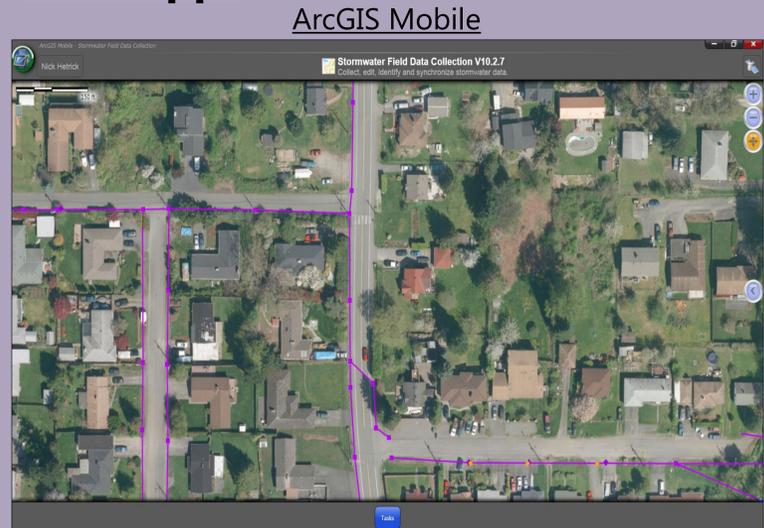


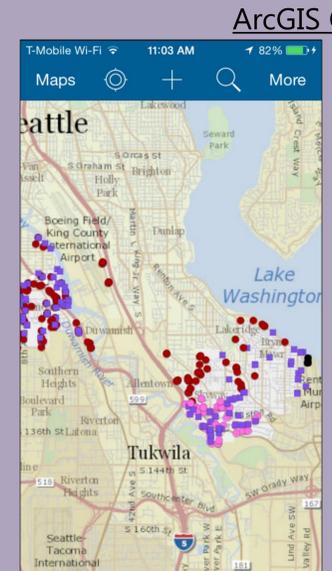
King County Stormwater Mapping Tools



Field Apps



-Field Mapping App allows field staff to map stormwater features on tablets without a cellular network connection.



ArcGIS Collector

Location: No valid Location

WQSamplingSites:

Sample Date: December 29, 1899

Sampled By:

Locator:

LIMS Sample Number:

Water Temperature (°C):

Specific Conductivity (µS/cm):

pH:

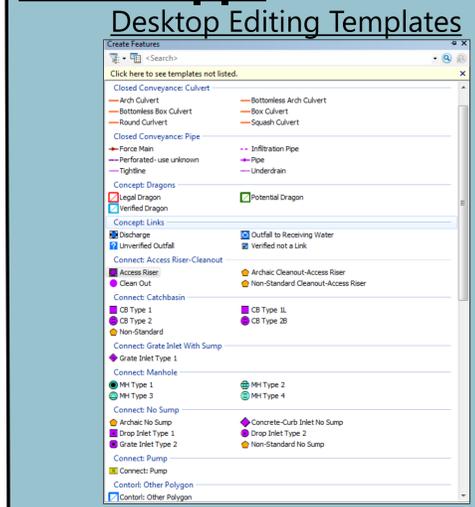
Ammonium NH4 (mg/L):

Nitrate NO3 (mg/L):

Dissolved Oxygen (mg/L):

- ODS App** allows field staff to modify existing outfalls or discharge points, plus add new points
- Water Quality Sampling App** allows users to track sample locations, results and other information
- Collector is available for iPhones, iPads and Android
- Can attach photos directly to entries in the database

Office Apps

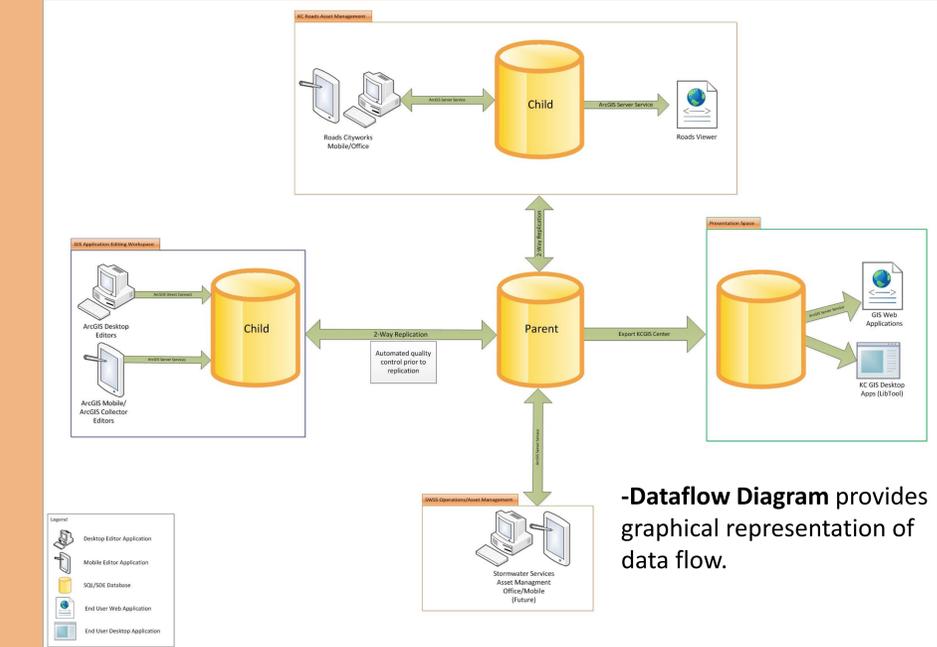


-Desktop Editing Template provides quality control and efficiency for ArcMap users



-Quality Control Scripts run nightly to auto-populate selected fields and flag inappropriate values for review

Data Flow



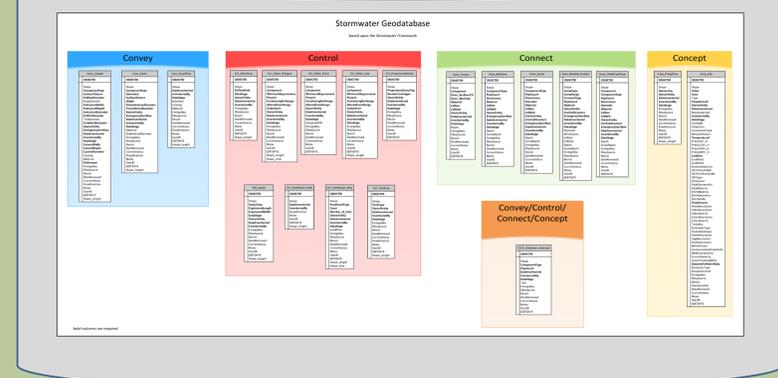
Stormwater Framework: The basis for all tools

Puget Sound Stormwater Framework for a Stormwater Management System Inventory

Function	Convey		Control							Connect			Concept		
Function Types	Open Conveyance	Closed Conveyance	Flow Control			Water Quality				Access	No Sump	Sump	Pump	UIC Link	
Components	Curb/Gutter Ditch Natural Drainage Trench Drain Channelized Flow*	Culvert Pipe Screw Pump	Other Control	Swale	Proprietary Device	Control Structure	Filter	Pond/Vault	Tank	Access Riser Clean Out Manhole Archaic Access	Concrete/Curb Inlet Drop Inlet Grate Inlet Type 2 Deep Inlet Type 2 Archaic No Sump	Catch basin Grate Inlet Type 1 Archaic Sump			
Component Types	Curb/Gutter: Asphalt Wedge, Concrete Barrier, Rolled, Vertical	Pipe/Culvert: Force Main, Stormwater Pipe, Tightline, Underdrain, Arch, Bottomless Arch, Box, Bottomless Box, Round, Squash	Other Control: Dry Well, Injection Well, Infiltration Trench, Permeable Pavement, Dispersion, Non-Veg, Veg, Full, Basic, Swale, Cell, Planter, Limited Footprint, Amended soils, Rain Garden, Rainwater Harvesting, Vegetated Roof	Swale	Proprietary Device	Control Structure: Bifiltration (All Types), Water Quality, Detention, Backup, Infiltration, Flow Through, Sand Filter with Underdrain, Stormwater Treatment Wetland, Oil/Water Separator Vault, Settling	Filter: Filter Strip, Sand	Pond/Vault: Combined, Water Quality, Detention, Infiltration, Water Quality	Tank	Access Riser/Clean Out/Manhole/Archaic Access	Concrete/Curb Inlet/Drop Inlet/Grate Inlet Type 2/Deep Inlet Type 2/Archaic No Sump	Catch basin/Grate Inlet Type 1/Archaic Sump			Jurisdiction Other public agency Private Incoming Discharge Point Outfall* (to Receiving Waters) Infall (from Natural Waters)

Legend
 Color = Definition & Hierarchy Completed
 Underlined = Definition not Vetted by Committee
 Italic = Not Defined by Committee
 Light Grey = Not in mapping database
 Bold = Defined by Dept. of Ecology

Database



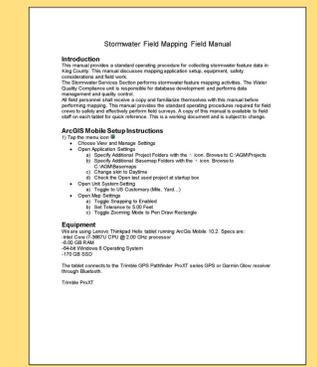
-The spatial database's data structure is based upon the dictionary.

-All of the tools in this presentation feed into or interact with this database.

Field Procedures



-Field cheat sheet is a quick reference sheet defining common features and differences between them.



-Field mapping guide contains standard operating procedures for field mapping and attribute collection.

King County Stormwater Mapping Tools Poster

Washington Stormwater Center Conference, 2014

Presentation by: Mark Preszler, Harkeerat Kang, Nick Hetrick, Brett Randle

Abstract

In compliance with the Phase I NPDES Municipal Stormwater Permit (Permit), King County aims to improve data collection proficiency through a progressive mapping toolset, including three mobile collection applications, a comprehensive spatial database, data quality control tools, and a field mapping guide for users. Though still preliminary in production, King County currently uses these tools for all stormwater mapping requirements, outfall and discharge point screening, and water quality sampling. Each tool is built upon the Washington Stormwater Framework (WSF) and its supporting database. This framework can be found on the Washington Stormwater Center's Website. King County hopes to assist other jurisdictions with comparable mapping needs by offering this toolset as well as through future collaboration designed to reduce costs and improve mapping and data collection effectiveness for all users. This poster presentation will outline the toolset described below and utilize mobile devices to provide hands-on demonstrations to permittees.

King County produced and currently uses three working mobile collection applications. The StormMap App is the most extensive tool in production and it utilizes the WSF and ESRI ArcGIS Mobile software. The StormMap App enables mapping and data collection for all of the most common stormwater features required by the Permit, as well as additional attributes indexed in the WSF. King County also developed the Outfall and Discharge Point Screening Application to meet conveyance screening and mapping requirements found in the Permit. It enables staff to reclassify existing features as outfalls or discharge points according to the Washington State Department of Ecology's recently proposed definitions, add new points, retire obsolete points, and relocate existing points. The Water Quality Sampling Application allows users to track sample locations, sample identifiers, notes, instrument parameters, and lab results of water samples as well as in situ readings.

The Outfall and Discharge Point Screening Application and the Water Quality Sampling Application utilize ESRI Collector App, which is currently available for iOS and Android devices at

no cost. Users can also upload attachments, allowing for photos and lab results to reside in the spatial database for easy access.

The spatial database's data structure is based upon the standard terminology within WSF. All of the tools in this presentation feed into or interact with this database.

The quality control tools automate the resolution of common errors. Similarly, a more extensive review can be completed using the ArcMap project (mxd) that ensures data quality control by using well defined editing templates based on the WSF.

The field mapping guide contains standard operating procedures for field mapping and attribute collection, as well as screenshots and application set-up instructions.

Link to download this and other tools from the Washington Stormwater Center Website

[Municipal Technical Tools > Stormwater Infrastructure Framework](#)