

This addendum is intended to provide additional information on the implications of alternative choices of the percent of waterbodies to target when establishing a depositional load ( $DL_{\%ECO}$ ) for a target ANC, either for the whole country or for acid-sensitivity categories. For the purposes here, we use the  $DL_{\%ECO}$ . This topic is introduced in Section 5.5 and is expanded on here for the four aggregation scenarios (one population, sensitive and less sensitive categories, ecoregions, and a cluster method based on log ANC), using a target ANC of 50  $\mu\text{eq/L}$  and three example percentiles (90%, 75%, and 50%). These percentiles represent the  $DL_{\%ECO}$  values for ANC 50  $\mu\text{eq/L}$  calculated to protect 90%, 75% and 50% of waterbodies under each aggregation scenario. While those waterbodies with CL less than the selected  $DL_{\%ECO}$  would not likely receive the same degree of protection as the targeted waterbodies, they would likely receive some benefit from the reductions in deposition necessary to meet the selected DL. Thus while they would not achieve an ANC of 50, they will see some improvement in the ANC. This section focuses on the expected level of protection that would be afforded these waterbodies with CL less than the  $DL_{\%ECO}$  for ANC 50  $\mu\text{eq/L}$  in each aggregation scenario.

### ONE POPULATION

This aggregation method looks at the entire country as one population of waterbodies and would allow a single  $DL_{\%ECO}$  for the whole population. The following table is identical to the table presented in Chapter 5 as Table 5-12. It is included here to provide detail for the figures A-1 through A-4.

Table 5-12. Comparison of percentage protection from ANC values less than 50  $\mu\text{eq/L}$  and less than 20  $\mu\text{eq/L}$  using DL that result when the US is considered one population.

	DL ( $\text{meq/m}^2/\text{yr}$ )	Total number of Sites in Analysis	Total Number of Sites protected from ANC <50	Total % Sites protected from ANC <50	Total Number of Sites protected from ANC <20	Total % Sites protected from ANC <20
DL 90% ANC 50	27	5280	4778	90	5145	97
DL 75% ANC 50	55	5280	3973	75	4394	83
DL 50% ANC 50	118	5280	2654	50	2947	56

Table 5-12 shows a comparison between the percent of waterbodies that would be protected from  $ANC < 50 \mu\text{eq/L}$  using 90%, 75% and 50%  $DL_{\%ECO}$  values for a target ANC of  $50 \mu\text{eq/L}$  for the one population approach (see Chapter 5 for discussion of one population aggregation method) and those that, while not protected from an  $ANC < 50 \mu\text{eq/L}$  would be protected from at least an  $ANC < 20 \mu\text{eq/L}$  under the  $DL_{\%ECO}$  values for a target ANC of  $50 \mu\text{eq/L}$ . These waterbodies would have an ANC between 20 and  $50 \mu\text{eq/L}$ . The selection of the  $DL_{\%ECO}$  values for a target ANC of  $50 \mu\text{eq/L}$  representing 90% of the waterbodies ( $27 \text{ meq/m}^2/\text{yr}$ ) would likely protect 97% of all waterbodies from having an  $ANC < 20 \mu\text{eq/L}$ . If the 75%  $DL_{\%ECO}$  values for a target ANC of  $50 \mu\text{eq/L}$  was chosen ( $55 \text{ meq/m}^2/\text{yr}$ ), 83% of waterbodies would likely be protected from an  $ANC < 20 \mu\text{eq/L}$  and if the 50%  $DL_{\%ECO}$  values for a target ANC of  $50 \mu\text{eq/L}$  was chosen ( $118 \text{ meq/m}^2/\text{yr}$ ) only 56% of waterbodies would likely be protected against an  $ANC < 20 \mu\text{eq/L}$ . This is an important distinction as severe degradation is likely to occur in lakes and streams with  $ANC < 20 \mu\text{eq/L}$ .

Figures A-1 through A-3 below show maps of those waterbodies with critical loads for a target ANC of  $50 \mu\text{eq/L}$  that are less than the  $DL_{\%ECO}$  values for a target ANC of  $50 \mu\text{eq/L}$  calculated to protect 90%, 75% and 50% of the population when the US is considered one population. Thus, the waterbodies shown on the map represent the 10%, 25% and 50% of waterbodies that would not be protected from  $ANC < 50 \mu\text{eq/L}$ . The intent is to determine what percentage of those remaining waterbodies, while not protected from  $ANC < 50 \mu\text{eq/L}$  would be protected from  $ANC < 20 \mu\text{eq/L}$  under each  $DL_{\%ECO}$  scenario. This is shown on the maps with blue and red dots representing those waterbodies with  $\geq ANC 20 \mu\text{eq/L}$  and  $< ANC 20 \mu\text{eq/L}$  respectively. Under each scenario, the waterbodies that would likely fall below  $ANC 20 \mu\text{eq/L}$  are spread throughout the US and varied in type and function. Figure A-4 is a graphical breakdown of the percent of waterbodies at each ANC level (50, 20-50, and less than  $20 \mu\text{eq/L}$ ) under the one population approach.

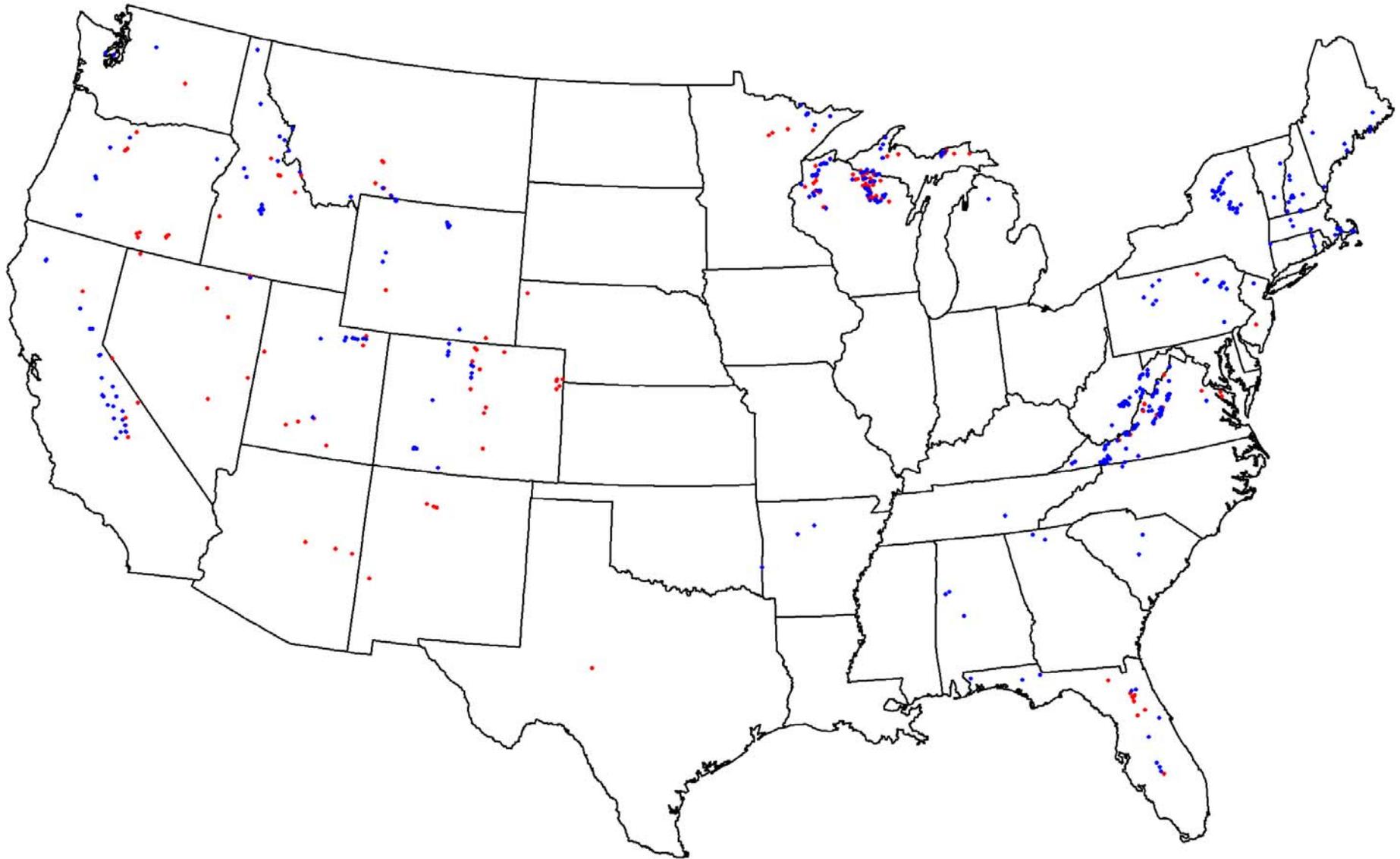


Figure A-1 Map of waterbodies with critical loads for an ANC limit of  $50 \mu\text{eq/L}$  that are less than the  $DL_{90\%ECO}$  values for the target ANC of  $50 \mu\text{eq/L}$  calculated to protect 90% of the population. The US is considered one population. The dots indicate the 10% of the population that would not likely achieve an ANC of  $50 \mu\text{eq/L}$ . Given that the country would meet the DL established for a target ANC of  $50 \mu\text{eq/L}$ , the red dots show waterbodies that would not likely be protected from an ANC of  $<20 \mu\text{eq/L}$  and blue dots show waterbodies that would likely be protected from ANC  $<20 \mu\text{eq/L}$ .

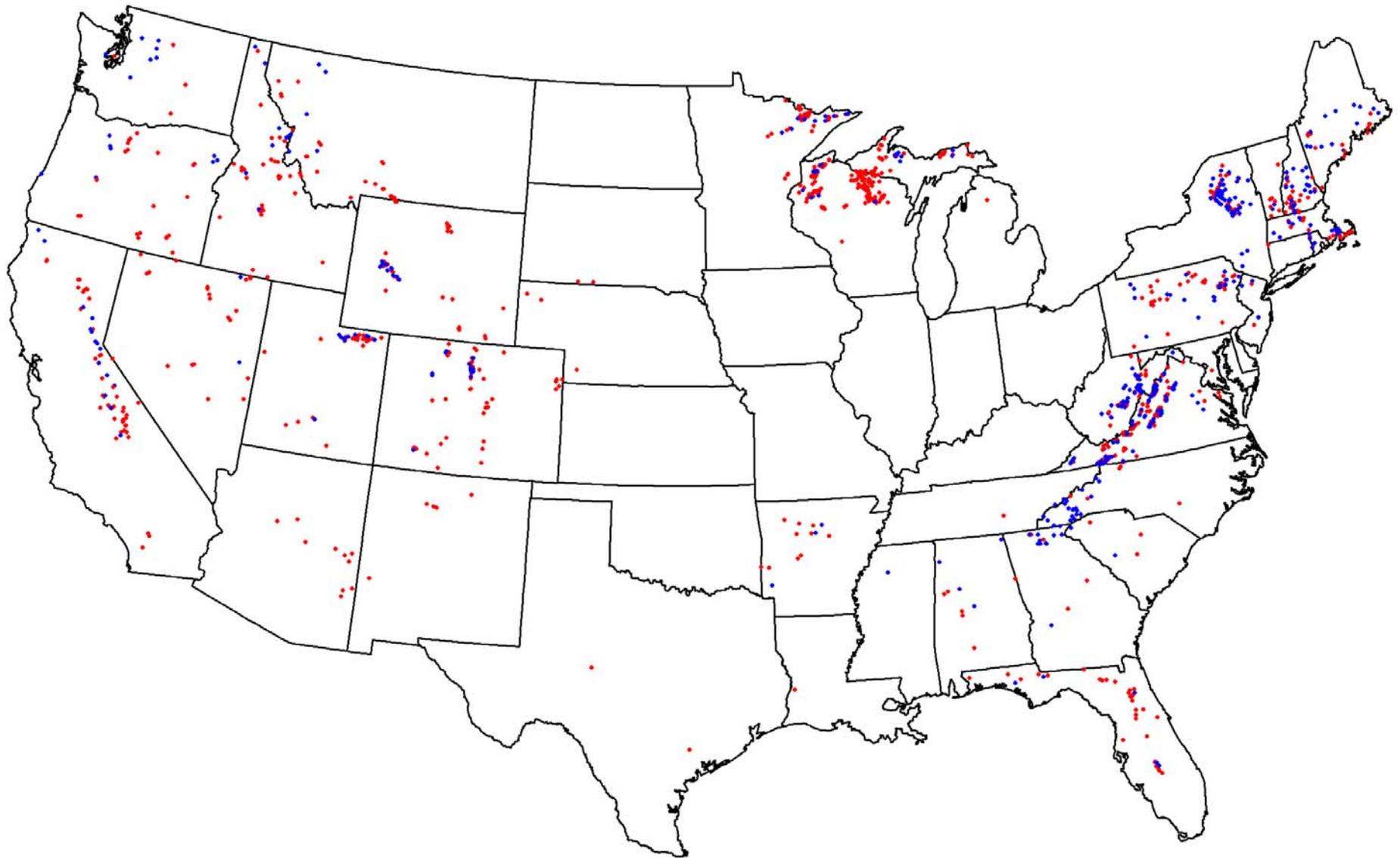


Figure A-2 Map of waterbodies with critical loads for an ANC limit of 50  $\mu\text{eq/L}$  that are less than the  $DL_{\%ECO}$  values for the target ANC of 50  $\mu\text{eq/L}$  calculated to protect 75% of the population. The US is considered one population. The dots indicate the 25% of the population that would not likely achieve an ANC of 50  $\mu\text{eq/L}$ . Given that the country would meet the DL established for a target ANC of 50  $\mu\text{eq/L}$ , the red dots show waterbodies that would not likely be protected from an ANC of <20  $\mu\text{eq/L}$  and blue dots show waterbodies that would likely be protected from ANC <20  $\mu\text{eq/L}$ .

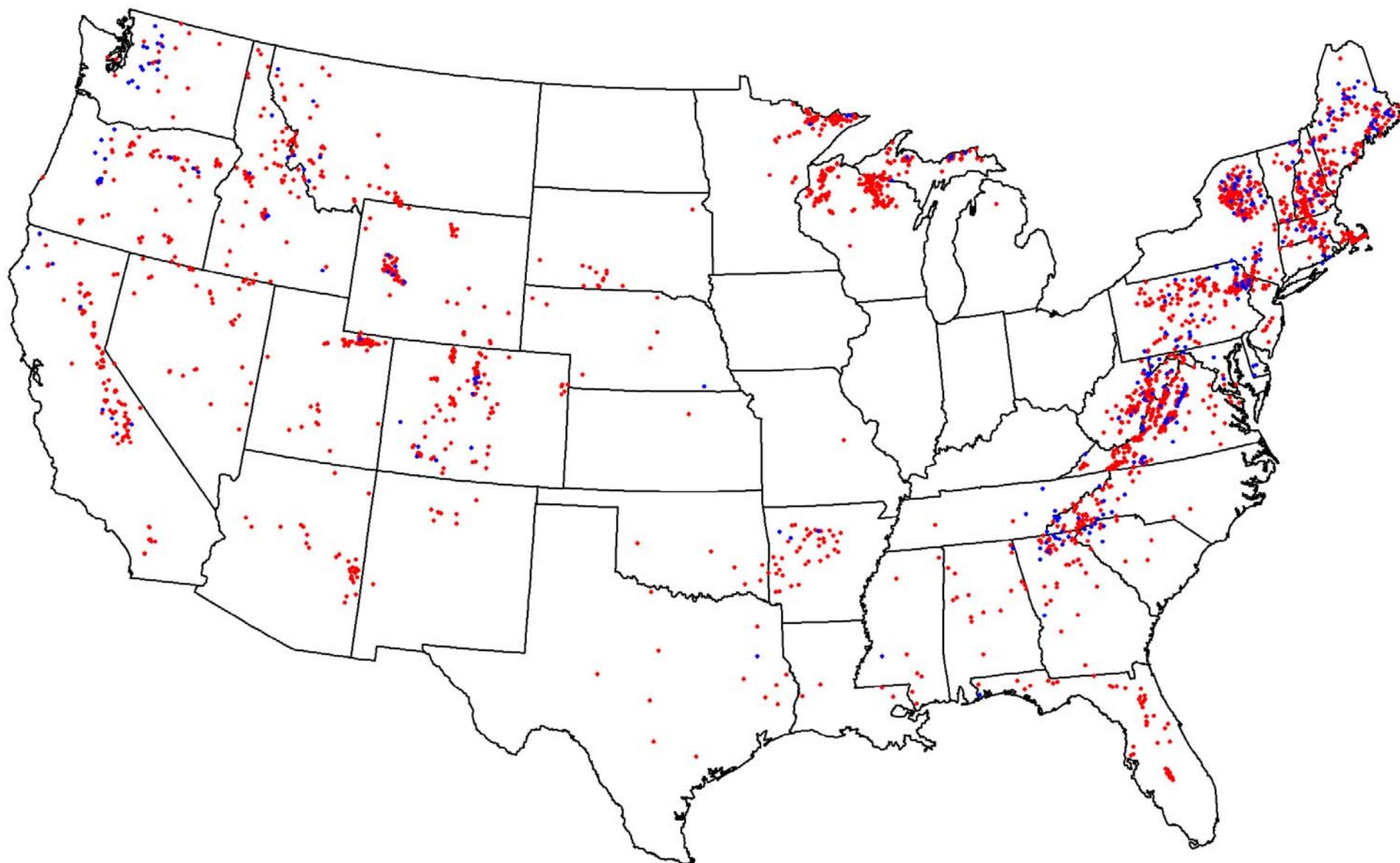
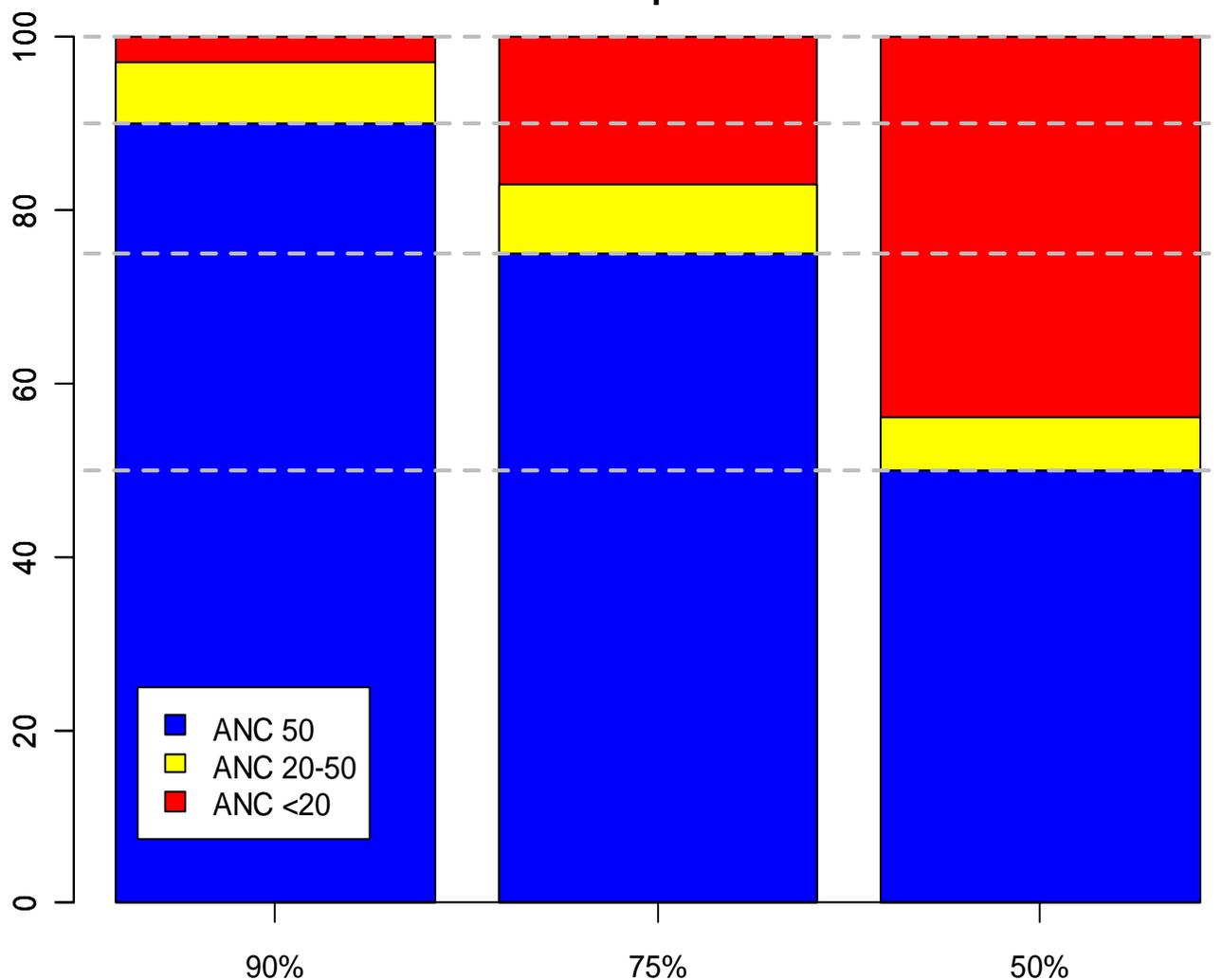


Figure A-3 Map of waterbodies with critical loads for an ANC limit of 50  $\mu\text{eq/L}$  that are less than the  $DL_{\%ECO}$  values for the target ANC of 50  $\mu\text{eq/L}$  calculated to protect 50% of the population. The US is considered one population. The dots indicate the 50% of the population that would not likely achieve an ANC of 50  $\mu\text{eq/L}$ . Given that the country would meet the DL established for a target ANC of 50  $\mu\text{eq/L}$ , the red dots show waterbodies that would not likely be protected from an ANC of <20  $\mu\text{eq/L}$  and blue dots show waterbodies that would likely be protected from ANC <20  $\mu\text{eq/L}$ .

### One Population



**Figure A-4.** Expected ANC values resulting from a target ANC of 50 µeq/L for specific target percentages of waterbodies. Blue represents the percent of lakes expected meet or exceed the ANC 50 µeq/L and by definition is equal to the target percentage indicated on the x-axis. Yellow represents the additional percentage of lakes expected to exceed the ANC 20 µeq/L. The remaining lakes, indicated in red, would potentially be below the ANC 20 µeq/L level.

## SENSITIVE AND LESS SENSITIVE CATEGORIES

This aggregation method divides the country into two categories based on sensitivity (further discussion of this method can be found in Chapter 5) and would allow two DL<sub>%ECO</sub> values for the whole population. The following table is identical to the table presented in Chapter 5 as Table 5-13. It is included here to provide detail for the figures A-5 through A-11.

Table 5-13. Comparison of percentage protection from ANC values less than 50 µeq/L and less than 20 µeq/L using DL that result when the US is divided into two categories, sensitive and less sensitive based on ANC data.

		DL (meq/m <sup>2</sup> /yr)	Total number of Sites in Analysis	Total Number of Sites protected from ANC <50	Total % Sites protected from ANC <50	Total Number of Sites protected from ANC <20	Total % Sites protected from ANC <20
Sensitive	DL 90% ANC 50	26	4553	4104	90	4451	98
	DL 75% ANC 50	51	4553	3428	75	3841	84
	DL 50% ANC 50	106	4553	2284	50	2575	57
Less sensitive	DL 90% ANC 50	53	727	655	90	672	92
	DL 75% ANC 50	117	727	546	75	560	77
	DL 50% ANC 50	277	727	364	50	377	52

Table 5-13 shows a comparison between the percent of waterbodies that would be protected from ANC<50 µeq/L using 90%, 75% and 50% DL<sub>%ECO</sub> values for a target ANC of 50 µeq/L for the two category approach and those that, while not protected from an ANC <50 µeq/L would be protected from at least an ANC<20 µeq/L under the DL<sub>%ECO</sub> values for a target ANC of 50 µeq/L. These waterbodies would have an ANC between 20 and 50 µeq/L. The selection of the DL<sub>%ECO</sub> values for a target ANC of 50 µeq/L representing 90% of the sensitive waterbodies would likely protect 98% of sensitive waterbodies from having an ANC<20

$\mu\text{eq/L}$ . If the 75%  $\text{DL}_{\%ECO}$  values for a target ANC of 50  $\mu\text{eq/L}$  was chosen, 84% of sensitive waterbodies would likely be protected from an  $\text{ANC} < 20 \mu\text{eq/L}$  and if the 50%  $\text{DL}_{\%ECO}$  values for a target ANC of 50  $\mu\text{eq/L}$  was chosen only 57% of sensitive waterbodies would likely be protected against an  $\text{ANC} < 20 \mu\text{eq/L}$ . The selection of the  $\text{DL}_{\%ECO}$  values for a target ANC of 50  $\mu\text{eq/L}$  representing 90% of the less sensitive waterbodies would likely protect 92% of less sensitive waterbodies from having an  $\text{ANC} < 20 \mu\text{eq/L}$ . If the 75%  $\text{DL}_{\%ECO}$  values for a target ANC of 50  $\mu\text{eq/L}$  was chosen, 77% of less sensitive waterbodies would likely be protected from an  $\text{ANC} < 20 \mu\text{eq/L}$  and if the 50%  $\text{DL}_{\%ECO}$  values for a target ANC of 50  $\mu\text{eq/L}$  was chosen only 52% of less sensitive waterbodies would likely be protected against an  $\text{ANC} < 20 \mu\text{eq/L}$ .

Figures A-5 through A-10 below show maps of those waterbodies with critical loads for a target ANC of 50  $\mu\text{eq/L}$  that are less than the  $\text{DL}_{\%ECO}$  values for a target ANC of 50  $\mu\text{eq/L}$  calculated to protect 90%, 75% and 50% of the population when the US is considered as two categories based on sensitivity. Thus, the waterbodies shown on the map represent the 10%, 25% and 50% of waterbodies that would not be protected from  $\text{ANC} < 50 \mu\text{eq/L}$ . The intent is to determine what percentage of those remaining waterbodies, while not protected from  $\text{ANC} < 50 \mu\text{eq/L}$  would be protected from  $\text{ANC} < 20$  under each  $\text{DL}_{\%ECO}$  scenario. This is shown on the maps with blue and red dots representing those waterbodies with  $\geq \text{ANC} 20 \mu\text{eq/L}$  and  $< \text{ANC} 20 \mu\text{eq/L}$  respectively. Again under each scenario, the waterbodies that would likely fall below  $\text{ANC} 20 \mu\text{eq/L}$  are geographically diverse and likely represent many types of waterbodies. Figure A-11 is a graphical breakdown of the percent of waterbodies at each ANC level (50, 20-50, and less than 20  $\mu\text{eq/L}$ ) under the two category approach based on sensitivity.

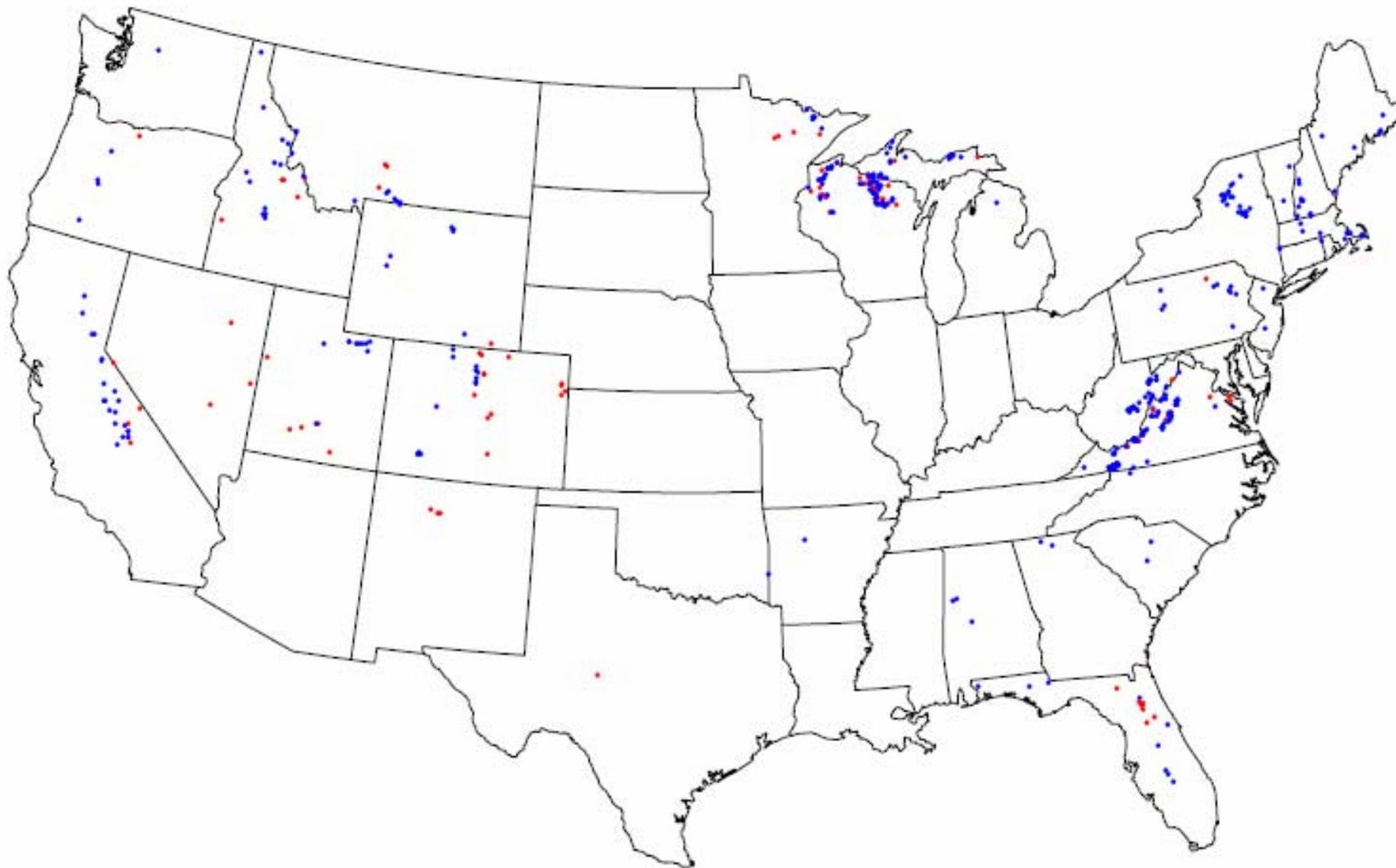


Figure A-5 Map of sensitive waterbodies with critical loads for an ANC limit of  $50 \mu\text{eq/L}$  that are less than the  $DL_{\%ECO}$  values for the target ANC of  $50 \mu\text{eq/L}$  calculated to protect 90% of the population. The US is divided into sensitive and less sensitive categories based on ANC values. The dots indicate the 10% of the population that would not likely achieve an ANC  $50 \mu\text{eq/L}$ . Given that the country would meet the DL established for a target ANC of  $50 \mu\text{eq/L}$ , the red dots show waterbodies that would not likely be protected from an ANC of  $<20 \mu\text{eq/L}$  and blue dots show waterbodies that would likely be protected from ANC  $<20$ .

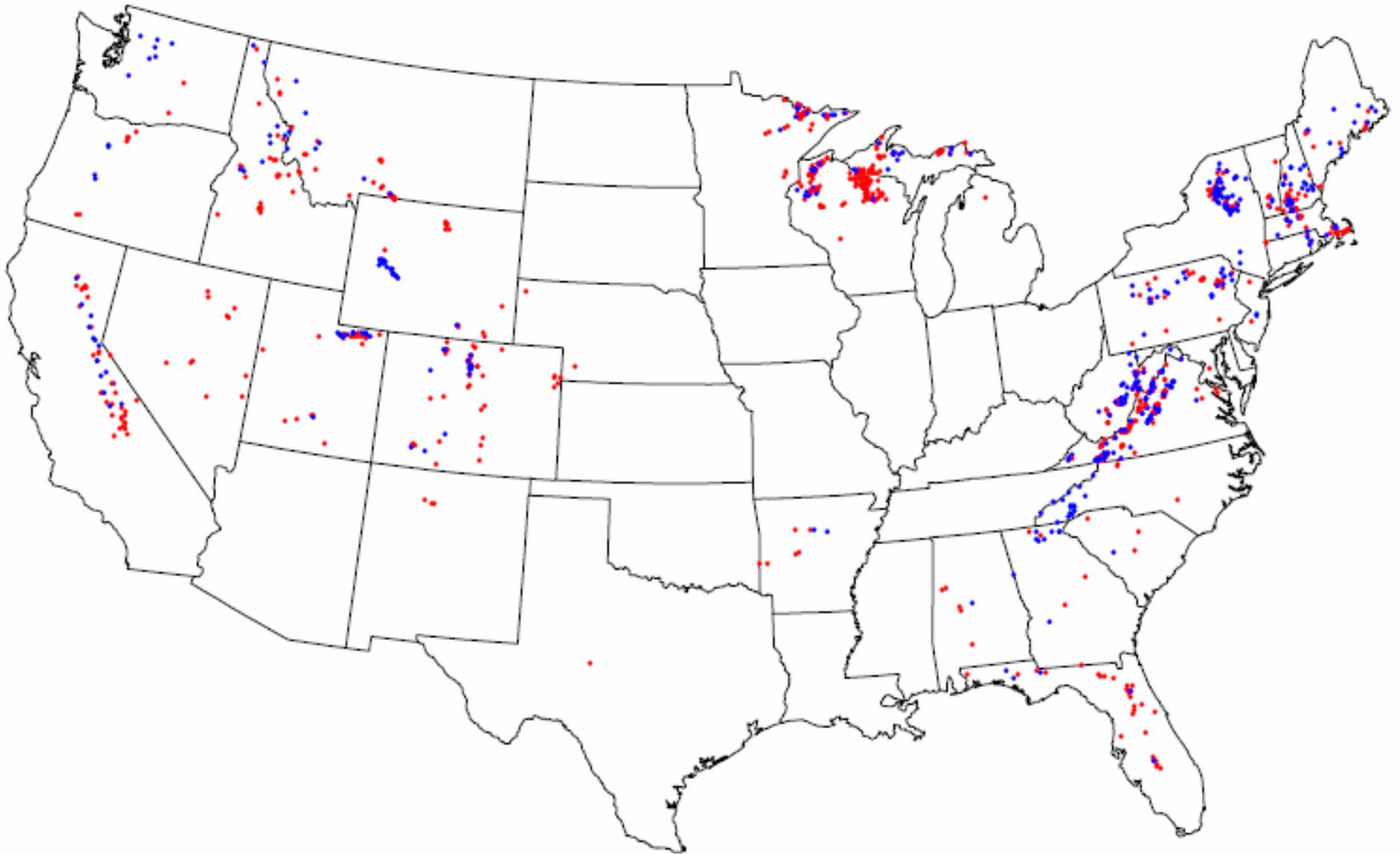


Figure A-6 Map of sensitive waterbodies with critical loads for an ANC limit of 50  $\mu\text{eq/L}$  that are less than the  $DL_{\%ECO}$  values for the target ANC of 50  $\mu\text{eq/L}$  calculated to protect 75% of the population. The US is divided into sensitive and less sensitive categories based on ANC values. The dots indicate the 25% of the population that would not likely achieve an ANC 50  $\mu\text{eq/L}$ . Given that the country would meet the DL established for a target ANC of 50  $\mu\text{eq/L}$ , the red dots show waterbodies that would not likely be protected from an ANC of <20  $\mu\text{eq/L}$  and blue dots show waterbodies that would likely be protected from ANC <20.

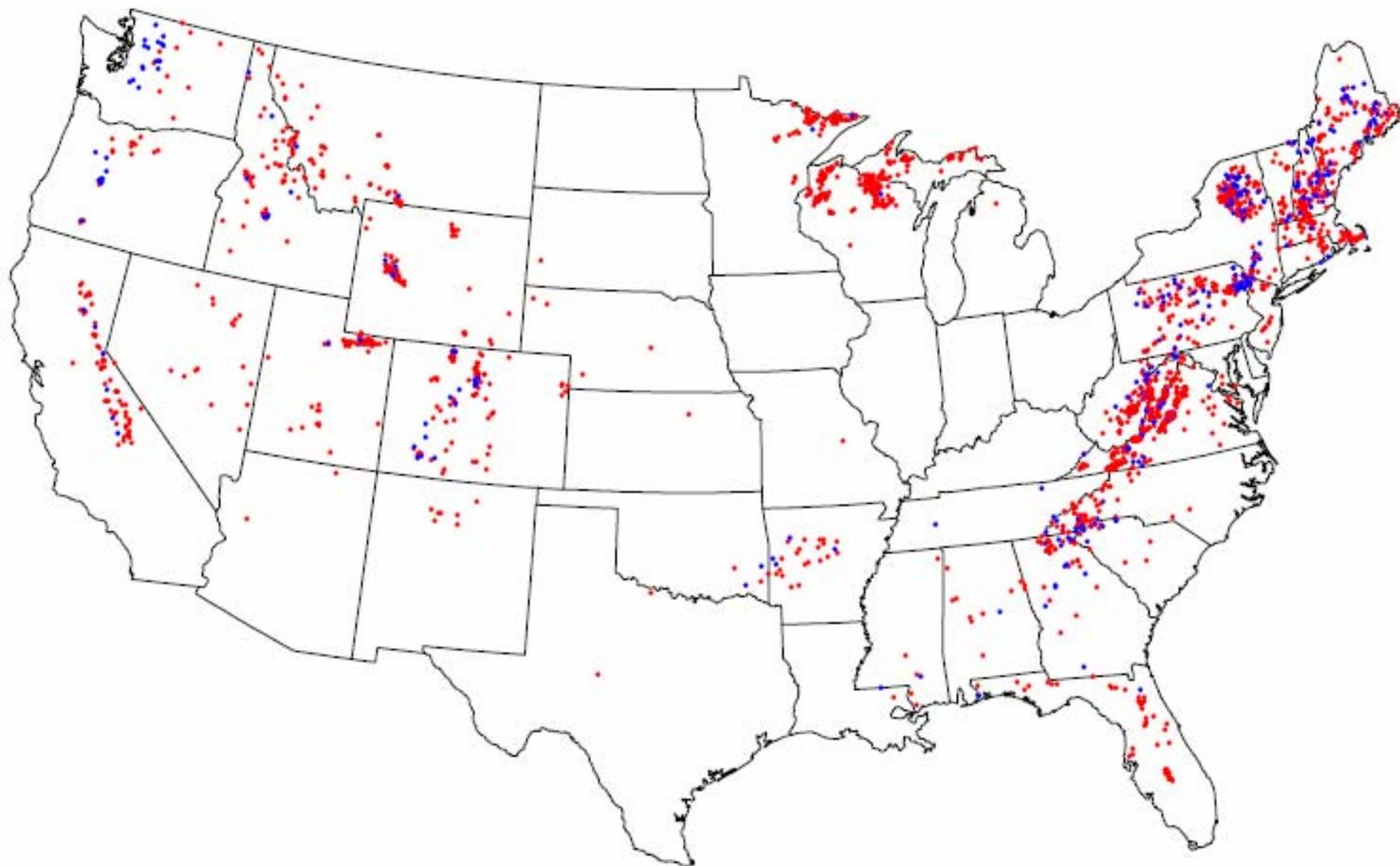


Figure A-7 Map of sensitive waterbodies with critical loads for an ANC limit of 50  $\mu\text{eq/L}$  that are less than the  $DL_{\%ECO}$  values for the target ANC of 50  $\mu\text{eq/L}$  calculated to protect 50% of the population. The US is divided into sensitive and less sensitive categories based on ANC values. The dots indicate the 50% of the population that would not likely achieve an ANC 50  $\mu\text{eq/L}$ . Given that the country would meet the DL established for a target ANC of 50  $\mu\text{eq/L}$ , the red dots show waterbodies that would not likely be protected from an ANC of  $<20$   $\mu\text{eq/L}$  and blue dots show waterbodies that would likely be protected from ANC  $<20$ .

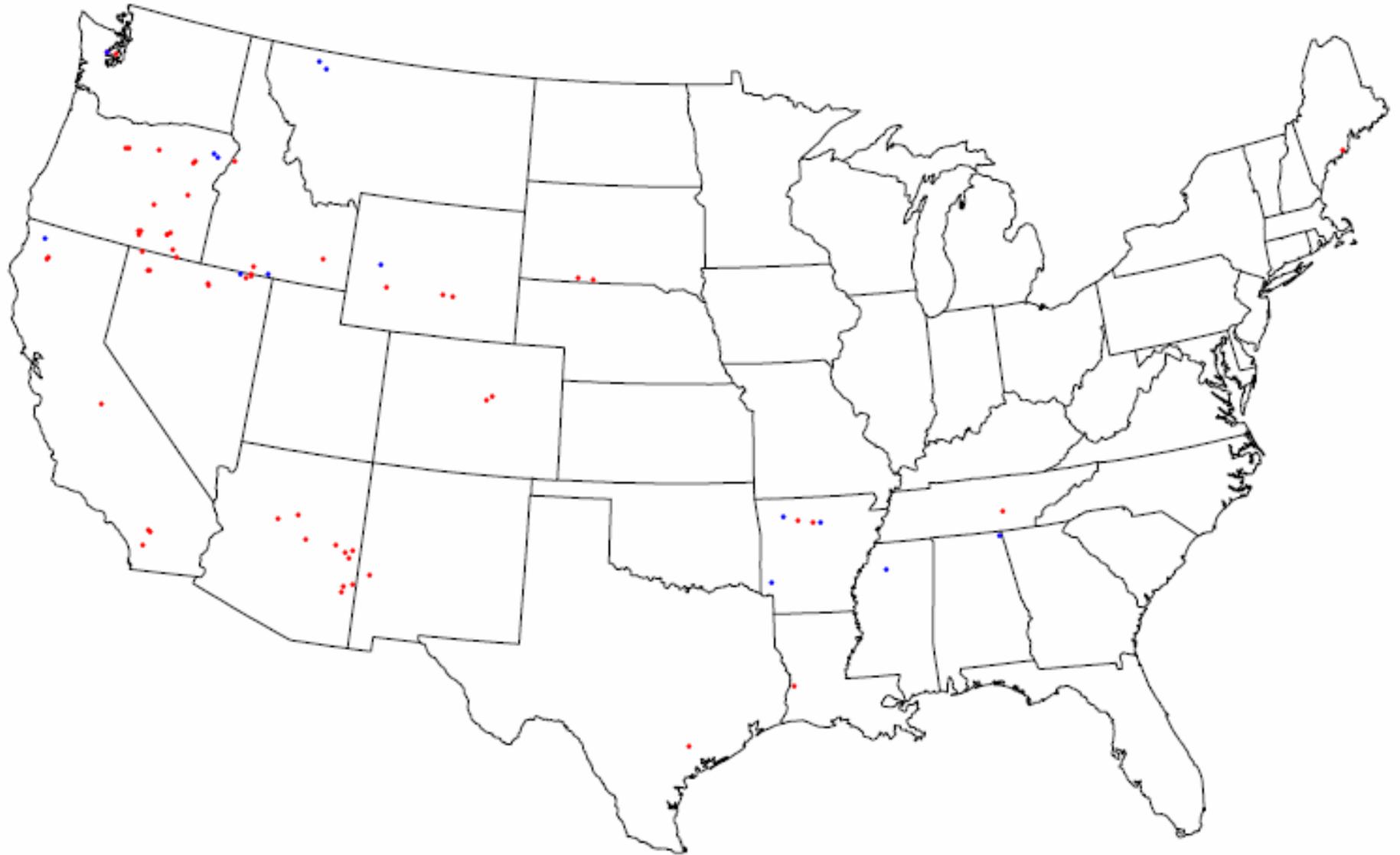


Figure A-8 Map of less sensitive waterbodies with critical loads for an ANC limit of  $50 \mu\text{eq/L}$  that are less than the  $DL_{\%ECO}$  values for the target ANC of  $50 \mu\text{eq/L}$  calculated to protect 90% of the population. The US is divided into sensitive and less sensitive categories based on ANC values. The dots indicate the 10% of the population that would not likely achieve an ANC  $50 \mu\text{eq/L}$ . Given that the country would meet the DL established for a target ANC of  $50 \mu\text{eq/L}$ , the red dots show waterbodies that would not likely be protected from an ANC of  $<20 \mu\text{eq/L}$  and blue dots show waterbodies that would likely be protected from ANC  $<20$ .

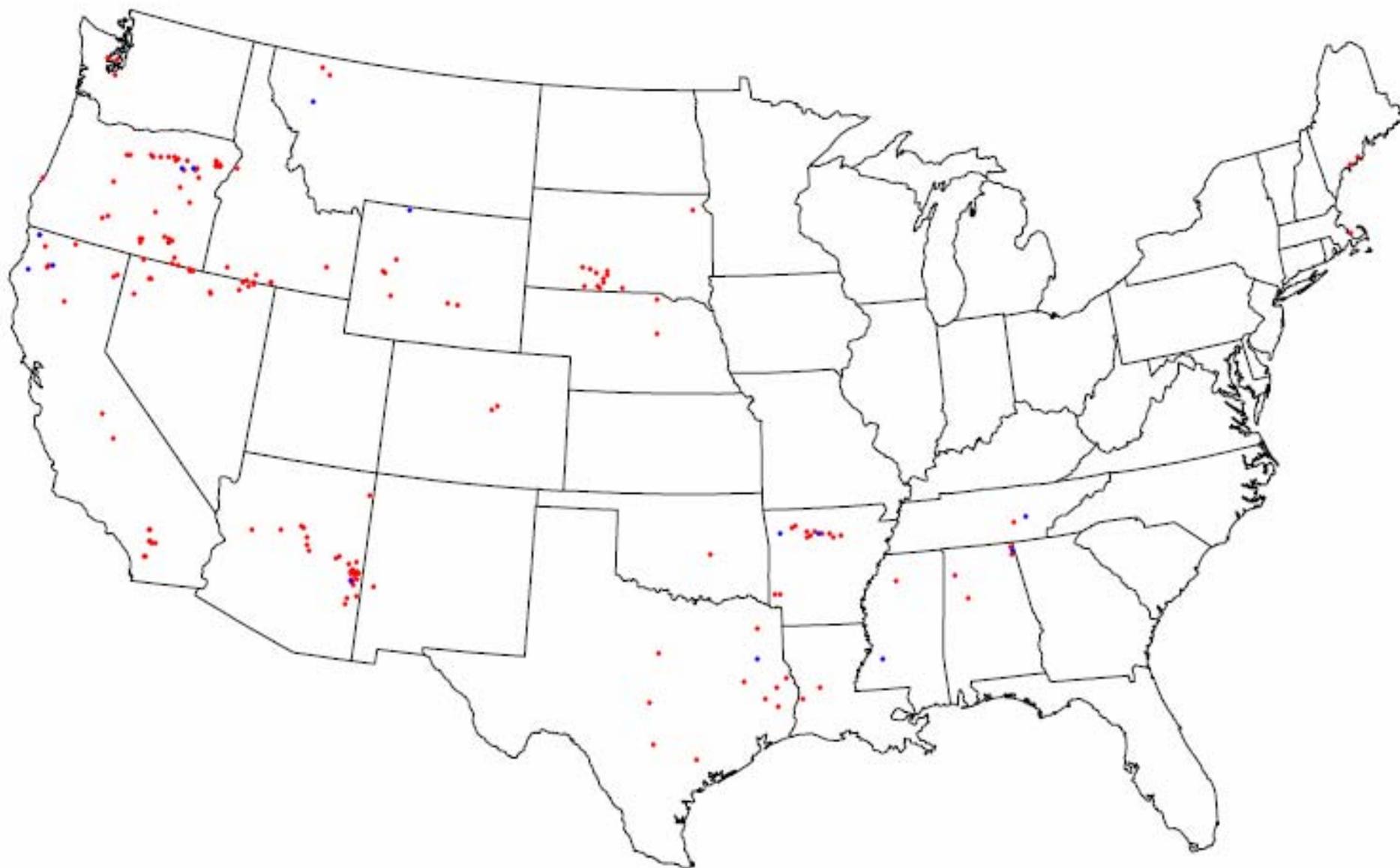


Figure A-9 Map of less sensitive waterbodies with critical loads for an ANC limit of  $50 \mu\text{eq/L}$  that are less than the  $DL_{\%ECO}$  values for the target ANC of  $50 \mu\text{eq/L}$  calculated to protect 75% of the population. The US is divided into sensitive and less sensitive categories based on ANC values. The dots indicate the 25% of the population that would not likely achieve an ANC  $50 \mu\text{eq/L}$ . Given that the country would meet the DL established for a target ANC of  $50 \mu\text{eq/L}$ , the red dots show waterbodies that would not likely be protected from an ANC of  $<20 \mu\text{eq/L}$  and blue dots show waterbodies that would likely be protected from ANC  $<20$ .

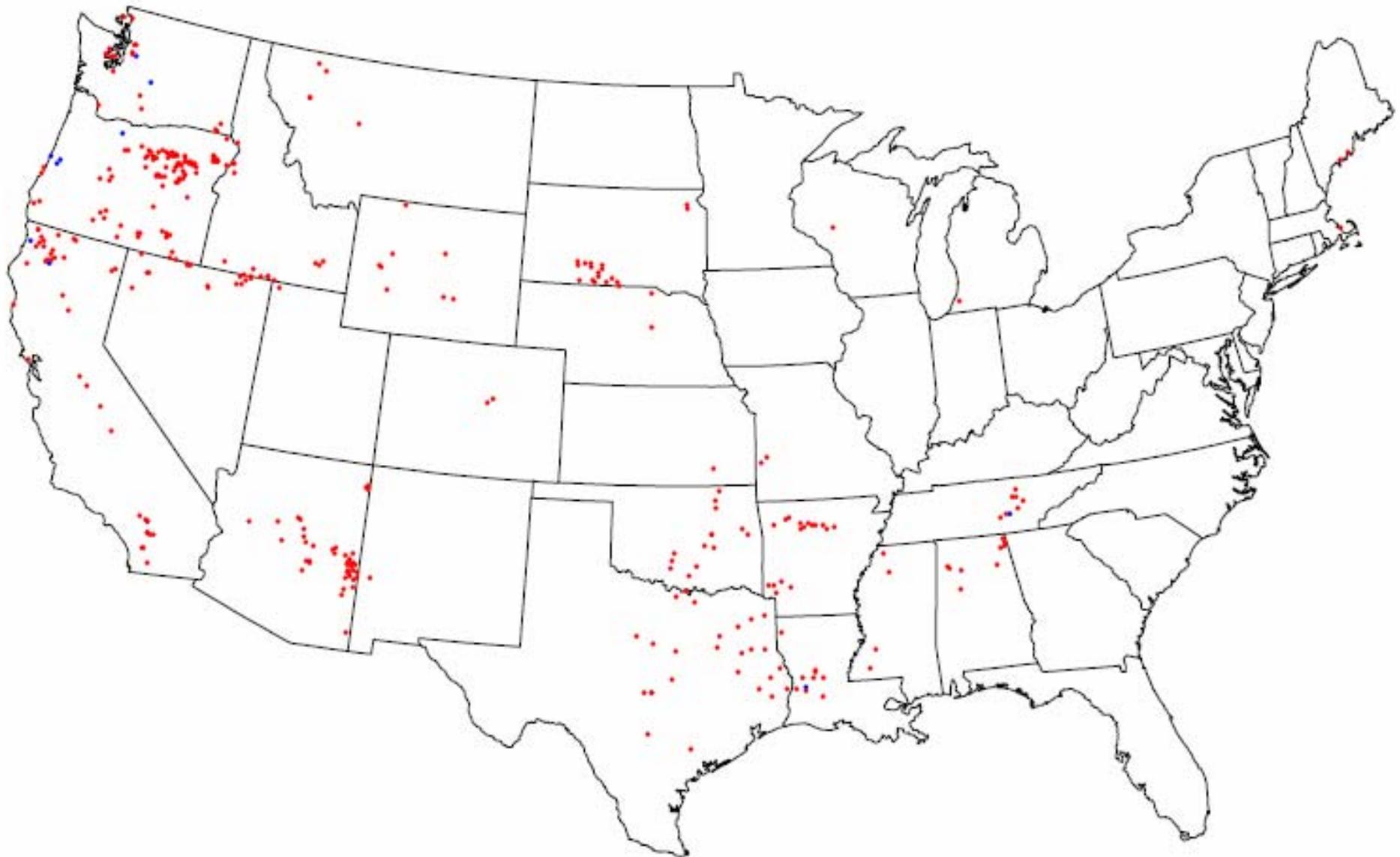


Figure A-10 Map of less sensitive waterbodies with critical loads for an ANC limit of 50  $\mu\text{eq/L}$  that are less than the  $DL_{50\%ECO}$  values for the target ANC of 50  $\mu\text{eq/L}$  calculated to protect 50% of the population. The US is divided into sensitive and less sensitive categories based on ANC values. The dots indicate the 50% of the population that would not likely achieve an ANC 50  $\mu\text{eq/L}$ . Given that the country would meet the DL established for a target ANC of 50  $\mu\text{eq/L}$ , the red dots show waterbodies that would not likely be protected from an ANC of <20  $\mu\text{eq/L}$  and blue dots show waterbodies that would likely be protected from ANC <20.

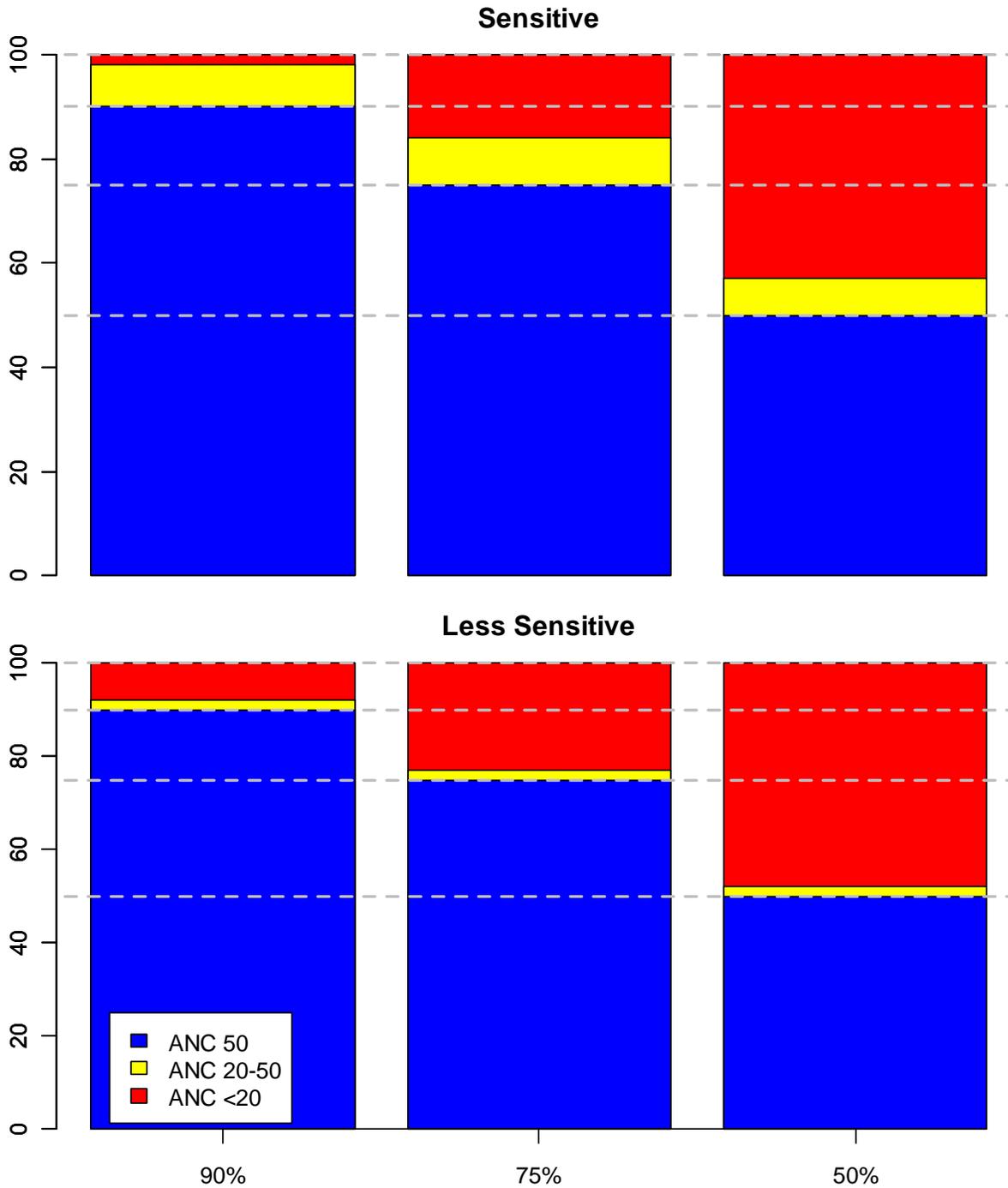


Figure A-11. Expected ANC resulting from a target ANC of 50  $\mu\text{eq/L}$  for specific target percentages of waterbodies. This classification of lakes categorizes the lakes based on sensitivity.

## ECOREGIONS

This aggregation method divides the country into Omernick Ecoregion Level 3 categories and would allow  $DL_{\%ECO}$  values for each ecoregion or some combination of ecoregions. This method of aggregation is useful in that it provides a biologically relevant grouping of waterbodies but is also data intensive. For this example, only ecoregions with greater than 50 observations were included as fewer observations lead to large

variations in the value of  $DL_{\%ECO}$  depending on whether this value was calculated by fitted distribution or ranking the observations. This is described more fully in Figure A-12. Table A-1 shows a comparison between the percent of waterbodies that would be protected from an  $ANC < 50 \mu\text{eq/L}$  using 90%, 75% and 50%  $DL_{\%ECO}$  values for a target ANC of  $50 \mu\text{eq/L}$  for each ecoregion with greater than 50 observations and those that, while not protected from an  $ANC < 50 \mu\text{eq/L}$  would likely be protected from an  $ANC < 20 \mu\text{eq/L}$ .

Figures A-13 through A-15 below show maps of those waterbodies with critical loads for a target ANC of  $50 \mu\text{eq/L}$  that are less than the  $DL_{\%ECO}$  values for a target ANC of  $50 \mu\text{eq/L}$  calculated to protect 90%, 75% and 50% of the population by ecoregion. Thus, the waterbodies shown on the map represent the 10%, 25% and 50% of waterbodies that would not be protected from  $ANC < 50 \mu\text{eq/L}$ . The intent is to determine what percentage of those remaining waterbodies, while not protected from  $ANC < 50 \mu\text{eq/L}$  would be protected from  $ANC < 20 \mu\text{eq/L}$  under each  $DL_{\%ECO}$  scenario. This is shown on the maps with blue and red dots representing those waterbodies with  $\geq ANC 20 \mu\text{eq/L}$  and  $< ANC 20 \mu\text{eq/L}$  respectively. Figure A-16 is a graphical breakdown of the percent of waterbodies at each ANC level (50, 20-50, and less than  $20 \mu\text{eq/L}$ ) under the ecoregion approach using mean values for all ecoregions.

Table A-1 Comparison of percentage protection from ANC values less than 50  $\mu\text{eq/L}$  and less than 20  $\mu\text{eq/L}$  using DL that result when ecoregions with greater than 50 observations are used.

Ecoregion	Ecoregion Waterbodies N=	% Protected ANC 50 90%	Total % Sites protected from ANC<20 Using ANC 50 90% DL	% Protected ANC 50 75%	Total % Sites protected from ANC<20 Using ANC 50 75% DL	% Protected ANC 50 50%	Total % Sites protected from ANC<20 Using ANC 50 50% DL
5.3.1	735	90%	98%	75%	87%	50%	60%
8.4.1	510	90%	97%	75%	86%	50%	56%
5.2.1	469	90%	100%	75%	91%	50%	56%
8.4.4	379	90%	100%	75%	92%	50%	69%
6.2.10	202	91%	98%	76%	84%	50%	53%
8.4.2	200	91%	100%	76%	99%	51%	63%
6.2.14	186	90%	96%	76%	85%	51%	57%
8.1.7	169	91%	95%	76%	83%	51%	62%
8.3.4	168	90%	96%	76%	85%	51%	57%
5.3.3	159	91%	99%	75%	86%	50%	62%
8.1.8	143	91%	97%	76%	90%	50%	63%
6.2.5	133	91%	98%	76%	86%	51%	56%
6.2.9	108	91%	92%	76%	78%	51%	52%
6.2.12	105	91%	100%	76%	96%	51%	57%
6.2.7	88	91%	95%	76%	88%	51%	63%
8.1.3	88	91%	95%	76%	81%	51%	55%
6.2.11	86	91%	92%	76%	76%	51%	53%
6.2.15	86	91%	100%	76%	91%	51%	65%
6.2.13	78	91%	96%	76%	90%	51%	64%
8.3.5	75	92%	100%	76%	87%	51%	59%
6.2.3	73	92%	97%	77%	78%	52%	55%
7.1.8	68	91%	94%	76%	78%	51%	56%
8.5.3	53	92%	100%	77%	87%	53%	57%
13.1.1	52	92%	92%	77%	79%	52%	52%

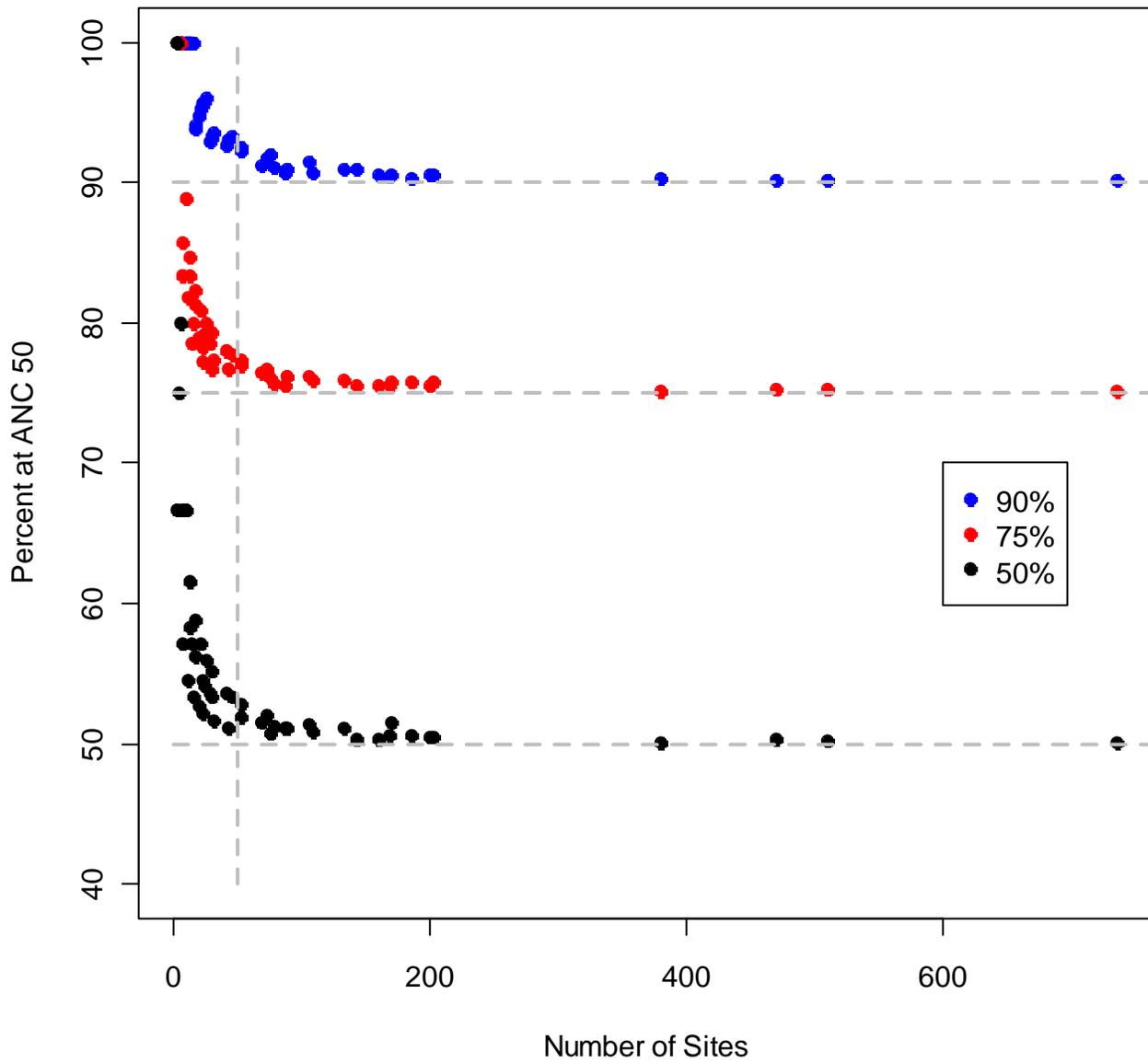


Figure A-12. Percent of lakes within an Ecoregion (n = 76) expected to equal or exceed ANC 50  $\mu\text{eq/L}$  compared to the number of sites sampled within the Ecoregion. Horizontal gray lines are provided for reference to the 50%, 75% and 90% target levels. The vertical gray line shows the cutoff level of n = 50 which was used for analyses.

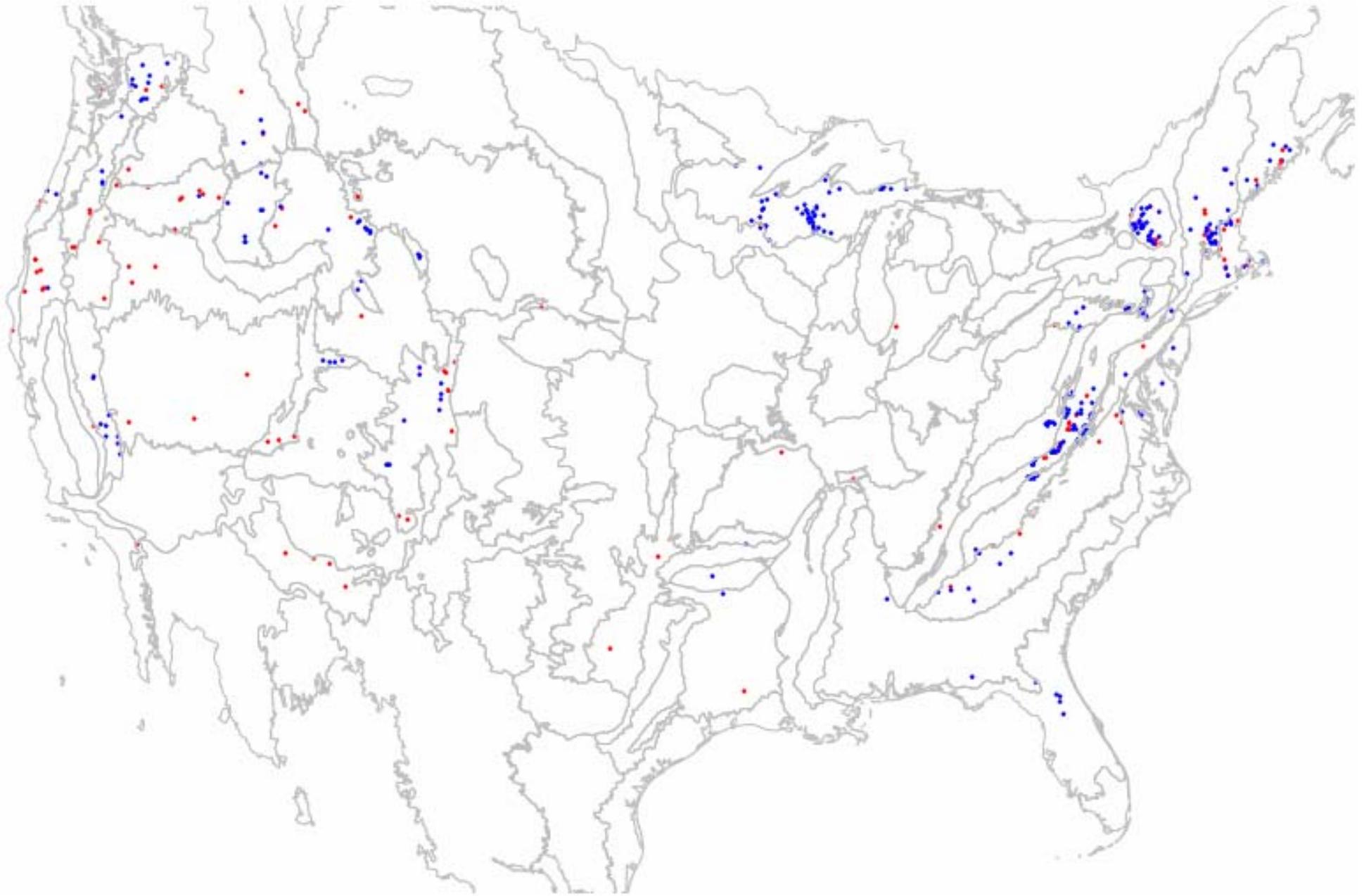


Figure A-13 Map of waterbodies by ecoregion with critical loads for an ANC limit of 50  $\mu\text{eq/L}$  that are less than the  $DL_{\%ECO}$  values for the target ANC of 50  $\mu\text{eq/L}$  calculated to protect 90% of the population. The US is divided into level 3 ecoregions. The dots indicate the 10% of the population that would not likely achieve an ANC of 50  $\mu\text{eq/L}$ . Given that each ecoregion would meet the DL established for a target ANC of 50  $\mu\text{eq/L}$ , the red dots show waterbodies that would not likely be protected from an ANC of <20  $\mu\text{eq/L}$  and blue dots show waterbodies that would likely be protected from ANC <20  $\mu\text{eq/L}$ .

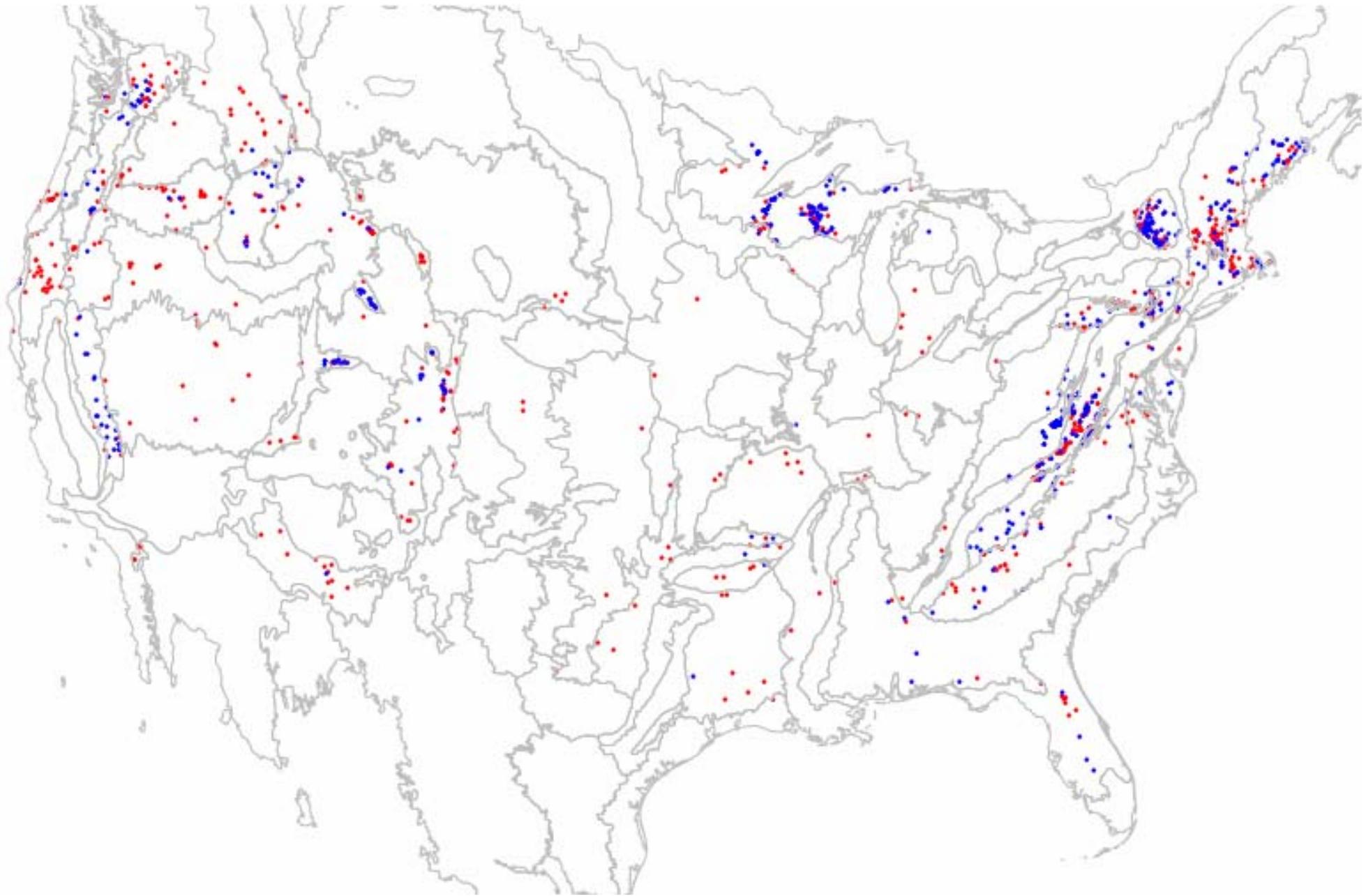


Figure A-14 Map of waterbodies by ecoregion with critical loads for an ANC limit of  $50 \mu\text{eq/L}$  that are less than the  $DL_{\%ECO}$  values for the target ANC of  $50 \mu\text{eq/L}$  calculated to protect 75% of the population. The US is divided into level 3 ecoregions. The dots indicate the 25% of the population that would not likely achieve an ANC of  $50 \mu\text{eq/L}$ . Given that each ecoregion would meet the DL established for a target ANC of  $50 \mu\text{eq/L}$ , the red dots show waterbodies that would not likely be protected from an ANC of  $<20 \mu\text{eq/L}$  and blue dots show waterbodies that would likely be protected from ANC  $<20 \mu\text{eq/L}$ .

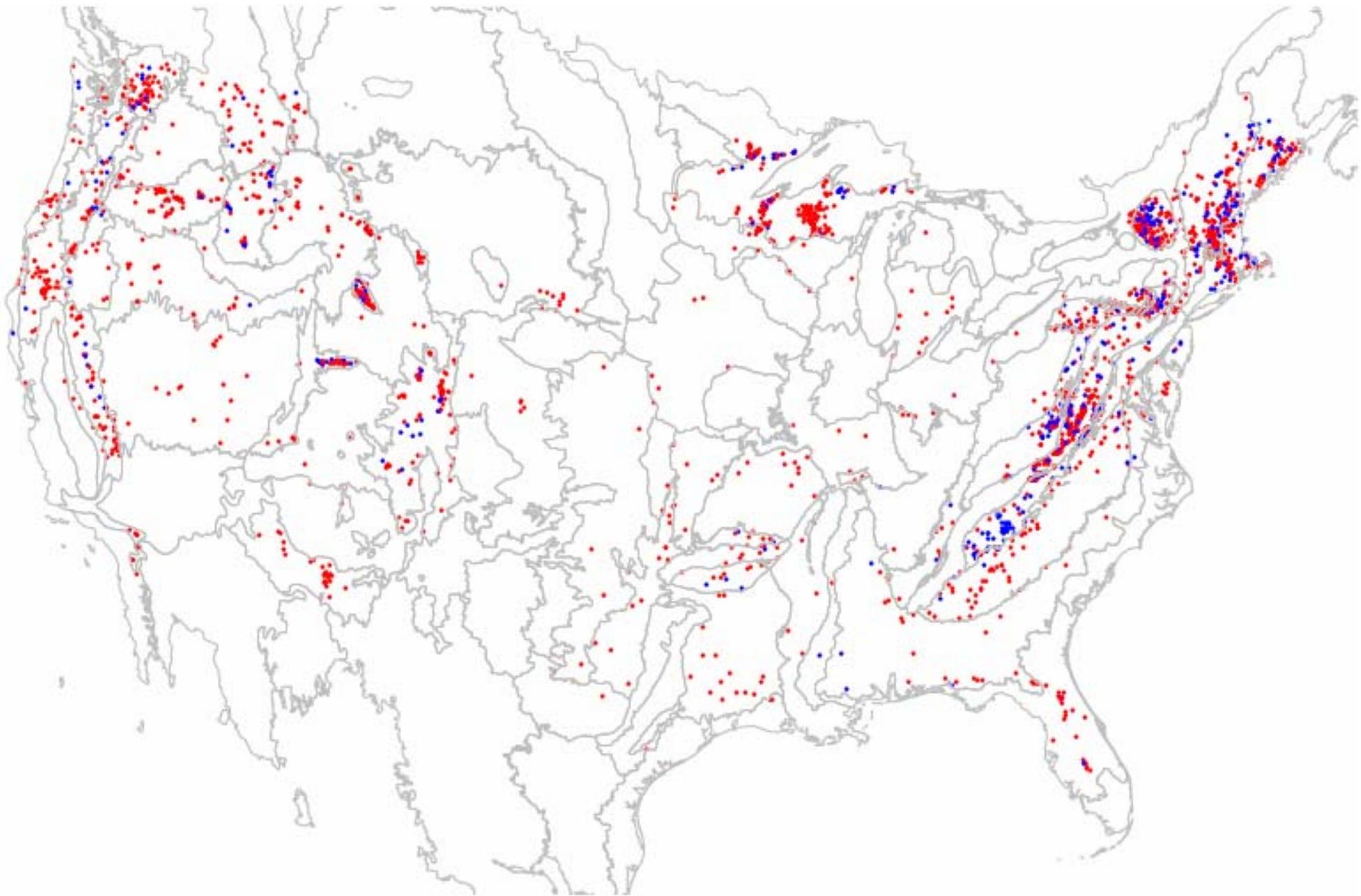


Figure A-15 Map of waterbodies by ecoregion with critical loads for an ANC limit of 50 µeq/L that are less than the  $DL_{\%ECO}$  values for the target ANC of 50 µeq/L calculated to protect 50% of the population. The US is divided into level 3 ecoregions. The dots indicate the 50% of the population that would not likely achieve an ANC of 50 µeq/L. Given that each ecoregion would meet the DL established for a target ANC of 50 µeq/L, the red dots show waterbodies that would not likely be protected from an ANC of <20 µeq/L and blue dots show waterbodies that would likely be protected from ANC <20 µeq/L.

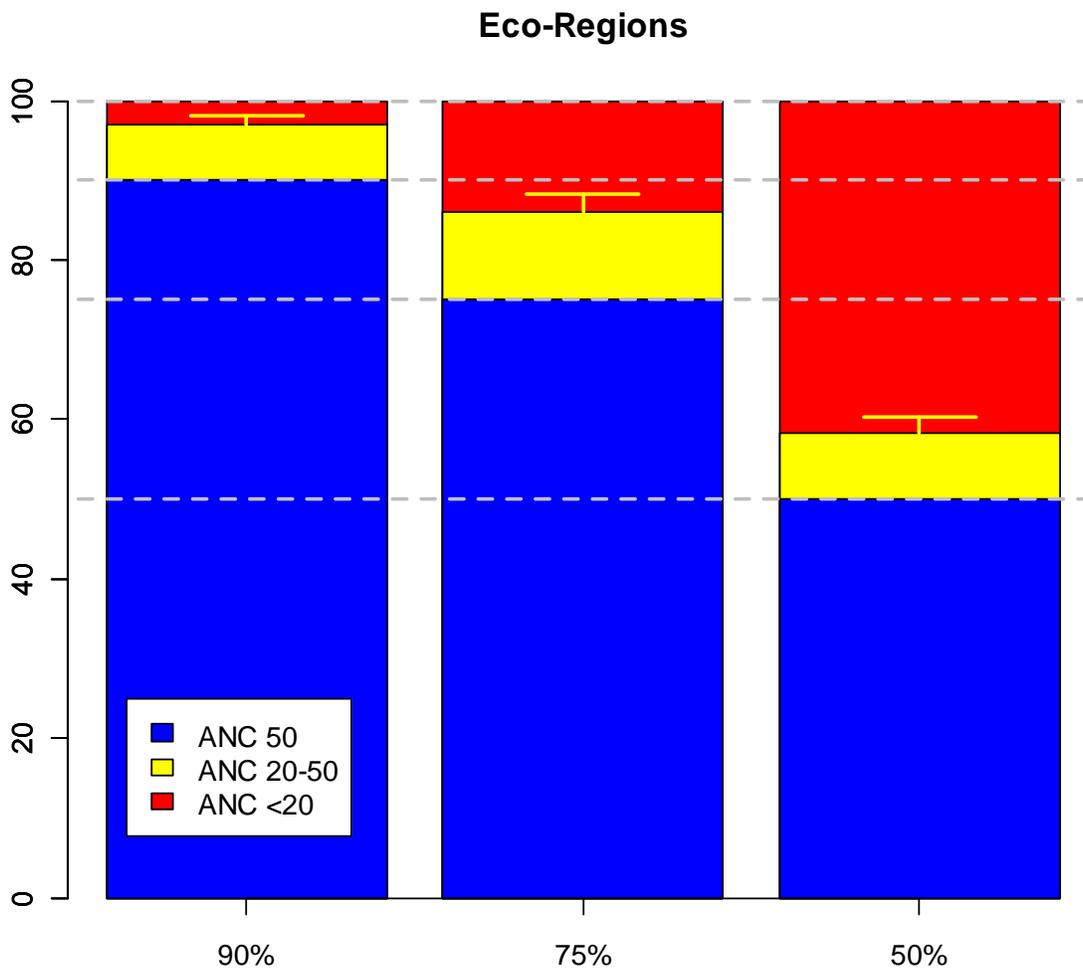


Figure A-16. Expected ANC resulting from a target ANC of 50  $\mu\text{eq/L}$  for specific target percentages of waterbodies. The yellow bars represent the mean value of all of the ecoregions. The whiskers associated with the ANC 20  $\mu\text{eq/L}$  (yellow) bars represent the upper confidence interval of the mean values.

## LOG ANC CLUSTER

This aggregation method divides the country into statistical clusters based on log ANC values and would allow  $DL_{\%ECO}$  values to be determined for each cluster. This method of aggregation is described more fully in Chapter 5 (Section 5.3.2.7). Table A-2 shows a comparison between the percent of waterbodies that would be protected from  $ANC < 50 \mu\text{eq/L}$  using 90%, 75% and 50%  $DL_{\%ECO}$  values for a target ANC of  $50 \mu\text{eq/L}$  for each cluster and those that, while not protected from an  $ANC < 50 \mu\text{eq/L}$  would likely be protected from an  $ANC < 20 \mu\text{eq/L}$ .

Figures A-17 through A-19 below show maps of those waterbodies with critical loads for a target ANC of  $50 \mu\text{eq/L}$  that are less than the  $DL_{\%ECO}$  values for a target ANC of  $50 \mu\text{eq/L}$  calculated to protect 90%, 75% and 50% of the population. Thus, the waterbodies shown on the map represent the 10%, 25% and 50% of waterbodies that would not be protected from  $ANC < 50 \mu\text{eq/L}$ . The intent is to determine what percentage of those remaining waterbodies, while not protected from  $ANC < 50 \mu\text{eq/L}$  would be protected from  $ANC < 20 \mu\text{eq/L}$  under each  $DL_{\%ECO}$  scenario. This is shown on the maps with blue and red dots representing those waterbodies with  $\geq ANC 20 \mu\text{eq/L}$  and  $< ANC 20 \mu\text{eq/L}$  respectively. Figure A-20 is a graphical breakdown of the percent of waterbodies at each ANC level (50, 20-50, and less than  $20 \mu\text{eq/L}$ ) under the cluster approach using mean values for all clusters.

**Table A-2 Comparison of percentage protection from ANC values less than  $50 \mu\text{eq/L}$  and less than  $20 \mu\text{eq/L}$  using DL that result when sites are clustered using logANC values.**

Cluster	Cluster N=	% Protected ANC 50 90%	Total % Sites protected from ANC <20 using ANC 50 90% DL	% Protected ANC 50 75%	Total % Sites protected from ANC <20 using ANC 50 75% DL	% Protected ANC 50 50%	Total % Sites protected from ANC <20 using ANC 50 50% DL
1	2432	90%	98%	75%	85%	50%	58%
2	1113	90%	98%	75%	85%	50%	58%
3	784	90%	95%	75%	81%	50%	54%
4	655	90%	96%	75%	80%	50%	51%
5	216	90%	91%	75%	76%	50%	51%

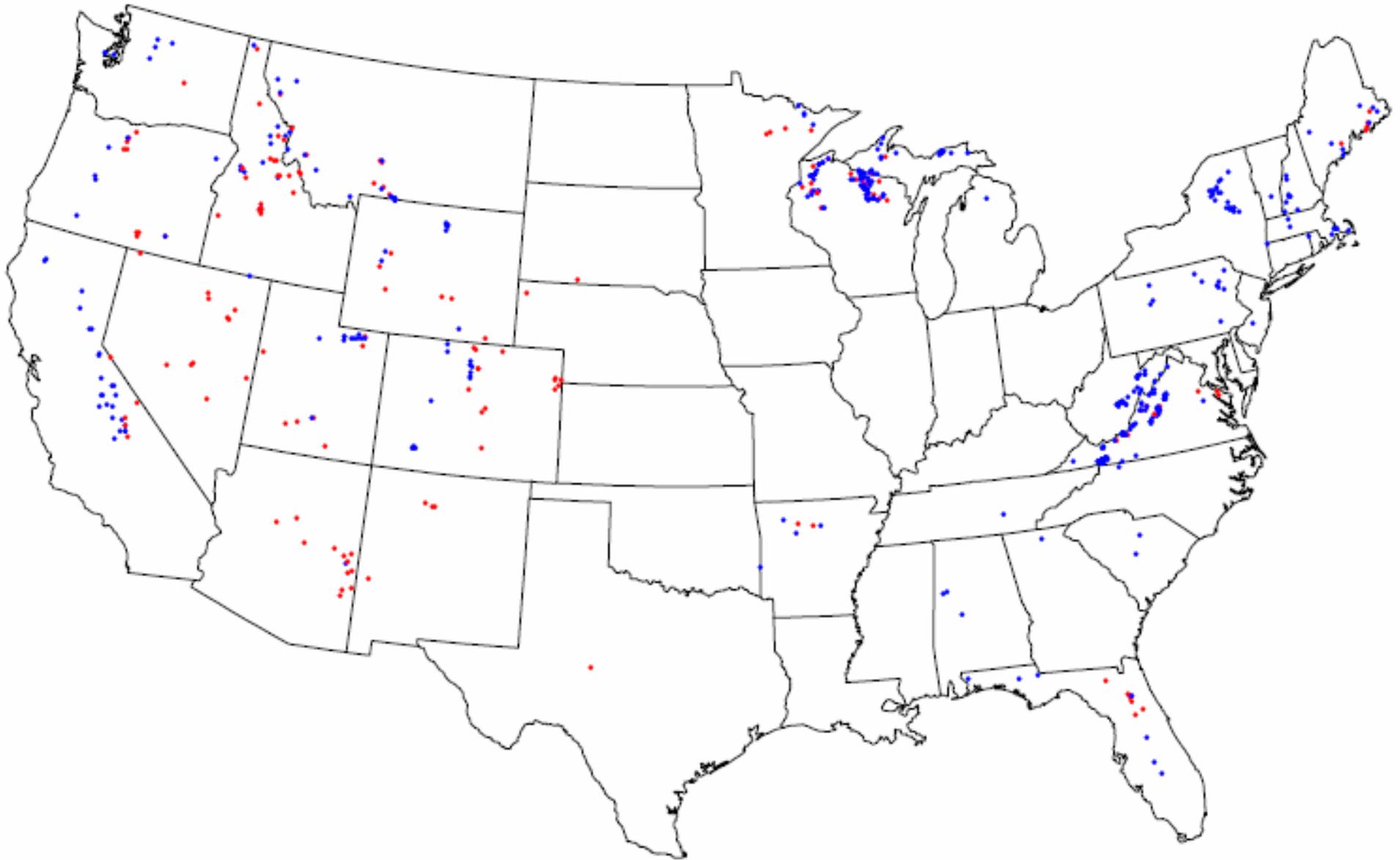


Figure A-17 Map of waterbodies with critical loads for an ANC limit of  $50 \mu\text{eq/L}$  that are less than the  $DL_{\%ECO}$  values for the target ANC of  $50 \mu\text{eq/L}$  calculated to protect 90% of the population using the cluster method. The US is divided into 5 clusters (see Chapter 5). The dots indicate the 10% of the population that would not likely achieve an ANC of  $50 \mu\text{eq/L}$ . Given that each cluster would meet the DL established for a target ANC of  $50 \mu\text{eq/L}$ , the red dots show waterbodies that would not likely be protected from an ANC of  $<20$  and blue dots show waterbodies that would likely be protected from ANC  $<20$ .

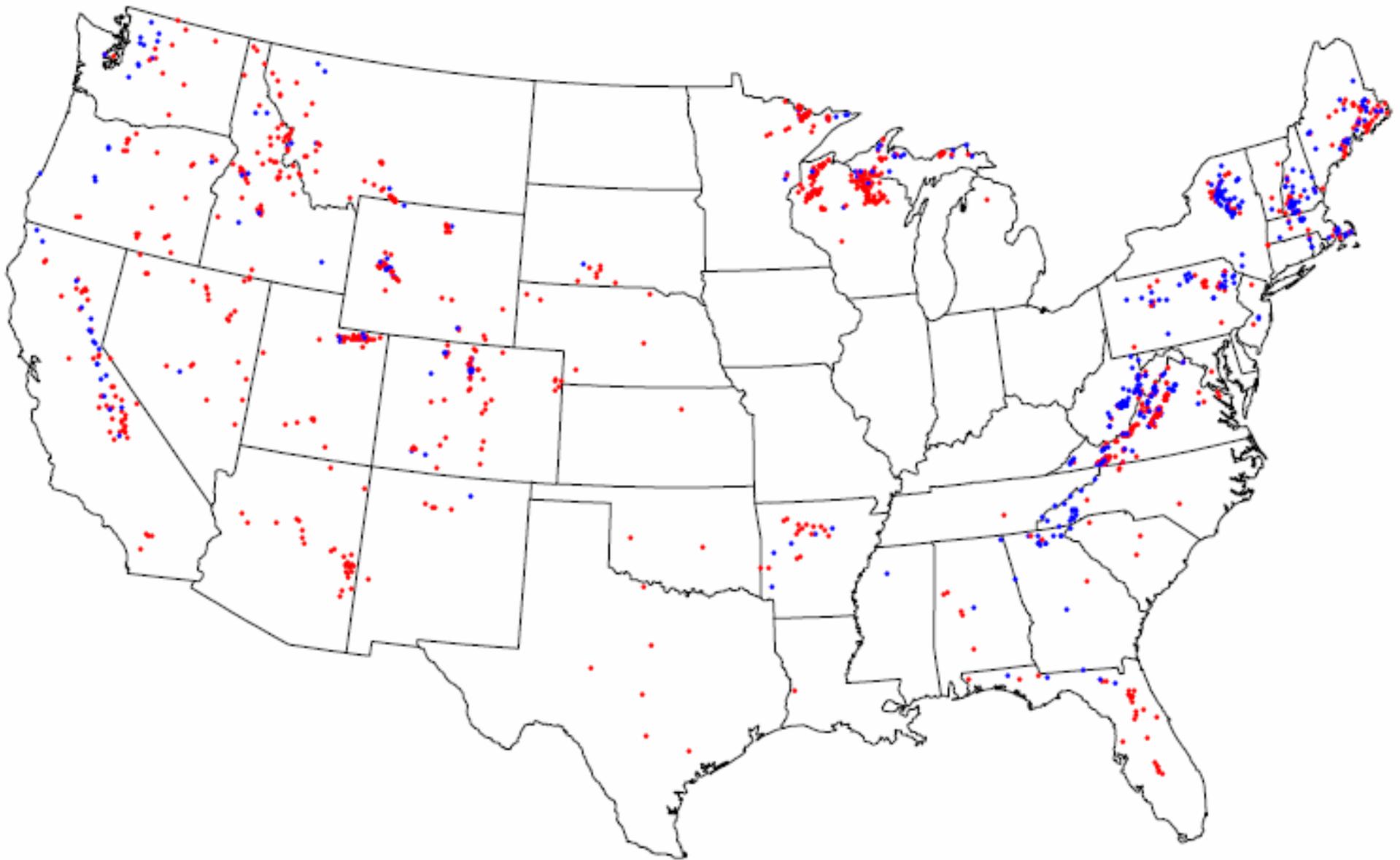


Figure A-18 Map of waterbodies with critical loads for an ANC limit of 50 µeq/L that are less than the  $DL_{\%ECO}$  values for the target ANC of 50 µeq/L calculated to protect 75% of the population using the cluster method. The US is divided into 5 clusters (see Chapter 5). The dots indicate the 25% of the population that would not likely achieve an ANC of 50 µeq/L. Given that each cluster would meet the DL established for a target ANC of 50 µeq/L, the red dots show waterbodies that would not likely be protected from an ANC of <20 and blue dots show waterbodies that would likely be protected from ANC <20.

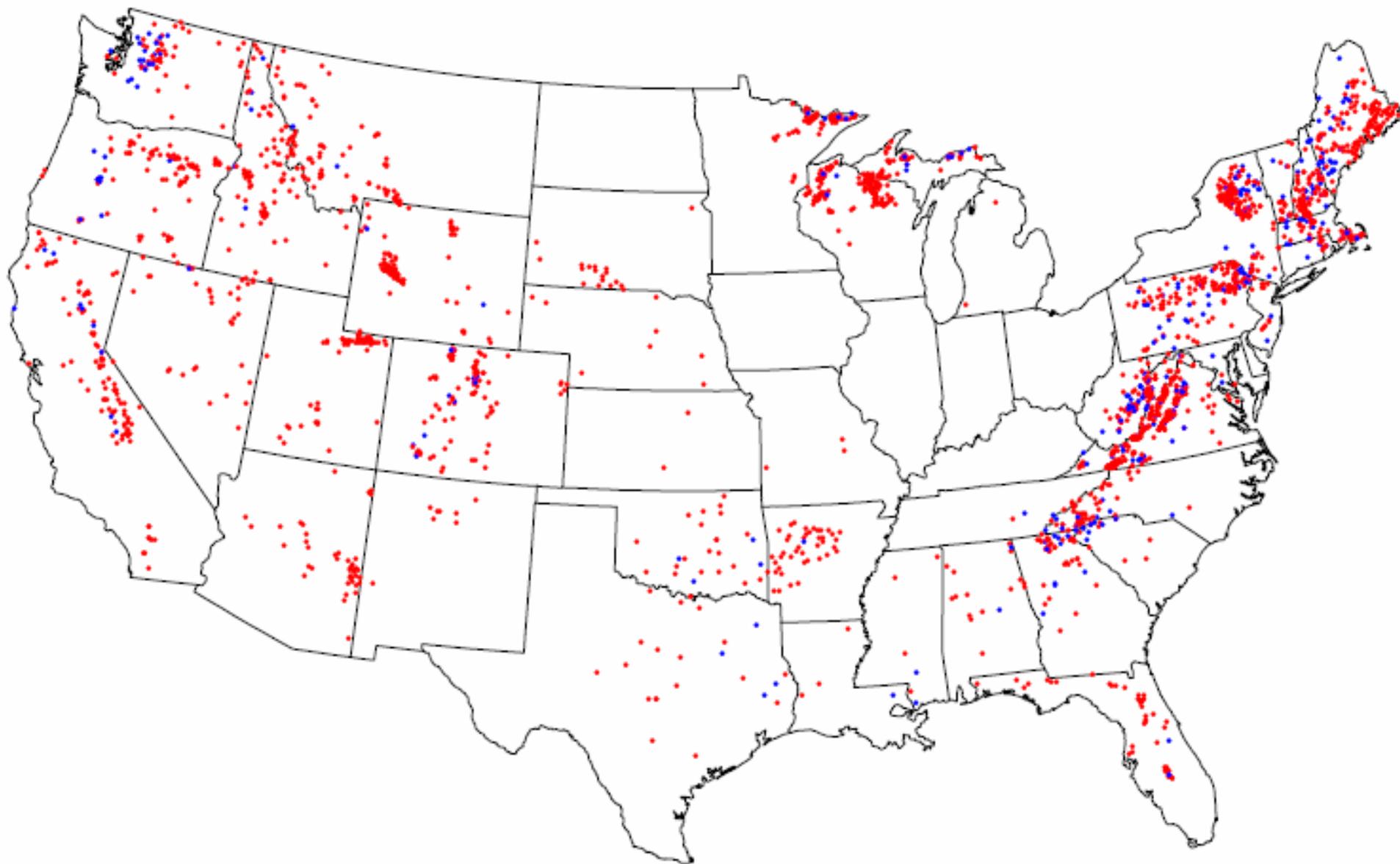


Figure A-19 Map of waterbodies with critical loads for an ANC limit of  $50 \mu\text{eq/L}$  that are less than the  $DL_{\%ECO}$  values for the target ANC of  $50 \mu\text{eq/L}$  calculated to protect 50% of the population using the cluster method. The US is divided into 5 clusters (see Chapter 5). The dots indicate the 50% of the population that would not likely achieve an ANC of  $50 \mu\text{eq/L}$ . Given that each cluster would meet the DL established for a target ANC of  $50 \mu\text{eq/L}$ , the red dots show waterbodies that would not likely be protected from an ANC of  $<20$  and blue dots show waterbodies that would likely be protected from ANC  $<20$ .

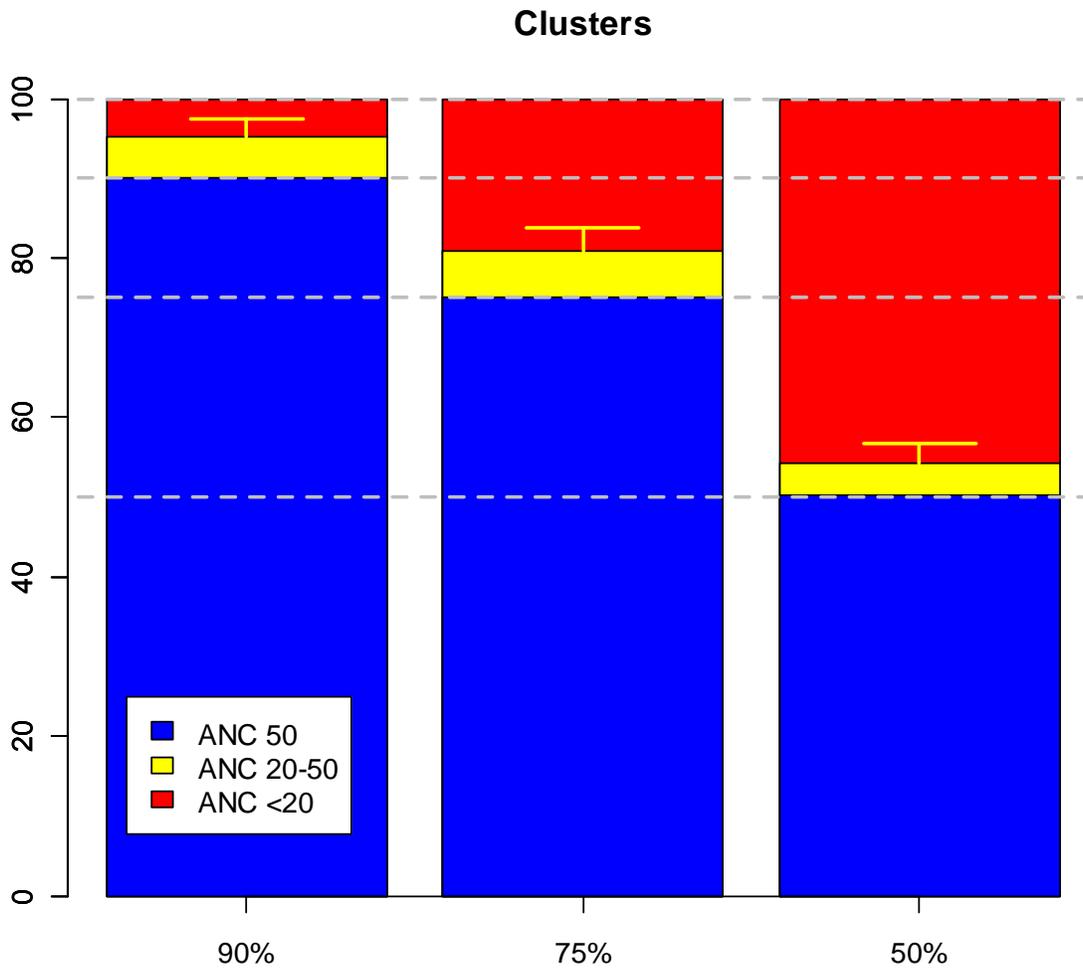


Figure A-20. Expected ANC resulting from a target ANC of 50  $\mu\text{eq/L}$  for specific target percentages of waterbodies. The yellow bars represent the mean value of all of the clusters. The whiskers associated with the ANC 20  $\mu\text{eq/L}$  (yellow) bars represent the upper confidence interval of the mean values.