Temperature in Wisconsin

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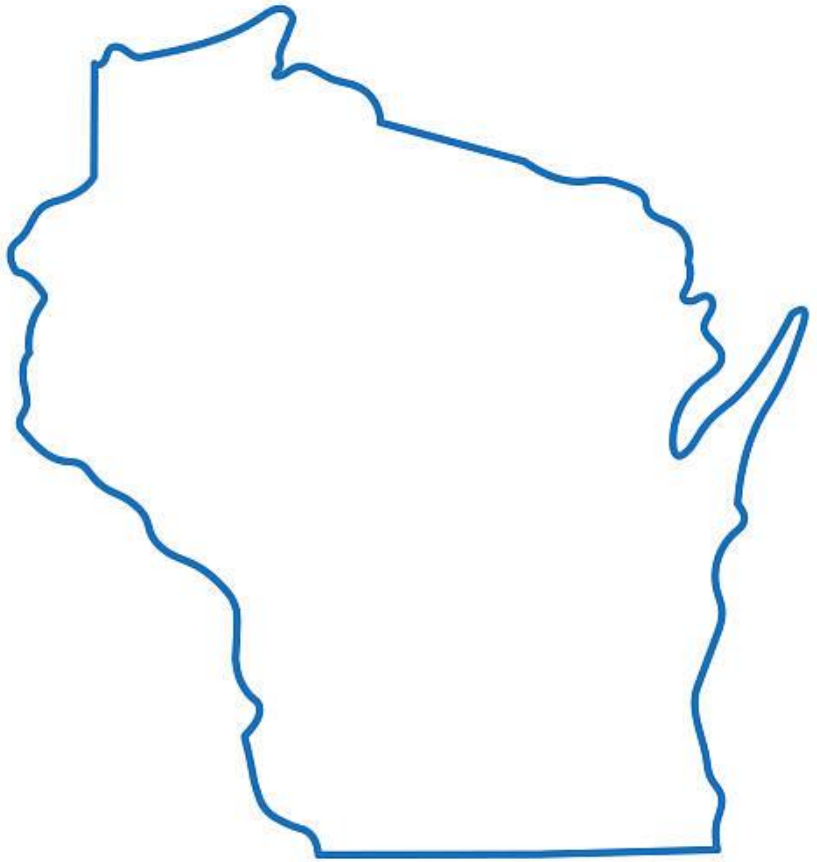
Wisconsin Overview

- Individual Permits: 908
  - 630 Municipal, 278 Industrial
- Facilities with Temperature Monitoring: 290
  - 136 Municipal, 154 Industrial
- Facilities with Temperature Limits: 66
  - 13 Municipal, 53 Industrial
- ~2800 general permits under 21 general permits
  - 290 under the Non-Contact Cooling Water GP



Temperature Criteria

- ch. NR 102, Subchapter II, Wis. Adm. Code
- Promulgated in 2010
- Numeric criteria for different waterbody types including
  - Great lakes (Superior, Michigan, Green Bay, Chequamegon Bay)
  - Inland lakes (North and South)
  - Rivers (Cold, Warm-Large, Warm-Small, Limited Forage Fish)
  - Wetlands (site-specific but limit may not exceed 120 F)
- Includes methodologies for site specific criteria

	Cold[4]		
Month	Ta[1]	SL[2]	A[3]
JAN	35	47	68
FEB	36	47	68
MAR	39	51	69
APR	47	57	70
MAY	56	63	72
JUN	62	67	72
JUL	64	67	73
AUG	63	65	73
SEP	57	60	72
OCT	49	53	70
NOV	41	48	69
DEC	37	47	69

Flexibilities for Temperature Compliance

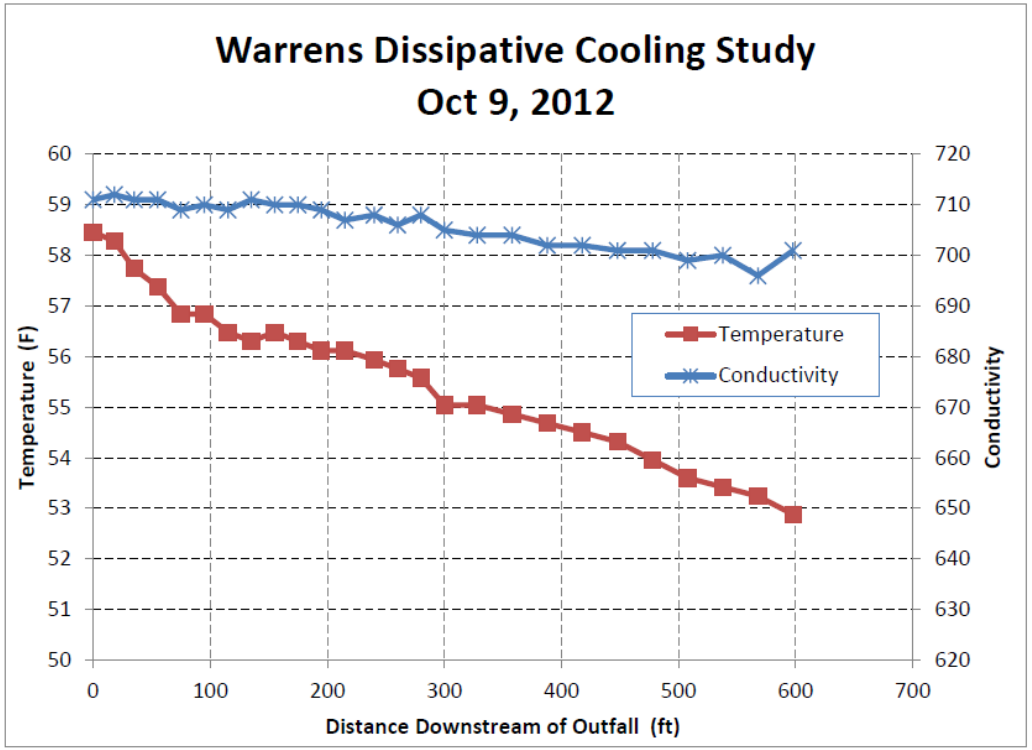
- Dissipative Cooling Studies
- Updated low flows from USGS
- Mixing Zones
- Real time limits
- Site Specific Ambient Temperature
- Alternative Effluent Limit (316a)
- Change in outfall design/location
- Cooling options (cooling tower, chiller, cooling ponds)

$$WQBEL = \left[\frac{(WQC - T_a)(Q_s + (1 - f)Q_e)}{Q_e}\right] + T_a$$

- WQBEL = Water Quality-Based Effluent **Limit**
- WQC = Water Quality **Criteria**
- T_a = Ambient **Temperature**
- Q_s = **Stream Flow** (Usually 25% of 7Q10)
- f = Fraction of water withdrawn from river
- Qe = **Effluent Flow**

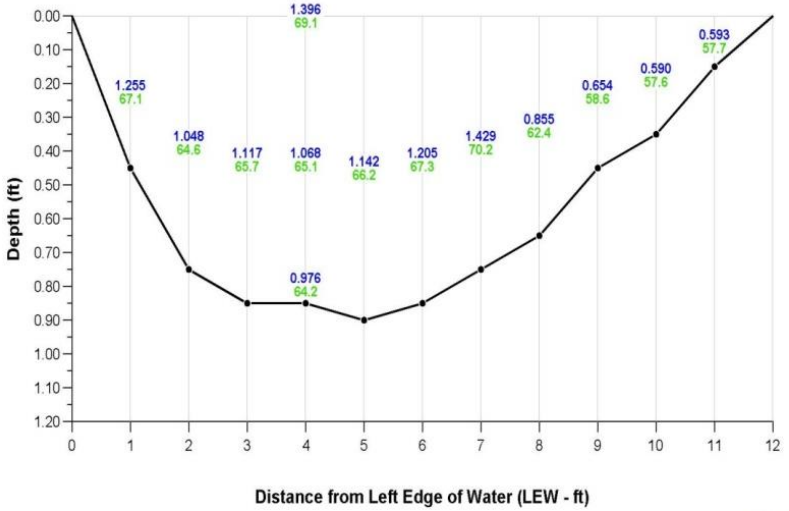
Dissipative Cooling (DC) Studies

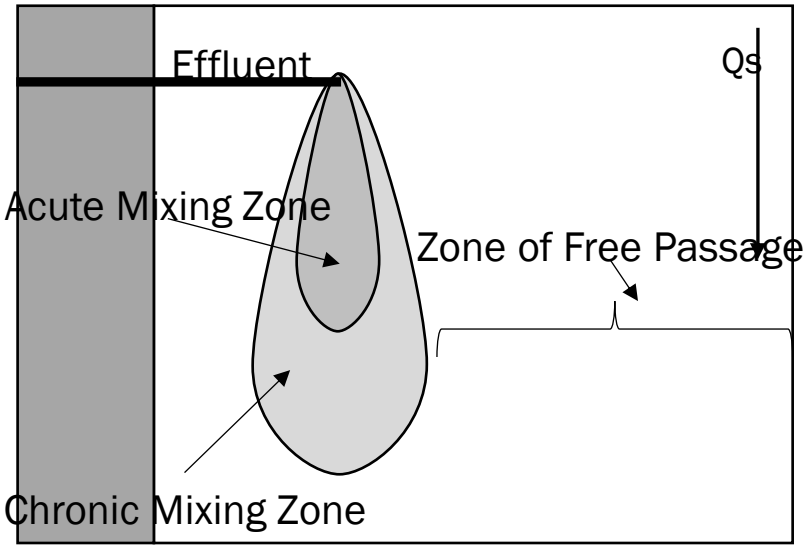
- Measures how much heat dissipates from outfalls
- Only available for municipalities
  - Based on the assumption that they are not the source of the thermal pollution
- Most common means of compliance for municipalities



Mixing Zone Studies

- Demonstration that the effluent mixes rapidly and the Qe percentage should be increased or that there is a clear zone of free passage
- Most common for industrial facilities facing thermal limits
- Mixing zones cannot impact spawning areas or migratory routes





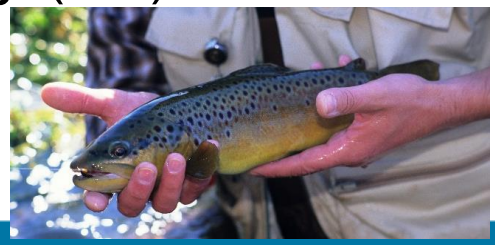
Alternative Effluent Limits (AELs – 316a)

Power Plants on large bodies of water

- Temperature data
- Thermal modeling
  - Plume size
- Biological data
  - Representative Important Species (RIS)
- Temperature tolerances of species

Cheese makers on small streams

- Temperature data
  - Area and magnitude of effluent impact on temperature
- Biological data
  - Representative Important Species (RIS)
- Index of Biotic Integrity (IBI) Scores



Opportunities for Collaboration Summary

- Biologists/Monitoring Staff
  - Evaluating DC Studies
  - Evaluating Mixing Zone Studies
  - Evaluating AELs
    - IBI's
    - Fish Identifications
    - RIS lists
    - Confirming Data
  - Surface water changes

- Standards Staff
  - Criteria
  - Rule changes
  - Surface water changes

CONNECT WITH US

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