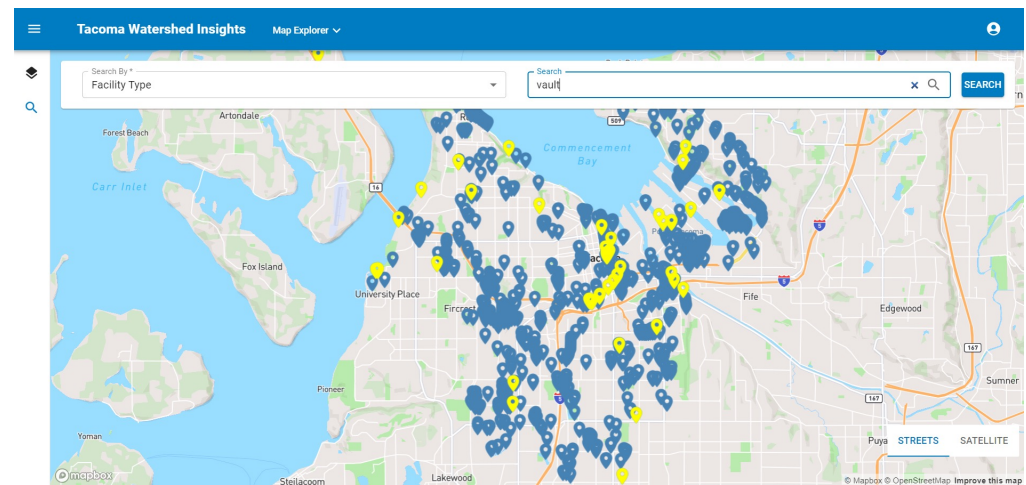
Map Explorer

Visualize Existing Infrastructure and Conditions

- Available Layers:
 - Pollutant heat maps
 - Landuse/Terrain
 - Stormwater subbasins
 - Stormwater BMPs
 - Stormwater pipes

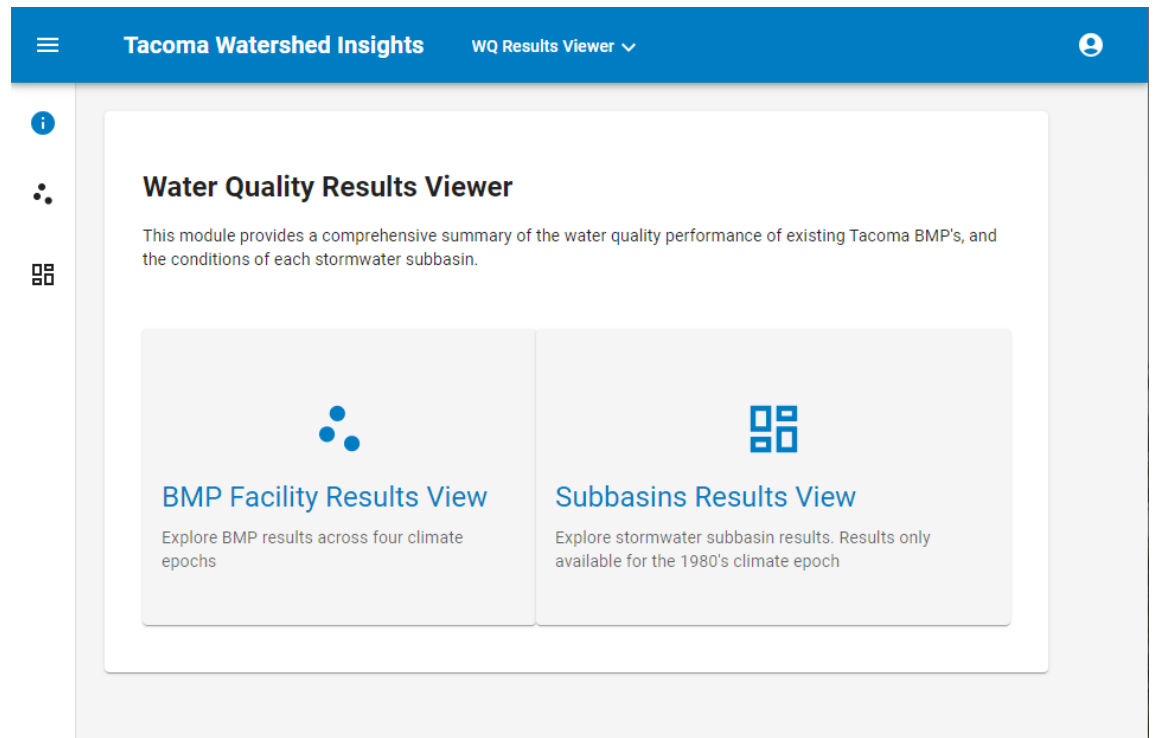


Search by
Facility Type



Results Reviewer

Explore WQ Performance at Facilities and Subbasins



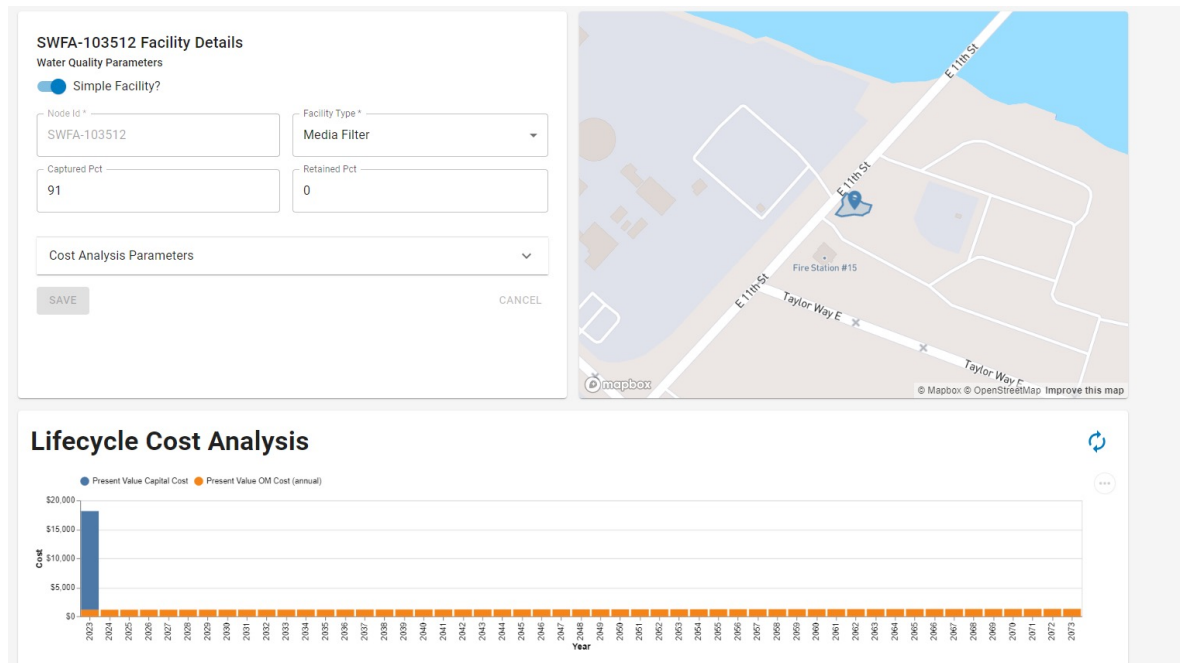
Explore BMP Attributes

- Link to individual facility details
- View stats by climate epoch and type

The screenshot shows a web application interface for "Tacoma Watershed Insights" with a "WQ Results Viewer" dropdown. The main content area is titled "Facility Water Quality Results" and includes a sub-header "View tabular data below, or click on individual facilities to view detailed stats". There is an "EXPORT" button and a "Climate Epoch" dropdown menu set to "1980s". Below these are four tabs: "Overview" (active), "Runoff Stats", "Pollutant Mass Flow", and "Pollutant Concentration". The table displays data for various facilities, with columns for Node Id, Epoch, Facility Type, Node Type, Captured Pct, Treated Pct, Retained Pct, and Bypassed Pct. The table shows 6 rows of data, all for the 1980s epoch. At the bottom right, it indicates "Rows per page: 100" and "1-100 of 889".

Node Id	Epoch	Facility Type	Node Type	Captured Pct	Treated Pct	Retained Pct	Bypassed Pct
SWFA-100362	1980s	infiltration	simple facility	91.0%	0.0%	91.0%	9.0%
SWFA-100420	1980s	bioretention with f...	simple facility	91.0%	0.0%	91.0%	9.0%
SWFA-100421	1980s	bioretention with f...	simple facility	91.0%	0.0%	91.0%	9.0%
SWFA-103704	1980s	infiltration	simple facility	91.0%	0.0%	91.0%	9.0%
SWFA-100422	1980s	bioretention with f...	simple facility	91.0%	0.0%	91.0%	9.0%
SWFA-102893	1980s	pervious pavement	simple facility	91.0%	0.0%	91.0%	9.0%
SWFA-103108	1980s	infiltration	simple facility	91.0%	0.0%	91.0%	9.0%

Drill down to individual BMPs



Create BMPs with Detailed Performance and Cost Attributes

- Toggle between 'simple' facilities driven by percentage based capture and treatment stats to ones based on physical attributes
- Add cost data that allows for capital and O&M costs to be amortized over the lifespan of the facility

SWFA-103512 Facility Details

Water Quality Parameters

☒ Simple Facility?

Node Id * SWFA-103512	Facility Type * Media Filter
Tributary Area To Min 5	Offline Diversion Rate Cfs 0
Total Volume Cuft * 1000	Area Sqft * 200
Media Filtration Rate In/hr * 4	

Cost Analysis Parameters

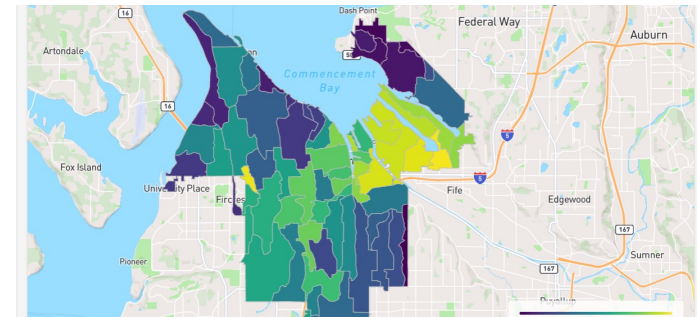
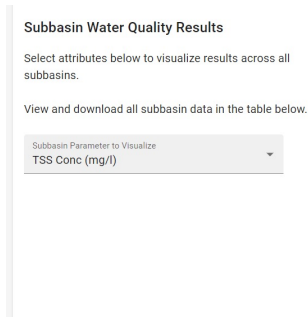
Capital Cost 17000	Capital Cost Basis Year 2023
Om Cost Per Yr 1150	Om Cost Basis Year 2023
Install Year	Replacement Cost
Lifespan Yrs	

KING COUNTY COST ESTIMATOR TOOL

SAVECANCEL

Visualize Subbasin Attributes

- Available Parameters:
- -Land Use/Cover
- -Runoff
- -Treatment Facility Summary
- -Pollutant Concentrations/Reductions



Visualize Subbasin Attributes

- View and download tabular results

EXPORT Land Use Breakdown Land Cover Breakdown Runoff Treatment Facility Summary Average Pollutant Washoff Concentration Annual Load Reductions								
Basinname	Subbasin	DEHP Conc (mg/l)	PHE Conc (mg/l)	PYR Conc (mg/l)	TCu Conc (mg/l)	TN Conc (mg/l)	TP Conc (mg/l)	TSS Conc (mg/l)
FLETT CREEK	FL_07	0.000476	0.00000583	0.00000886	0.0121	1.28	0.161	16.8
FLETT CREEK	FL_08	0.00041	0.00000502	0.00000763	0.0114	1.37	0.147	14.5
FLETT CREEK	FL_09	0.00038	0.00000466	0.00000708	0.012	1.05	0.0832	13.4
FLETT CREEK	FL_10	0.000445	0.00000545	0.00000829	0.0117	1.37	0.177	15.7
FOSS WATERWAY	FS_01	0.000445	0.00000545	0.00000829	0.015	1.18	0.137	15.7
FOSS WATERWAY	FS_02	0.000486	0.00000595	0.00000905	0.0136	1.42	0.233	17.1

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Scenario Builder

Purpose and Process

- Allows users to model a proposed single BMP facility with an upstream delineation
- Scenarios can be designed incrementally (facility/delineation can be added after creation)
- WQ results can be generated after scenario creation and future edits

Scenario Design Process

Tacoma Watershed InsightsHome

1 Enter Basic Info

2 Create a Delineation
Optional

3 Create a BMP
Optional


Scenario Name *

Purpose

Description

BACK

NEXT



Scenario Design Process

Tacoma Watershed Insights

Home

1

Enter Basic Info

2

Create a Delineation

Optional

3

Create a BMP

Optional

Delineation Name *

Test Delineation

BACK

SKIP

NEXT



Tacoma Watershed Insights
 Home

Enter Basic Info

Create a Delineation
Optional

Create a BMP
Optional

Water Quality Parameters

☐ Simple Facility?

Node Id *	Facility Type *
Test BMP	Media Filter
Tributary Area To Min	Offline Diversion Rate Cfs
5	0
Total Volume Cuft *	Area SqFt *
1000	200
Media Filtration Rate InHr *	
4	

Cost Analysis Parameters

[BACK](#)
[SKIP](#)
[NEXT](#)

Purpose and Process

Allows users to prioritize subbasins for stormwater improvements based on a number of goals and subgoals:

- Clean Water Goal
- Resilient Community Goal
- Healthy Ecosystem Goal
- Equity Goal

Subbasins are ranked using a pairwise algorithm - visual/tabular results are produced

Criteria and subbasin ranks can be downloaded for future use

About Subbasin Prioritization

Use this tool to identify regions of the City of Tacoma Watershed that are most in need of stormwater retrofit or preservation projects

Set a project type

Are you prioritizing preservation projects or retrofit projects?

Retrofit

Set Priority Weights

Goal 1: Improve water quality outcomes (Clean Water Goal)

1.1: Prioritize areas based on pollutant concentrations

1

1.2: Improve infrastructure in areas with inadequate stormwater management

0

Goal 2: Increase resilience to climate change impacts (Resilient Community Goal)

2.1: Target areas most vulnerable to and at risk for climate change impacts

0

Goal 3: Preserve and restore critical and sensitive habitat (Healthy Ecosystems)

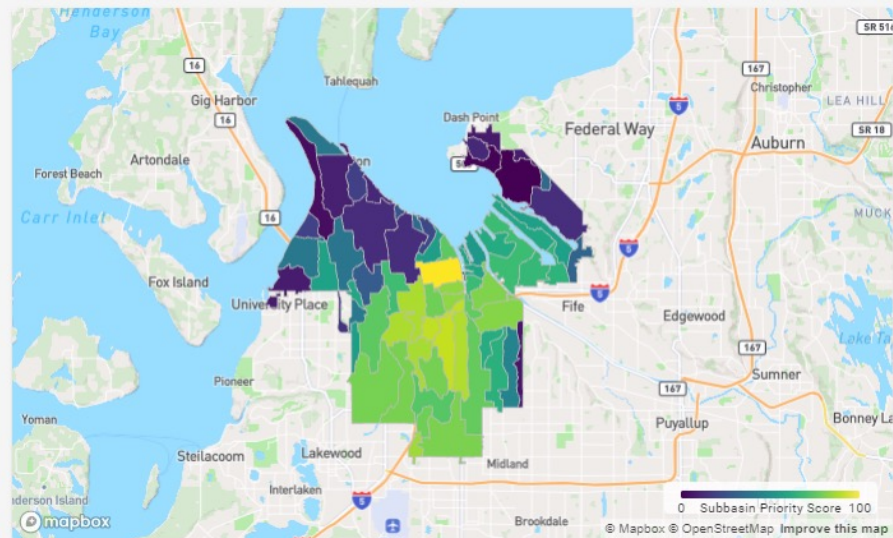
3.1: Preserve and improve Natural Spaces

0

Goal 4: Implement Equity and Social Justice (Healthy neighborhoods; Equity)

4.1: Prioritize areas of overlapping equity needs as identified by other Tacoma programs

2



Subbasin Prioritization Results

Higher priority scores indicate subbasins more favorable for new projects

To view the specific subbasin attributes that determine scores, export the results below

[EXPORT](#)

Subbasin ID	Priority Score ↓
FS_05	100
FS_09	91.153
FS_08	90.349
FS_10	88.204
FS_02	87.668
FS_03	87.668
FL_05	86.863

After submitting priorities, subbasins are scored, and results can be visualized and downloaded

Tacoma GIS (refreshed each morning)

- BMP Facilities
- BMP Facility Delineations
- Subbasins (and static subbasin metrics forthcoming)

TNC in Washington Stormwater Heatmap

- POC concentration
- runoff depth (4 climate epochs)

Changeable data




- BMP Facility modeling attributes (e.g. % capture performance, size)
- BMP Facility cost attributes (e.g., capital cost)
- Scenarios
 - Delineations, facility attributes
- Users & Permissions
- Cost Settings (e.g., Inflation rate)

Calculated data

- BMP Facility volume and load reductions
- BMP Facility cost metrics
- Delineation and Subbasin loading
- Upstream and Downstream source control measures (sweeping and drain line cleaning for Foss Watershed)
- Scenarios
 - Delineations, BMP Facility WQ, BMP Facility Cost

Access via api with token

- TMNT Facilities:
https://dev.tacomawatersheds.com/api/rest/tmnt_facility/token/<token>?f=geojson

Data Integration	Via User Profile
 https://dev.tacomawatersheds.com/api/rest/tmnt_facility/token/9ddba26a-79a8-412f-b06f-4eebd2405457?f=json&limit=1000000&offset=0 Get attributes or geojson for all tmnt facilities. f: str (optional, default=json, [json, geojson]) Format of response data limit: int (optional, default=1e6) Number of records to return offset: int (optional, default=0) Start from index	
 https://dev.tacomawatersheds.com/api/rest/tmnt_facility/{altid}/token/9ddba26a-79a8-412f-b06f-4eebd2405457 Get attributes for tmnt facility with given altid.	
 https://dev.tacomawatersheds.com/api/rest/tmnt_delineation/token/9ddba26a-79a8-412f-b06f-4eebd2405457?f=json&limit=1000000&offset=0 Get attributes for all delineations. f: str (optional, default=json, [json, geojson]) Format of response data limit: int (optional, default=1e6) Number of records to return offset: int (optional, default=0) Start from index	

Data Integration GIS

