

Appendix G – Alternative Pollutant Load Expressions to Facilitate Implementation of Concentration-based Allocations

The purpose of this appendix is to provide alternative, non-daily pollutant load expressions to facilitate implementation of the daily allocations. Daily allocations, as expressed in this TMDL, are on the basis of daily time-step concentrations (e.g., instantaneous receiving water concentrations represented in grab and field samples). Relevant guidance published by the U.S. Environmental Protection Agency (USEPA) pertaining to alternative load expressions is presented below:

Facilitating Implementation of Wasteload Allocations and Load Allocations

“TMDL submissions may include alternative, non-daily pollutant load expressions in order to facilitate implementation of the applicable water quality standards*. To facilitate implementation of such a load in water bodies where the applicable water quality standard is expressed in non-daily terms, it may be appropriate for the TMDL documentation to include, in addition to wasteload allocations expressed in daily time increments, wasteload allocations expressed as weekly, monthly, seasonal, annual, or other appropriate time increments. The TMDL and its supporting documentation should clearly explain that the non-daily loads and allocations are implementation-related assumptions of the daily wasteload allocations and are included to facilitate implementation of the daily allocations as appropriate in NPDES permits and nonpoint source directed management measures.”

From: U.S. Environmental Protection Agency, Memorandum, Nov. 15, 2006. Subject: Establishing TMDL "Daily" Loads in Light of the Decision by the U.S. Court of Appeals for the D.C. Circuit in Friends of the Earth, Inc. v. EPA, et al., No. 05-5015, and Implications, for NPDES Permits

* *emphasis added by Water Board staff*

In addition, non-daily and alternative load expressions of the concentration-based allocations may be needed to provide a meaningful connection with implementation efforts (such as nonpoint source best management practices) where averaging periods other than daily time steps, or expressions other than receiving water concentration allocations provide the basis for water quality-based control strategies. However, in accordance with USEPA guidance, all final TMDL submissions must contain a daily time-step load component; this requirement is satisfied by the proposed concentration-based TMDLs and allocations.

Table 1 and Table 2 present alternative, non-daily mass load expressions and estimated load reductions for nitrate to facilitate implementation of the TMDLs on an annual (Table 1) and seasonal (Table 2) basis. These alternative load expressions shall be considered implementation-related assumptions of the daily time-step concentration-based allocations.

Figure 1 and Figure 2 provide graphical, map-view context regarding the spatial distribution of existing nitrate-N annual and seasonal loads in TMDL project area stream reaches.

It is important to recognize that there is uncertainty associated with these mass load expressions, as they are in many cases based on limited amounts of instantaneous flow data, or NHDplus modeled flow data and as such reflect coarser temporal load representations (annual and seasonal loads). In the absence of reliable continuous, or daily flow data (i.e., USGS gages or hydrologic modeling), there

could be a high degree of error associated with estimated daily flows from limited amounts of instantaneous flows¹. According to USEPA, the potential for error is particularly pronounced in arid areas, areas with few USGS gages, and areas where flows are highly modified by human activities (e.g., impoundments, regulated flows, and irrigation return flows)². Therefore, as noted previously, this TMDL and associated load allocation are based on instantaneous concentration-based loads – this satisfies the USEPA guidance to incorporate a daily time-step load. In addition, concentration is generally a more direct linkage to the protection of aquatic habitat, than annual or seasonal mass loads.

As more flow data, or better flow estimates become available in the future, these alternative, non-daily load expressions may be revised during reconsideration of the TMDL, scheduled for ten years after adoption.

Table 1. Alternative, non-daily (annual) load expressions and estimated annual load reductions to facilitate implementation of allocations.

Waterbody-Site	Estimated Mean Annual Flow (cfs)	Mean Annual Conc. (mg/L)	Mean Annual Existing Load (lbs.)	Mean Annual Loading Capacity (lbs.)	Estimated Load Reduction Necessary (lbs.)	% Reduction Goal ^A	NO3-N Numeric Target Used for Loading Capacity (mg/L)
Salinas River @ Spreckels-309 SSP	420	1.85	1,529,907	8,269,769	0	0%	MUN (10)
Salinas River @ Hwy 1 - 309SBR	350	13.29	9,158,769	5,513,179	3,645,590	40%	Wet Season Biostim (8.0)
Old Salinas Riv-OLS-MON	36.2	18.68	1,331,464	570,220	761,244	57%	Wet Season Biostim (8.0)
Tembladero Slough-309TDW	36	27.2	1,928,037	567,070	1,360,967	71%	Wet Season Biostim (8.0)
Moro Cojo Slough-306MOR	6	5.3	62,614	94,512	0	0%	Wet Season Biostim (8.0)
Chualar Creek-309CRR	1.79	90.5	318,967	35,245	283,722	89%	MUN (10)
Quail Creek-309QUI	0.7	30.62	42,203	13,783	28,420	67%	MUN (10)
Esperanza Creek-ESZ-HWY	0.38	65.43	48,956	7,482	41,474	85%	MUN (10)
Blanco Drain-BLA-PUM	5.75	61.76	699,229	90,574	608,655	87%	Wet Season Biostim (8.0)
Lower Reclamation Canal-309JON	16.66	13.28	435,629	262,427	173,202	40%	Wet Season Biostim (8.0)
Upper Reclamation Canal-309ALG	10.47	16.48	339,741	164,923	174,818	51%	Wet Season Biostim (8.0)
Natividad Creek-309NAD	0.99	21.3	41,520	15,594	25,926	62%	Wet Season Biostim (8.0)
Gabilan Creek-309GAB	8.22	10.49	169,782	129,481	40,301	24%	Wet Season Biostim (8.0)
Alisal Creek – 309HRT & 309UAL	2.3	23.9	106,825	35,757	71,068	67%	Wet Season Biostim (8.0)
Alisal Slough – 309ASB	1.64	47.5	153,385	20,667	132,718	87%	Wet Season Biostim (8.0)

¹ U.S. Environmental Protection Agency, 2007. Options for Expression Daily Loads in TMDLs. June 22, 2007.

² *Ibid.*

Waterbody-Site	Estimated Mean Annual Flow (cfs)	Mean Annual Conc. (mg/L)	Mean Annual Existing Load (lbs.)	Mean Annual Loading Capacity (lbs.)	Estimated Load Reduction Necessary (lbs.)	% Reduction Goal ^A	NO3-N Numeric Target Used for Loading Capacity (mg/L)
Santa Rita Creek-309SRTA-36	4.9	12.16	105,110	69,151	35,959	34%	Wet Season Biostim (8.0)
Merrit Ditch-309MER	3.7	20.98	111,122	58,282	52,840	48%	Wet Season Biostim (8.0)
Gabilan Creek-GAB-OSR	5.16	1.48	15.037	101,600	0	0%	MUN (10)

^A Percent reduction goals are for informational purposes only, and should not be viewed as the TMDL.
See TMDL project report Section 5.5 – Hydrology for source information on flow estimates.

Table 2. Alternative, non-daily (dry season – May. 1 to Oct. 30) load expressions and estimated dry season load reductions to facilitate implementation of allocations.

Waterbody-Site	Estimated Mean Dry Flow (cfs)	Mean Dry Season Conc. (mg/L)	Mean Dry Existing Load (lbs.)	Mean Dry Loading Capacity (lbs.)	Estimated Load Reduction Necessary (lbs.)	% Reduction Goal ^A	NO3-N Numeric Target Used for Loading Capacity (mg/L)
Salinas River-309 DAV	5.98	17.24	101,497	8,242	93,255	92%	dry Season Biostim (1.4)
Salinas River-309SBR	26.3	19.02	492,471	36,249	456,222	93%	dry Season Biostim (1.4)
Salinas River-309SAC	57.33	1.59	88,664	564,412	0	0%	MUN
Old Salinas River-OLS-MON	7.08	19.47	135,711	21,608	114,103	84%	dry Season Biostim (3.1)
Tembladero Slough-309TEH	14.2	28.72	401,501	89,471	312,030	78%	dry Season Biostim (6.4)
Moro Cojo Slough-306MOR	4.15	4.5	18,386	6,946	11,440	62%	dry Season Biostim (1.7-TN)
Chualar Creek-309CRR	0.95	106.42	99,139	9,353	89,786	91%	MUN (10)
Quail Creek-309QUI	1.99	28.32	55,444	19,592	35,852	65%	MUN (10)
Blanco Drain-BLA-PUM	5.6	57.67	317,945	35,285	282,660	89%	dry Season Biostim (6.4)
Lower Reclamation Canal-309JON	3.73	7.72	28,349	23,502	4,847	17%	dry Season Biostim (6.4)
Upper Reclamation Canal-309ALG	2.4	18.06	42,667	15,122	27,545	65%	dry Season Biostim (6.4)
Natividad Creek-309NAD	0.33	25.91	8,418	650	7,768	92%	dry Season Biostim (2.0)
Gabilan Creek-309GAB	0.69	7.27	4,939	1,359	3,580	72%	dry Season Biostim (2.0)
Alisal Creek – 309HRT & 309UAL	0.5	23.1	11,371	984	10,387	91%	dry Season Biostim (2.0)
Alisal Slough-209ASB	1.29	42.13	53,505	16,256	37,249	70%	dry Season Biostim (6.4)
Espinosa Slough-309ESP	1.71	36.82	61,986	10,775	51,211	83%	dry Season Biostim (6.4)
Merrit Ditch-309MER	3.7	30.98	47,604	12,350	35,254	74%	dry Season Biostim (6.4)

^A Percent reduction goals are for informational purposes only, and should not be viewed as the TMDL.
See TMDL project report Section 5.5 – Hydrology for source information on flow estimates.

Figure 1. Spatial distribution of estimated mean annual existing nitrate-N loading in TMDL project area.

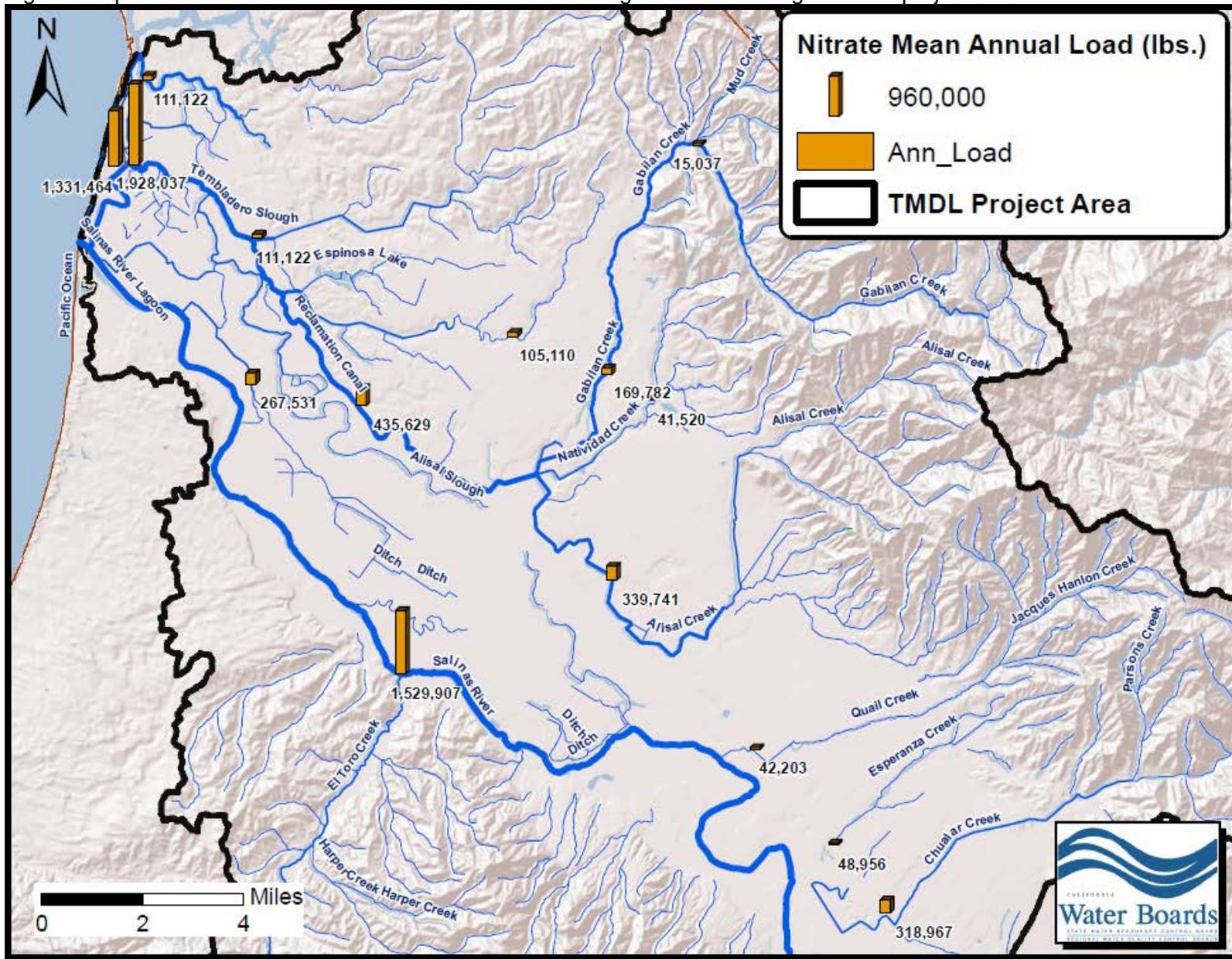


Figure 2. Spatial distribution of estimated dry season (May 1 – Oct 31) existing nitrate-N loading in TMDL project area.

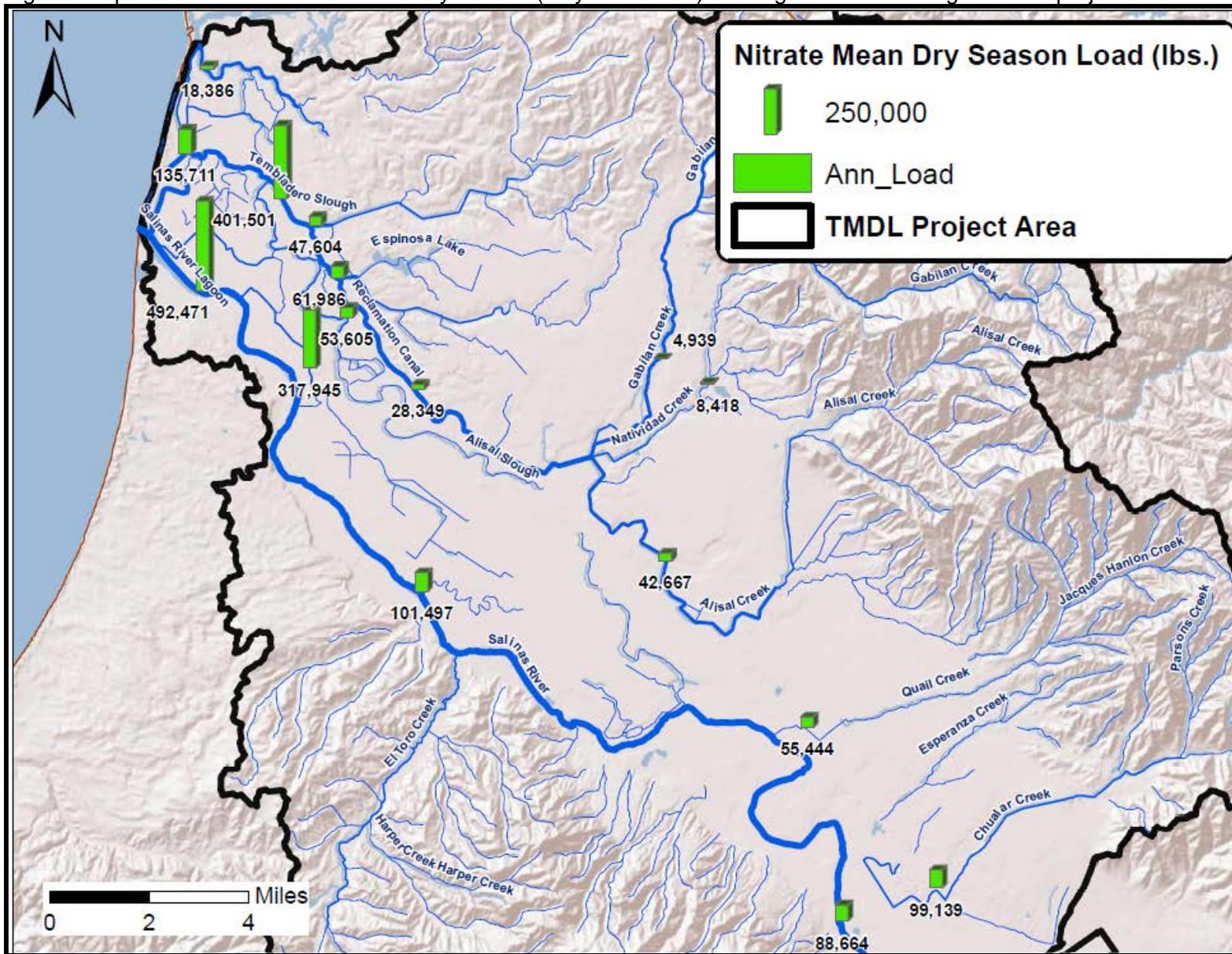


Figure 3. Monitoring sites and subwatersheds.

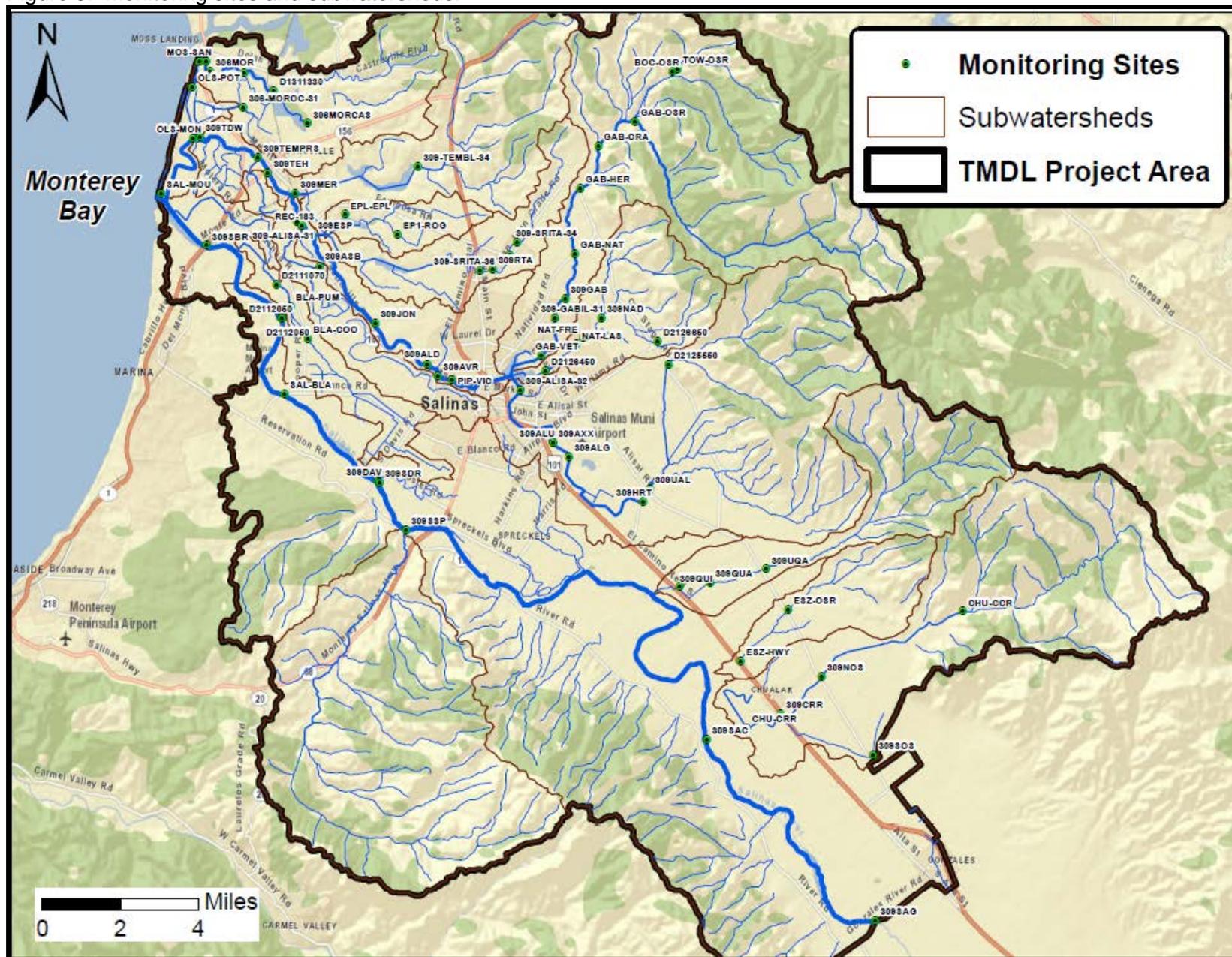


Figure 4. Estimated nitrogen loading risk based on Export Coefficient Model assessment.

