# Southern California Bight Model Monitoring

**Ken Schiff**

**Southern California Coastal Water Research Project**

**www.sccwrp.org**

# Background and Rationale

- Ocean monitoring for over 30 years
  - inequities among monitoring agencies
- Many questions answered, but monitoring continues unchanged
- New questions arise, but no mechanism to address them

# Challenged to Develop a Model Monitoring Program

- Four largest POTWs in southern California and three Regional Water Quality Control Boards
  - Goal was consensus
- Determine monitoring questions of greatest management need
- Inventory existing effort
  - how well do they answer the monitoring question?
- Recommend monitoring design alterations to improve efficiency and effectiveness
  - not facility specific

# Philosophy for Model Monitoring Development

- Monitoring is a responsibility for having a discharge permit
- Monitoring must be question-based
  - if no action, then why collect data?
- Monitoring should be adaptive
  - More impact = more monitoring (and converse)
- Monitoring should address the needs of different audiences
  - requires a framework for different designs approaches

# Attributes for Effective Monitoring Questions

- State management need
  - permit limit, TMDL, public or ecosystem health….
- Define decision criteria
  - Ocean Plan, CA Toxic Rule, Sed Qual Obj, FDA action levels…
- Envision expected products
  - Specific graph or table
- Identify the action
  - Can be big or small, depends on confidence in answer

# Three Piece Framework For Model Monitoring

- **Core monitoring**
  - Site specific routine compliance
- **Regional monitoring**
  - Cumulative impacts and public concern
- **Special studies**
  - Fills in data gaps raised by core/regional monitoring data

# Large POTW
# Five Monitoring Elements

- Effluent
- Water quality
- Microbiology
- Sediments
- Fish

# Effluent Monitoring As An Example

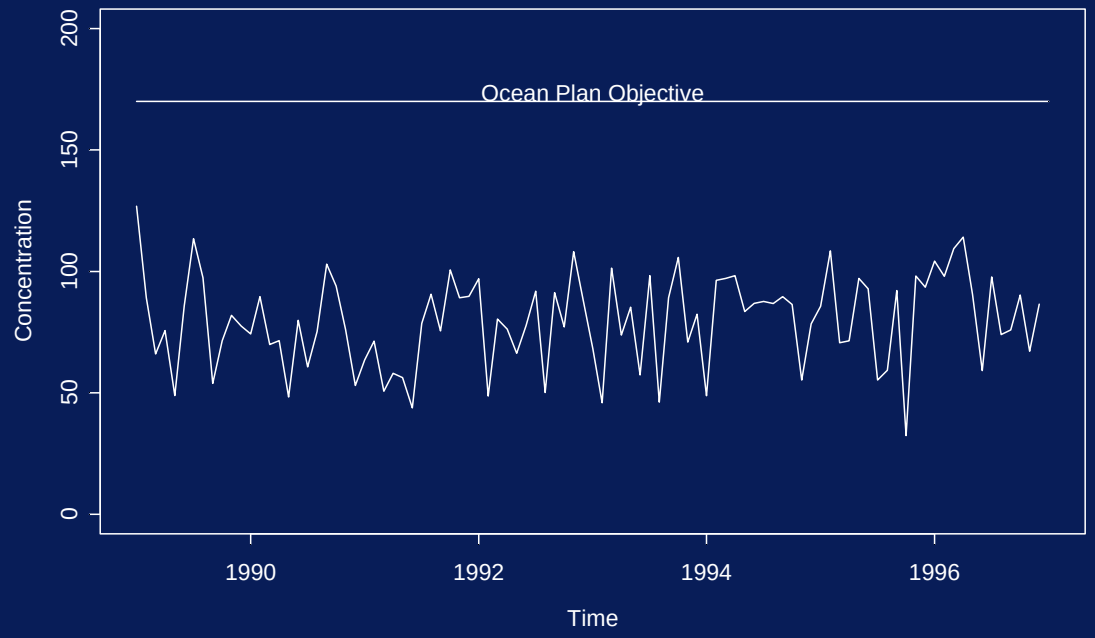
- Is the effluent concentration of selected constituents below levels that will ensure public safety and protect aquatic life?
- What is the mass of selected materials that are discharged annually?
- Is the effluent concentration or mass changing over time?

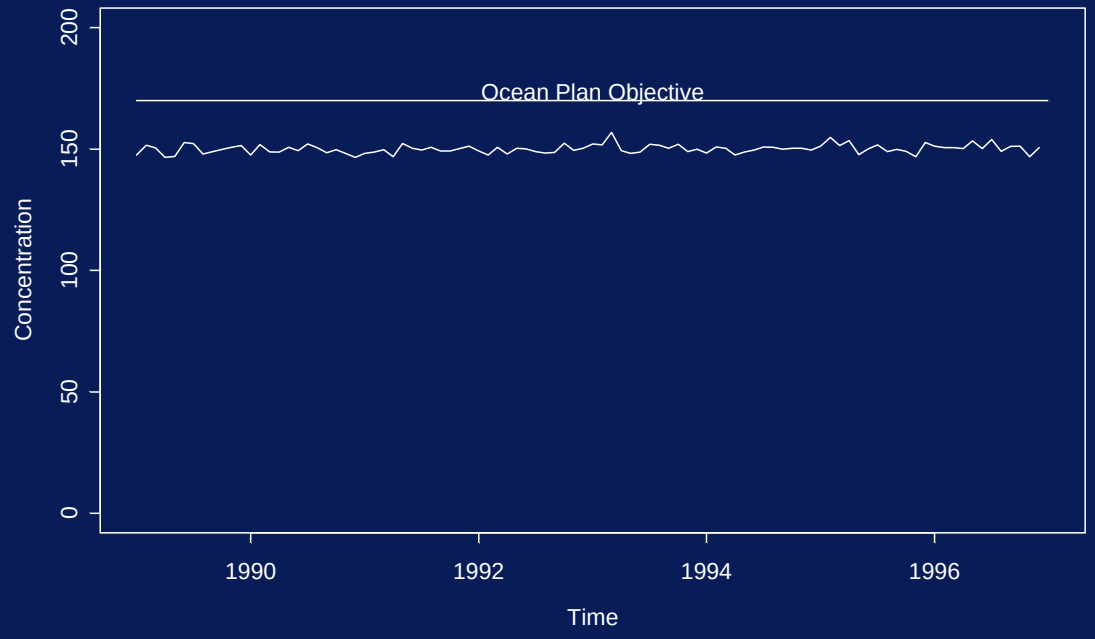
# Inventory of Existing Effluent Monitoring Effort

- Between 2,000 and 5,000 effluent measurements per year depending on facility
- At least 20% of constituents not measured in common
- Wide range in frequencies and detection limits

# Evaluation and Recommendations

- Current monitoring is effective at answering the management questions
- Efficiency can be improved through optimizing frequency
  - use a risk-based approach
- Use power analysis to determine most efficient designs
  - Comparison to a threshold
  - Trend detection


Ocean Plan Objective
Concentration
0
50
100
150
200
1990
1992
1994
1996
Time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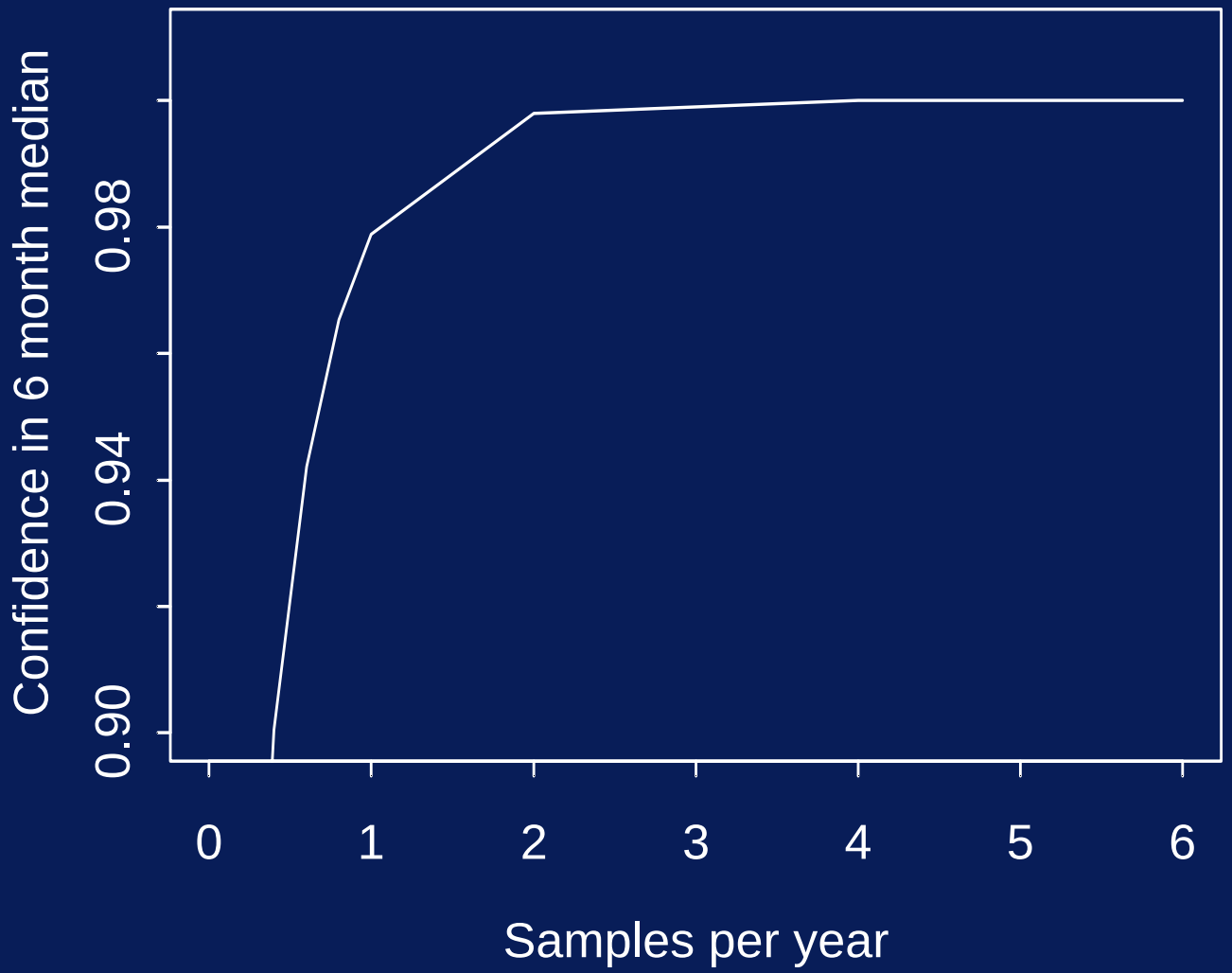
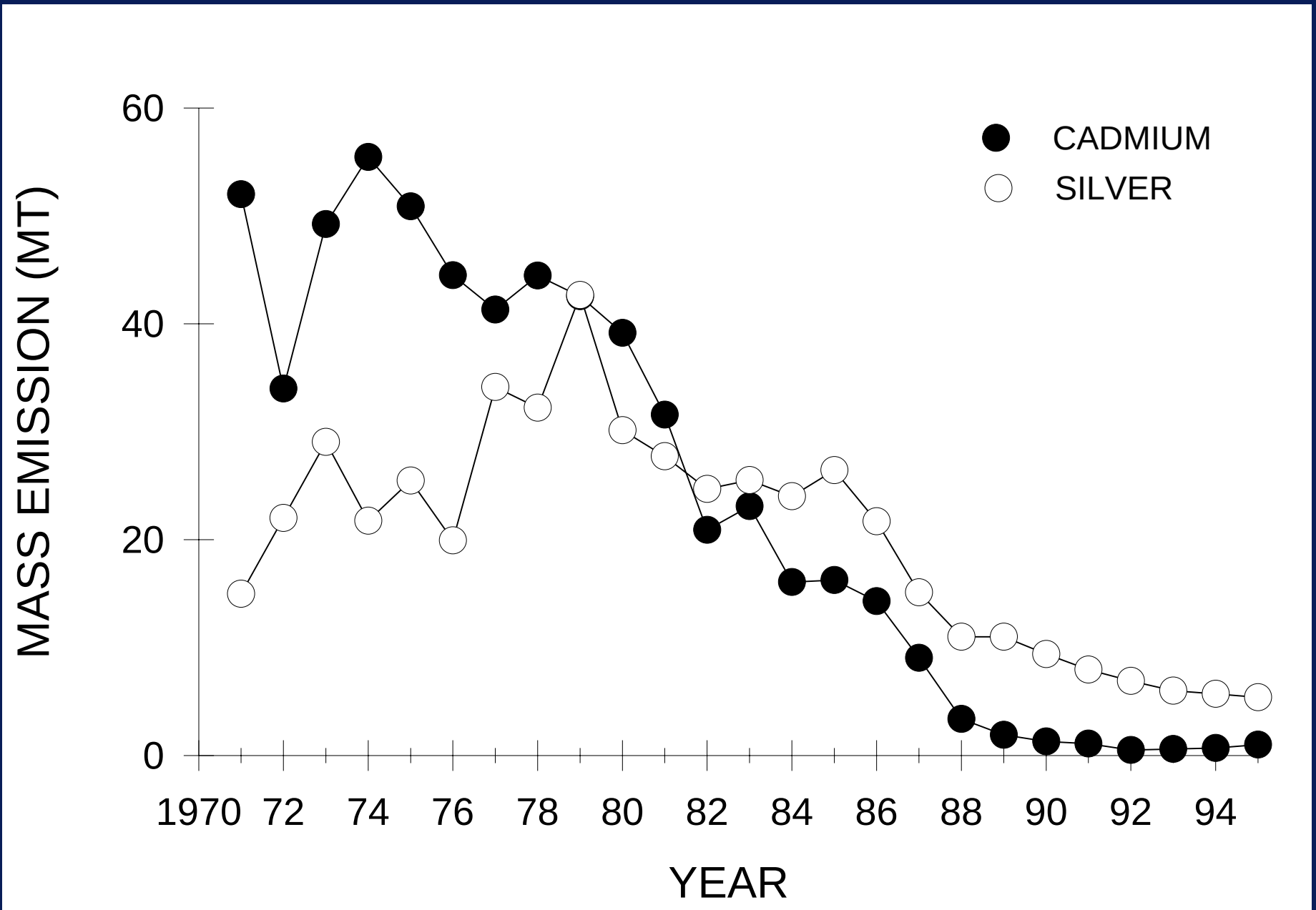
# Exceedence of Lead Permit Limit




60
40
20
0
MASS EMISSION (MT)
CADMIUM
SILVER
1970
72
74
76
78
80
82
84
86
88
90
92
94
YEAR

# % Detectable Trend After Five Years

| | HTP | JWPCP | OCSD | PLWWTP |
|---|---|---|---|---|
| TSS | 4 | 2 | 2 | 7 |
| Cadmium | 12 | 19 | 17 | 6 |
| Silver | 9 | 44 | 12 | 5 |
| Lead | 18 | 15 | 37 | 6 |

# Outcome of the Model Monitoring Program

- Used for the new permit and monitoring program at two Large POTWs
  - other two permit renewals are pending
- Embraced the model monitoring concepts
  - Three-part framework is prominent
- Model monitoring development process adopted for Municipal Stormwater and Small POTW permits