Cook Inlet
Citizens Environmental Monitoring Program

Homer Soil and Water Conservation District

KENAI WATERSHED FORUM

USGS science for a changing world

Alaska Department of Environmental Conservation

ANCHORAGE WATERWAYS COUNCIL

Wasilla Soil & Water Conservation District

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

ALASKA DEPT OF FISH AND GAME

ALASKA STREAM TEAM

Upper Susitna Soil & Water Conservation District

COOK INLET KEEPER

Matanuska - Susitna Borough

Environmental Monitoring Program: Partnering to Monitor Water Quality and Habitat in the Cook Inlet Watershed

Joel Cooper
Cook Inlet Keeper

Elaine Major
UAA-Environment and Natural Resources Institute

Robert Ruffner
Kenai Watershed Forum

Tim Stevens
Alaska Department of Environmental Conservation

Collecting Consistent, Scientifically-Defensible Baseline Data: Citizens Monitor Their Water Resources

CEMP Partners

- Homer Soil & Water Conservation District
- Cook Inlet Keeper
- UAA-Environment and Natural Resources Institute
- Kenai Watershed Forum
- Seldovia Oil Spill Response Team
- Anchorage Waterways Council
- Wasilla Soil & Water Conservation District
- Mat-Su Borough Planning Department
- Upper Susitna Soil and Water Conservation District

History

Cook Inlet Keeper

- **In 1994, a group of fishermen, scientists, Native Alaskans, artists and concerned citizens came together for a water quality workshop in Homer, Alaska. The group shared a common concern for the rapid ecological changes occurring in Cook Inlet, and decided to form a watchdog group modeled after successful "Keeper" programs across the country.**
- **In 1995, local conservation groups negotiated a settlement for over 4000 violations of the federal Clean Water Act in Cook Inlet.**
- **The EPA joined the litigation, and the defendants chose to direct 3 years of start-up funding to Cook Inlet Keeper in a landmark settlement.**

History

QAPP & Volunteer Training Manual

- **Spring 1996: Technical Advisory Committee (TAC) Convened**
- **Spring 1997: TAC and Citizen Advisory Panel (CAP) Joint Meeting**
- **August 1998: QAPP and Training Manual Approved by TAC, CAP, EPA and ADEC**
- **Winter 2000-2001: Begin Work on Quality Management Plan (QMP)**
- **Spring 2002: Approve QMP and Associated Documents**

History

CEMP Partnership

- 1997
  - Seldovia Oil Spill Response Team
  - Kenai Watershed Forum
  - Homer Soil and Water Conservation District
  - UAA-Environment and Natural Resources Institute
- 1999
  - Anchorage Waterways Council
  - Mat-Su Borough Planning Dept.
- 2000
  - Wasilla Soil and Water Conservation District
  - First Partner Conference in December
- 2001
  - Upper Susitna Soil and Water Conservation District

Working to Integrate the Interests and Concerns of the Native Communities

- Native American Fish and Wildlife Society
- Cook Inlet Treaty Tribes
  - Native Village of Eklutna
  - Knik Tribal Council
  - Chickaloon Native Village
  - Native Village of Tyonek
  - Port Graham Village Council
  - Kenatize Indian Tribe
  - Seldovia Village Tribe
  - Ninilchik Tradition Council
  - Nanwalek IRA Council

Supporting Agencies

- Alaska Department of Environmental Conservation
- U. S. Environmental Protection Agency
- U.S. Geological Survey
- Natural Resource Conservation Service
- U.S. Fish and Wildlife Service
- Alaska Department of Fish and Game
- Kachemak Bay Research Reserve
- UAA- Kachemak Bay Campus of the Kenai Peninsula College

Funding Support

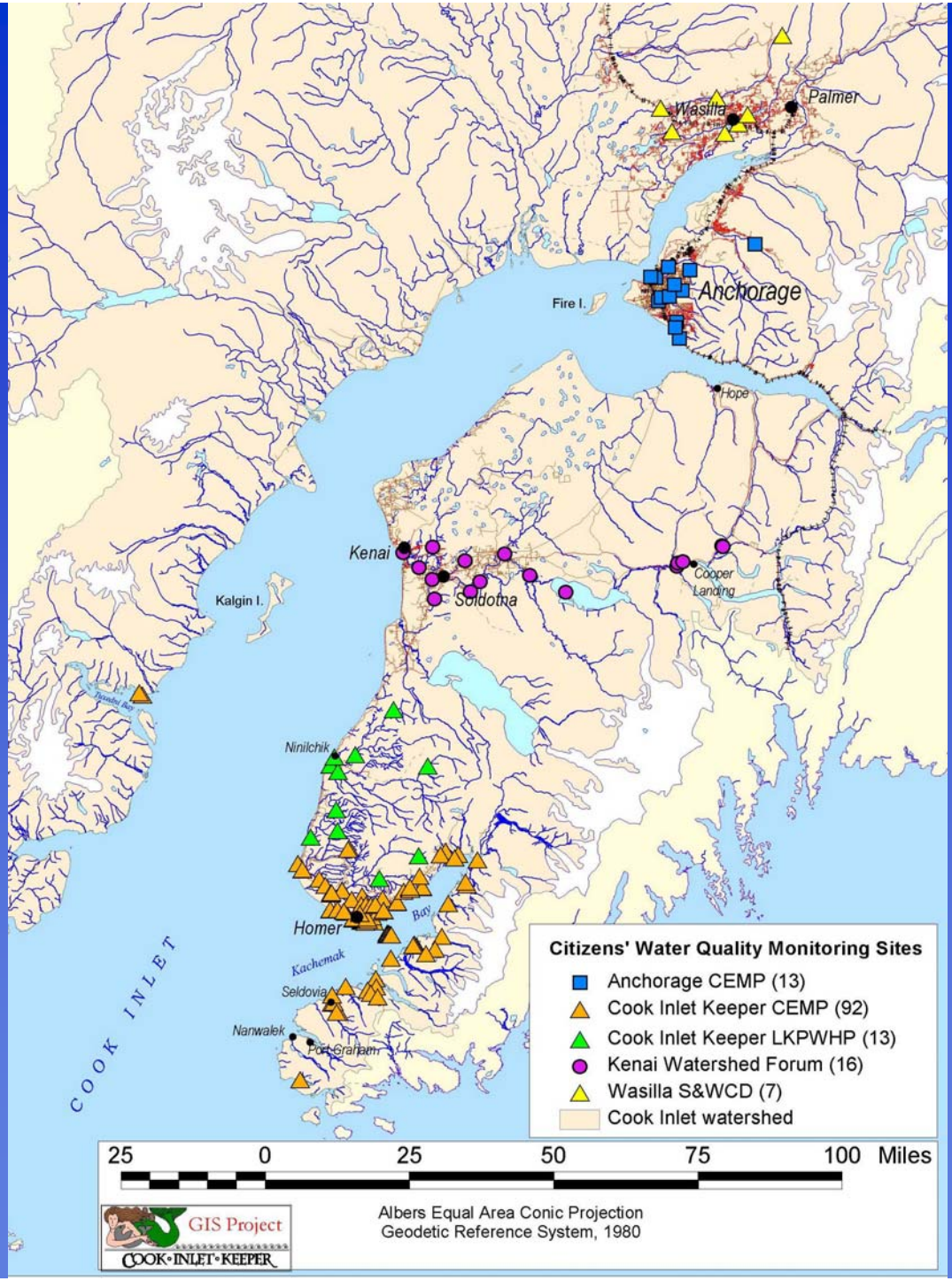
- U. S. Environmental Protection Agency
- Alaska Department of Environmental Conservation
- U.S. Fish and Wildlife Service
- *Exxon Valdez* Oil Spill Trustee Council
- Norcross Wildlife Foundation
- The Skaggs Foundation
- Bullitt Foundation

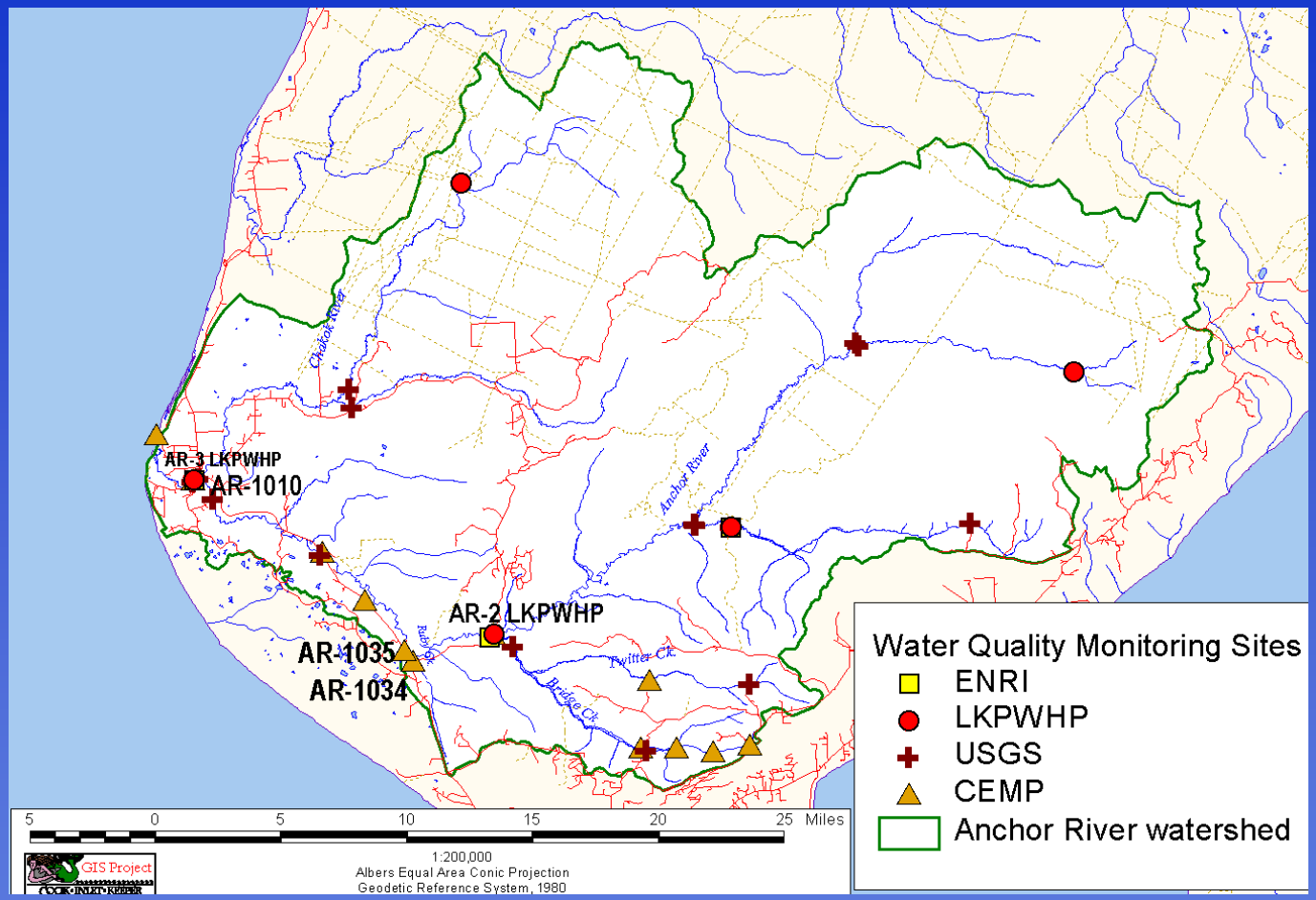
What We Monitor

- **Chemical**
- **Biological**
- **Physical**

CEMP Objectives

- **Inventory baseline water quality in the water of the Cook Inlet Basin.**
- **Detect and report significant changes and track water quality trends.**
- **Raise public awareness of the importance of water quality through hands on involvement.**


Wasilla
Palmer
Anchorage
Fire I.
Hope
Kenai
Soldotna
Cooper Landing
Kalgin I.
Ninilchik
Homer
Bay
Kachemak
Seldovia
Nanwalek
Port Graham
COOK INLET
Citizens' Water Quality Monitoring Sites
Anchorage CEMP (13)
Cook Inlet Keeper CEMP (92)
Cook Inlet Keeper LKPWHP (13)
Kenai Watershed Forum (16)
Wasilla S&WCD (7)
Cook Inlet watershed
25 0 25 50 75 100 Miles
GIS Project
COOK•INLET•KEEPER
Albers Equal Area Conic Projection
Geodetic Reference System, 1980


AR-3 LKPWHP
AR-1010
AR-2 LKPWHP
AR-1035
AR-1034
Chuitok River
Anchor River
Twitter Ck.
Bridge Ck.
Water Quality Monitoring Sites
ENRI
LKPWHP
USGS
CEMP
Anchor River watershed
5 0 5 10 15 20 25 Miles
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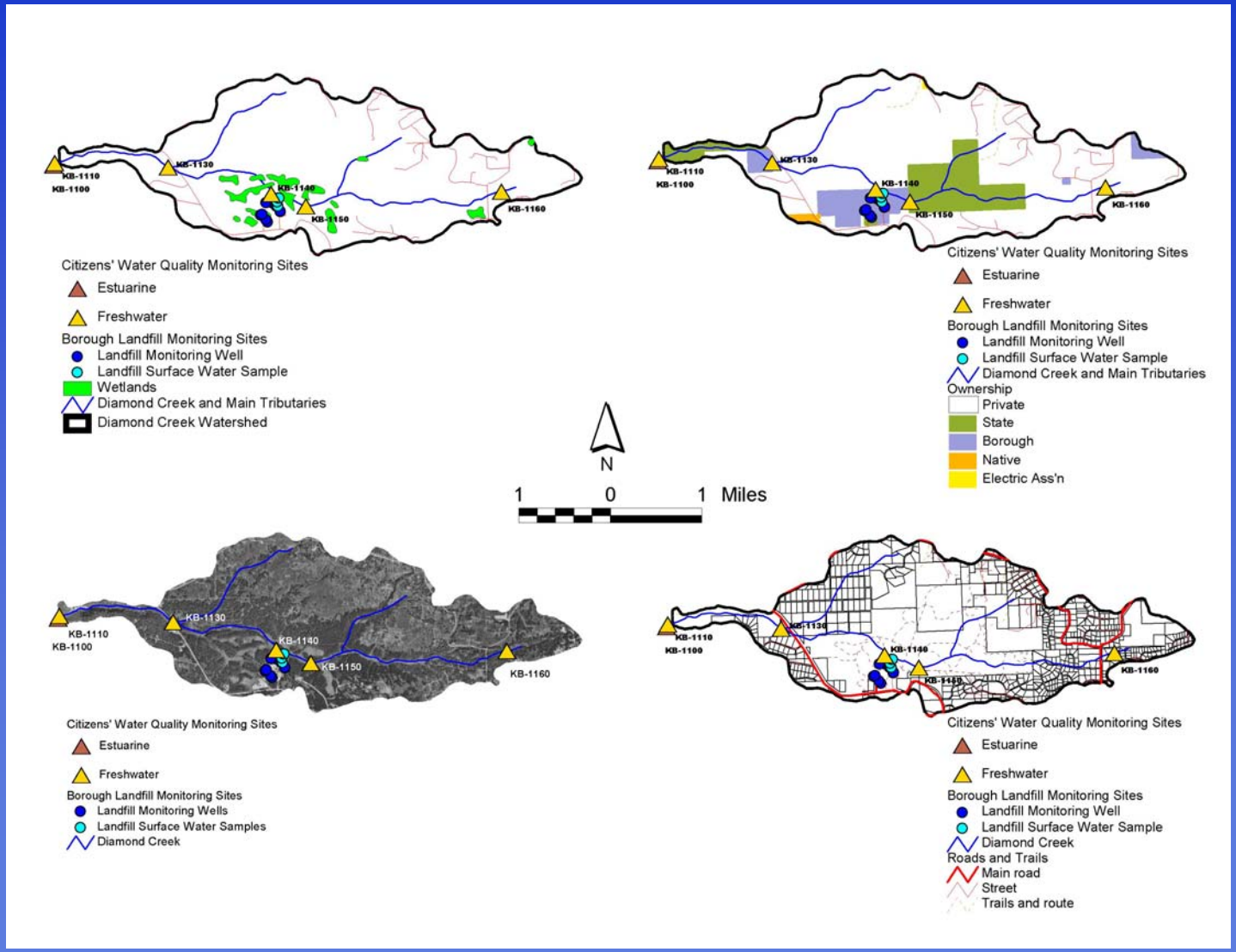
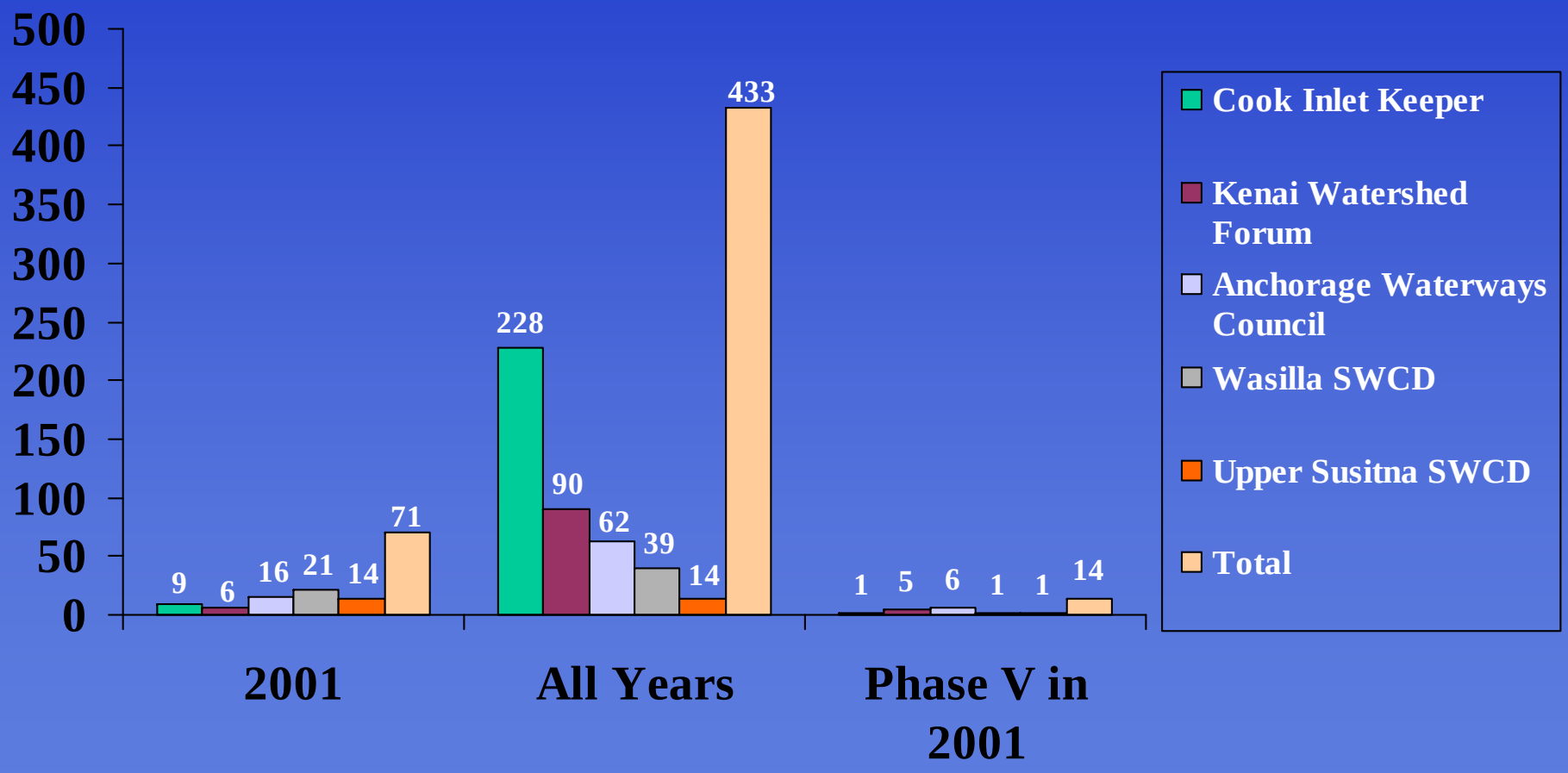
Geodetic Reference System, 1980
GIS Project

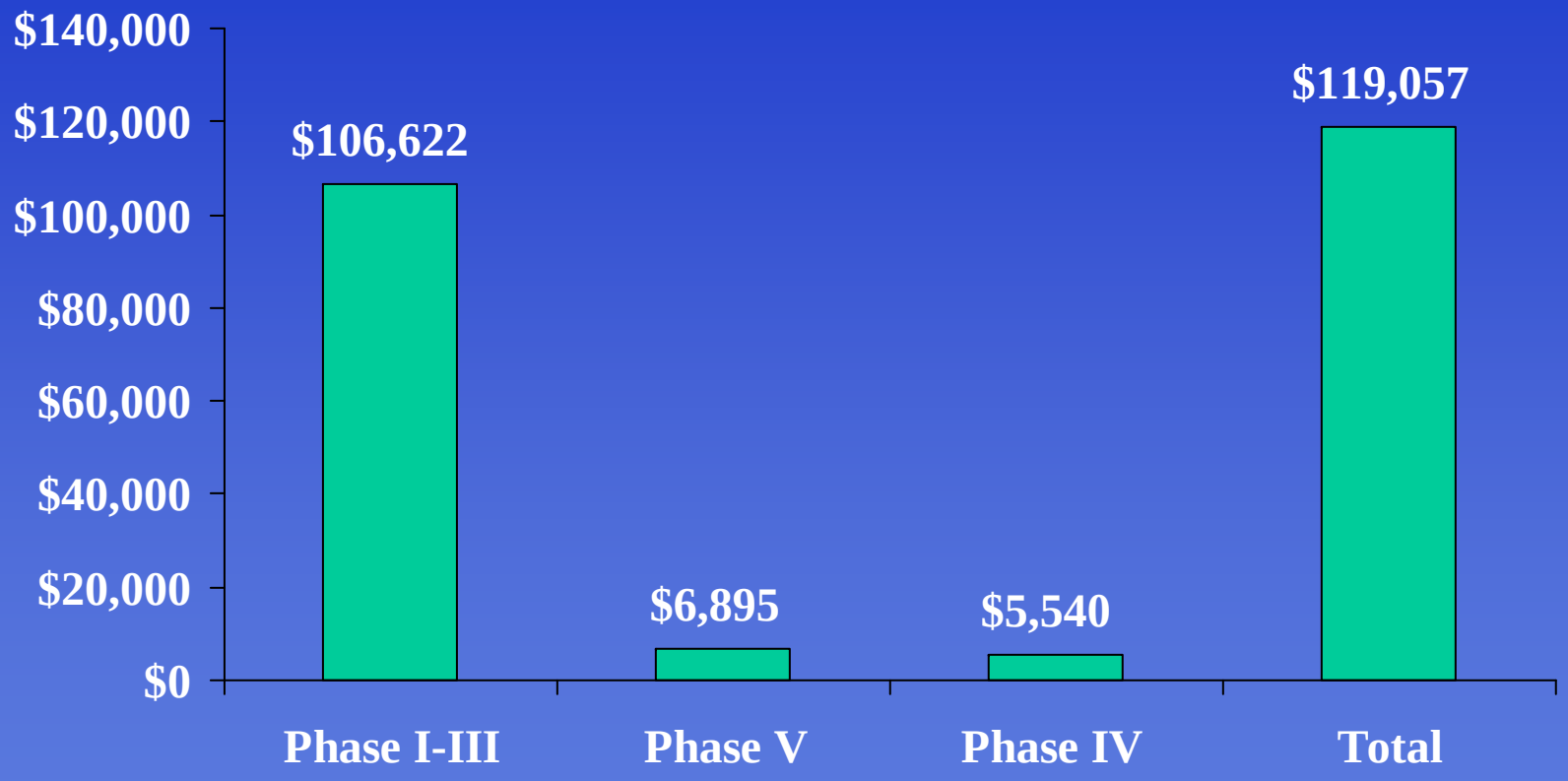
Diamond Creek Watershed



Number of CEMP Volunteers Trained

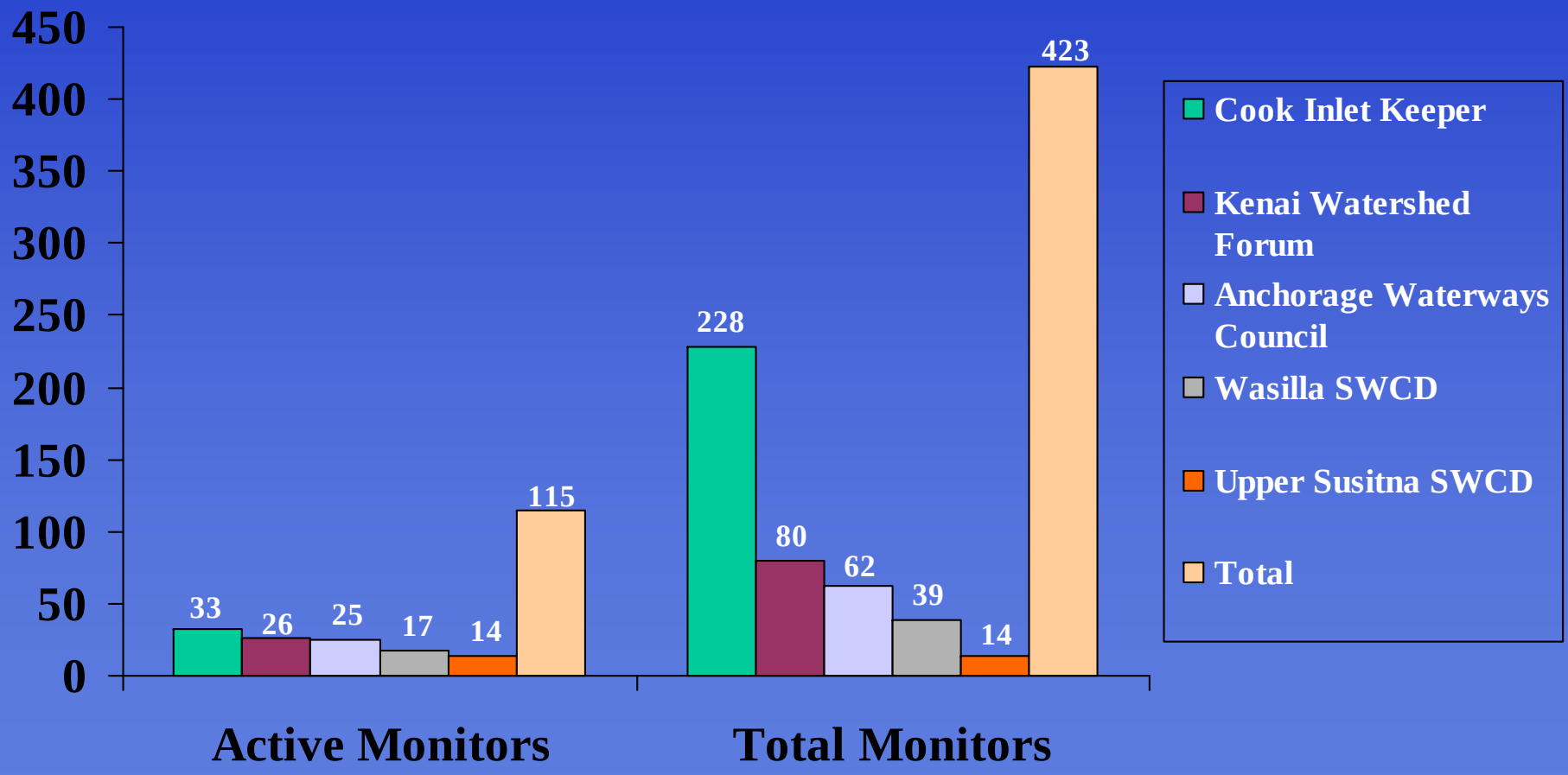


CEMP Volunteer Training
Estimated In-Kind Contributions Since 1996



Based on the latest data available on the average hourly wage for nonagricultural workers as published in the *Economic Report of the President*, the assigned hourly wage for volunteers is $15.39. Phase I-III is 16 hours/ vol.; Phase V is 16 hours /vol.; Phase IV is 4 hours/vol.

Number of CEMP Volunteer Monitors



Site Types

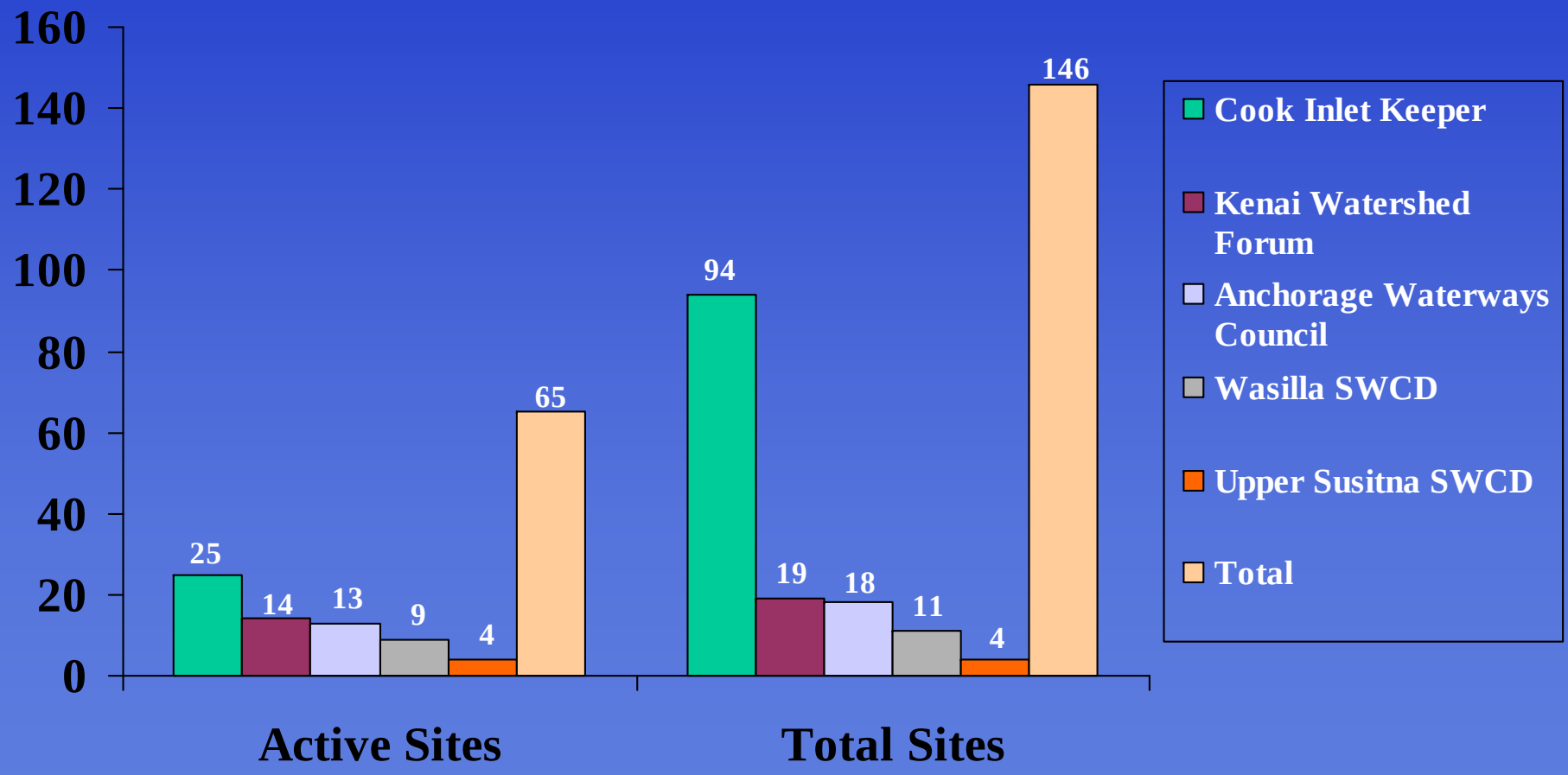
- Freshwater (Stream)
- Estuarine (Near Shore)
- Lake

Cook Inlet Keeper Sites

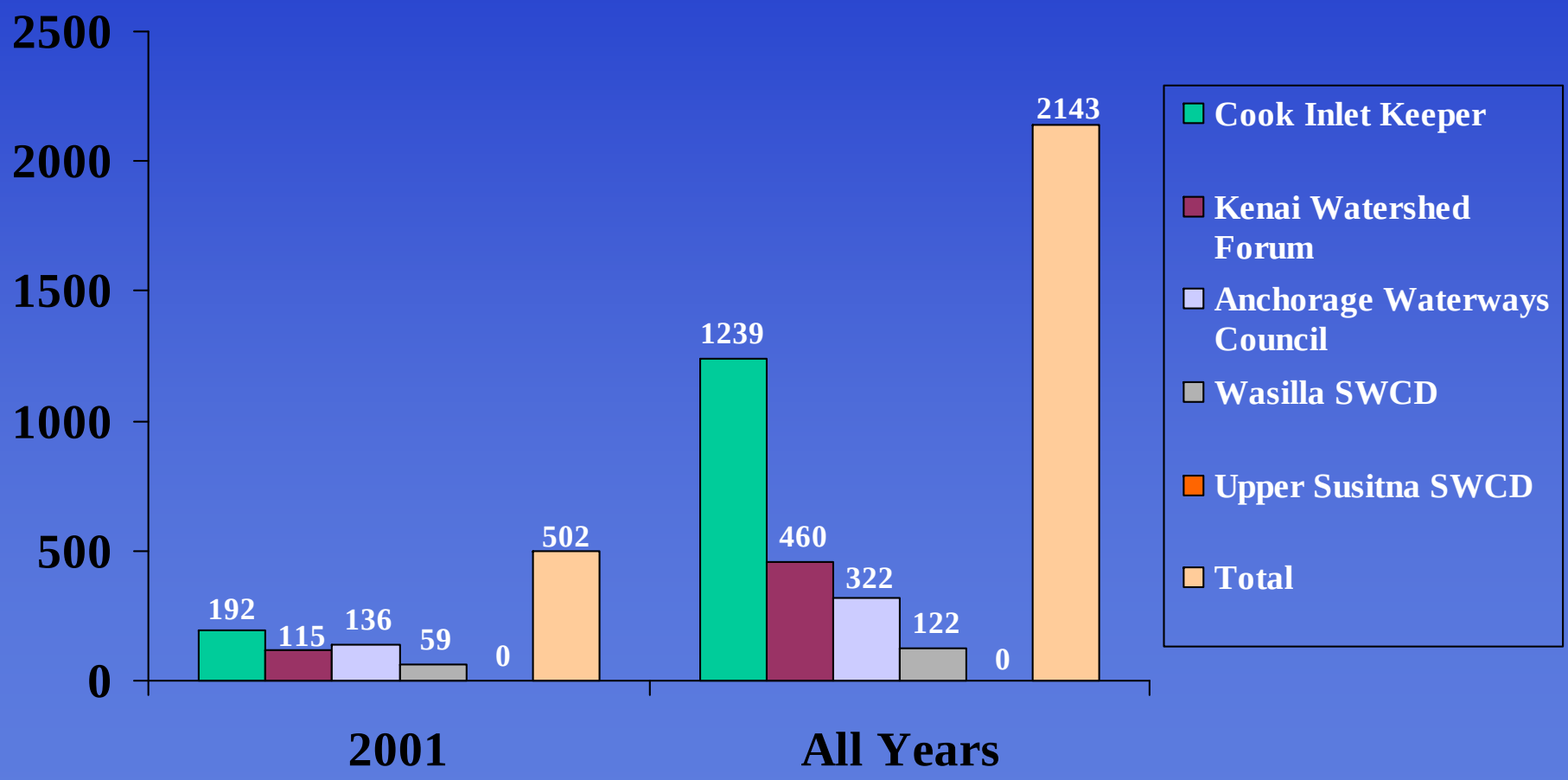
Kachemak Bay and Anchor River Watersheds

- **51 Freshwater**
- **43 Estuarine**

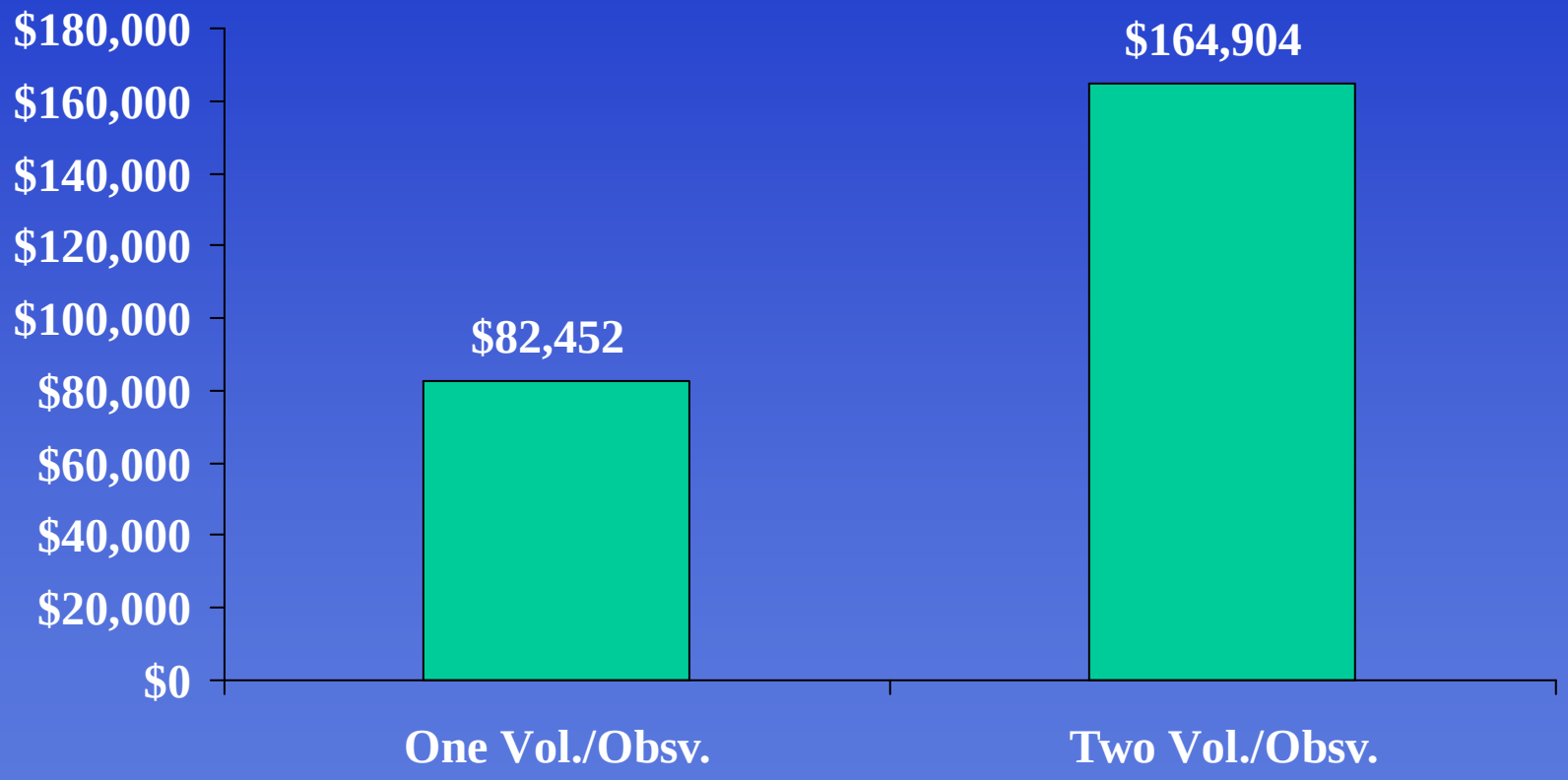
Number of CEMP Monitoring Sites



Number of Observations

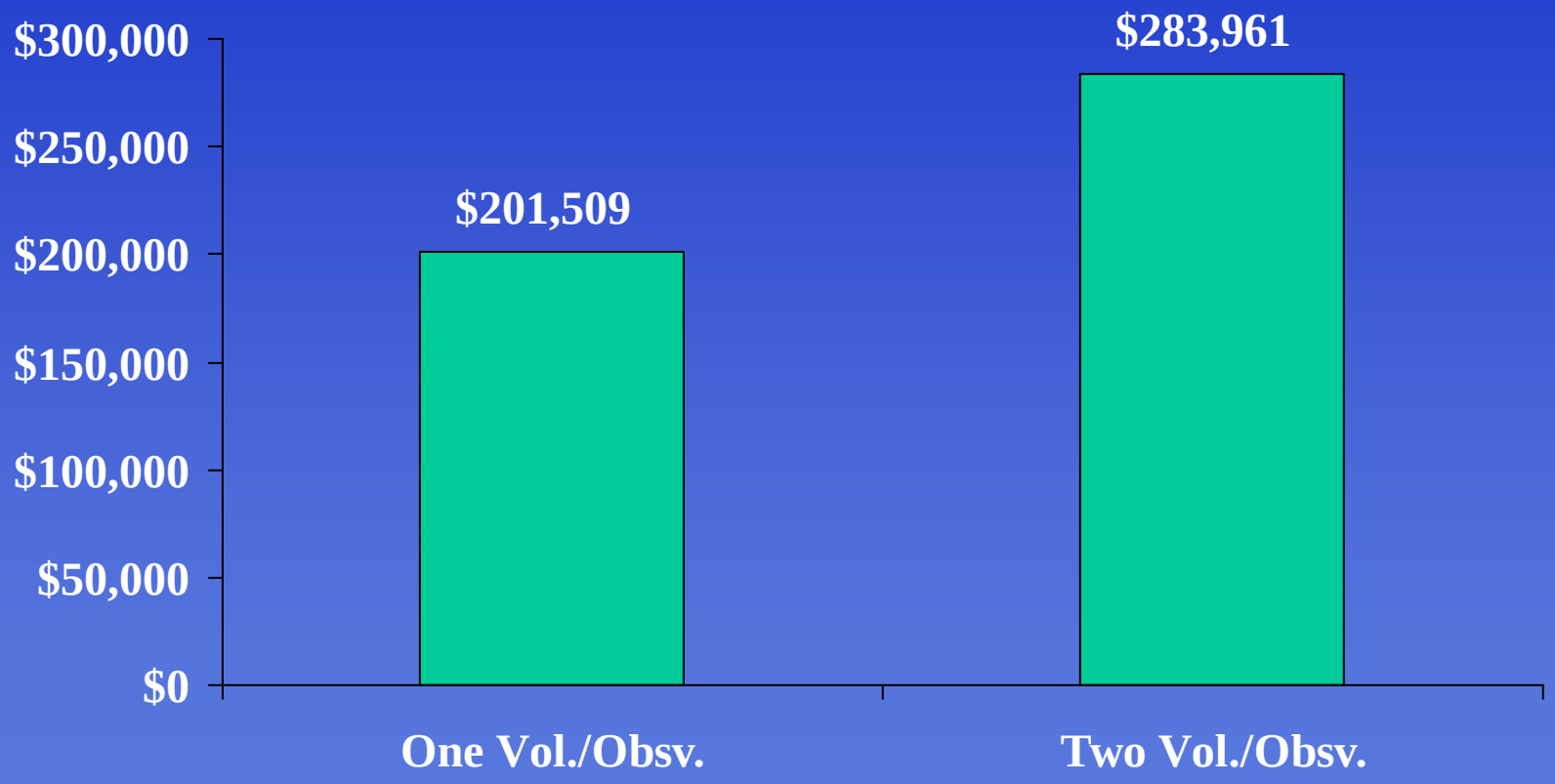


CEMP Volunteer Time/Observation Estimated In-Kind Contribution Since 1996

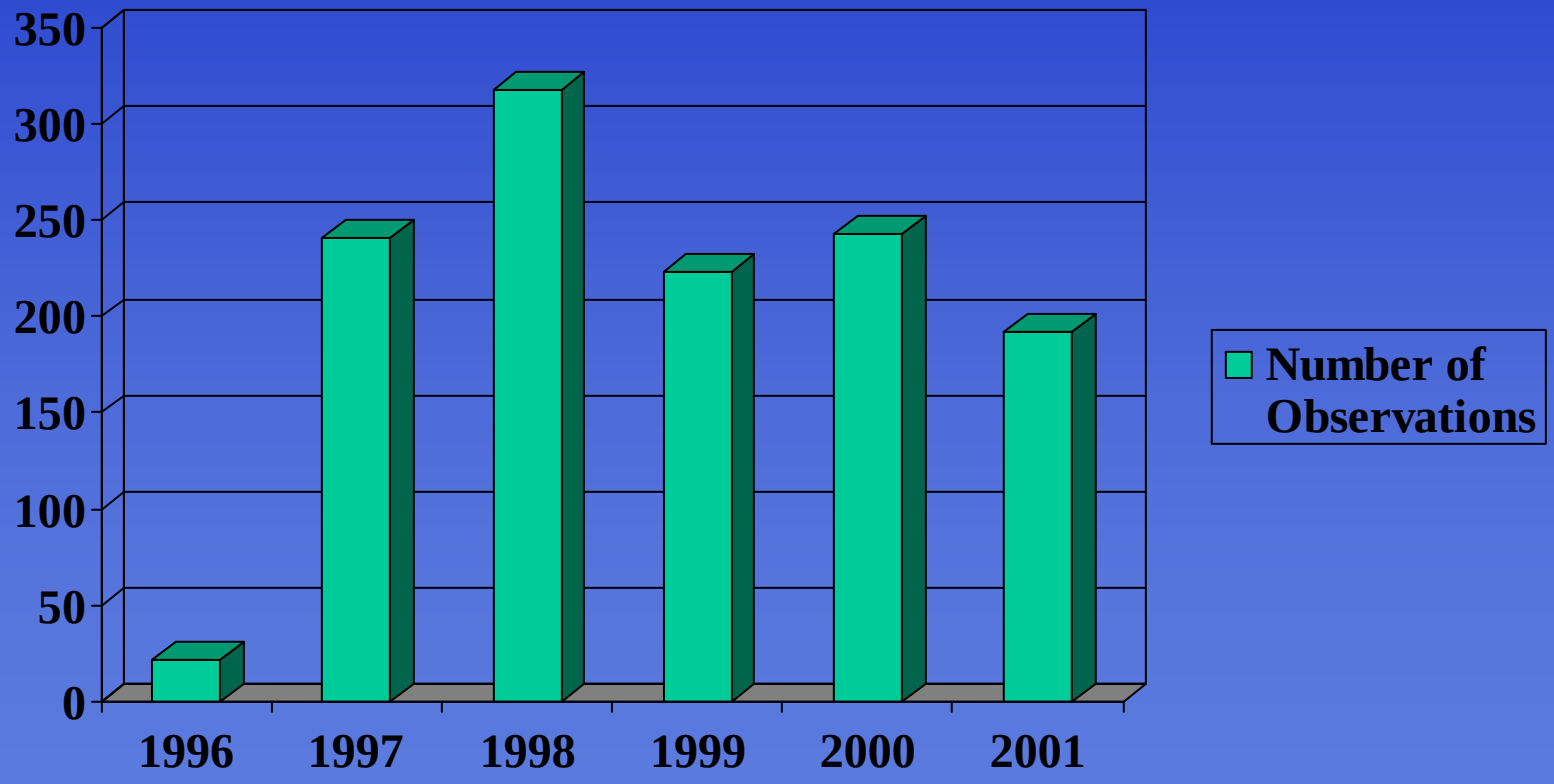


Based on the latest data available on the average hourly wage for nonagricultural workers as published in the *Economic Report of the President*, the assigned hourly wage for volunteers is $15.39. Calculation: 2.5 hours of time/volunteer x $15.39/hour x 2143 observations.

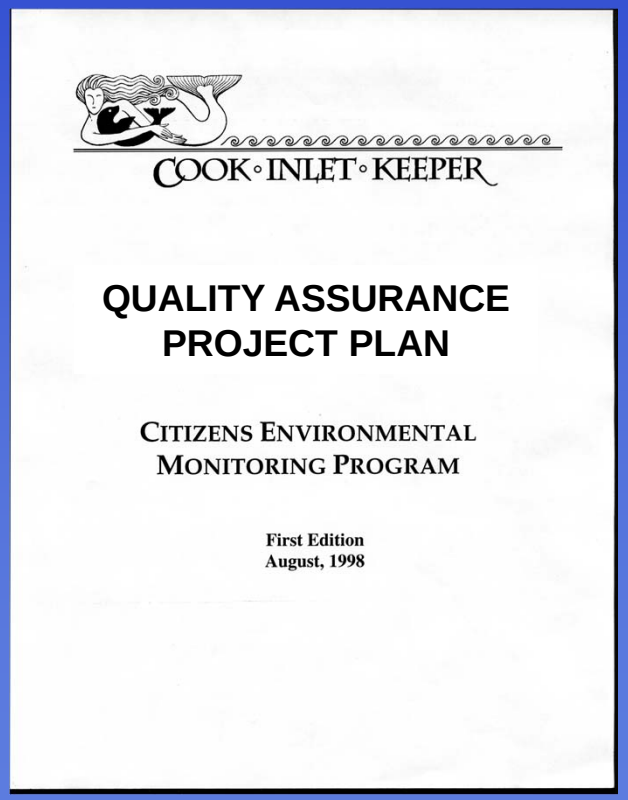
CEMP Volunteer Training & Time/Observation Estimated In-Kind Contribution Since 1996



Cook Inlet Keeper Observations



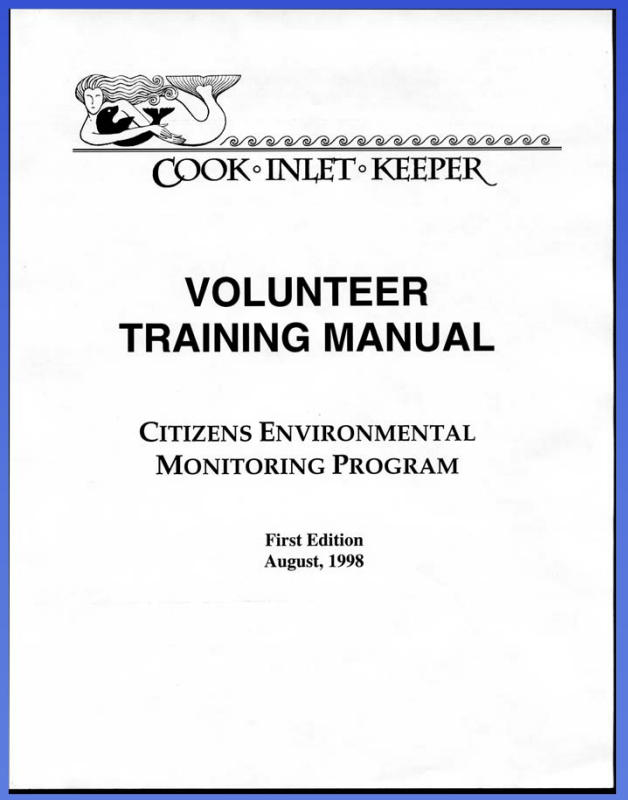
Citizens Environmental Monitoring Program


COOK·INLET·KEEPER

QUALITY ASSURANCE PROJECT PLAN

CITIZENS ENVIRONMENTAL MONITORING PROGRAM

First Edition
August, 1998


COOK·INLET·KEEPER

VOLUNTEER TRAINING MANUAL

CITIZENS ENVIRONMENTAL MONITORING PROGRAM

First Edition
August, 1998

Site Selection

- **Balance between more impacted and less impacted areas.**
- **Safely and reasonably accessible.**
- **Personal interest to the Volunteer Monitor.**

Collection Frequency

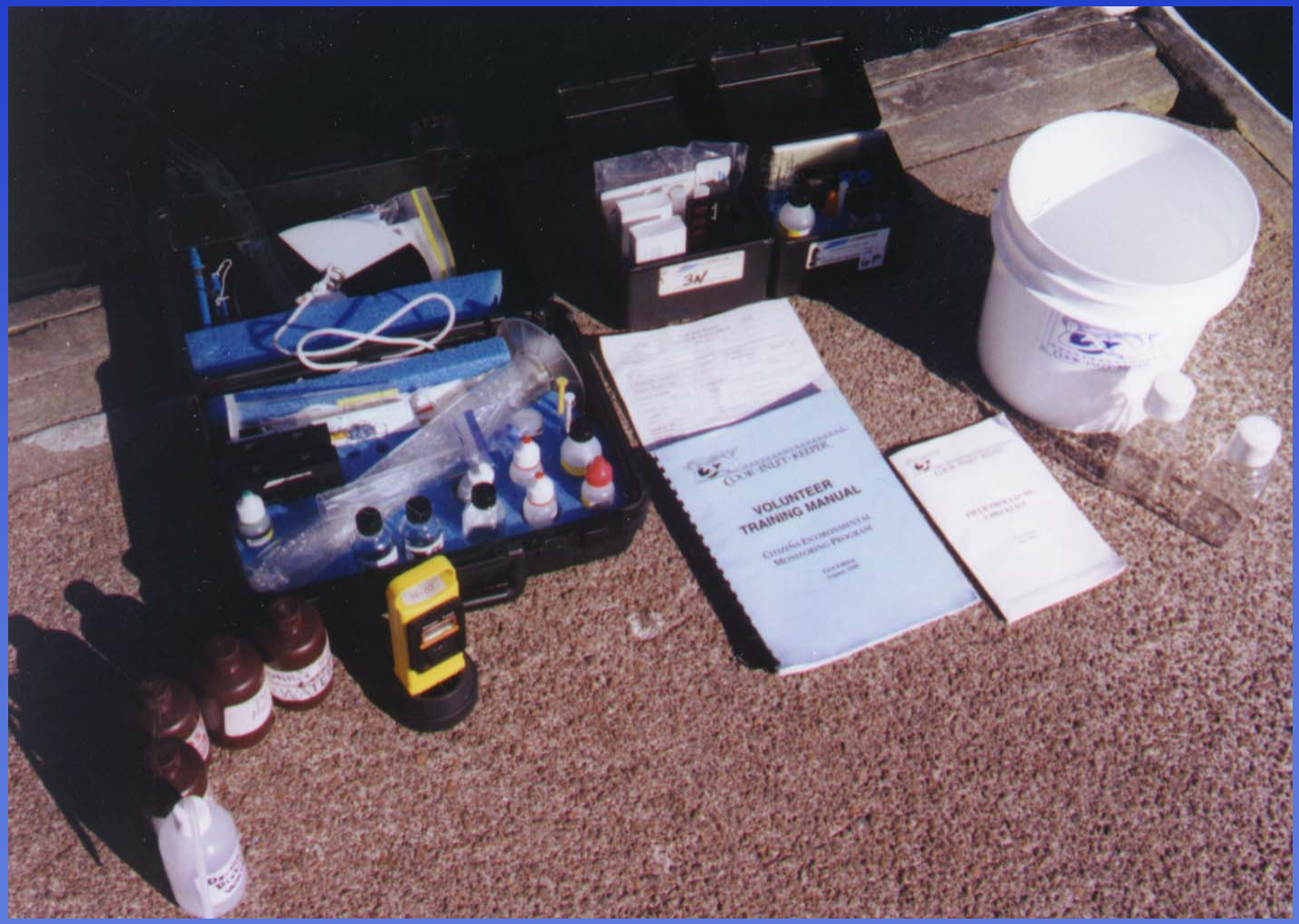
- **The last Sunday of each month (as well as the second Sunday of each month from May through August) plus or minus two days.**
- **Sampling time is 2:00 PM, and the time of allowance range is 1:00 PM to 5:00 PM.**

Frequency By Weekday and Time

	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Tot
% Weekday	32	13	9	9	10	11	16	100
Avg. Time	2:32 pm	2:27 pm	2:04 pm	2:25 pm	2:54 pm	2:01 pm	2:18 pm	2:15 pm

* 81% total, plus or minus two days

Monitoring Kits



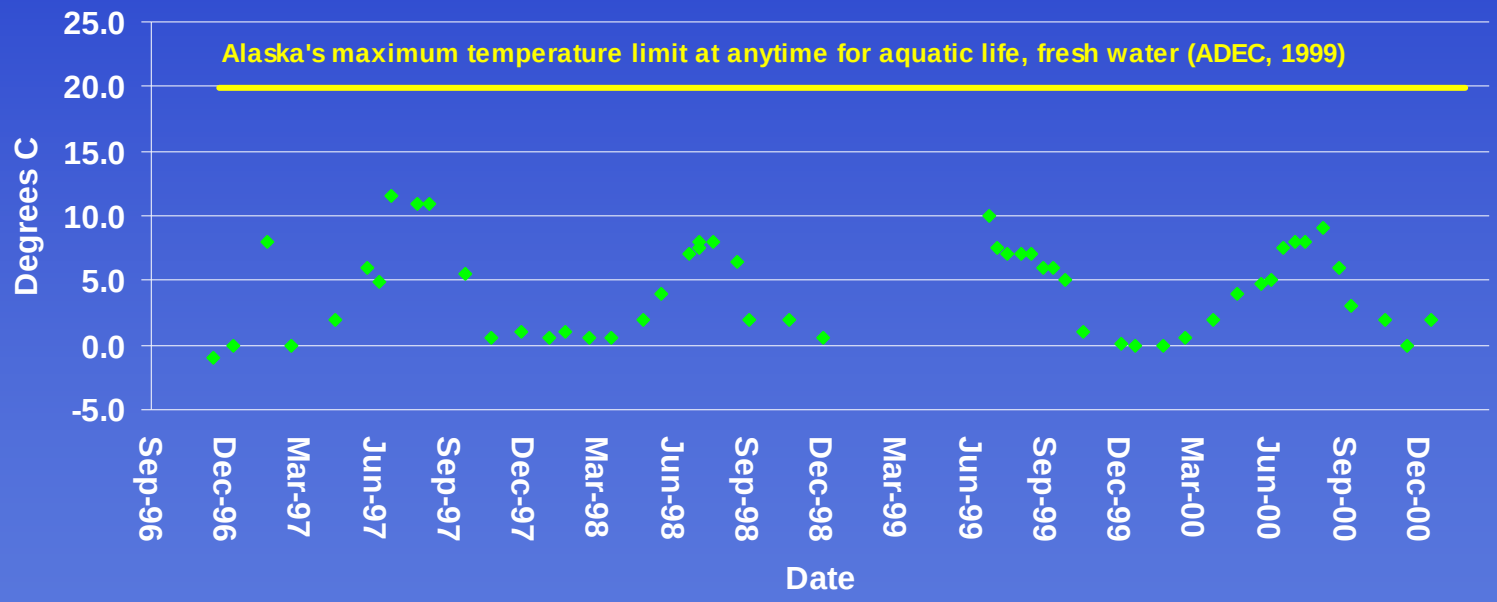
Parameter	Method	Sensitivity
Temperature	Thermometer	0.5 C°
pH	Colorimetric	0.25 pH units
pH	Hanna Meter	0.1 pH Units
Dissolved Oxygen	Micro Winkler Titration	0.1 mg/l
Salinity	Hydrometer	0.1 ppt
Turbidity	0-200 JTUs	5 JTUs

Parameter	Method	Sensitivity
Conductance	Hanna Meter	1.0×10^{-6}
Apparent Color	Color Chart	Color Index Number
Nitrate-Nitrogen	Colorimetric	1.0 ppm
Ortho-phosphate	Colorimetric	0.2 ppm
Coliforms (Total & E. Coli)	Chromogenics agents in medium	1 CFU

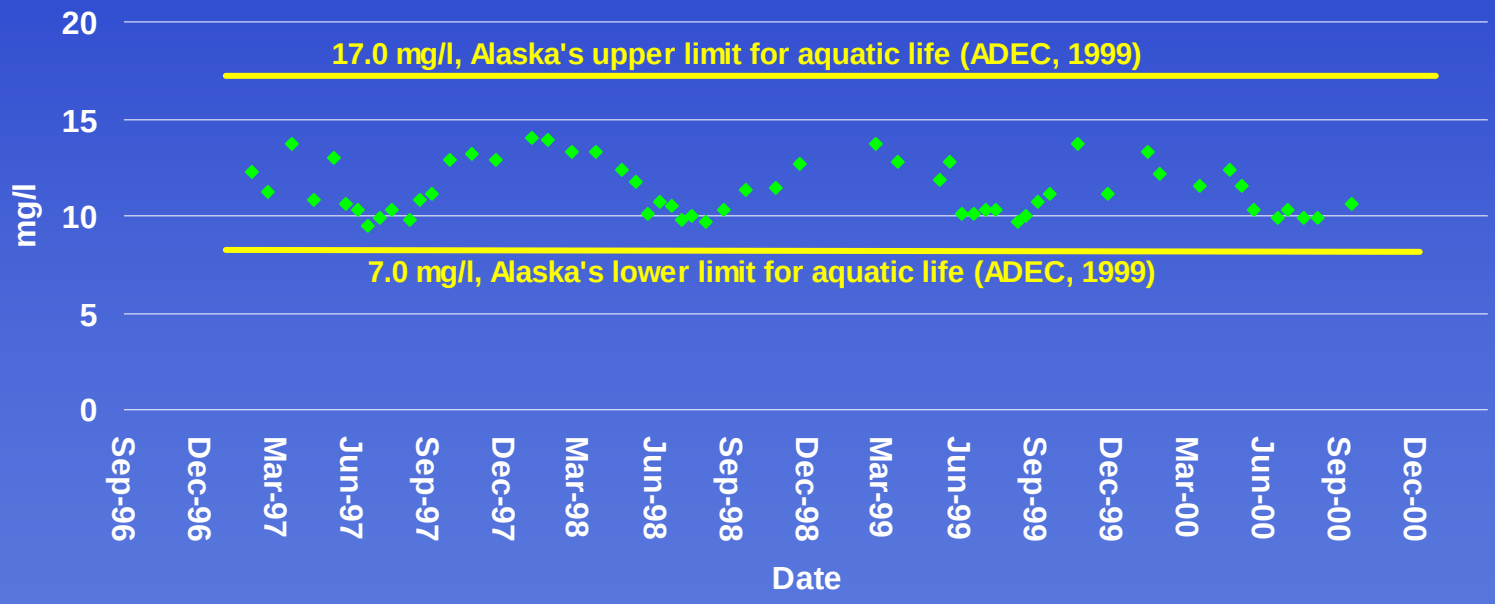
Data Summary

- **Data shows seasonal trends.**
- **Data has begun to identify ranges of natural variations.**
- **Data is being compared against preliminary statewide water quality standards.**
- **Data have highlighted potential problems due to urbanization.**
- **Photo documentation has identified habitat alteration.**

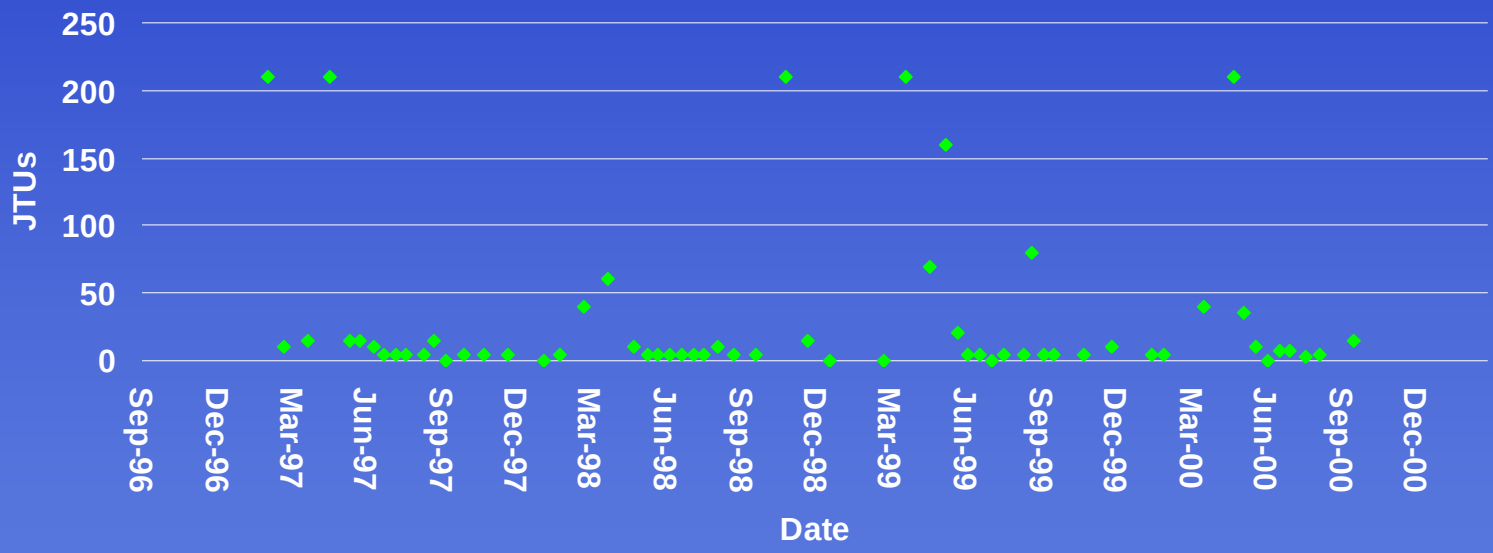
Water Temperature @ KB-490, Bridge Creek @ Wynn Nature Center Bridge



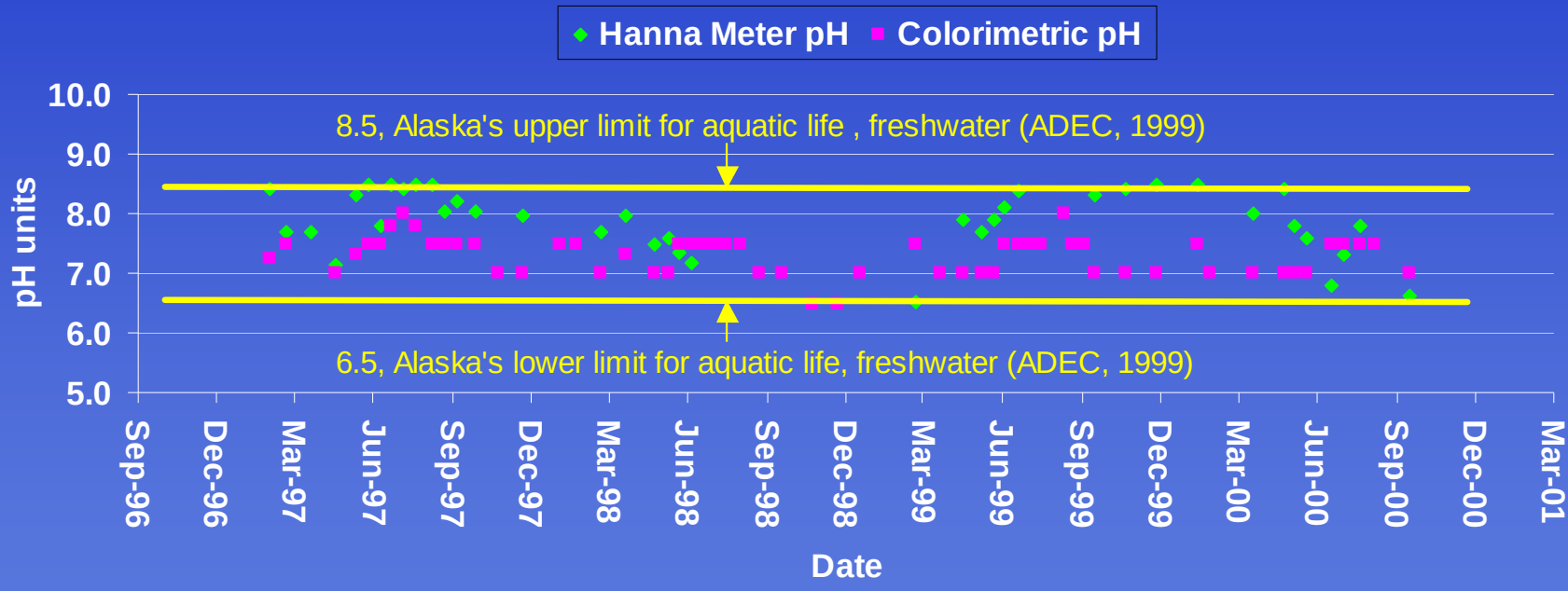
Dissolved Oxygen @ KB-1110, Diamond Creek @ Beach Outflow Above Beach



Turbidity @ KB-1110, Diamond Creek @ Outflow Above Beach



pH @ KB-1110, Diamond Creek @ Outflow Above Beach



Gravel Pile @ McNeil Creek

Lower Kenai Peninsula Watershed Health Project