Pilot Project:

Managing Stormwater

with Drones

Ben Nield Water Quality Analyst II



Background



The Port of Tacoma's Environmental department has recently created a drone program

The purpose of this project is to implement the use of drones into the Environmental department to assist with environmental mapping, modeling, and monitoring. The use of this technology is a cost-effective solution that will allow the gathering of data without putting humans or the environment in harm's way, while saving tens of thousands of dollars in staff time per year.

Justification



Problem:

Some inspections of SW infrastructure gets deferred due to safety

Examples:

- Railroads
- Piers
- Ditches
- High-traffic areas (terminals)



Solution:

Inspect Port's assets more frequently, efficiently, and safer using drone technology

Advantages



- Real-time, up-to-date, high-resolution data
- Repeatability
- Promotes inspector safety
- Time & cost efficient
- Innovative
- Transparency in projects
- Real-time up-to-date imagery
- Ability to easily reach inaccessible areas

Using Drones for Permit Compliance



Drones can assist with Municipal, Industrial, Construction, and Sand & Gravel Permit inspections required for compliance

Examples:

- Outfall inspections
- Ditch inspections
- Source control inspections
- Spill tracing

- Construction inspections
- Post-construction
 BMP inspections
- Derelict Vessel inspection

Wapato Creek

Tacoma

Outfall Inspection







Drone provides easy access to structures

Bullfrog Junction Ditch



Site Conditions Inspection





Easy to underestimate severity of conditions without this footage.

Better data = better decisions

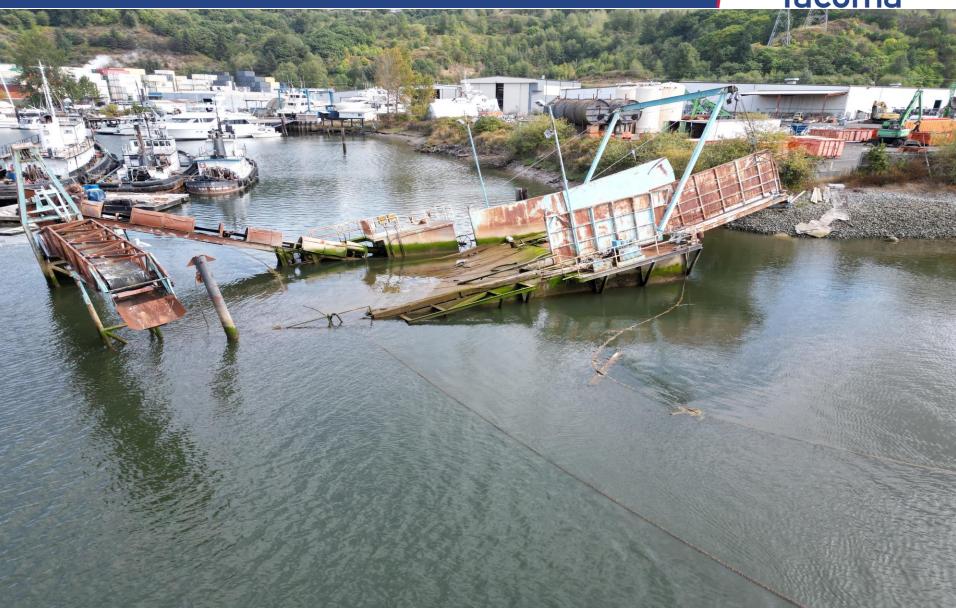
Derelict Vessel Inspection





Derelict Vessel Inspection





Future Plans



- Integrate drone imagery with ArcGIS
 - Field-verify stormwater assets in GIS
 - Projected to reduce costs by 83% (approx. \$38,000)
 - Oriented Imaging Catalog of all Port-owned shoreline
 - "Google Streetview" of shoreline
 - Photogrammetry of Port-owned parcels and assets
 - Use repeatable and automated flight plans
 - Create deliverables to be used for project decisionmaking
 - Digital Elevation Models, Point Clouds, Orthomosaics, etc.
 - Increase transparency with stakeholders

Resources Available



WA GIS Association Special Interest Group- Drones

Meets 3rd Thursday of every month on Zoom

Other agencies that have implemented similar drone programs into their organizations:

- Pierce County
- City of Tacoma
- Thurston County
- City of Port Orchard
- WSDOT Environmental Services
- King County

Want to learn more?



Contact:

Ben Nield Northwest Seaport Alliance Water Quality Analyst II bnield@nwseaportalliance.com (253) 241-0297