

An orca is breaching the surface of the water, creating a splash. The background shows a dark blue sea and distant, hazy mountains under a dim sky.

King County Modeling Results

PSI: The Science of Puget Sound Water Quality

Current Conditions in 2014

Days Non-Compliant

Puget Sound

- 229 days non-compliant
- Maximum extent late August
- 16 areas of concern

Within Main Basin

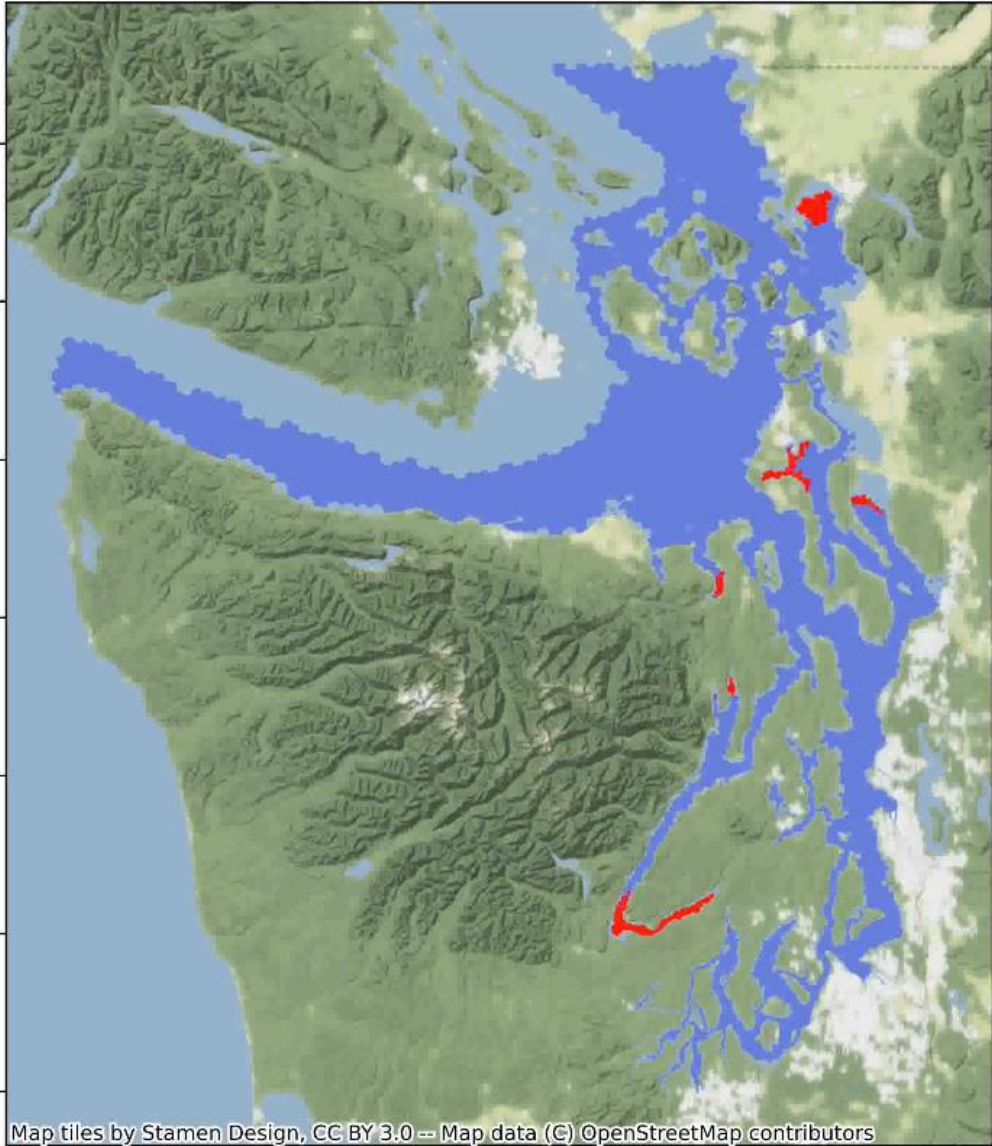
- 162 days non-compliant
- Maximum extent August
- Areas of concern: Liberty Bay, Dyes Inlet, Sinclair Inlet, and Quartermaster Harbor

2014 conditions
non-compliant nodes for January 06, 2014

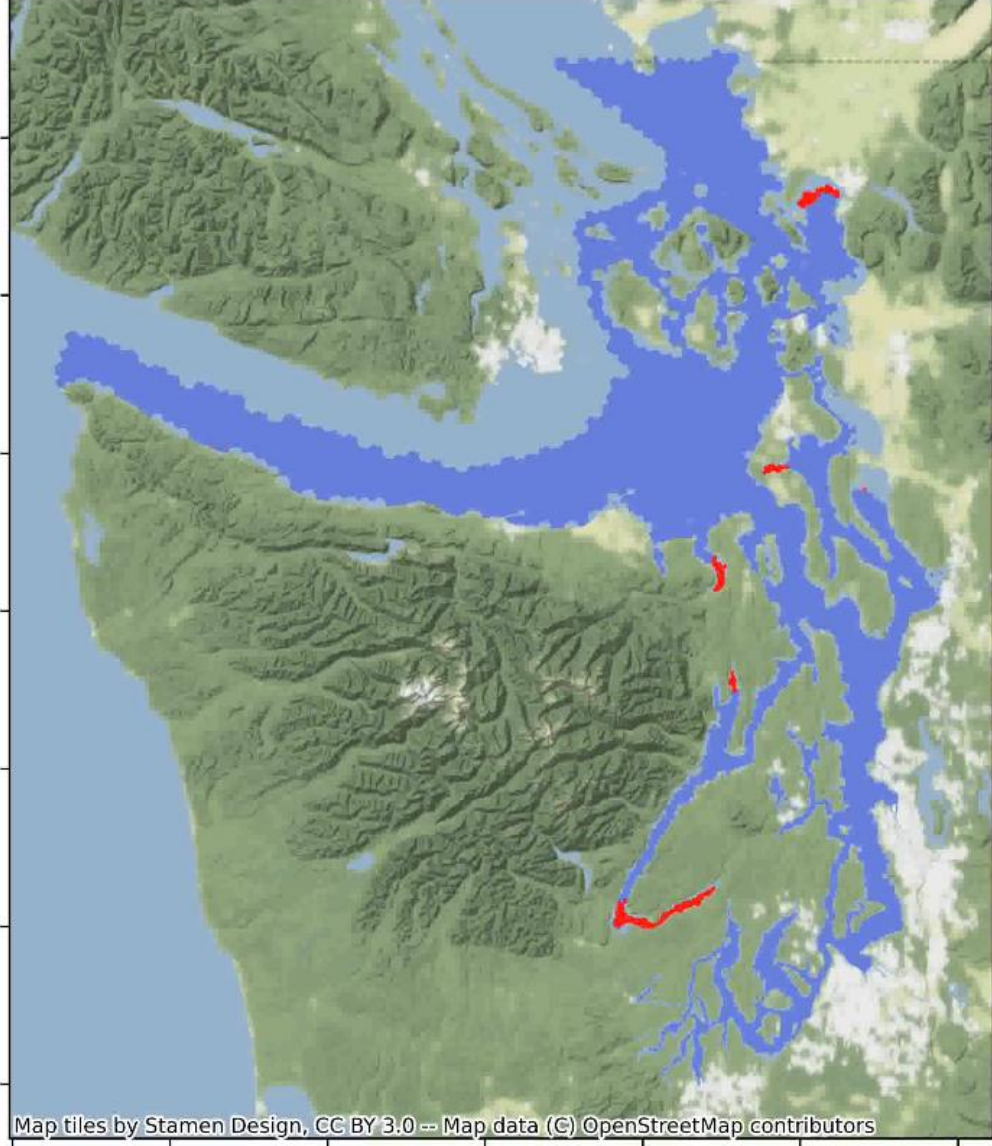


Hypoxia in 2014

Current Conditions



Reference

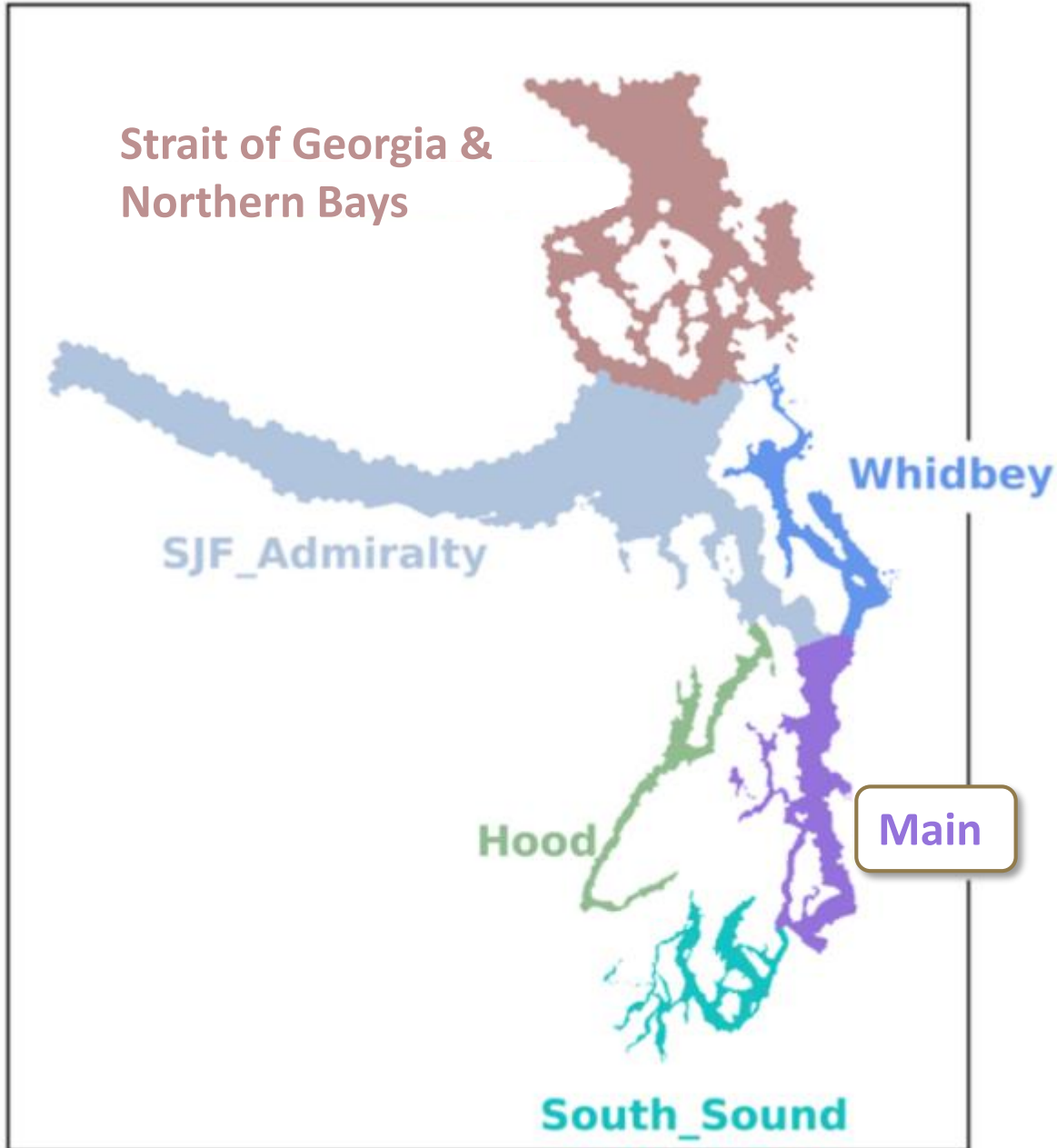


King County Scenarios

- West Point load reduced to 85%, South Plant and Brightwater TIN reduced to 3mg/l
- West Point, South Plant, Brightwater TIN reduced to 3mg/l (April – October only)
- West Point, South Plant, Brightwater load reduced to 85%
- West Point, South Plant, and Brightwater each individually:
 - Reduced to 50%
 - Reduced to 0%
- Green River
 - 50% reduction in pre-anthropogenic loading
 - 200% increase in pre-anthropogenic loading



Across the Scenarios



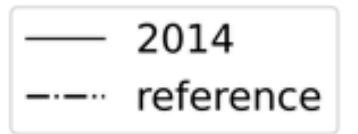
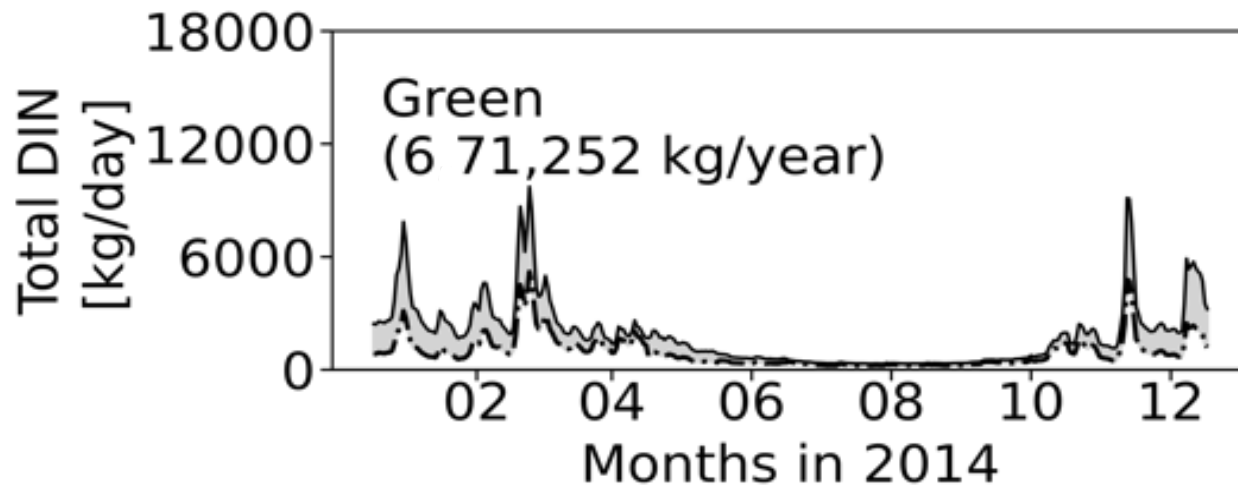
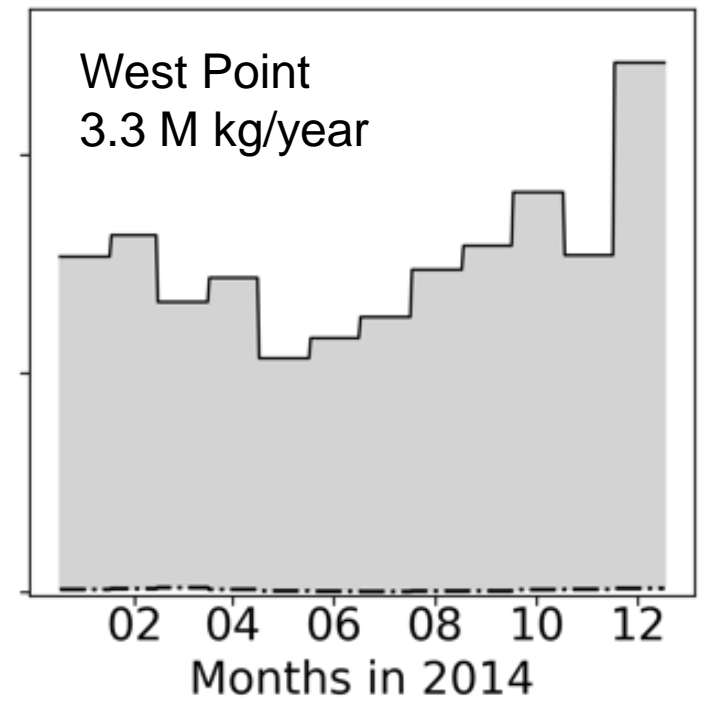
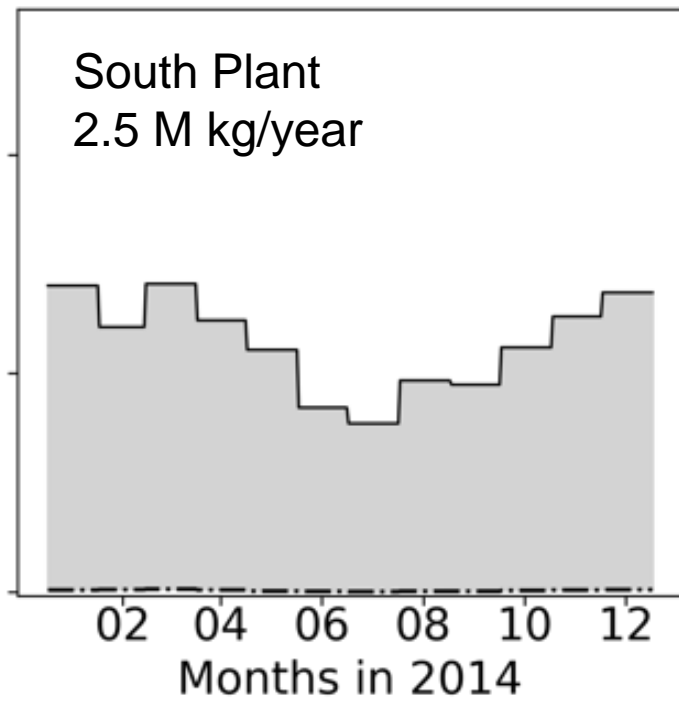
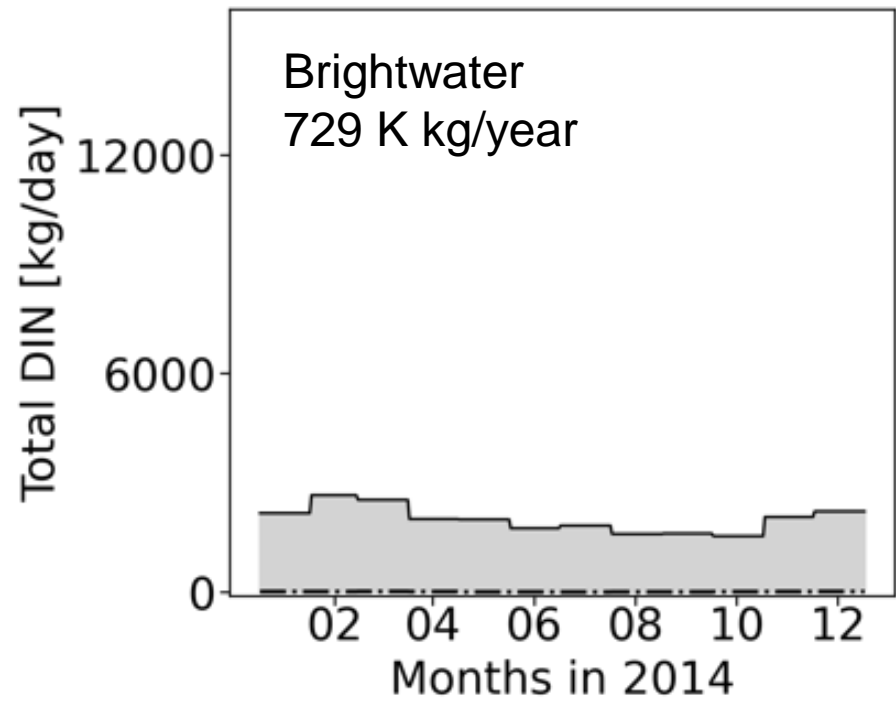
2014 conditions

Alter nitrogen concentrations (both $\text{NO}_2^-/\text{NO}_3^-$ and NH_4^+) for local wastewater treatment plants and rivers, but maintain flows

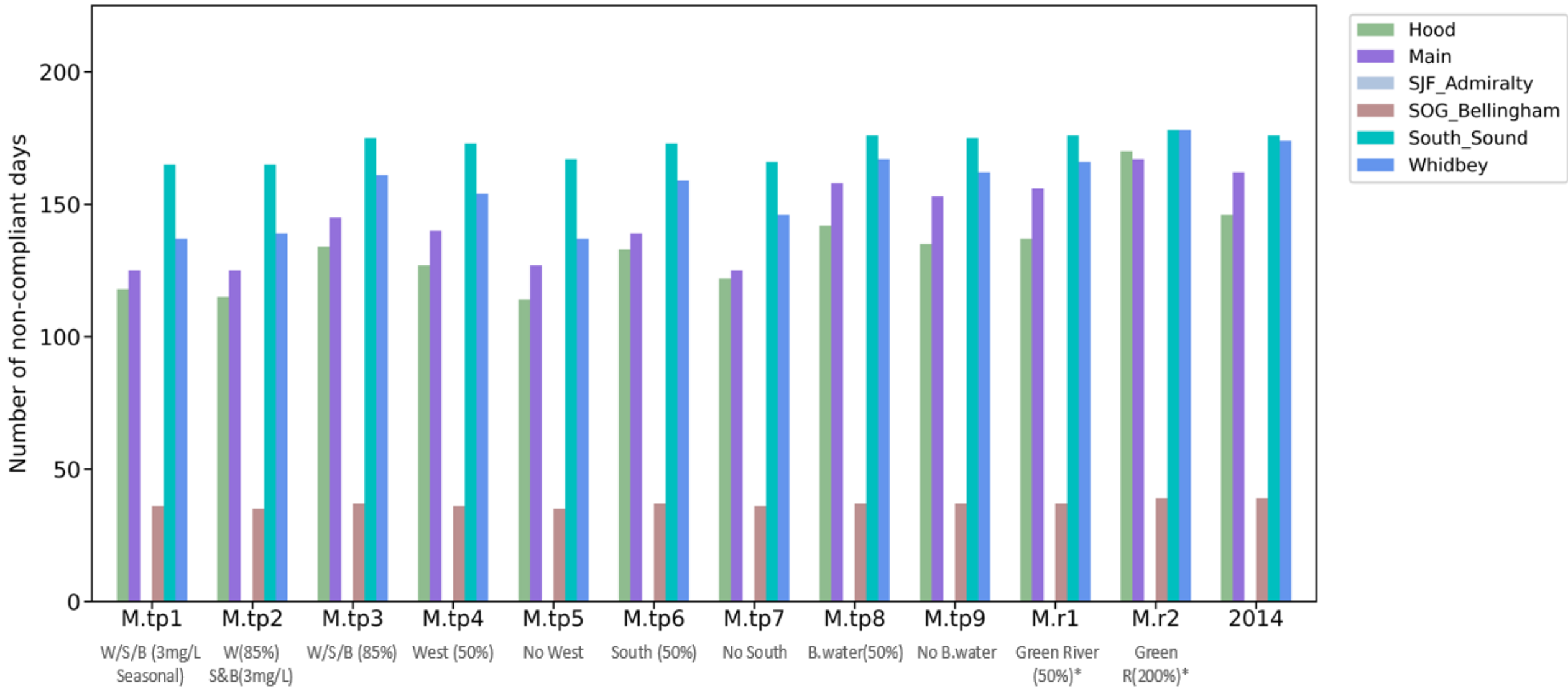
- Keep concentrations at ‘current conditions’ in other regions

Maintain other conditions (e.g., hydrodynamics, meteorology, biogeochemical kinetics, ocean exchange, etc.) at their ‘current conditions’

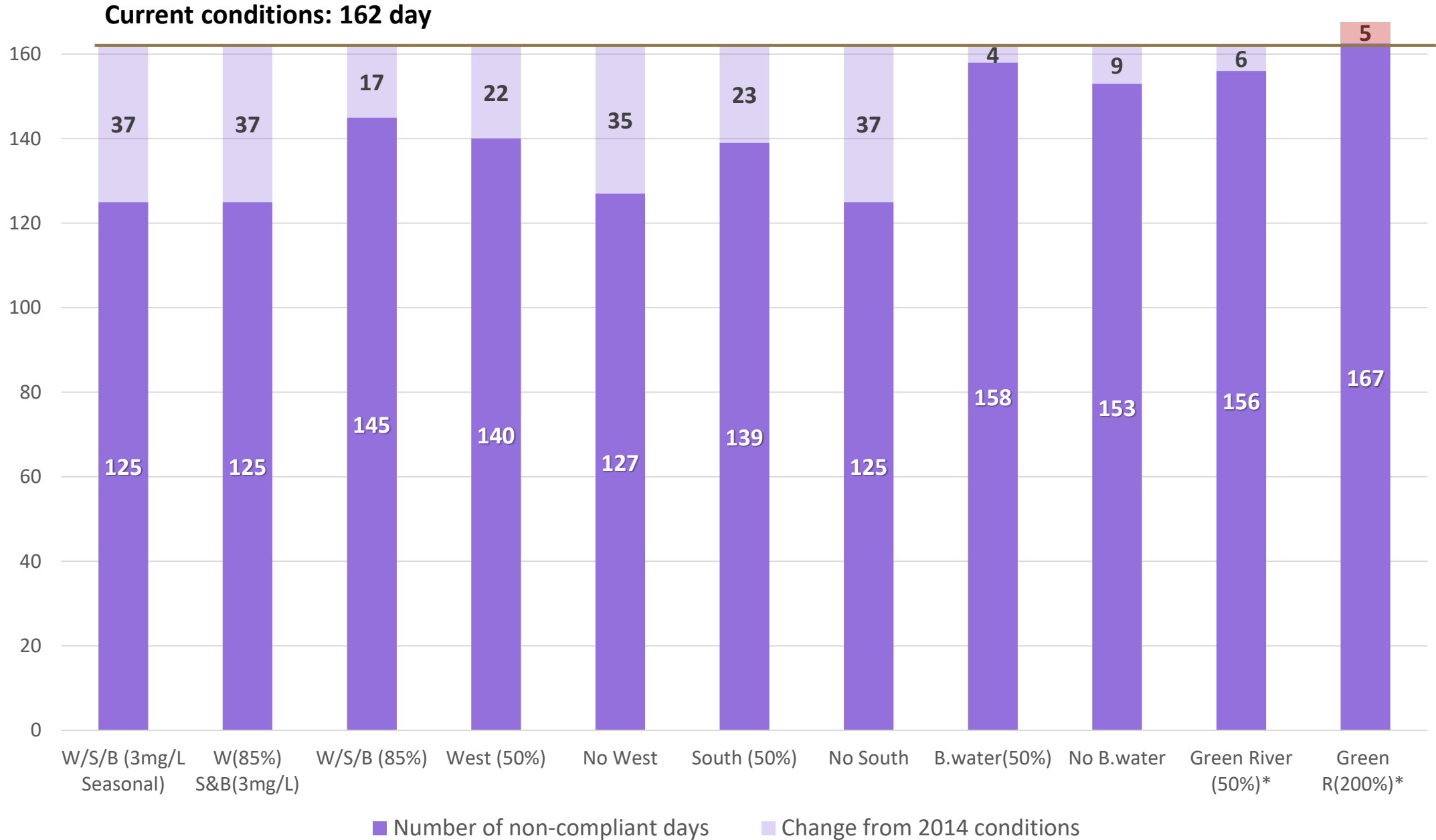
Green River and King County Wastewater Loads (2014)



Puget Sound | Non-Compliant Days



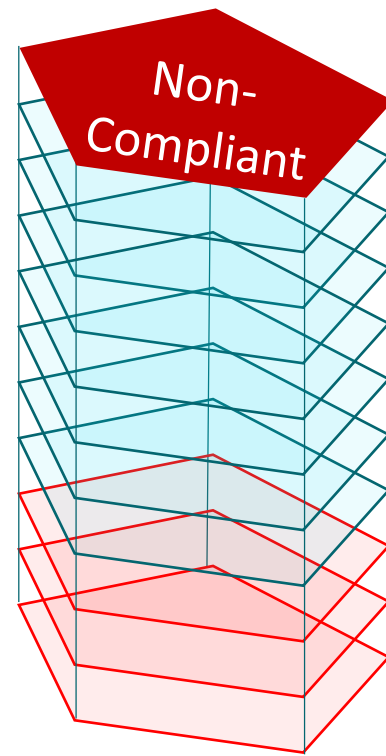
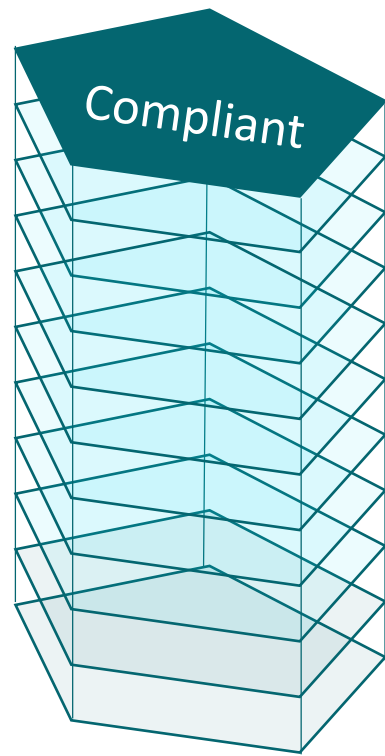
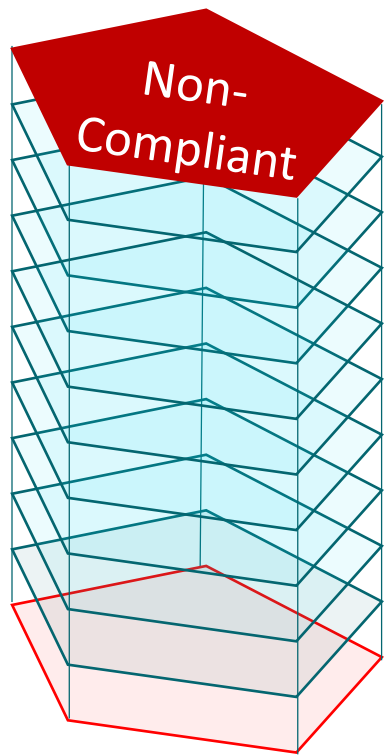
Main Basin | Non-Compliant Days



Supporting Line of Evidence

Volume Days Non-Compliant

	Day 1	Day 2	Day 3
Area	2 km ²	0 km ²	2 km ²
Volume	0.056 km ³	0 km ³	0.13 km ³



Puget Sound in 2014

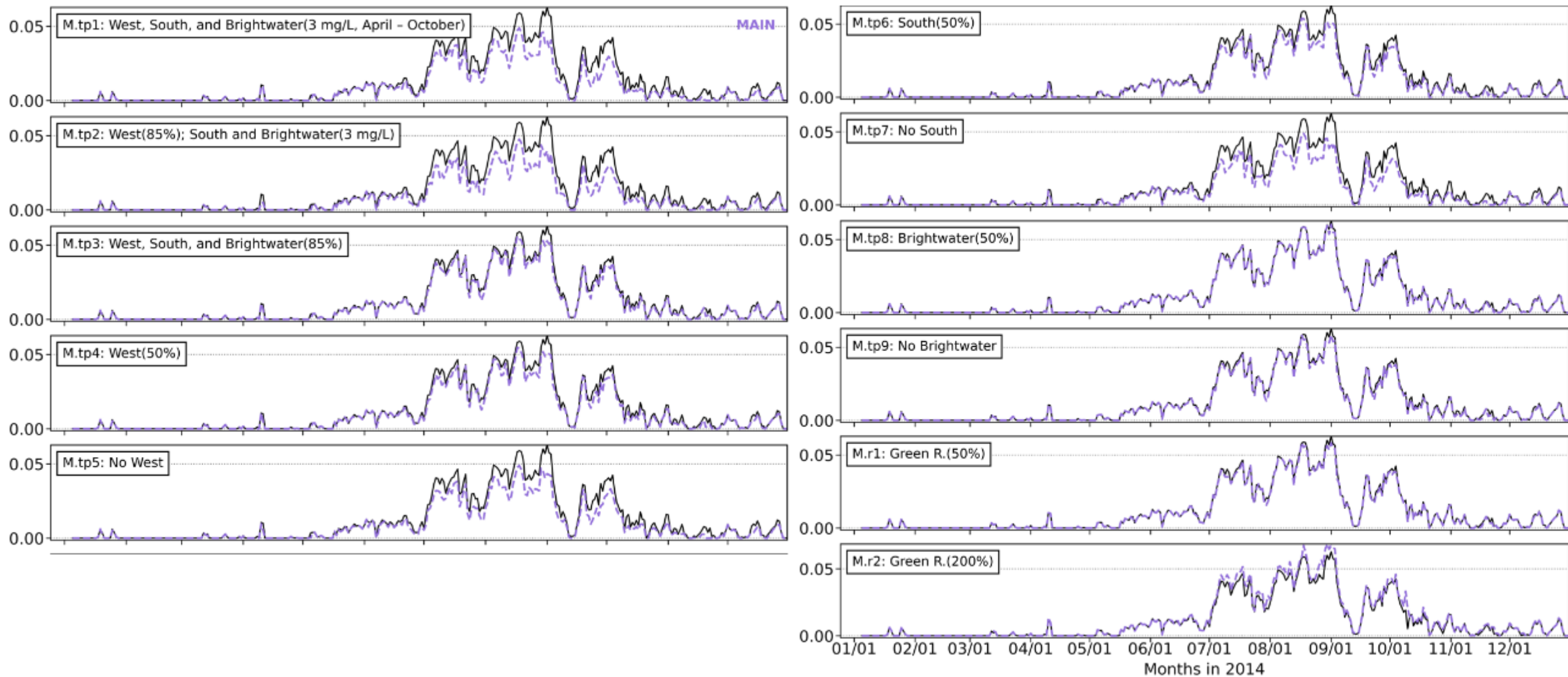
- 229 days
- 5% area
- 0.051% percent volume days

Main Basin in 2014

- 162 days
- 0.007 % percent volume days

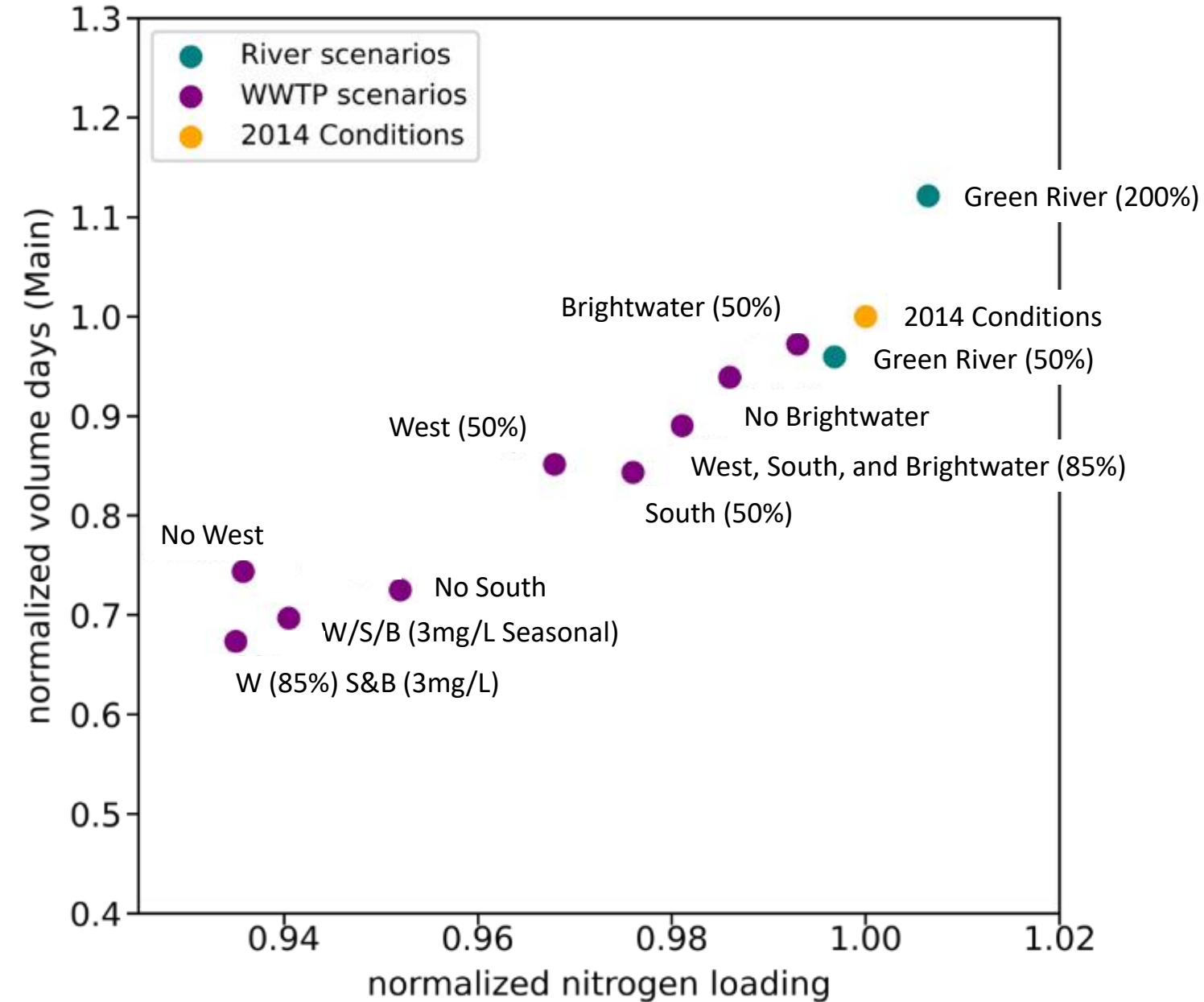
Main Basin

% Volume non-compliant ($\Delta < -0.25$)



— 2014 conditions
- - - Scenario

Puget Sound | Normalized Loading & Volume Days



King County | Scenarios

	2014 Cond.	M.tp1 W/S/B (3mg/L seasonal)	M.tp2 W (85%) S&B (3mg/L)	M.tp3 W/S/B (85%)	M.tp4 West (50%)	M.tp5 No West	M.tp6 South (50%)	M.tp7 No South	M.tp8 B.Water (50%)	M.tp9 No B.water	M.r1 Green River (50%)*	M.r2 Green River (200%)*
Loading (kg/year)												
King County WWTPs	6,575,493	3,496,580	3,213,616	5,595,965	4,914,730	3,253,303	5,333,587	4,091,129	6,212,796	5,850,129	6,575,492	6,575,492
Green River	671,252	671,252	671,252	671,252	671,252	671,252	671,252	671,252	671,252	671,252	504,678	1,004,409
Days Non-Compliant												
Main	162	125	125	145	140	127	139	125	158	153	156	167
Hood	146	118	115	134	127	114	133	122	142	135	137	170
SJF/Admiralty	0	0	0	0	0	0	0	0	0	0	0	0
SOG/Northern Bays	39	36	35	37	36	35	37	36	37	37	37	39
South Sound	176	165	165	175	173	167	173	166	176	175	176	178
Whidbey	174	137	139	161	154	137	159	146	167	162	166	178
ALL REGIONS	229	200	198	222	217	200	219	207	225	224	225	242
Percent Volume-Days Non-Compliant												
Main	0.0065	0.0045	0.0044	0.0058	0.0055	0.0048	0.0055	0.0047	0.0063	0.0061	0.0062	0.0073
Hood	0.0522	0.0331	0.0292	0.0433	0.0378	0.0282	0.0422	0.0344	0.0485	0.0458	0.0466	0.0735
SJF/Admiralty	0	0	0	0	0	0	0	0	0	0	0	0
SOG/Northern Bays	0.0012	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0011	0.0012	0.0011	0.0011	0.0012
South Sound	1.1457	0.7302	0.6325	0.9986	0.9381	0.7547	0.9079	0.7048	1.1065	1.0654	1.0934	1.2900
Whidbey	0.5009	0.2457	0.2483	0.3996	0.3290	0.2217	0.3891	0.3034	0.4681	0.4387	0.4544	0.6241
ALL REGIONS	0.0509	0.0296	0.0272	0.0428	0.0382	0.0290	0.0402	0.0314	0.0485	0.0462	0.0475	0.0603

**Percentage reduction of the anthropogenic or modern-day portion of river loading above and beyond estimated natural loadings*