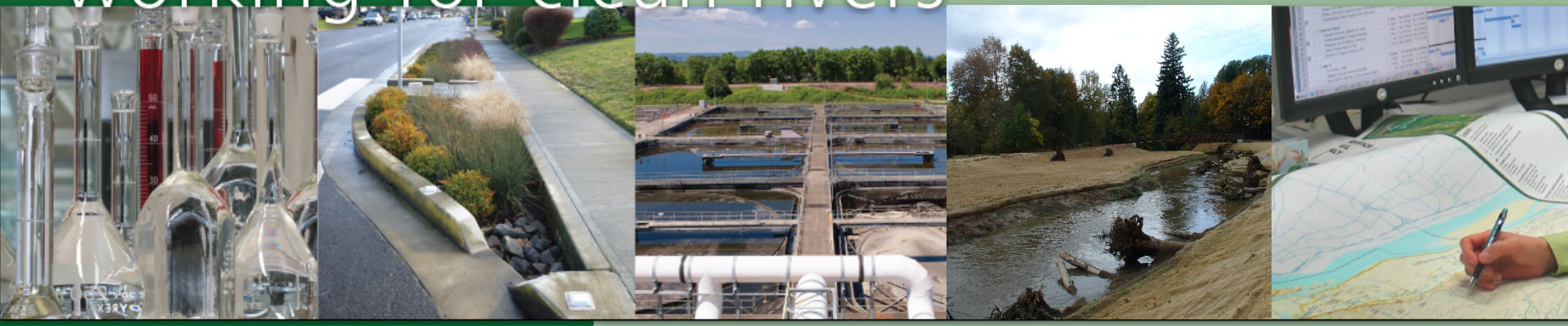
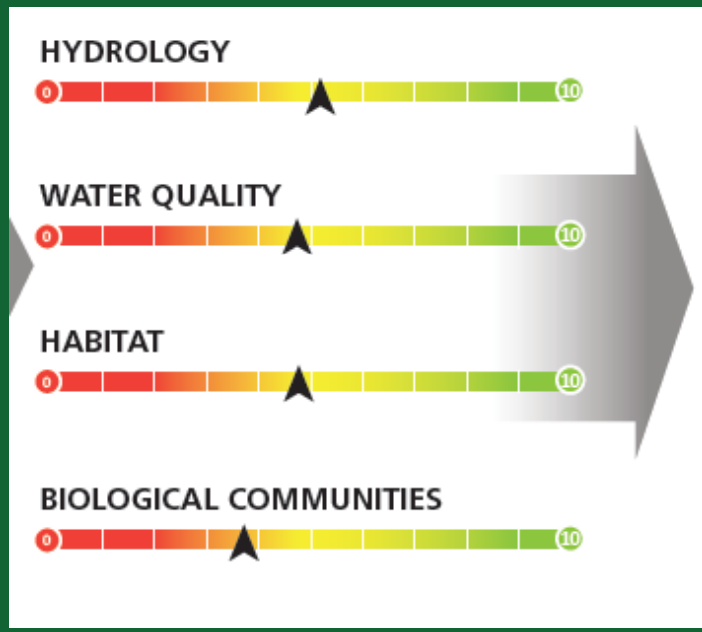
working for clean rivers





Watershed Health Index & Report Cards

Johnson Creek Science Symposium

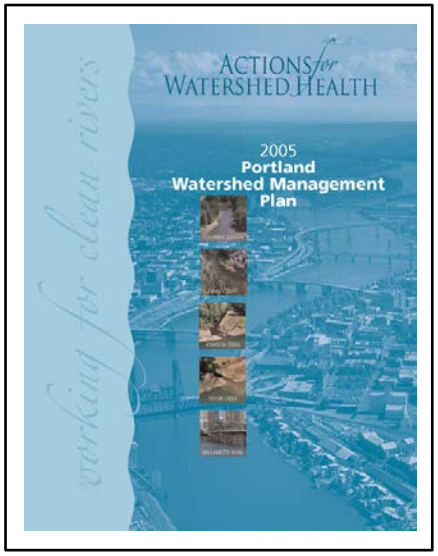
City of Portland Environmental Services

5/21/15

Overview

1. Big picture: Where this comes from
2. What's measured
3. Why use an index
4. How it's calculated (in 30 seconds!)
5. What it looks like for Johnson Creek
6. Next steps

Portland's Watershed Health Index: Big Picture



- *2005 Portland Watershed Management Plan* adopted by City Council
  - Goals: **Improvement in 4 areas**
    - Hydrology
    - Water Quality
    - Habitat
    - Biological Communities

- Implementation tasks:
  - Develop measures to track progress
  - **Develop citywide monitoring strategy that includes those measures**
  - Annual reporting (tie to measures)

Big Picture

2006-2014:

- Developed new monitoring program (PAWMAP)
  - Citywide, consistent across watersheds
  - Efficient, cost-saving way to collect data for a variety of purposes, including the Watershed Health Index

Big Picture

2006- 2014, continued

- 2010: started collecting data under PAWMAP methodology
- 2014: completed 4th year of data collection (= baseline)

- Meanwhile: developing Watershed Health Index
- Calculating Index scores with baseline data
- Develop scores based on data to create Watershed Report Cards

Watershed Health Index Measures

Physical Habitat

- Flood Plain Condition (% vegetation cover)
- Bank Condition (% of banks hardened)
- Tree Canopy (% canopy cover)
- Shallow Water Refugia (% of channel < 20 ft.)
- Stream Accessibility (% of streams accessible)
- Riparian Integrity (% canopy)
- Large Wood (m3/100m)
- Substrate Composition (% fines and % gravel in riffles)

Hydrology

- Effective Impervious Area (EIA)
- Stream Connectivity (% of stream piped)

Water Quality

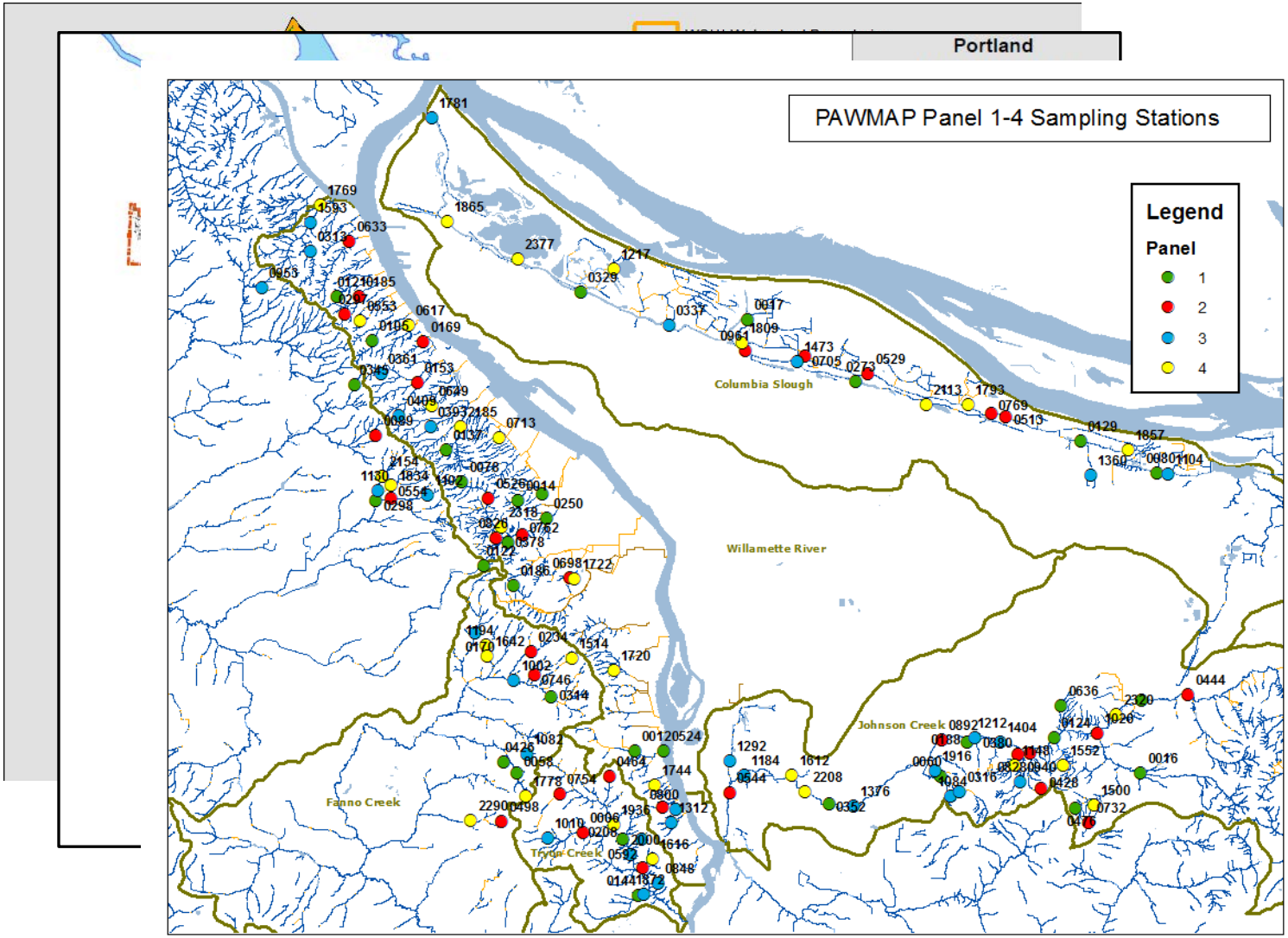
- Temperature
- Dissolved Oxygen
- TSS
- Dissolved and Total Metals (Cu, Hg, Pb, Zn)
- E.Coli
- Ammonia-N
- Total Phosphorus

Biological Communities

- Benthic Macroinvertebrates
- Fish
- Birds

Blue = from PAWMAP monitoring
Black = from other data sources

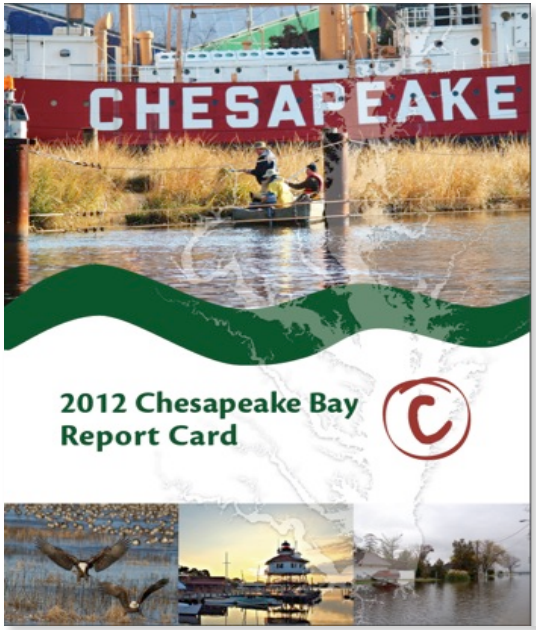
Where the data comes from

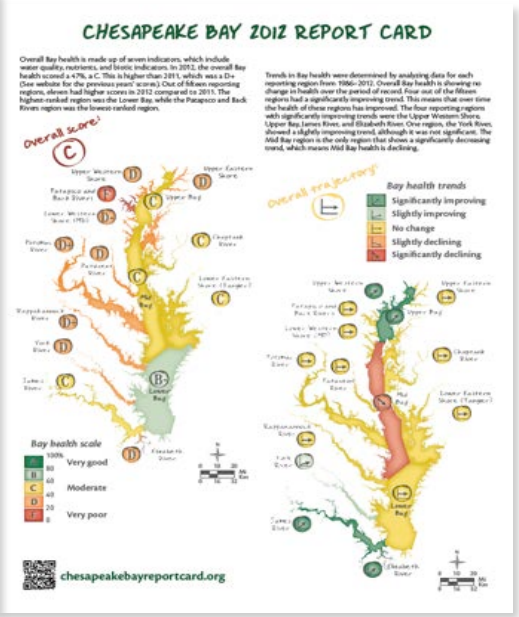


Index/Report Cards: Why?

- Give people the big picture about Portland's environmental health
- Highlight good news *and* persisting problems with our rivers and streams
- Connect projects and programs to the reasons we're doing them
- Help frame policy and budget questions
- Illustrate where we have impact vs. what are distributed solutions
- Inspire people to stay involved, take individual actions

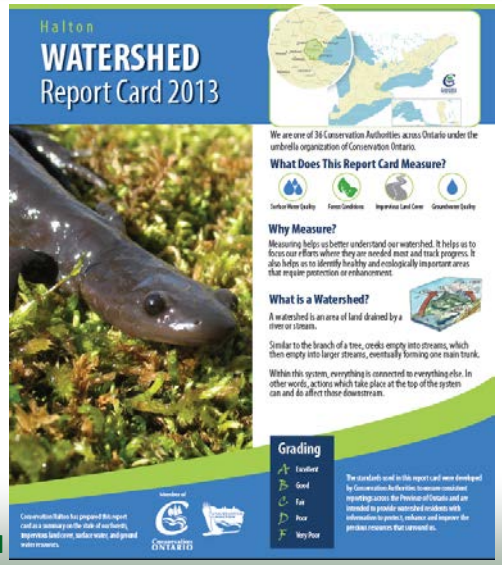
Portland isn't weird

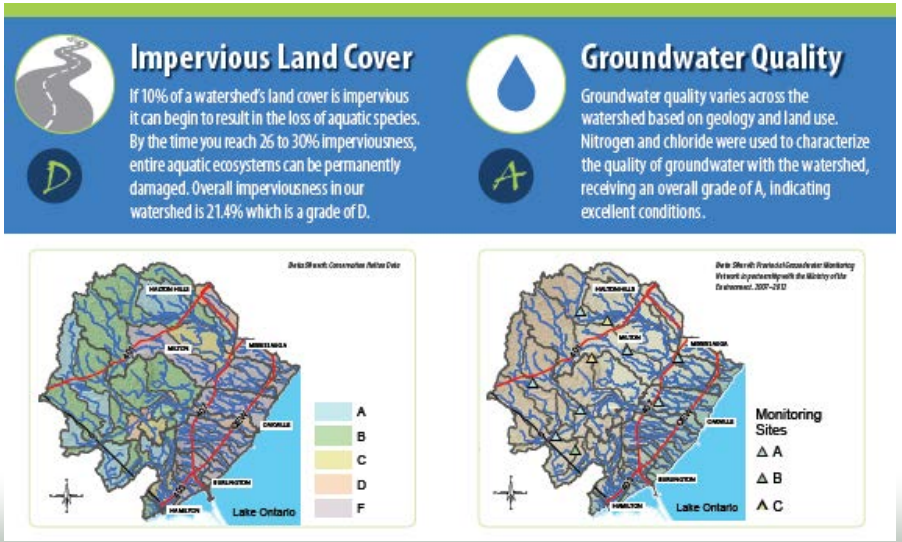




Many other cities and regions using indexes and report cards.

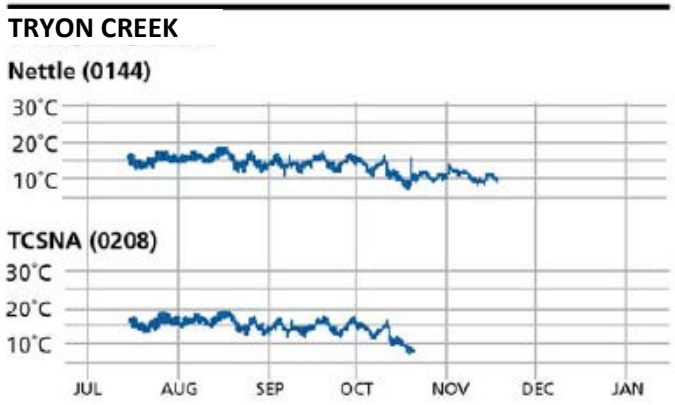
Similar, but can't compare scores across cities. It's a local tool.

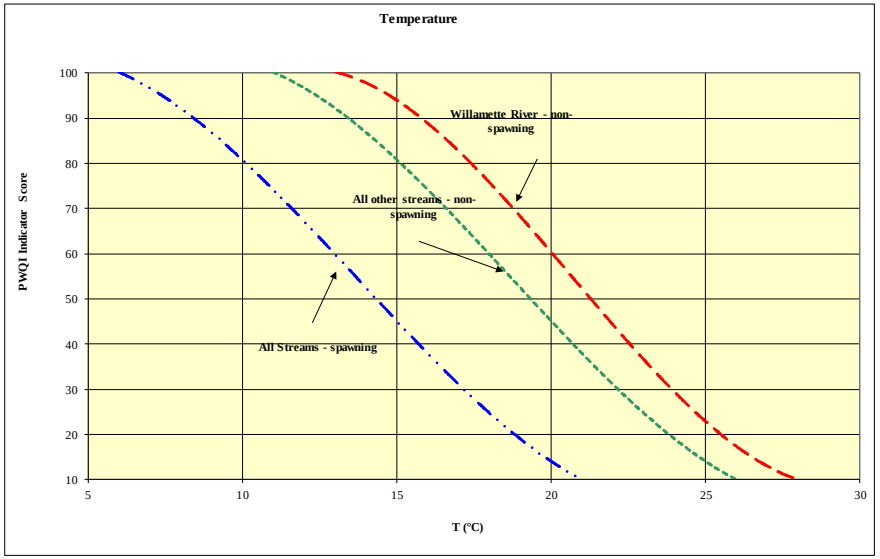




Index: converts data into a simple score

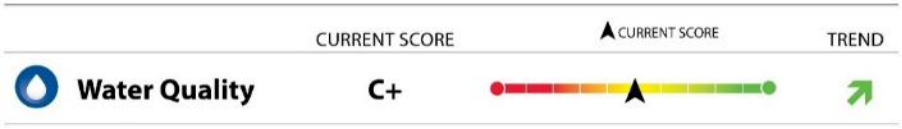
Time series plot of PAWMAP temperature data





WSHI Letter Grade Scale

		RANGE		
Very good	A+	8.50	10.00	Properly functioning conditions
	A	8.00	<8.50	
	A-	7.50	<8.00	
Fair	B	6.00	<0.00	*benchmark for regulated water quality indicators
	B-	5.50	<6.00	
	C+	5.00	<5.50	
	C	4.50	<5.00	
	C-	4.00	<4.50	
	D+	3.50	<4.00	
	D	>3.00	<3.50	
Very poor	D-	2.50	3.00	Not properly functioning conditions
	F	0.00	<2.50	



Watershed Report Cards

What do the scores mean?

WSHI Letter Grade Scale

		RANGE		
Very good	A+	8.50	10.00	Properly functioning conditions
	A	8.00	<8.50	
	A-	7.50	<8.00	
	B	6.00	<0.00	*benchmark for regulated water quality indicators
	B-	5.50	<6.00	
Fair	C+	5.00	<5.50	
	C	4.50	<5.00	
	C-	4.00	<4.50	
	D+	3.50	<4.00	
	D	>3.00	<3.50	
Very poor	D-	2.50	3.00	Not properly functioning conditions
	F	0.00	<2.50	

- Scales is for urban watersheds
- Goal is not straight As
- Intermediate and long-term goals: will vary by indicator
- Near-term goal: no overall decline

Index/Report Cards: Things to Remember

- It's a conversation starter
  - One tool in the toolbox: like GDP (not perfect!)
  - Not the level of detail we use internally for project decisions
  - Some things we can impact
- Not just about BES:
  - Other bureaus in the city
  - Other jurisdictions upstream
  - Individual Portlanders
- Not about quick changes (150 years?)

Watershed Report Cards

Columbia Slough		
Hydrology	**5.82**	**B-**
Effective Impervious Area	4.95	
Stream Connectivity	6.69	
Water Quality	**5.74**	**B-**
Dissolved Copper	7.00	
Dissolved Oxygen	5.88	
E. coli	7.62	
Total Mercury	4.00	
Ammonia-Nitrogen	9.14	
Total Phosphorus	5.88	

Fanno Creek		
Hydrology	**4.65**	**C**
Effective Impervious Area	4.24	
Stream Connectivity	5.06	
Water Quality	**5.48**	**C+**
Dissolved Copper	4.80	
Dissolved Oxygen	8.33	
E. coli	3.35	
Total Mercury	2.60	
Ammonia-Nitrogen	9.67	
Total Phosphorus	5.73	

Johnson Creek		
Hydrology	**7.33**	**B+**
Effective Impervious Area	7.53	
Stream Connectivity	7.13	
Water Quality	**5.05**	**C+**
Dissolved Copper	6.90	
Dissolved Oxygen	8.33	
E. coli	3.96	
Total Mercury	1.40	
Ammonia-Nitrogen	9.77	
Total Phosphorus	6.30	

Tryon Creek		
Hydrology	**6.02**	**B**
Effective Impervious Area	5.24	
Stream Connectivity	6.79	
Water Quality	**6.07**	**B**
Dissolved Copper	5.70	
Dissolved Oxygen	8.56	
E. coli	5.26	
Total Mercury	1.80	
Ammonia-Nitrogen	9.89	
Total Phosphorus	6.60	
Total Suspended Solids	5.72	
Temperature	5.01	
Habitat	**6.51**	**B**
Tree Canopy	10.00	
Floodplain Condition	10.00	
Bank Condition (Hardening)	10.00	
Stream Accessibility	1.55	
Riparian Integrity	6.90	
Large Wood	4.80	
Substrate Composition	2.30	
Biological Communities (Fish and Wildlife)	**4.14**	**C-**
Fish	1.99	
Macroinvertebrates	5.70	
Birds	4.73	

Willamette Mainstem		
Hydrology	**3.43**	**D**
Effective Impervious Area	3.43	
Stream Connectivity	N/A	
Water Quality	**6.72**	**B**
Copper, Dissolved	8.30	
Dissolved Oxygen	9.14	
E. coli	9.06	
Total Mercury	1.70	
Ammonia-Nitrogen	9.76	
Total Phosphorus	7.81	
Total Suspended Solids	6.01	
Temperature	2.00	
Habitat	**4.23**	**C-**
Tree Canopy	3.00	
Floodplain Condition	2.80	
Bank Condition (Hardening)	0.00	
Stream Accessibility	10.00	
Shallow Water Refugia*	4.08	
Riparian Integrity	2.40	
Biological Communities (Fish and Wildlife)	**UD**	
Fish	UD	
Macro Invertebrates	N/A	
Birds	UD	

Willamette Tributaries		
Hydrology	**3.49**	**D**
Effective Impervious Area	3.79	
Stream Connectivity	3.19	
Water Quality	**6.13**	**B**
Dissolved Copper	5.60	
Dissolved Oxygen	8.74	
E. coli	6.14	
Total Mercury	1.70	
Ammonia-Nitrogen	9.92	
Total Phosphorus	6.57	
Total Suspended Solids	4.79	
Temperature	5.57	
Habitat	**6.32**	**B**
Tree Canopy	10.00	
Floodplain condition	N/A	
Bank Condition (Hardening)	10.00	
Stream Accessibility	0.72	
Riparian Integrity	8.10	
Large Wood	4.80	
Substrate Composition	6.50	
Biological Communities (Fish and Wildlife)	**4.20**	**C-**
Fish	1.33	
Macroinvertebrates	5.90	
Birds	5.37	

Johnson Creek

Johnson Creek		
Hydrology	**7.33**	**B+**
Effective Impervious Area	7.53	
Stream Connectivity	7.13	
Water Quality	**5.05**	**C+**
Dissolved Copper	6.90	
Dissolved Oxygen	8.33	
E. coli	3.96	
Total Mercury	1.40	
Ammonia-Nitrogen	9.77	
Total Phosphorus	6.30	
Total Suspended Solids	1.93	
Temperature	1.85	
Habitat	**4.73**	**C**
Tree Canopy	6.90	
Floodplain Condition	6.00	
Bank Condition (Hardening)	1.80	
Stream Accessibility	3.58	
Riparian Integrity	5.60	
Large Wood	2.60	
Substrate Composition	6.60	
Biological Communities (Fish and Wildlife)	**3.65**	**D+**
Fish	2.49	
Macroinvertebrates	4.30	
Birds	4.17	

www.portlandoregon.gov/bes/ReportCards

Portland Watershed Report Cards

Manage Slideshow

Edit Description

Healthy rivers, streams, forests and wetlands help keep our homes and neighborhoods safe and livable. They help prevent flooding and protect the city's infrastructure. And, they provide a place for salmon and other wildlife to live and thrive in our city.

Water Quality

Manage Slideshow

Edit Description

Good water quality protects the health of people who boat, swim, and fish in Portland's rivers, play along the beaches, or explore our many smaller urban streams.

al for fish and wildlife that live in or
gh Portland. Many species, including
ensitive to even small amounts of
anges in water temperature.

in Portland's rivers and streams has
e the early 20th century, when raw
ther pollutants from industry and
drained directly
umbia Slough.

WATER QUALITY

300 MILES

Portland has about 300 miles of rivers and streams.

Johnson Creek Report Card

This is a summary of conditions in the Johnson Creek Watershed based on data from the 2015 Watershed Health Index. The scores are a snapshot of conditions across the entire watershed. Conditions can vary in smaller parts of the watershed.

Learn more about what's behind the watershed scores.

Learn more about the Johnson Creek Watershed Program and Projects

HYDROLOGY B+

The city and its partners have worked to improve hydrology in the main stem of Johnson Creek for more than 15 years. Environmental Services has restored more than 16,000 feet of stream bank, and work to restore the floodplain and stream banks continues. The stream connectivity score is fair because most of the creek is free-flowing and long lengths of smaller tributaries are not piped as many streams are in other areas of the city. That's because of the newer development standards in place as east Portland grew, and recent projects to remove or replace culverts.

	Johnson Creek Hydrology Average Score	F D A A+ C	7.3
?	Effective impervious area	A	7.5
?	Stream connectivity	A	7.1

WATER QUALITY INDICATORS

Many organizations and government agencies throughout the Willamette basin monitor water quality for a variety of purposes. In Portland, water quality monitoring supports a broad set of responsibilities including watershed protection, wastewater treatment, stormwater management, and sewer construction and maintenance.

Ammonia-nitrogen

Ammonia-nitrogen is the amount of inorganic, dissolved ammonia in water measured in milligrams per liter (mg/L).

Sources include sewage, fertilizers, animal waste, and some industrial uses. Ammonia-nitrogen dissolved in water can stunt aquatic species growth and damage gills. It's even more harmful when pH and water temperatures increase.

Dissolved copper

Dissolved copper is the fraction of copper remaining in a water sample after filtration and is measured in micrograms per liter (µg/L).

Sources include household plumbing, hull paint on boats, and automotive brakes.

Dissolved copper is toxic to aquatic species and can cause decreased growth, changes in olfactory response, and cell or organ damage.

Next steps

- Outreach to key partners and stakeholders
- Further analysis and messaging about scores
- Connections to citywide goals and policies
- Introduce this new tool to the community