

SURFACE WATER MONITORING

Blanchette Brook

PRIMARY WATER QUALITY CONCERNS

- **Water temperature:** Warm water temperatures increase the amount of food and oxygen that fish and other aquatic animals need.
- **Low oxygen concentrations:** Aquatic animals and plants are stressed or killed due to high water temperatures and the corresponding low dissolved oxygen.



WHAT ARE WE DOING?

- The Colonel Westbrook riparian planting (for shade) and stream channel restoration (for aeration) was implemented during September 2011.
- Blanchette Brook stormwater retrofits on Thomas Drive that will be installed during 2012.
- More frequent monitoring for temperature and dissolved oxygen will be implemented at Site 7 during the 2013 monitoring season.

WATER QUALITY CRITERIA INDICATORS

	Red	Orange	Yellow	Green
Oxygen	Below criterion for >21 days	Below criterion for 7-21 days	Below criterion for 1-7 days	Above criterion
Chloride, Metals, and Nutrients	Above criterion for >50% of samples	Above criterion for 30-50% of samples	Above criterion for 25% of samples and not during baseflow	Below criterion
Petroleum Hydrocarbons	Data collection is ongoing. Not enough data to make a determination.			
Stream-Dwelling Invertebrates	Determinations made by Maine DEP based on calculated probability of stream meeting criteria. The calculations are based on the number and types of invertebrates collected.			



Site	Oxygen	Chloride	Metals	Nutrients	Petroleum Hydrocarbons	Stream-Dwelling Invertebrates
S07						



SURFACE WATER MONITORING

Upper Main Stem

Primary Water Quality Concerns

- **Water temperature:** Warm water temperatures increase the amount of food and oxygen that fish and other aquatic animals need.
- **Low oxygen concentrations:** Aquatic animals and plants are stressed or killed due to high water temperatures and the corresponding low dissolved oxygen.
- **Metals (copper, cadmium, and lead):** Collect in street dust and wash into the stream during storm events. These metals collect in sediment and can harm fish and invertebrates.



Water Quality Criteria Indicators

	Red	Orange	Yellow	Green
Oxygen	Below criterion for >21 days	Below criterion for 7-21 days	Below criterion for 1-7 days	Above criterion
Chloride, Metals, and Nutrients	Above criterion for >50% of samples	Above criterion for 30-50% of samples	Above criterion for 25% of samples and not during baseflow	Below criterion
Petroleum Hydrocarbons	Data collection is ongoing. Not enough data to make a determination.			
Stream-Dwelling Invertebrates	Determinations made by Maine DEP based on calculated probability of stream meeting criteria. The calculations are based on the number and types of invertebrates collected.			

What are We Doing?

- The Colonel Westbrook riparian planting (for shade) and stream channel restoration (for aeration) was implemented during September 2011.
- Continuously monitoring for temperature and dissolved oxygen at Site 6 during 2012.
- Look at possible sources of metals during stormflow throughout the Main Stem watershed. Continue the targeted sweeping program.

Site	Oxygen	Chloride	Metals	Nutrients	Petroleum Hydrocarbons	Stream-Dwelling Invertebrates
S06						
S05						



SURFACE WATER MONITORING

Lower Main Stem

Primary Water Quality Concerns

- **Metals (copper, cadmium, and lead):** Collect in street dust and wash into the stream during storm events. These metals collect in sediment and can harm fish and invertebrates.
- Other contaminants (such as chloride) can make the metals more toxic to stream life.

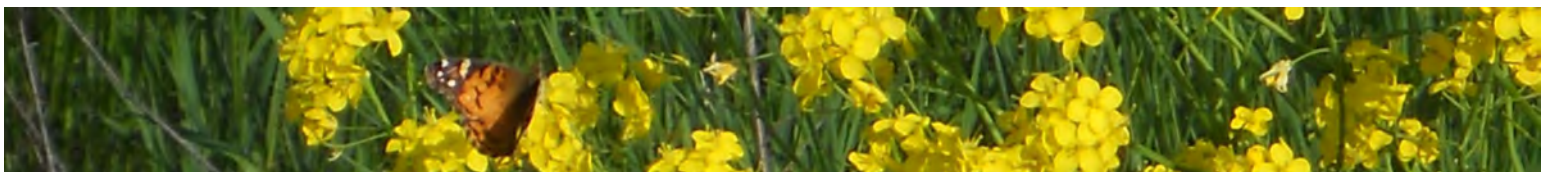


What are We Doing?

- Look at possible sources of metals during stormflow throughout the Main Stem watershed.
- Continue the targeted sweeping program.
- Dr. Lucille Benedict at USM (in partnership with LCWMD) has been awarded a grant from the Water Resources Research Institute to continue her study of metals and PAHs in street dust and stream sediments. LCWMD is supporting this effort by providing water quality data and database support.

Water Quality Criteria Indicators

	Red	Orange	Yellow	Green
Oxygen	Below criterion for >21 days	Below criterion for 7-21 days	Below criterion for 1-7 days	Above criterion
Chloride, Metals, and Nutrients	Above criterion for >50% of samples	Above criterion for 30-50% of samples	Above criterion for 25% of samples and not during baseflow	Below criterion
Petroleum Hydrocarbons	Data collection is ongoing. Not enough data to make a determination.			
Stream-Dwelling Invertebrates	Determinations made by Maine DEP based on calculated probability of stream meeting criteria. The calculations are based on the number and types of invertebrates collected.			



Site	Oxygen	Chloride	Metals	Nutrients	Petroleum Hydrocarbons	Stream-Dwelling Invertebrates
S02 & S08						

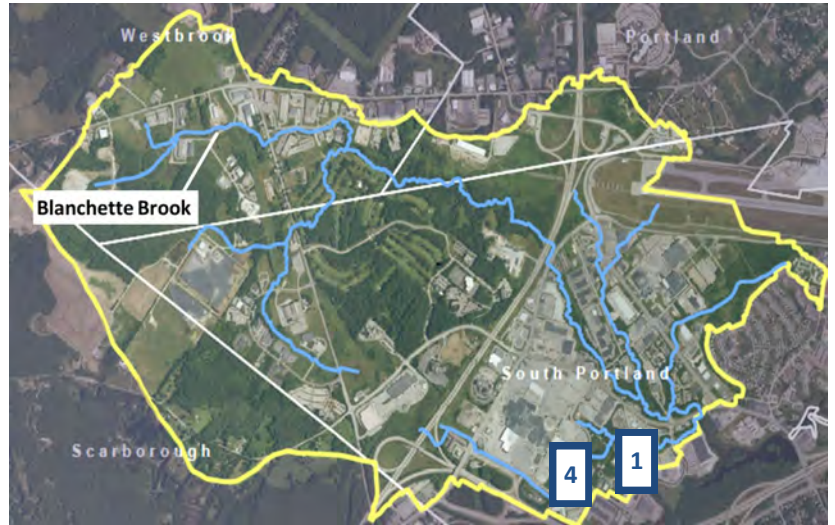


SURFACE WATER MONITORING

South Branch

Primary Water Quality Concerns

- **Water temperature:** Warm water temperatures increase the amount of food and oxygen that fish and other aquatic animals need.
- **Low oxygen concentrations:** Aquatic animals and plants are stressed or killed due to high water temperatures and the corresponding low dissolved oxygen.
- **Metals (copper, cadmium, and lead)** collect in street dust and wash into the stream during storm events. These metals collect in sediment and can harm fish and invertebrates.



What are We Doing?

- Catchment E-24 design and construction (2013-2015)
- Continue the targeted sweeping program.
- Dr. Lucille Benedict at USM will continue her study of metals and PAHs in street dust and stream sediments.
- Winter maintenance evaluation to identify possibilities for reduced salt use within the watershed.

Water Quality Criteria Indicators

	Red	Orange	Yellow	Green
Oxygen	Below criterion for >21 days	Below criterion for 7-21 days	Below criterion for 1-7 days	Above criterion
Chloride, Metals, and Nutrients	Above criterion for >50% of samples	Above criterion for 30-50% of samples	Above criterion for 25% of samples and not during baseflow	Below criterion
Petroleum Hydrocarbons	Data collection is ongoing. Not enough data to make a determination.			
Stream-Dwelling Invertebrates	Determinations made by Maine DEP based on calculated probability of stream meeting criteria. The calculations are based on the number and types of invertebrates collected.			

Site	Oxygen	Chloride	Metals	Nutrients	Petroleum Hydrocarbons	Stream-Dwelling Invertebrates
S04						Not Applicable (Wetland Conditions)
S01						



SURFACE WATER MONITORING

North Branch

Primary Water Quality Concerns

- **Water temperature:** Warm water temperatures increase the amount of food and oxygen that fish and other aquatic animals need.
- **Low oxygen concentrations:** Aquatic animals and plants are stressed or killed due to high water temperatures and the corresponding low dissolved oxygen.
- **Metals (copper, cadmium, and lead)** collect in street dust and wash into the stream during storm events. These metals collect in sediment and can harm fish and invertebrates.



What are We Doing?

- Darling Avenue Retrofits complete (2011).
- Fairchild & Texas Instruments Retrofits (2013-2014).
- Continue the targeted sweeping program. Dr. Lucille Benedict at USM will continue her study of metals and PAHs in street dust and stream sediments.
- Winter maintenance evaluation to evaluate salt use and snow storage alternatives to keep chloride out of the groundwater.

Water Quality Criteria Indicators

	Red	Orange	Yellow	Green
Oxygen	Below criterion for >21 days	Below criterion for 7-21 days	Below criterion for 1-7 days	Above criterion
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Stream-Dwelling Invertebrates	Determinations made by Maine DEP based on calculated probability of stream meeting criteria. The calculations are based on the number and types of invertebrates collected.			

Site	Oxygen	Chloride	Metals	Nutrients	Petroleum Hydrocarbons	Stream-Dwelling Invertebrates
S03						

