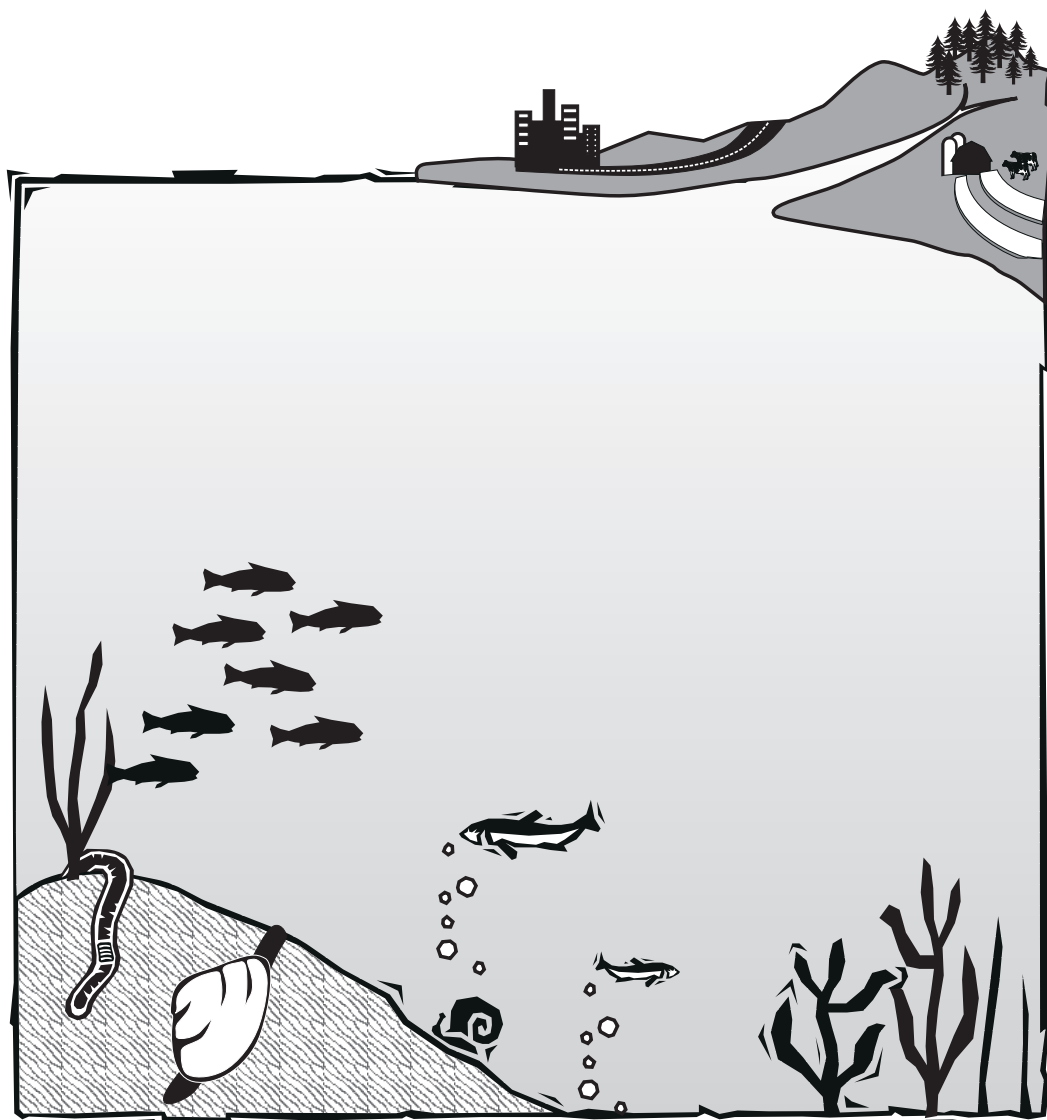




The Incidence And Severity Of Sediment Contamination In Surface Waters Of The United States

Volume 2: Data Summaries For Areas Of Probable Concern



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September 1997

Office of Science and Technology
United States Environmental Protection Agency
401 M Street, SW
Washington, DC 20460

The *National Sediment Quality Survey* is a screening-level assessment of sediment quality that compiles and evaluates sediment chemistry data and related biological data taken from existing databases. The data and information contained in this document could be used in various EPA regulatory programs for priority setting or other purposes after further evaluation for program-specific criteria. However, this document has no immediate or direct regulatory consequence. It does not in itself establish any legally binding requirements, establish or affect legal rights or obligations, or represent a determination of any party's liability.

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Introduction

The Water Resources Development Act (WRDA) of 1992 directed the U.S. Environmental Protection Agency (EPA), in consultation with the National Oceanic and Atmospheric Administration and the U.S. Army Corps of Engineers, to conduct a comprehensive national survey of data regarding the quality of sediments in the United States. The Act required EPA to compile all existing information on the quantity, chemical and physical composition, and geographic location of pollutants in sediment, including the probable sources of such pollutants and identification of those sediments which are contaminated. The Act further required EPA to report to the Congress the findings, conclusions, and recommendations of such survey, including recommendations for actions necessary to prevent contamination of aquatic sediments and to control sources of contamination.

To comply with the WRDA mandate, EPA's Office of Science and Technology initiated the National Sediment Inventory (NSI). The goals of the NSI are to compile sediment quality information from available electronic databases, gather information from available electronic databases and published reports on sediment contaminant sources, develop screening-level assessment protocols to identify potentially contaminated sediment, and produce biennial reports to Congress on the incidence and severity of sediment contamination nationwide. *The Incidence And Severity Of Sediment Contamination In Surface Waters Of The United States* is the first of these reports to Congress. EPA produced this report to Congress in four volumes:

- **Volume 1: National Sediment Quality Survey**—Screening analysis to qualitatively assess the probability of associated adverse human health or ecological effects based on a weight-of-evidence evaluation.
- **Volume 2: Data Summaries For Areas Of Probable Concern**—Sampling station location maps and chemical and biological summary data for watersheds containing areas of probable concern for sediment contamination.
- **Volume 3: National Sediment Contaminant Point Source Inventory**—Screening analysis to identify probable point source contributors of sediment pollutants.
- **Volume 4: National Sediment Contaminant Nonpoint Source Inventory**—Screening analysis to identify probable nonpoint source contributors of sediment pollutants (in preparation for subsequent biennial reports).

As part of the NSI data evaluation, EPA evaluated more than 21,000 sampling stations nationwide. Data for each sampling station were collected during the period of 1980 to 1993 by a wide variety of federal, state, regional, local, and other monitoring programs. The approach used to evaluate the NSI data focuses on the risk to benthic organisms exposed directly to contaminated sediments and the risk to human consumers of organisms exposed to sediment contaminants. EPA analyzed three types of data, alone and in combination, for the NSI evaluation—sediment chemistry data, chemical residue levels in edible tissue of aquatic organisms, and sediment toxicity data. Using the evaluation techniques described in detail in Volume 1 of this report to Congress, EPA associated sampling stations with their “probability of adverse effects.” Each sampling station was classified into one of three categories, or tiers, based on this evaluation:

- Tier 1: associated adverse effects are probable.
- Tier 2: associated adverse effects are possible, but expected infrequently.
- Tier 3: no indication of associated adverse effects (any sampling station not categorized as Tier 1 or Tier 2; includes sampling stations for which substantial data were available, as well as sampling stations for which limited data were available).

Although sampling stations are an important unit of assessment, the most significant contamination problems exist where multiple contaminated locations are in close proximity or are distributed throughout a discrete hydrologic unit. A single “hot spot” might not affect a benthic community or accumulation of contaminants in resident fish tissue to a great extent. Widespread contamination, however, is more likely to adversely affect benthic communities and lead to a greater extent of contaminant accumulation in resident fish.

The NSI data evaluation identified 96 watersheds throughout the United States that contain areas of probable concern for sediment contamination (APCs). An APC is defined by a watershed that contains 10 or more Tier 1 sampling stations and in which at least 75 percent of all sampling stations have been classified as Tier 1 or Tier 2. These dual criteria are based on empirical observation of the data. Watersheds with 10 or more Tier 1 sampling stations include the upper 10 percent of all watersheds evaluated. In addition, because approximately 75 percent of all sampling stations nationwide were classified as Tier 1 or Tier 2, at least the same percentage of stations in a watershed had to be classified as Tier 1 or Tier 2 before a watershed could be identified as containing an APC. EPA recommends further investigation of the human and ecological risks from sediment contamination in these watersheds. For further discussion of watersheds containing APCs, please refer to Chapter 3 in Volume 1 of this report, under the heading “Watershed Analysis”.

This document presents summary data related to each of the 96 watersheds containing APCs in the NSI data evaluation. The first section of this document, Classification of Sampling Stations by Watershed, presents the U.S. Geological Survey (USGS) cataloging unit number and name for each watershed identified as containing an APC. It also identifies the state(s) in which the watershed is located and the number of Tier 1, Tier 2, and Tier 3 sampling stations located in the watershed. (State abbreviations presented in parentheses indicate that no NSI sampling stations occur in that state even though at least part of the watershed is located in the state.)

The remainder of this document presents specific information for each watershed containing APCs. The watersheds are presented in the order of their USGS cataloging unit number, which follow a general geographic pattern of northeast to southeast to west. The USGS cataloging unit name and number for each watershed is presented at the top of the first page of each summary. The first page of each watershed summary presents general information concerning the watershed—USGS accounting unit in which it is located; state(s) in which it is located; political boundaries (counties that include at least part of the watershed); major waterways; and number of Tier 1, Tier 2, and Tier 3 sampling stations in the watershed—and a map identifying the location of the watershed relative to the primary state in which it is located. The second page of each summary presents a map identifying the location of major waterways (RF1) in the watershed and the location of Tier 1, Tier 2, and Tier 3 sampling stations in the watershed. The location of sampling stations is plotted using latitude and longitude coordinates provided in the source data. EPA did not attempt to verify these locations. Recent attempts by other users of NSI data to verify sampling station locations have suggested that some coordinates are, in fact, in error. The precise location of measured elevated levels of contaminants in sediment or fish, or sediment toxicity should be included in the initial stage of further investigation. Following the watershed map is a table listing the data sources used in the evaluation of sampling stations in the watershed. In addition to the sources of data, this table presents the agency code for the agency responsible for collecting the data, the name of the monitoring program, the number of stations in the watershed that were sampled as part of the monitoring program, and the sampling period or date. A series of tables follows the list of data sources. Depending on the types of data collected, all of the tables might not be presented for a given watershed; for example, if toxicity data were not collected, a “Biototoxicity Data” table is not included.

The table titled “Chemicals Responsible for Sampling Station Classification as Tier 1 or Tier 2” presents the following information for each chemical:

- Total number of stations in the watershed where the chemical was measured.
- Total number of stations in the watershed classified as either Tier 1 or Tier 2 due to the chemical for either aquatic life effects, human health effects, or both. (Note: A station can be classified as Tier 1 or Tier 2 due to several chemicals.)
- Number of sampling stations in the watershed classified as Tier 1 due to the chemical for either aquatic life effects, human health effects, or both.

- Number of sampling stations in the watershed classified as Tier 2 due to the chemical for either aquatic life effects, human health effects, or both.
- Number of sampling stations in the watershed classified as Tier 1 or Tier 2 for aquatic life effects due to the chemical.
- Number of sampling stations in the watershed classified as Tier 1 or Tier 2 for human health effects due to the chemical.

The table titled “Sediment Chemistry Data: Chemical Summary” presents the following information for each chemical measured in the sediment:

- Total number of observations in the watershed.
- Mean and median concentration of all observations in the watershed (assuming zero for nondetects).
- Number of detected observations in the watershed.
- Maximum and minimum concentration of detected observations in the watershed.

The table titled “Tissue Residue Data: Chemical Summary” presents the following information for each chemical measured in fish tissue (if any):

- Total number of observations in the watershed.
- Mean and median concentration of all observations in the watershed (assuming zero for nondetects).
- Number of detected observations in the watershed.
- Maximum and minimum concentration of detected observations in the watershed.

The tissue residue table presents data evaluation results only for those species which are considered demersal, resident, and edible. These are the only species evaluated for this report to Congress, although the NSI also includes data for species that are considered pelagic, migratory, and/or nonedible.

The table titled “Biototoxicity Data” presents information about toxicity tests (if any). The toxicity test results presented in the table are grouped under the monitoring programs responsible for collecting the data, and include:

- Sampling station latitude and longitude
- Sampling date (year-month-day)
- Test species name
- Type (i.e., sediment phase) of test
 - Liquid-phase (L)
 - Elutriate-phase (E)
 - Suspended particulate-phase (P)
 - Solid-phase (S)
- Percent mortality in test and control
- Whether the toxicity results indicate significant toxicity.

Classification of Sampling Stations by Watershed

CU- **01090001** CU Name- **Charles**

State(s): MA #Tier1- 195 #Tier2- 402 #Tier3- 111

CU- **01090002** CU Name- **Cape Cod**

State(s): MA (RI) #Tier1- 15 #Tier2- 73 #Tier3- 20

CU- **01090004** CU Name- **Narragansett**

State(s): RI MA #Tier1- 28 #Tier2- 20 #Tier3- .

CU- **02030103** CU Name- **Hackensack-Passaic**

State(s): NJ NY #Tier1- 43 #Tier2- 58 #Tier3- 2

CU- **02030104** CU Name- **Sandy Hook-Staten Island**

State(s): NJ NY #Tier1- 60 #Tier2- 21 #Tier3- 19

CU- **02030105** CU Name- **Raritan**

State(s): NJ #Tier1- 13 #Tier2- 37 #Tier3- 15

CU- **02030202** CU Name- **Southern Long Island**

State(s): NY #Tier1- 11 #Tier2- 24 #Tier3- 8

CU- **02040105** CU Name- **Middle Delaware-Musconetcong**

State(s): NJ PA #Tier1- 11 #Tier2- 26 #Tier3- 11

CU- **02040202** CU Name- **Lower Delaware**

State(s): NJ PA #Tier1- 18 #Tier2- 29 #Tier3- 10

CU- **02040203** CU Name- **Schuylkill**

State(s): PA #Tier1- 12 #Tier2- 23 #Tier3- 9

CU- **02040301** CU Name- **Mullica-Toms**

State(s): NJ #Tier1- 10 #Tier2- 22 #Tier3- 10

CU- **02060003** CU Name- **Gunpowder-Patapsco**

State(s): MD (PA) #Tier1- 17 #Tier2- 7 #Tier3- 5

CU- **02070004** CU Name- **Conococheague-Opequon**

State(s): MD VA WV (PA) #Tier1- 11 #Tier2- 12 #Tier3- 6

CU- **03040201** CU Name- **Lower Pee Dee**

State(s): SC NC #Tier1- 11 #Tier2- 20 #Tier3- 3

CU- **03060101** CU Name- **Seneca**

State(s): SC NC #Tier1- 10 #Tier2- 3 #Tier3- 3

CU- **03060106** CU Name- **Middle Savannah**

State(s): SC GA #Tier1- 20 #Tier2- 11 #Tier3- 5

CU- **03080103** CU Name- **Lower St. Johns**

State(s): FL #Tier1- 32 #Tier2- 111 #Tier3- 45

CU- **03130002** CU Name- **Middle Chattahoochee-Lake Harding**
State(s): GA (AL) #Tier1- **21** #Tier2- **4** #Tier3- **2**

CU- **03140102** CU Name- **Choctawhatchee Bay**
State(s): FL #Tier1- **19** #Tier2- **23** #Tier3- **9**

CU- **03140107** CU Name- **Perdido Bay**
State(s): AL FL #Tier1- **10** #Tier2- **24** #Tier3- **4**

CU- **03160205** CU Name- **Mobile Bay**
State(s): AL #Tier1- **31** #Tier2- **43** #Tier3- **7**

CU- **04030102** CU Name- **Door-Kewaunee**
State(s): WI #Tier1- **12** #Tier2- **5** #Tier3- **3**

CU- **04030108** CU Name- **Menominee**
State(s): WI MI #Tier1- **12** #Tier2- **6** #Tier3- **3**

CU- **04030204** CU Name- **Lower Fox**
State(s): WI #Tier1- **49** #Tier2- **2** #Tier3- **.**

CU- **04040001** CU Name- **Little Calumet-Galien**
State(s): IN IL (MI) #Tier1- **45** #Tier2- **26** #Tier3- **18**

CU- **04040002** CU Name- **Pike-Root**
State(s): IL WI #Tier1- **34** #Tier2- **30** #Tier3- **8**

CU- **04040003** CU Name- **Milwaukee**
State(s): WI #Tier1- **60** #Tier2- **16** #Tier3- **14**

CU- **04050001** CU Name- **St. Joseph**
State(s): MI IN #Tier1- **17** #Tier2- **9** #Tier3- **6**

CU- **04060103** CU Name- **Manistee**
State(s): MI #Tier1- **11** #Tier2- **3** #Tier3- **.**

CU- **04090002** CU Name- **Lake St. Clair**
State(s): MI #Tier1- **13** #Tier2- **5** #Tier3- **1**

CU- **04090004** CU Name- **Detroit**
State(s): MI #Tier1- **85** #Tier2- **29** #Tier3- **1**

CU- **04100001** CU Name- **Ottawa-Stony**
State(s): MI OH #Tier1- **13** #Tier2- **15** #Tier3- **1**

CU- **04100002** CU Name- **Raisin**
State(s): MI (OH) #Tier1- **18** #Tier2- **19** #Tier3- **1**

CU- **04100010** CU Name- **Cedar-Portage**
State(s): OH MI #Tier1- **13** #Tier2- **39** #Tier3- **4**

CU- **04100012** CU Name- **Huron-Vermilion**
State(s): OH #Tier1- **10** #Tier2- **35** #Tier3- **.**

CU- **04110001** CU Name- **Black-Rocky**

State(s): OH #Tier1- 24 #Tier2- 31 #Tier3- 4

CU- **04110003** CU Name- **Ashtabula-Chagrin**
State(s): OH #Tier1- 10 #Tier2- 18 #Tier3- 3

CU- **04120101** CU Name- **Chautauqua-Conneaut**
State(s): OH PA NY #Tier1- 21 #Tier2- 86 #Tier3- 3

CU- **04120103** CU Name- **Buffalo-Eighteenmile**
State(s): NY #Tier1- 59 #Tier2- 33 #Tier3- 9

CU- **04120104** CU Name- **Niagara**
State(s): NY #Tier1- 24 #Tier2- 16 #Tier3- 1

CU- **04130001** CU Name- **Oak Orchard-Twelvemile**
State(s): NY #Tier1- 39 #Tier2- 46 #Tier3- 1

CU- **04150301** CU Name- **Upper St. Lawrence**
State(s): NY #Tier1- 21 #Tier2- 5 #Tier3- 5

CU- **05030101** CU Name- **Upper Ohio**
State(s): OH PA WV #Tier1- 12 #Tier2- 29 #Tier3- 12

CU- **05030102** CU Name- **Shenango**
State(s): PA OH #Tier1- 11 #Tier2- 1 #Tier3- 3

CU- **05040001** CU Name- **Tuscarawas**
State(s): OH #Tier1- 10 #Tier2- 53 #Tier3- 15

CU- **05120109** CU Name- **Vermilion**
State(s): IL (IN) #Tier1- 12 #Tier2- 16 #Tier3- .

CU- **05120111** CU Name- **Middle Wabash-Busseron**
State(s): IL IN #Tier1- 15 #Tier2- 17 #Tier3- 1

CU- **06010104** CU Name- **Holston**
State(s): TN #Tier1- 12 #Tier2- 2 #Tier3- 1

CU- **06010201** CU Name- **Watts Bar Lake**
State(s): TN #Tier1- 63 #Tier2- 7 #Tier3- 19

CU- **06010207** CU Name- **Lower Clinch**
State(s): TN #Tier1- 61 #Tier2- 14 #Tier3- 4

CU- **06020001** CU Name- **Middle Tennessee-Chickamauga**
State(s): TN GA (AL) #Tier1- 47 #Tier2- 29 #Tier3- 18

CU- **06020002** CU Name- **Hiwassee**
State(s): TN NC GA #Tier1- 13 #Tier2- 17 #Tier3- 3

CU- **06030001** CU Name- **Guntersville Lake**
State(s): AL TN (GA) #Tier1- 25 #Tier2- 46 #Tier3- 21

CU- **06030005** CU Name- **Pickwick Lake**
State(s): AL TN (MS) #Tier1- 49 #Tier2- 9 #Tier3- 11

CU- **06040001** CU Name- **Lower Tennessee-Beech**
State(s): TN (MS) #Tier1- 15 #Tier2- 6 #Tier3- 4

CU- **06040005** CU Name- **Kentucky Lake**
State(s): TN KY #Tier1- 15 #Tier2- 14 #Tier3- 1

CU- **07010206** CU Name- **Twin Cities**
State(s): MN WI #Tier1- 26 #Tier2- 2 #Tier3- 7

CU- **07040001** CU Name- **Rush-Vermillion**
State(s): MN WI #Tier1- 13 #Tier2- 1 #Tier3- .

CU- **07040003** CU Name- **Buffalo-Whitewater**
State(s): MN WI #Tier1- 17 #Tier2- 3 #Tier3- 6

CU- **07070003** CU Name- **Castle Rock**
State(s): WI #Tier1- 20 #Tier2- . #Tier3- 2

CU- **07080101** CU Name- **Copperas-Duck**
State(s): IA IL #Tier1- 17 #Tier2- 5 #Tier3- 5

CU- **07090006** CU Name- **Kishwaukee**
State(s): IL (WI) #Tier1- 10 #Tier2- 24 #Tier3- .

CU- **07120003** CU Name- **Chicago**
State(s): IL IN #Tier1- 64 #Tier2- 36 #Tier3- 3

CU- **07120004** CU Name- **Des Plaines**
State(s): IL WI #Tier1- 61 #Tier2- 43 #Tier3- 6

CU- **07120006** CU Name- **Upper Fox**
State(s): IL WI #Tier1- 15 #Tier2- 40 #Tier3- 5

CU- **07130001** CU Name- **Lower Illinois-Senachwine Lake**
State(s): IL #Tier1- 11 #Tier2- 10 #Tier3- .

CU- **07140101** CU Name- **Cahokia-Joachim**
State(s): IL MO #Tier1- 18 #Tier2- 34 #Tier3- 4

CU- **07140106** CU Name- **Big Muddy**
State(s): IL #Tier1- 23 #Tier2- 65 #Tier3- 6

CU- **07140201** CU Name- **Upper Kaskaskia**
State(s): IL #Tier1- 31 #Tier2- 24 #Tier3- .

CU- **07140202** CU Name- **Middle Kaskaskia**
State(s): IL #Tier1- 13 #Tier2- 22 #Tier3- 3

CU- **08010100** CU Name- **Lower Mississippi-Memphis**
State(s): TN KY MO AR MS #Tier1- 14 #Tier2- 3 #Tier3- 3

CU- **08030209** CU Name- **Deer-Steele**
State(s): MS (LA) #Tier1- 11 #Tier2- 10 #Tier3- .

CU- **08040207** CU Name- **Lower Ouachita**
State(s): LA #Tier1- 12 #Tier2- . #Tier3- .

CU- **08080206** CU Name- **Lower Calcasieu**
State(s): LA #Tier1- 26 #Tier2- 52 #Tier3- 22

CU- **08090100** CU Name- **Lower Mississippi-New Orleans**
State(s): LA #Tier1- 16 #Tier2- 34 #Tier3- 1

CU- **10270104** CU Name- **Lower Kansas**
State(s): KS MO #Tier1- 12 #Tier2- 15 #Tier3- 2

CU- **11070207** CU Name- **Spring**
State(s): KS MO OK #Tier1- 10 #Tier2- 25 #Tier3- 6

CU- **11070209** CU Name- **Lower Neosho**
State(s): OK (AR) #Tier1- 13 #Tier2- 3 #Tier3- 4

CU- **12040104** CU Name- **Buffalo-San Jacinto**
State(s): TX #Tier1- 10 #Tier2- 23 #Tier3- 3

CU- **17010303** CU Name- **Coeur D'Alene Lake**
State(s): ID (WA) #Tier1- 10 #Tier2- 13 #Tier3- .

CU- **17030003** CU Name- **Lower Yakima**
State(s): WA #Tier1- 23 #Tier2- 19 #Tier3- 5

CU- **17090012** CU Name- **Lower Willamette**
State(s): OR #Tier1- 21 #Tier2- 51 #Tier3- 4

CU- **17110002** CU Name- **Strait Of Georgia**
State(s): WA #Tier1- 32 #Tier2- 168 #Tier3- 63

CU- **17110013** CU Name- **Duwamish**
State(s): WA #Tier1- 48 #Tier2- 69 #Tier3- 10

CU- **17110014** CU Name- **Puyallup**
State(s): WA #Tier1- 12 #Tier2- 6 #Tier3- 1

CU- **17110019** CU Name- **Puget Sound**
State(s): WA #Tier1- 418 #Tier2- 851 #Tier3- 114

CU- **18030012** CU Name- **Tulare-Buena Vista Lakes**
State(s): CA #Tier1- 10 #Tier2- 5 #Tier3- 5

CU- **18050003** CU Name- **Coyote**
State(s): CA #Tier1- 18 #Tier2- 6 #Tier3- .

CU- **18050004** CU Name- **San Francisco Bay**
State(s): CA #Tier1- 19 #Tier2- 37 #Tier3- 8

CU- **18070104** CU Name- **Santa Monica Bay**
State(s): CA #Tier1- 79 #Tier2- 31 #Tier3- 22

CU- **18070105** CU Name- **Los Angeles**

State(s): CA #Tier1- 14 #Tier2- 19 #Tier3- 4

CU- **18070107** CU Name- **San Pedro Channel Islands**

State(s): CA #Tier1- 14 #Tier2- 10 #Tier3- 1

CU- **18070201** CU Name- **Seal Beach**

State(s): CA #Tier1- 63 #Tier2- 339 #Tier3- 40

CU- **18070204** CU Name- **Newport Bay**

State(s): CA #Tier1- 24 #Tier2- 68 #Tier3- 16

CU- **18070301** CU Name- **Aliso-San Onofre**

State(s): CA #Tier1- 10 #Tier2- 22 #Tier3- .

CU- **18070304** CU Name- **San Diego**

State(s): CA #Tier1- 53 #Tier2- 51 #Tier3- 3