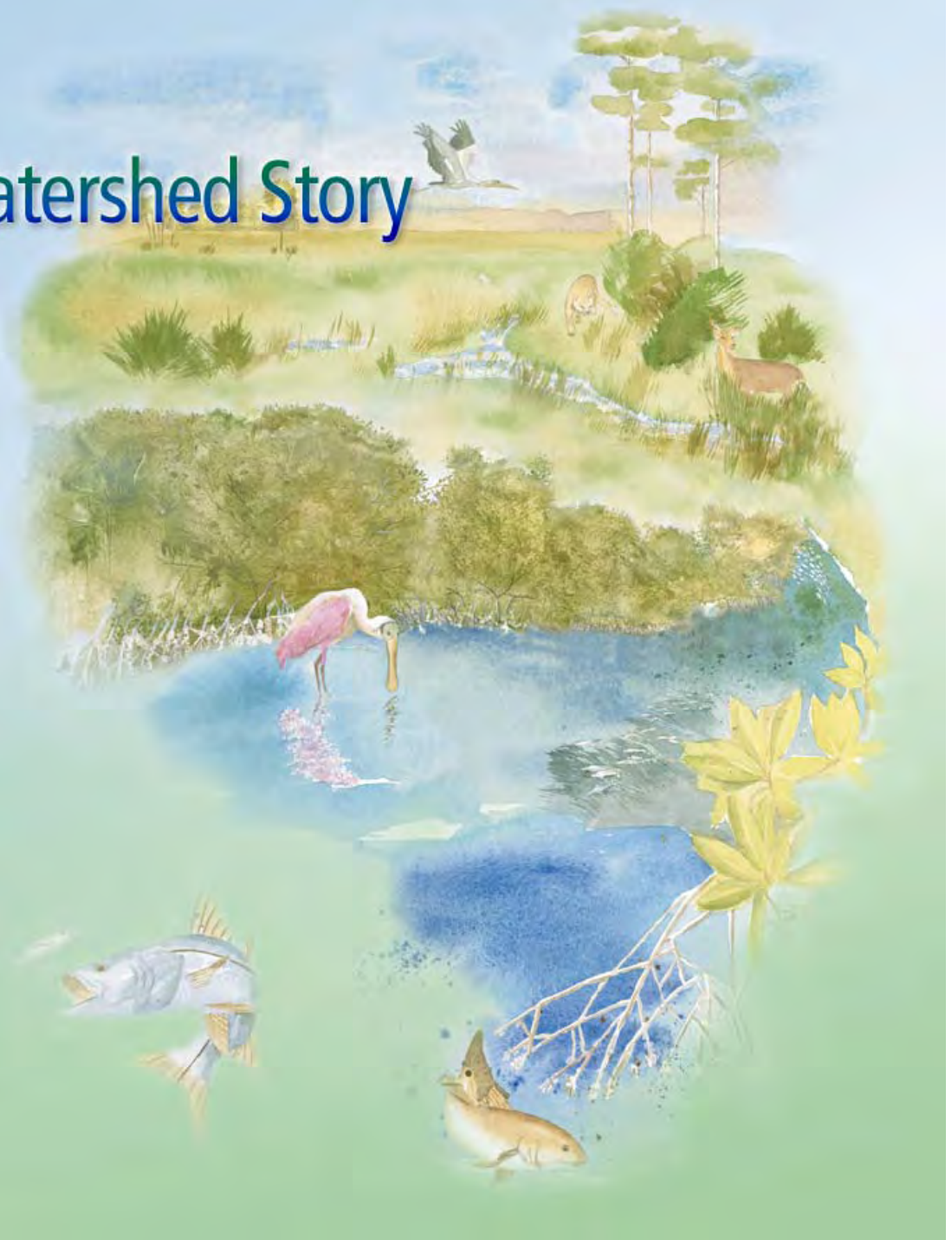


Sarasota County's Watershed Story

Dona Bay Watershed Management Plan Progress Report August, 2006



RECAP OF FIRST PUBLIC MEETING:

**UNDERSTANDING THE PROBLEM –
MERGING HISTORICAL AND SCIENTIFIC KNOWLEDGE**

PUBLIC INPUT SUMMARY

August, 2006

The interface of freshwater and saltwater



August, 2006

... and between Land and Water.



August, 2006

1847 Survey

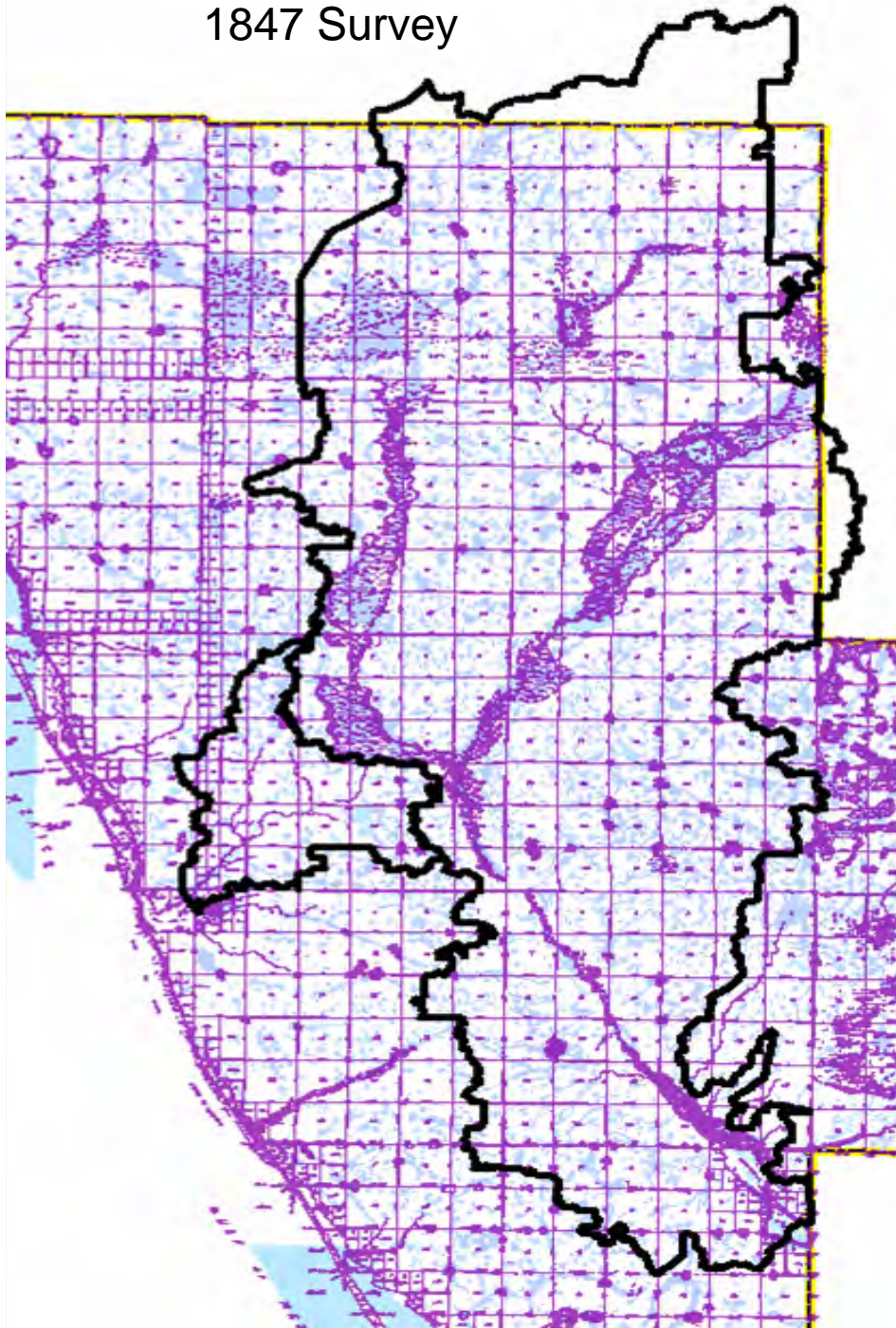
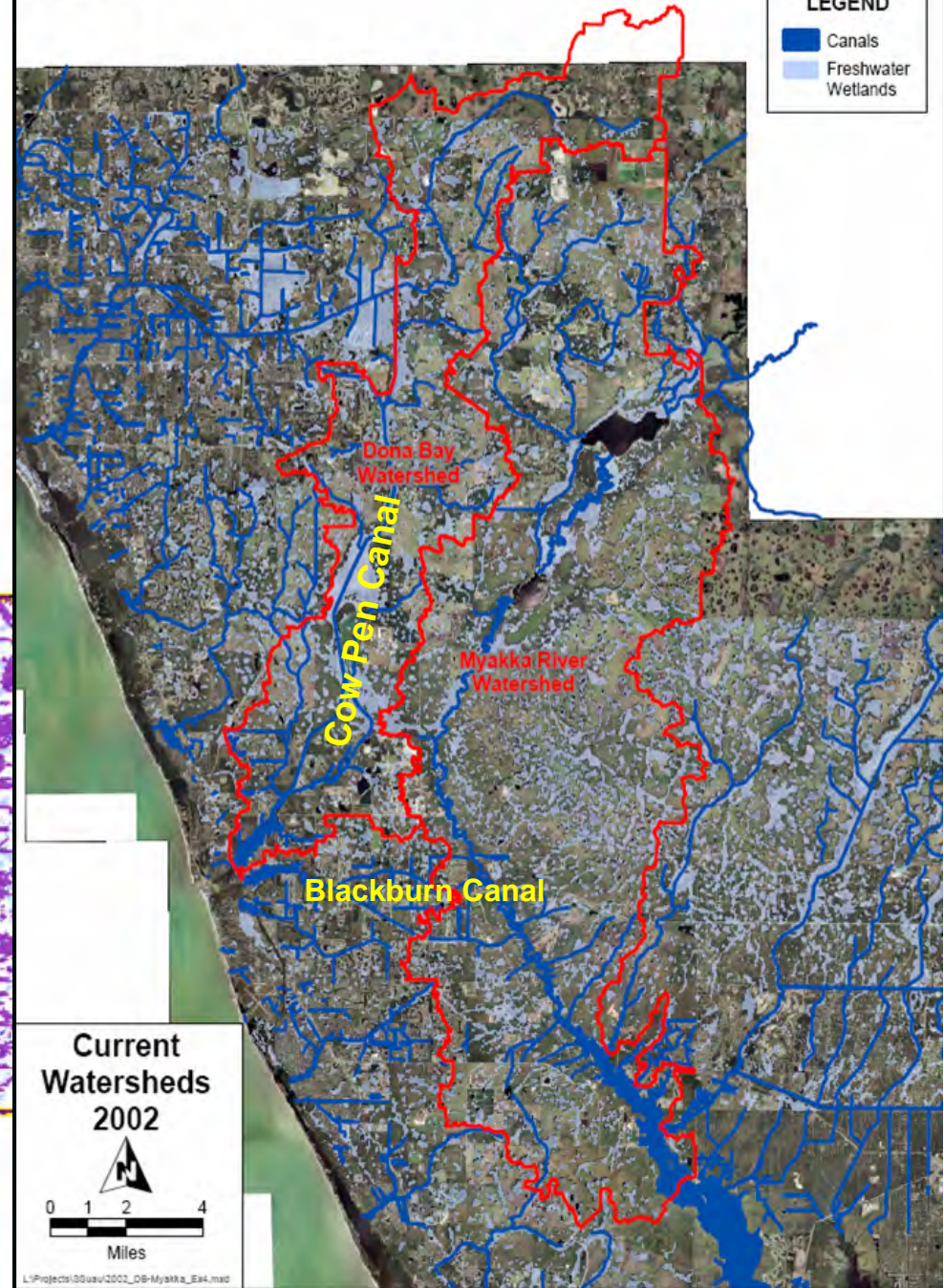
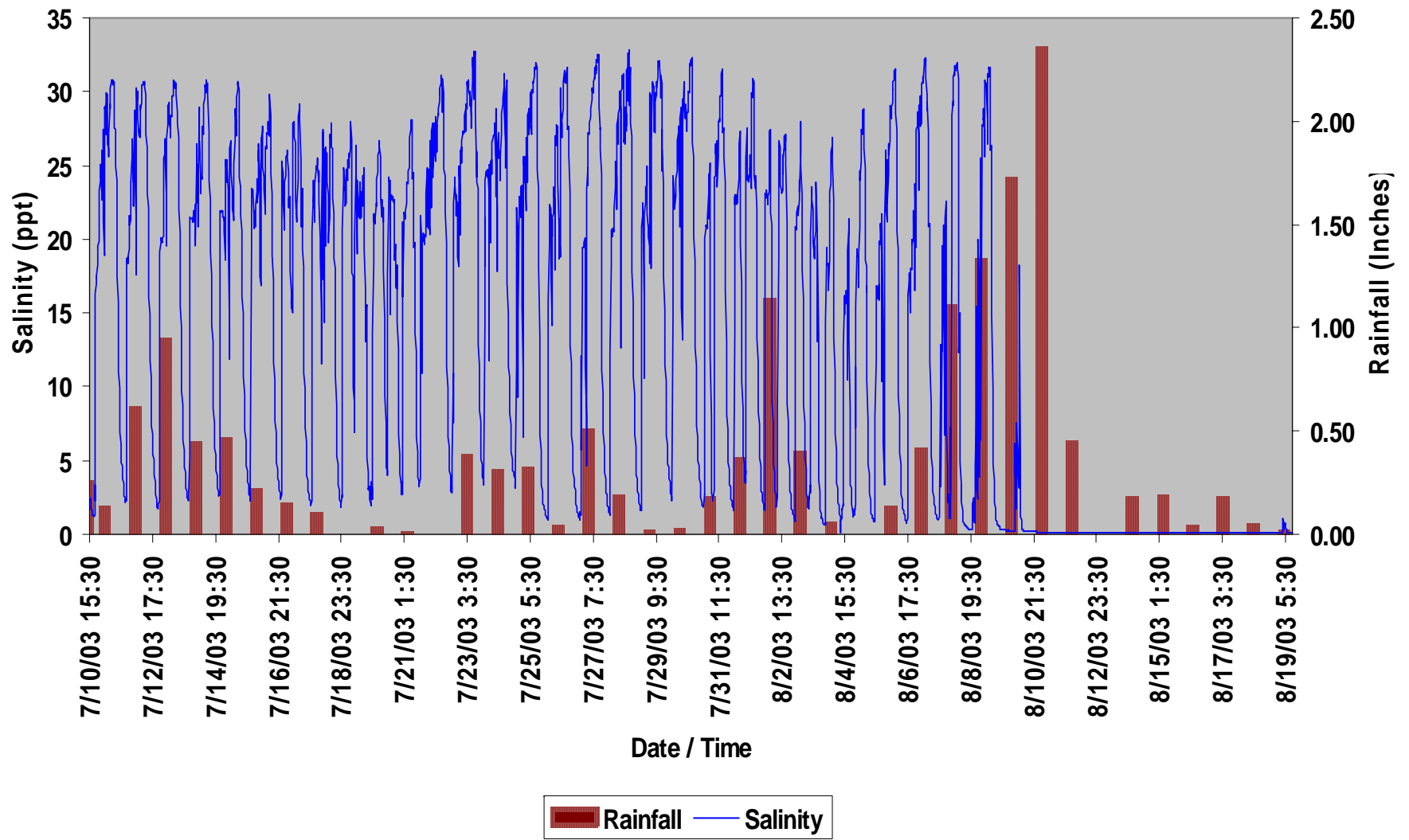


EXHIBIT 4 Current Conditions



**Biological Indicators:
How we measure the impact of
freshwater on our bays.**

Salinity at Curry Creek / U.S. 41 compared to rainfall in the Myakka River basin 7/10/2003 – 8/18/2003



Percent of seagrass coverage

LYONS

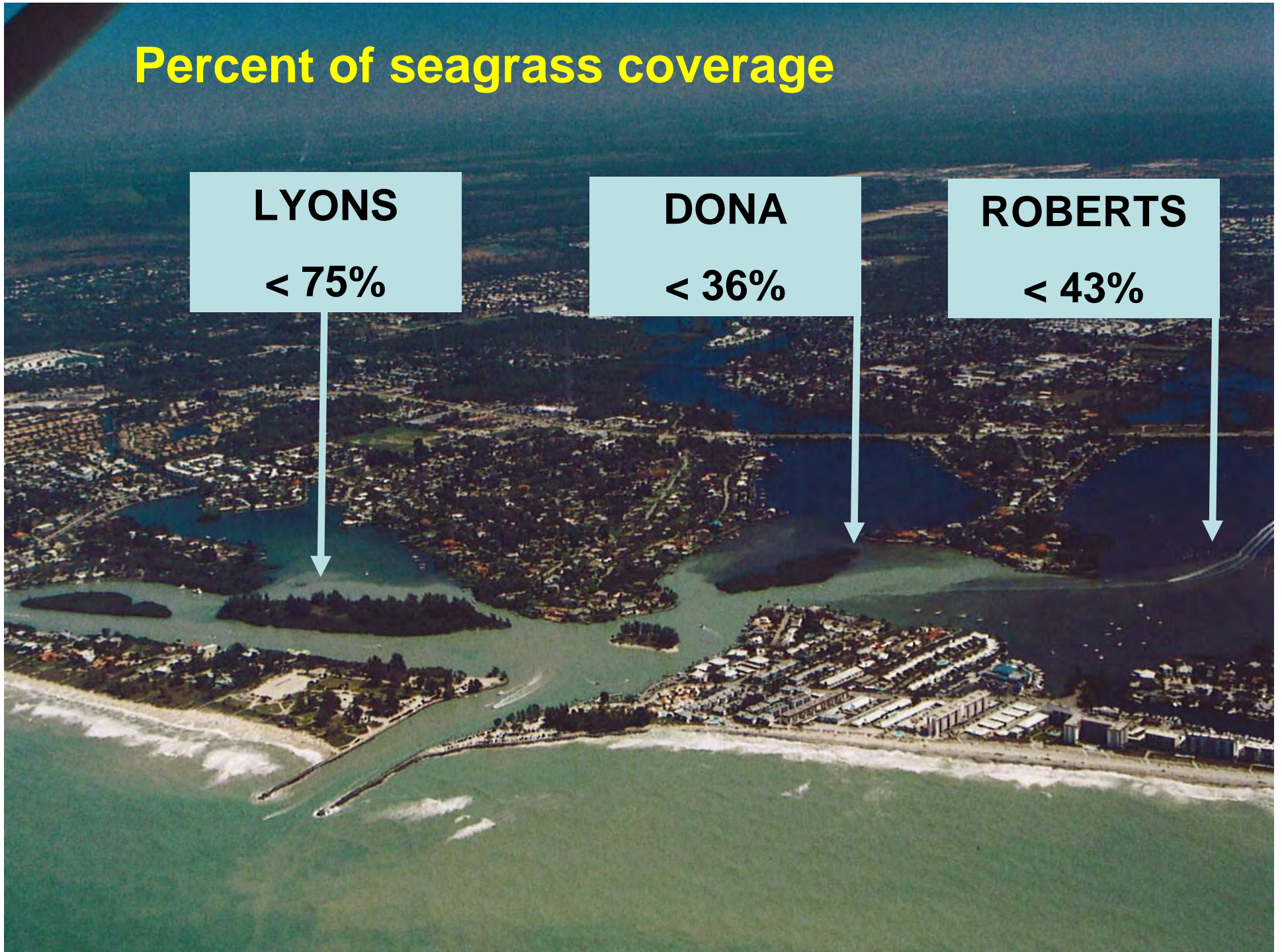
< 75%

DONA

< 36%

ROBERTS

< 43%



Hard Clams

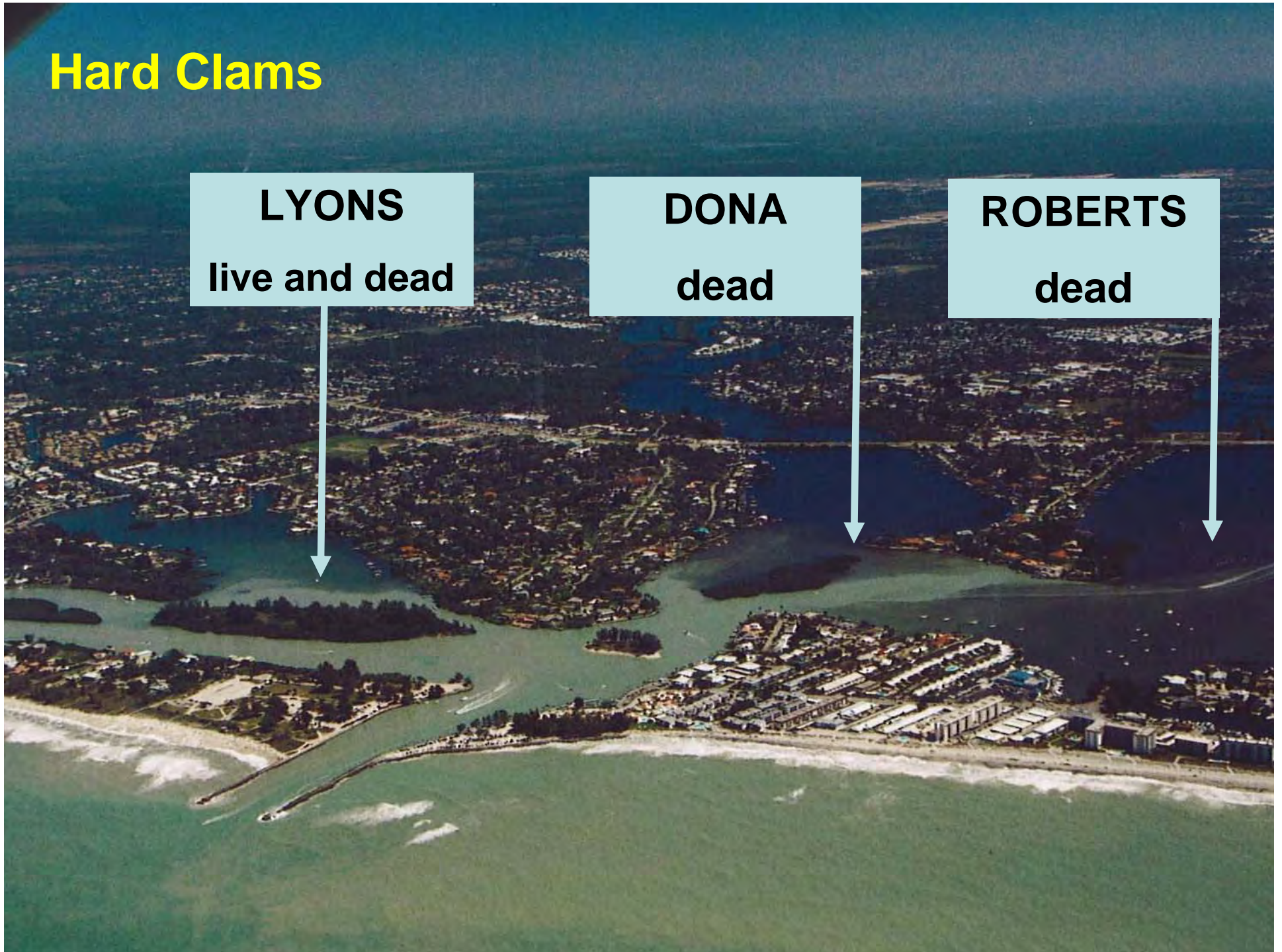
LYONS
live and dead



DONA
dead



ROBERTS
dead



% Live Oysters

LYONS

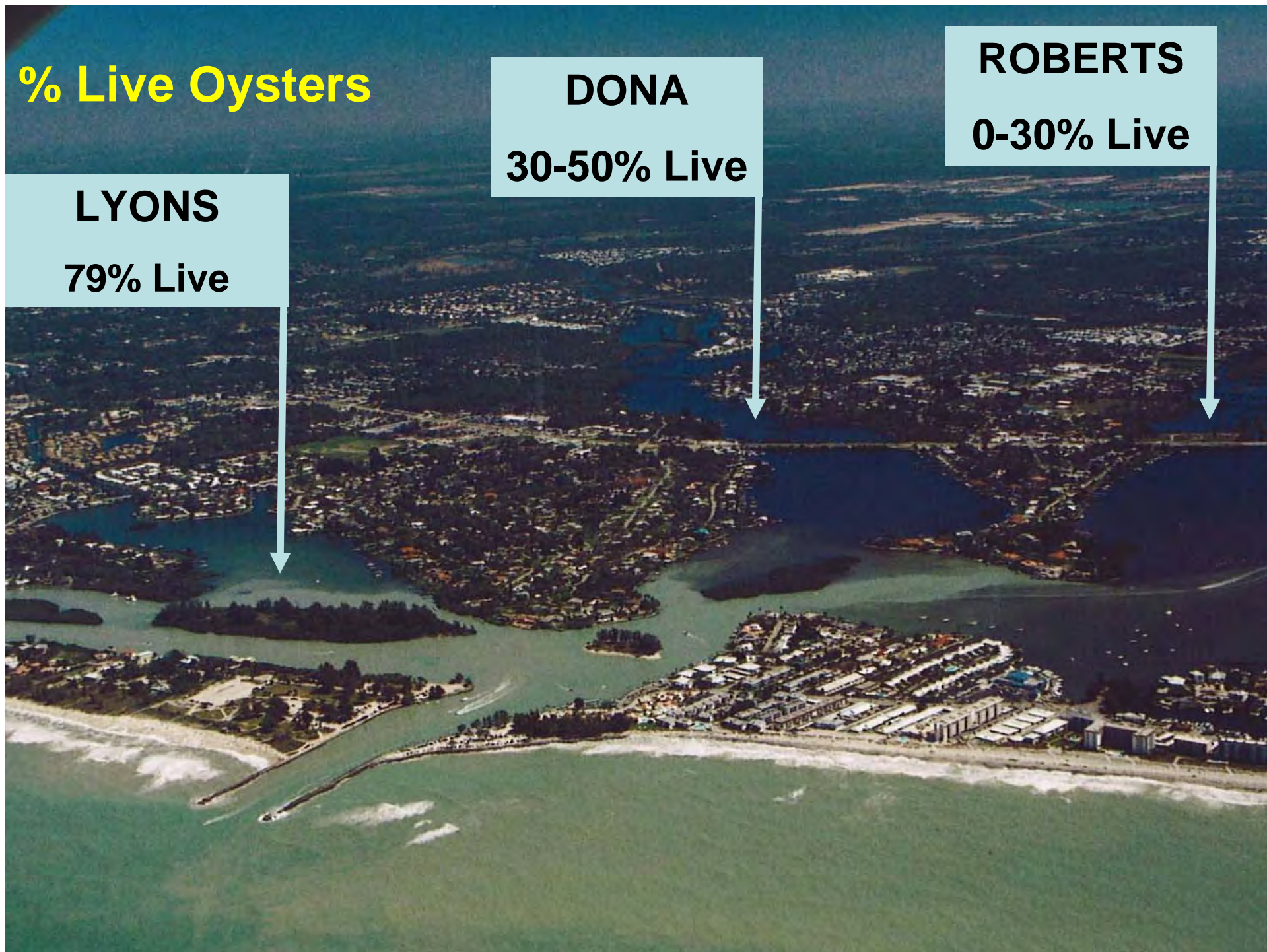
79% Live

DONA

30-50% Live

ROBERTS

0-30% Live



COMMUNITY INPUT:

Major Issues

- Too Much Freshwater
- Nutrients
- Construction

Opportunities

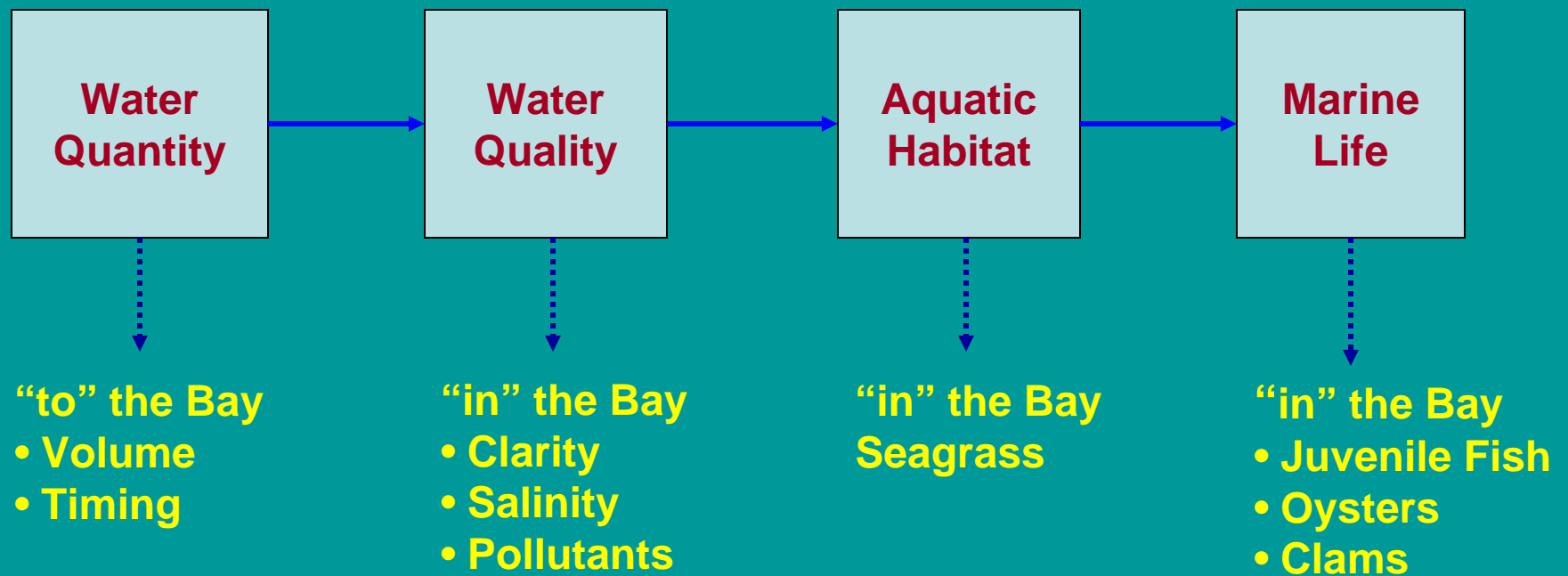
- Native Planting
- Education
- Reduce Runoff/Pollution
- Restoration

DONA BAY WATERSHED MANAGEMENT GOALS:

- **Provide a more natural freshwater/saltwater range in Dona Bay**
- **Provide a more natural hydrologic range for the watershed**
- **Protect existing and future property owners from flood damage**
- **Protect or improve existing water quality**
- **Develop alternative water supply options that are consistent with and support other program objectives**

August , 2006

WATERSHED ALTERATION – CAUSE & EFFECT

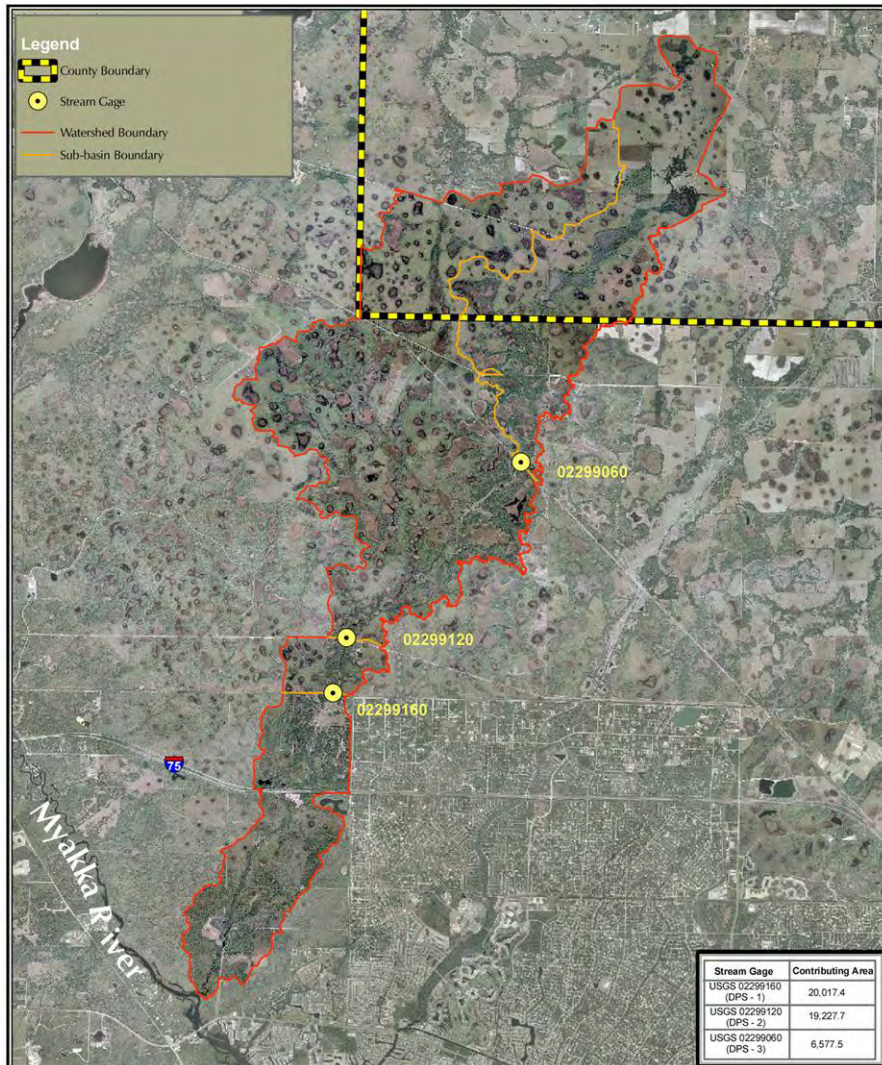


August, 2006

HYDROLOGIC MANAGEMENT PLAN DEVELOPMENT

- **Estimate the Historical or Natural System Water Budget**
- **Quantify the Existing Water Budget**
- **Evaluate Hydrologic Restoration Proposals based upon ability to move from Existing to Historical Water Budgets**

SEASONAL (MONTHLY) RUNOFF TRENDS – Natural Watershed



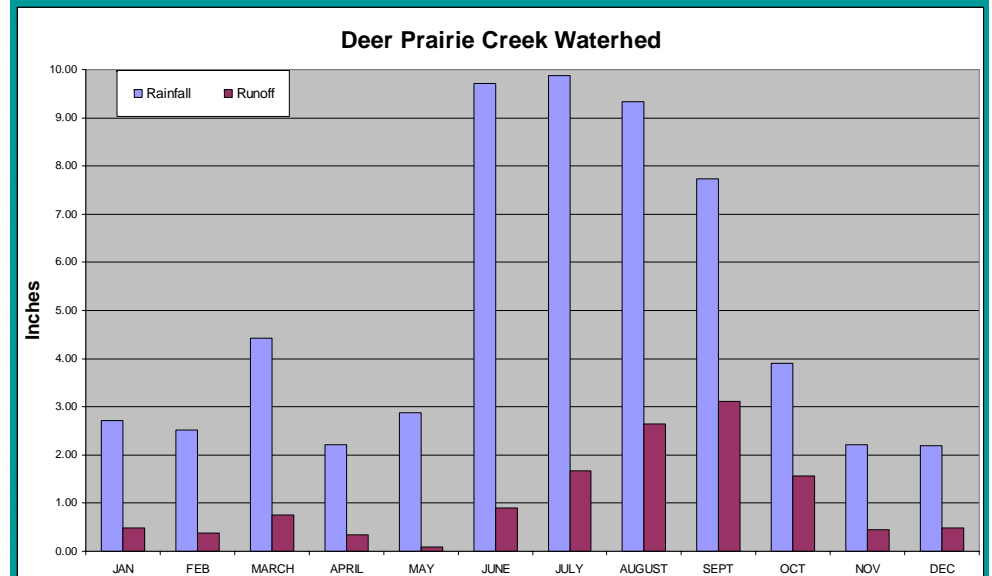
DEER PRAIRIE CREEK WATERSHED

Stream Gage Locations

SARASOTA AND MANATEE COUNTIES, FL
 URBAN RESOURCE GROUP
© 2006 URBAN RESOURCE GROUP, INC. ALL RIGHTS RESERVED. DATA FROM USGS, 2005.

Period	Data Base Used
April, 1981 through March, 1991	Site 336
April, 1991 through June, 1991	Site 194
July, 1991 through December, 1992	Site 336
January, 1993 through December, 2005	ARMS, Site 417, Site 336

Period	Data Base Used
April, 1981 through September, 1992	Site 02299160
October, 1993 through December, 2002	Site 02299120
June, 2004 through December, 2005	ARMS, Site DPS-2



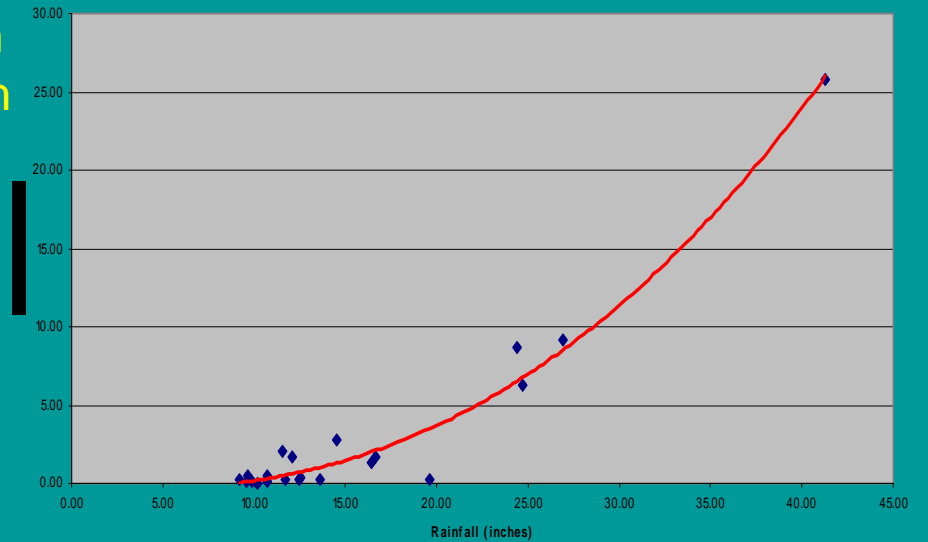
August, 2006

SEASONAL "BLOCK" RUNOFF TRENDS – Natural Watershed

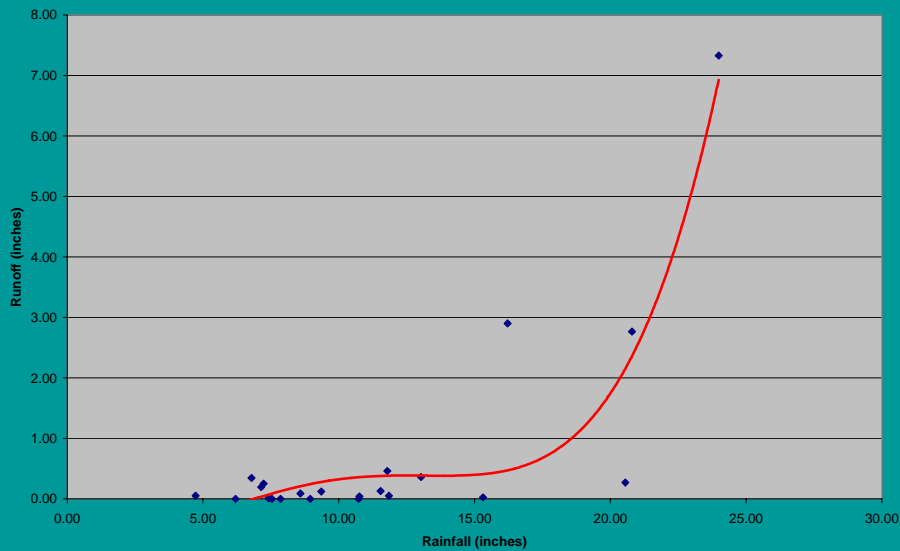
- BLOCK 1 – April 20th through June 24th
- BLOCK 2 – October 28th through April 19th
- BLOCK 3 – June 25th through October 27th

Seasonal Block	Equation	R ²
1	$y = 0.000210132x^4 - 0.0081255x^3 + 0.10215x^2 - 0.387x$	R ² = 0.82
2	$y = 0.0001323x^3 + 0.01278x^2 - 0.124x$	R ² = 0.97
3	$y = 0.0008651x^3 - 0.04269x^2 + 0.68x$	R ² = 0.81

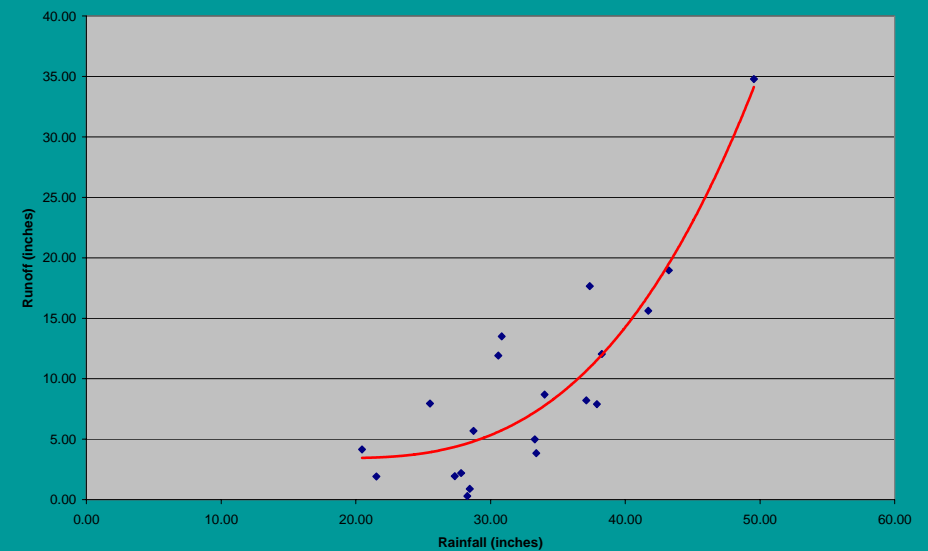
Deer Prairie Creek - Seasonal Block 2



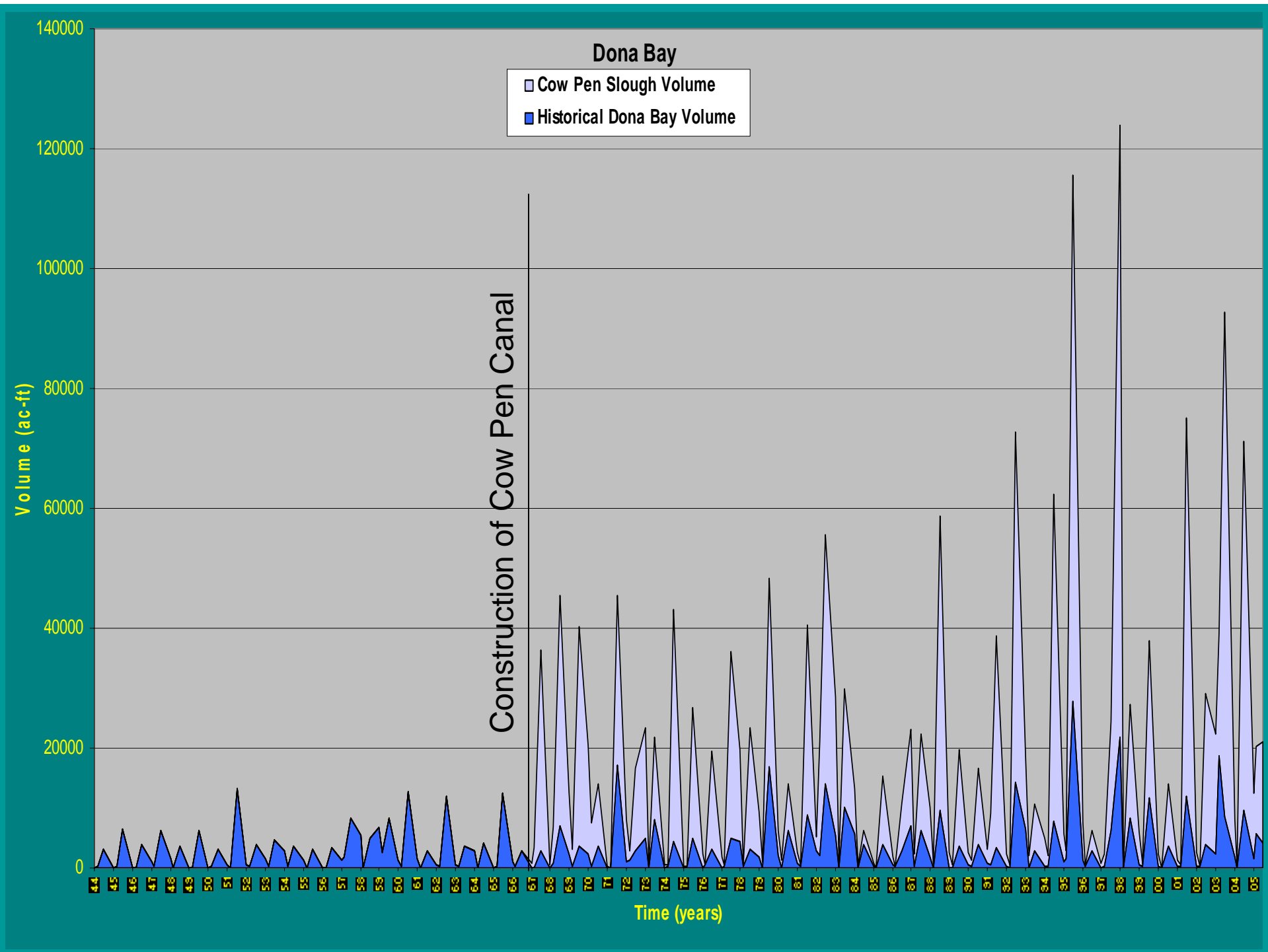
Deer Prairie Creek - Seasonal Block 1

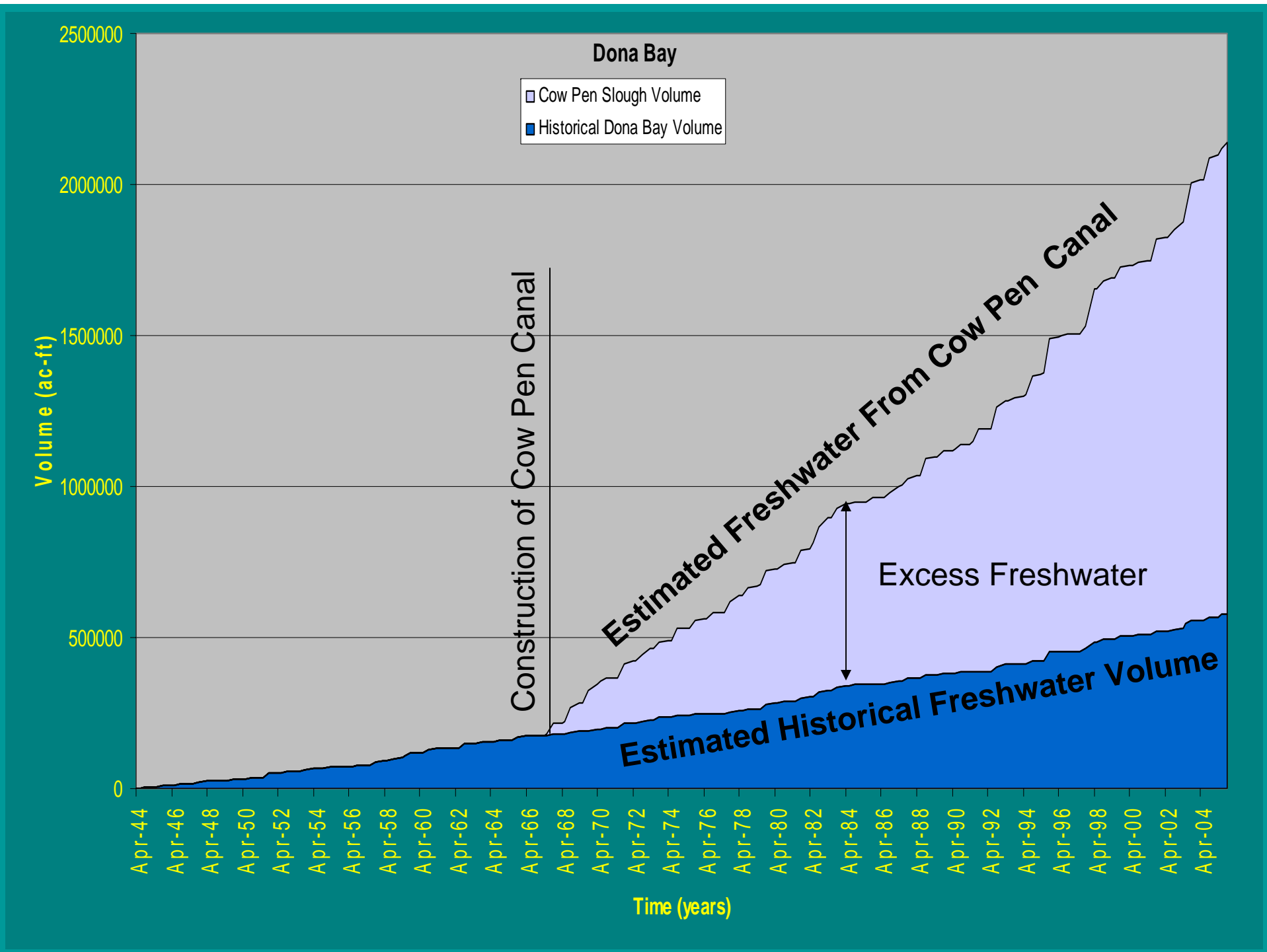


Deer Prairie Creek - Seasonal Block 3



August, 2006



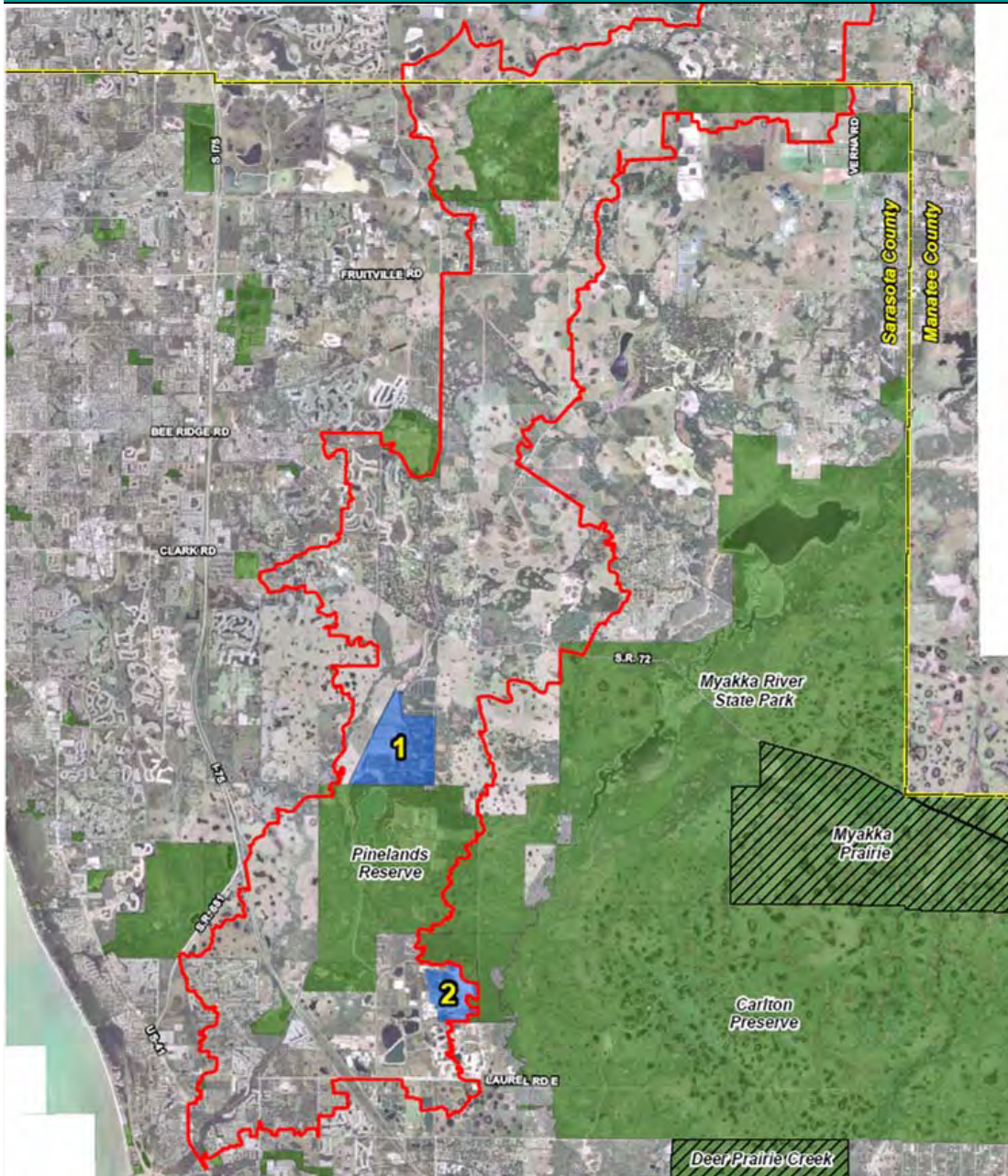


FORMULATING SOLUTIONS

WHOLE SYSTEM APPROACH:

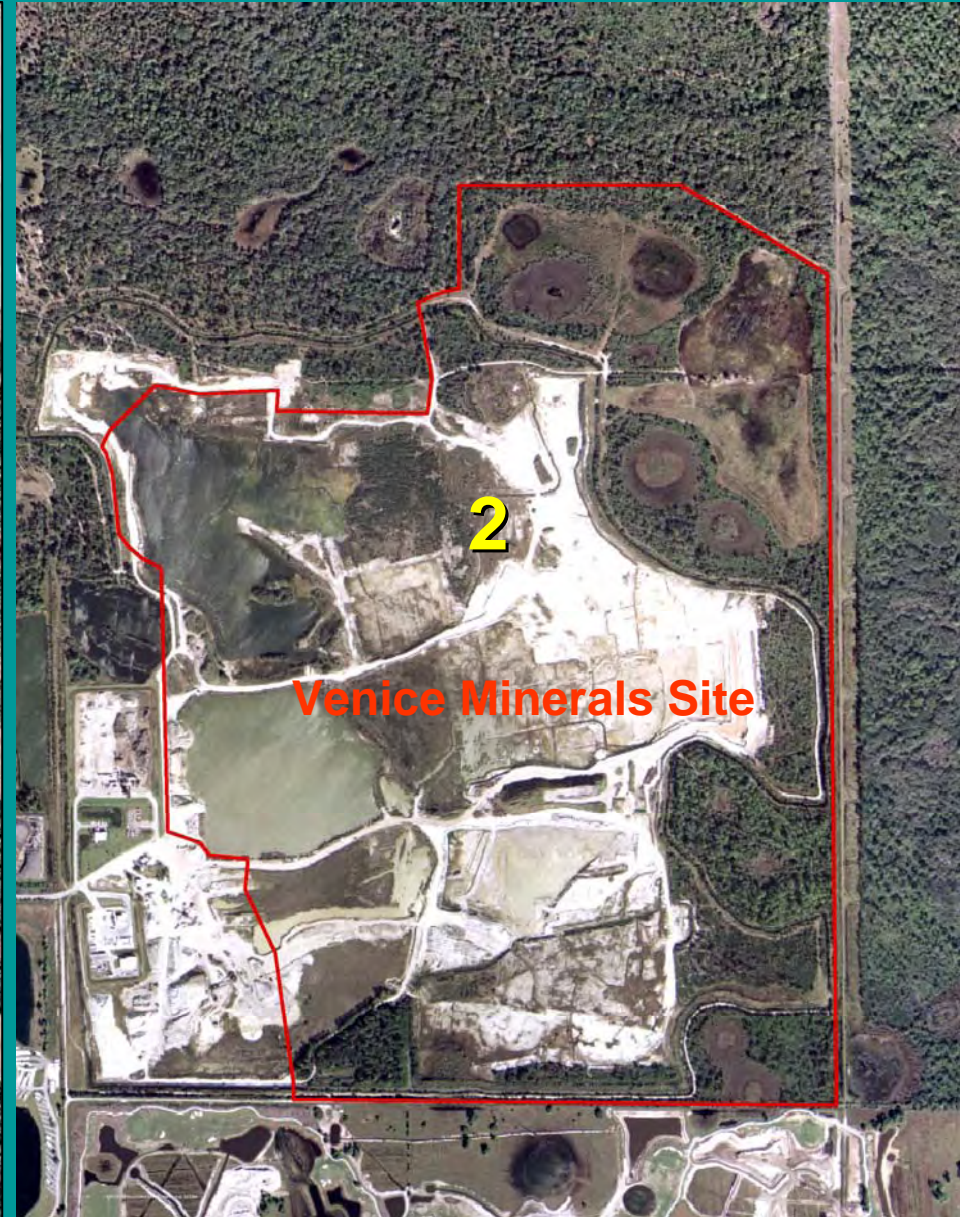
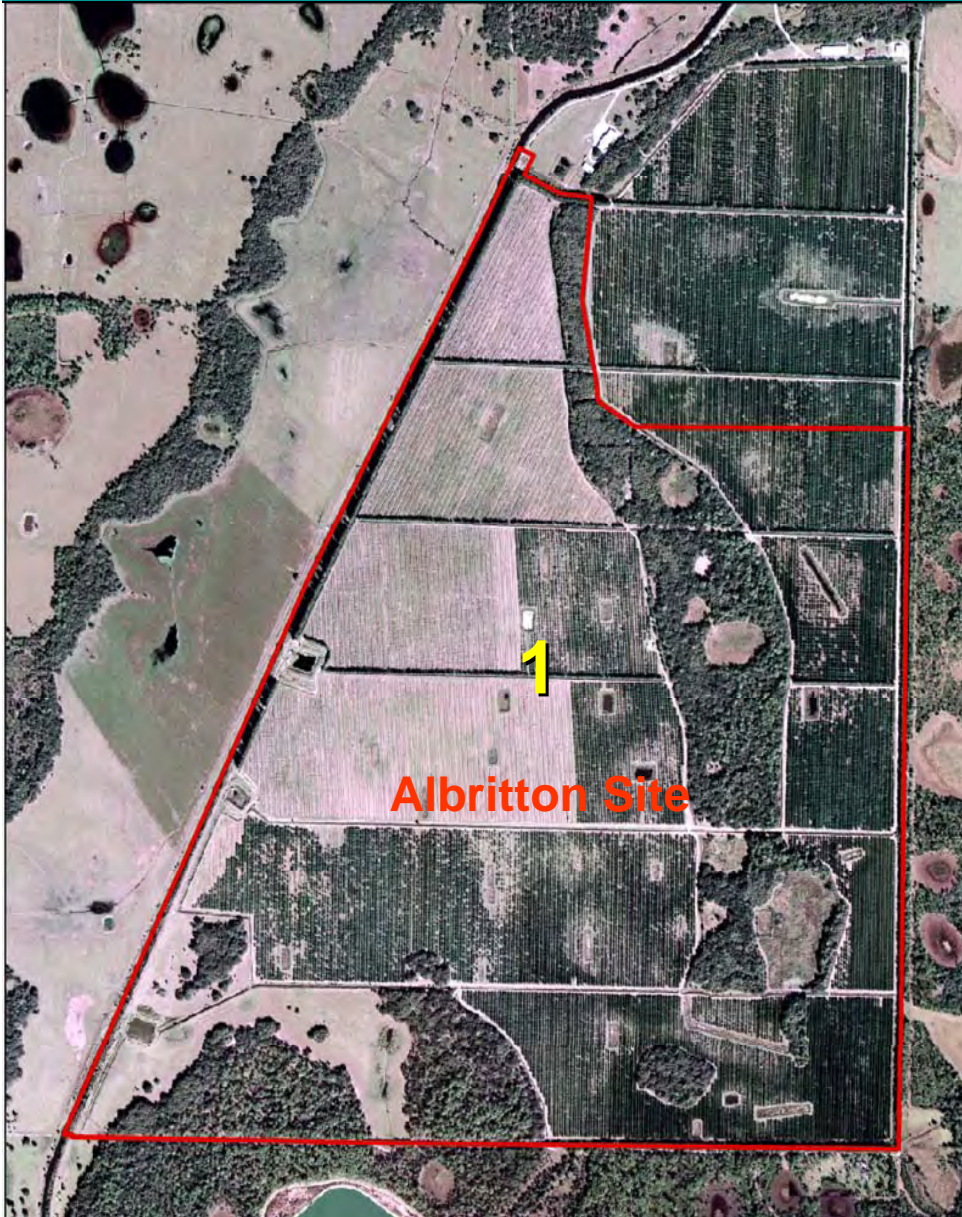
- **Restore Watershed Storage
(Volume and Timing Restoration)**
- **Recycle/Reuse Excess Freshwater
(Volume Restoration)**

SOLUTIONS AT THE WATERSHED SCALE



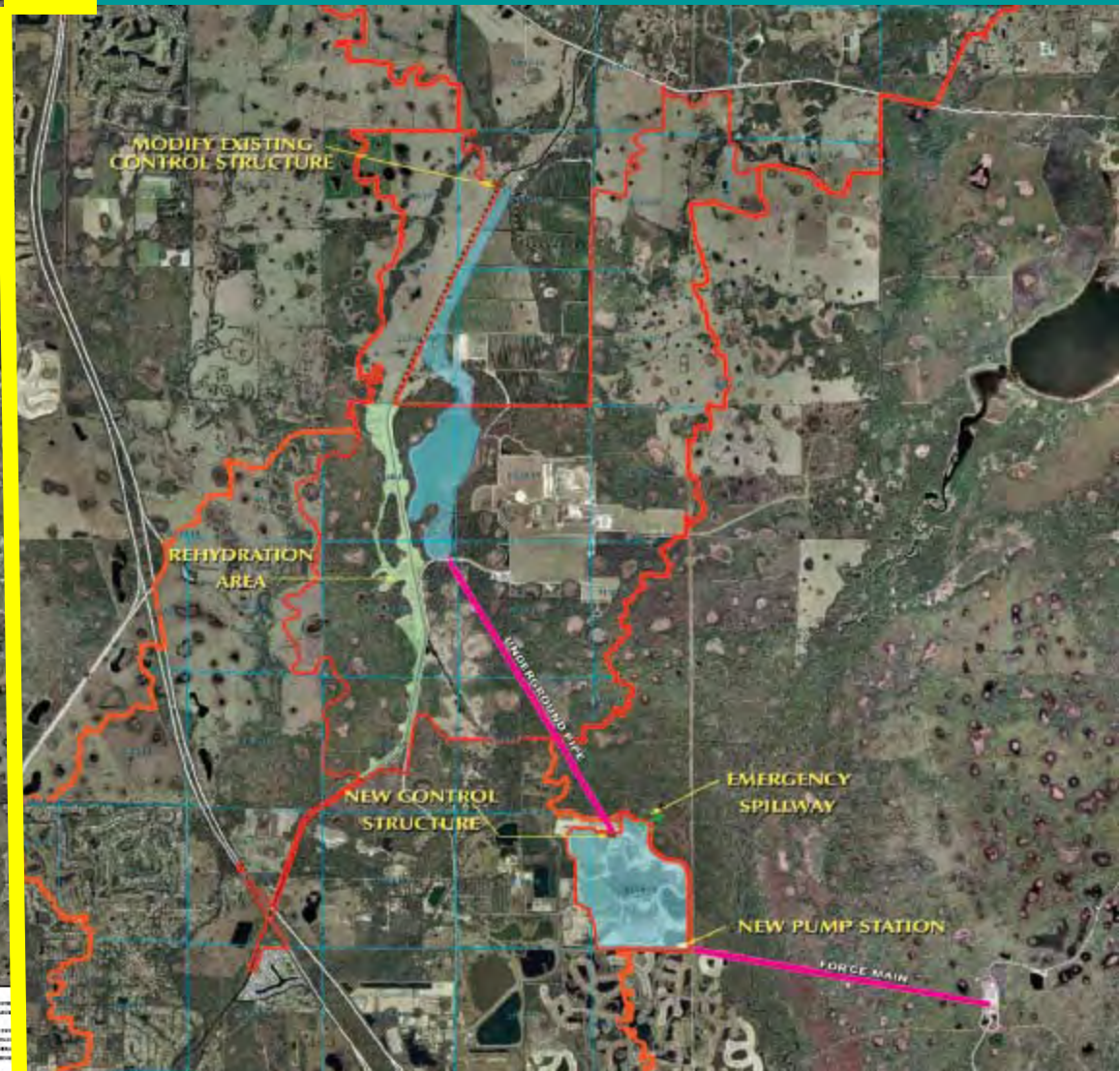
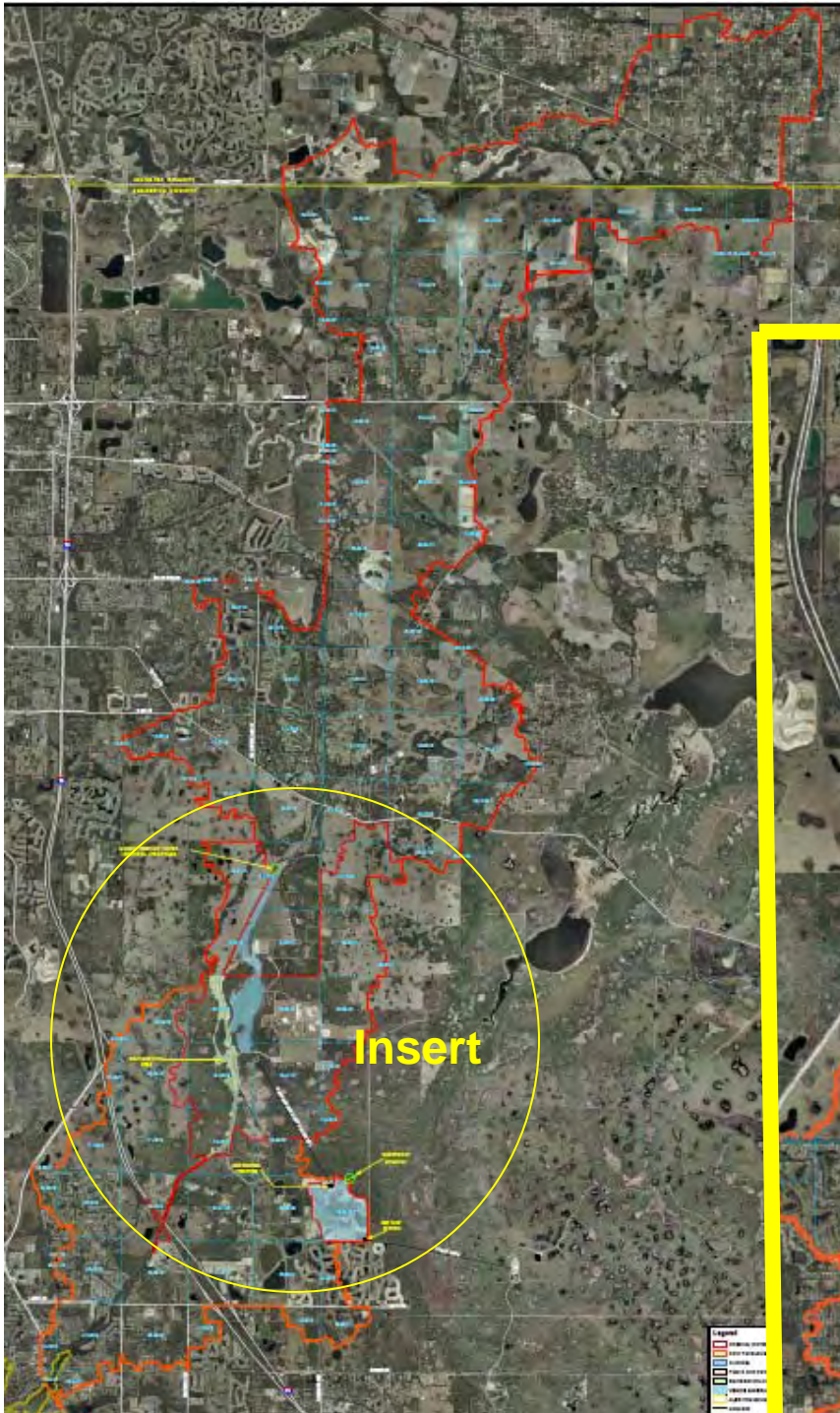
- Restore hydrology of watershed storage
- Acquire strategic water resource lands

SOLUTIONS AT THE WATERSHED SCALE



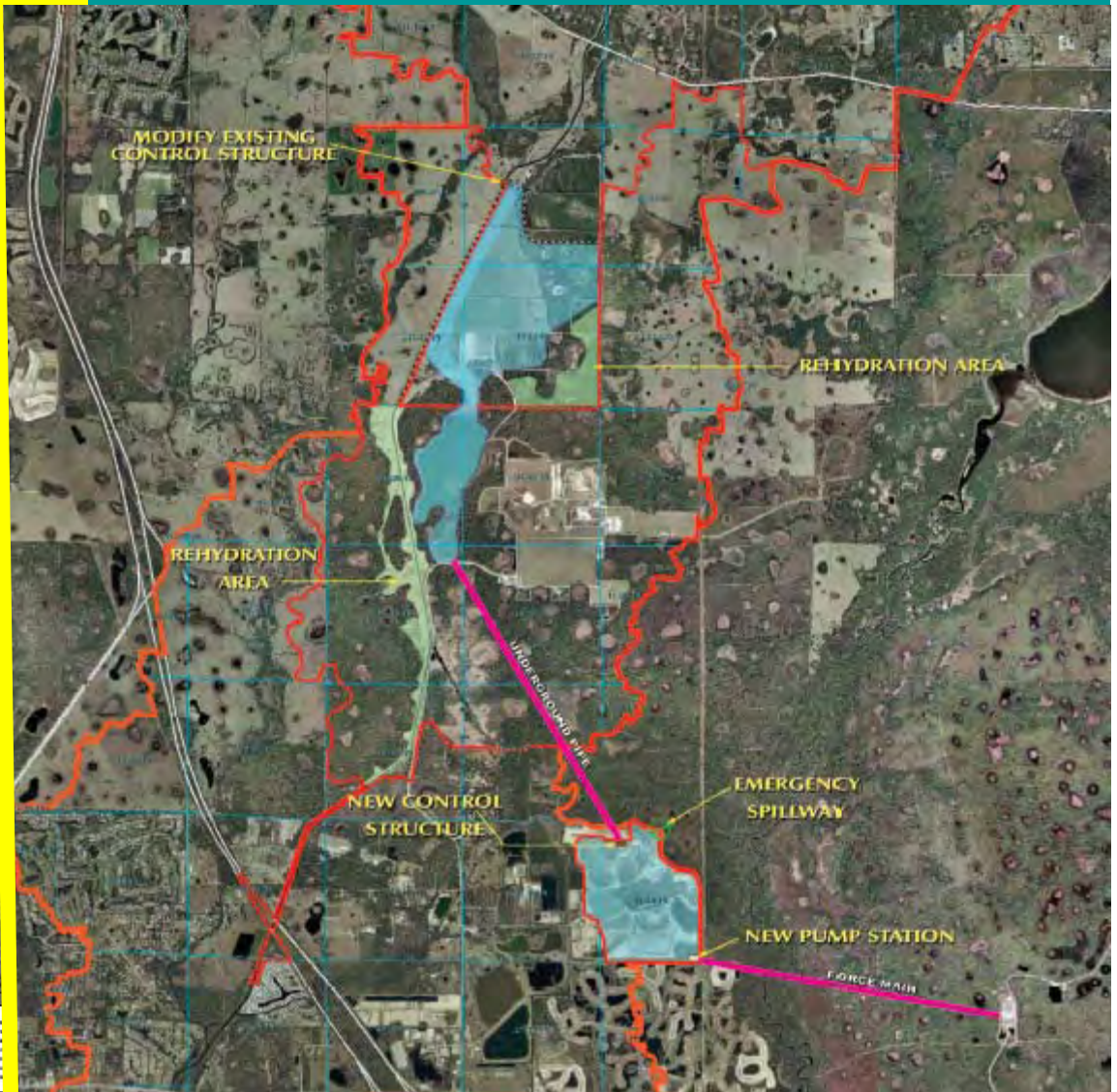
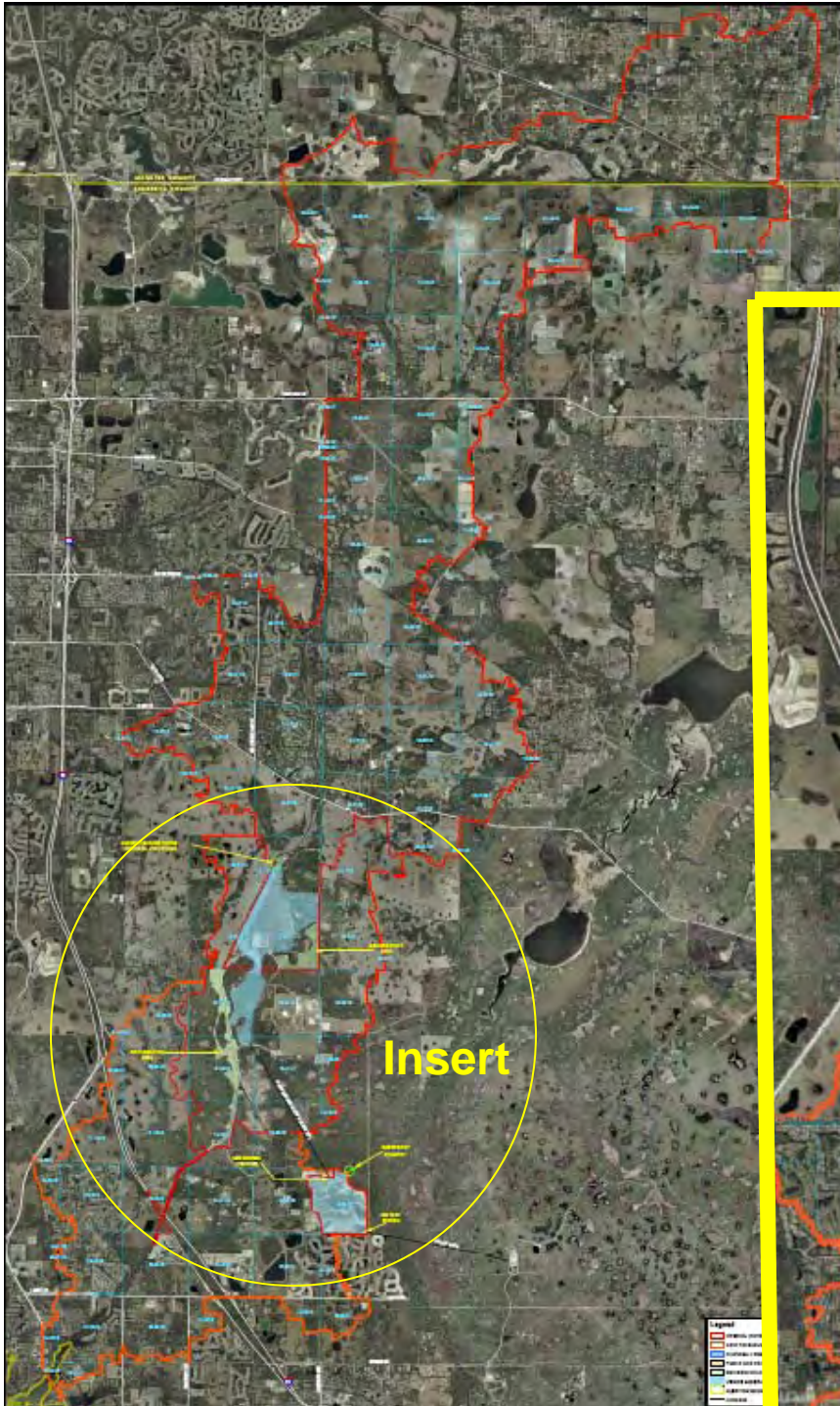
Dona Bay Watershed Management Program

Phase 1 – Preliminary Plan

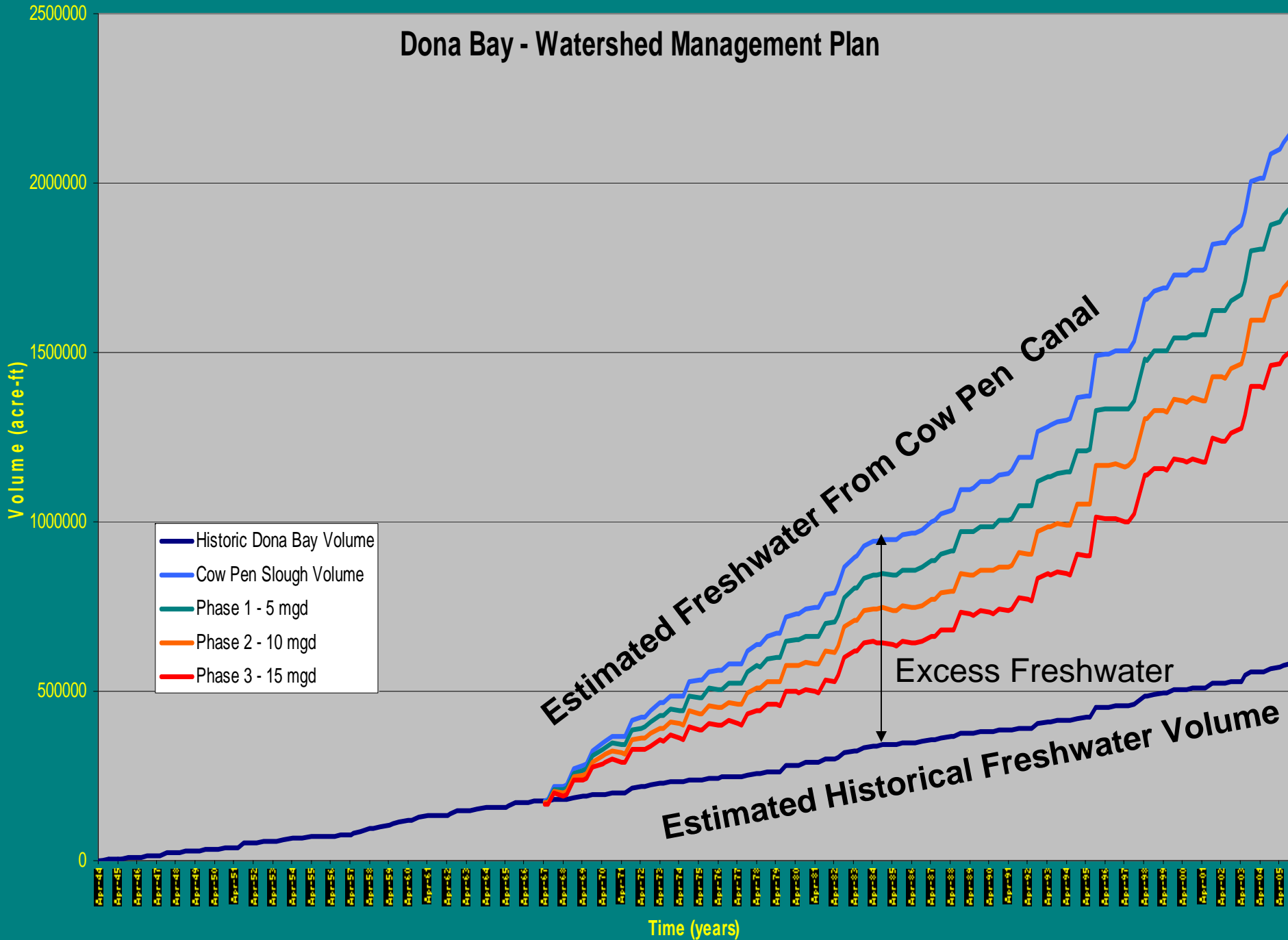


Dona Bay Watershed Management Program

Phase 2 – Preliminary Plan



Dona Bay - Watershed Management Plan



Biological Indicators

**DONA BAY WATERSHED MANAGEMENT PLAN:
Salinity Targets for Watershed Management in Dona and Roberts
Bays and their Tributaries**

**SARASOTA COUNTY – KIMLEY HORN AND ASSOCIATES
MASTER AGREEMENT FOR CONTINUING PROFESSIONAL SERVICES
TASK 3: WATERSHED GOALS
TASK 4.1.1.1: LIFE HISTORY REQUIREMENTS
TASK 4.1.1.2: OYSTER SURVEY
(INDIVIDUAL PROJECT ORDER NUMBER 1)**

JULY 5, 2006



Submitted to:

MIKE JONES
SARASOTA COUNTY ENVIRONMENTAL SERVICES
2817 CATTLEMEN ROAD
SARASOTA, FLORIDA 34232

Submitted by:

E. D. ESTEVEZ
CENTER FOR COASTAL ECOLOGY
MOTE MARINE LABORATORY
1600 KEN THOMPSON PARKWAY
SARASOTA, FLORIDA 34236

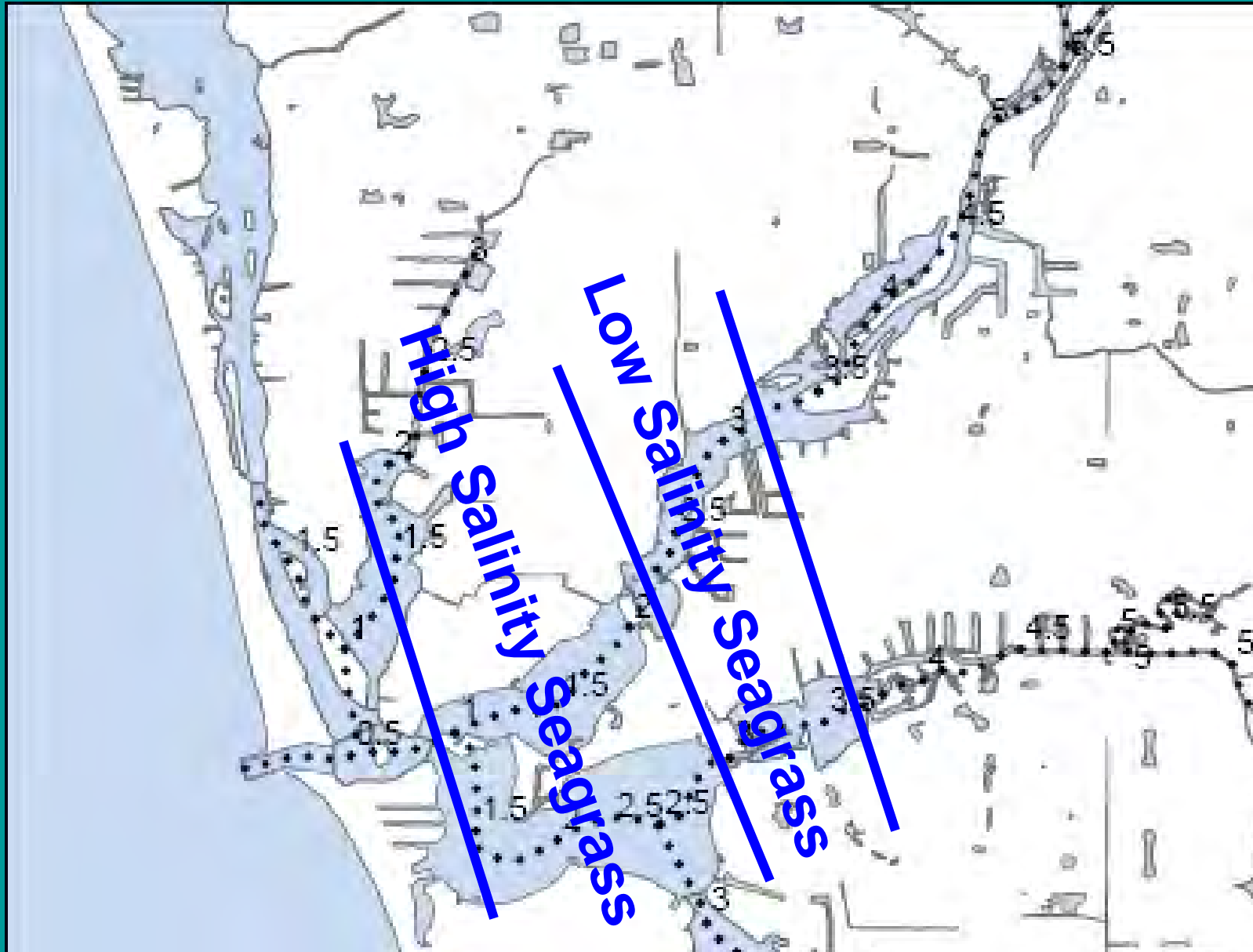
MOTE MARINE LABORATORY TECHNICAL REPORT NO. 1114

MOTE MARINE LABORATORY

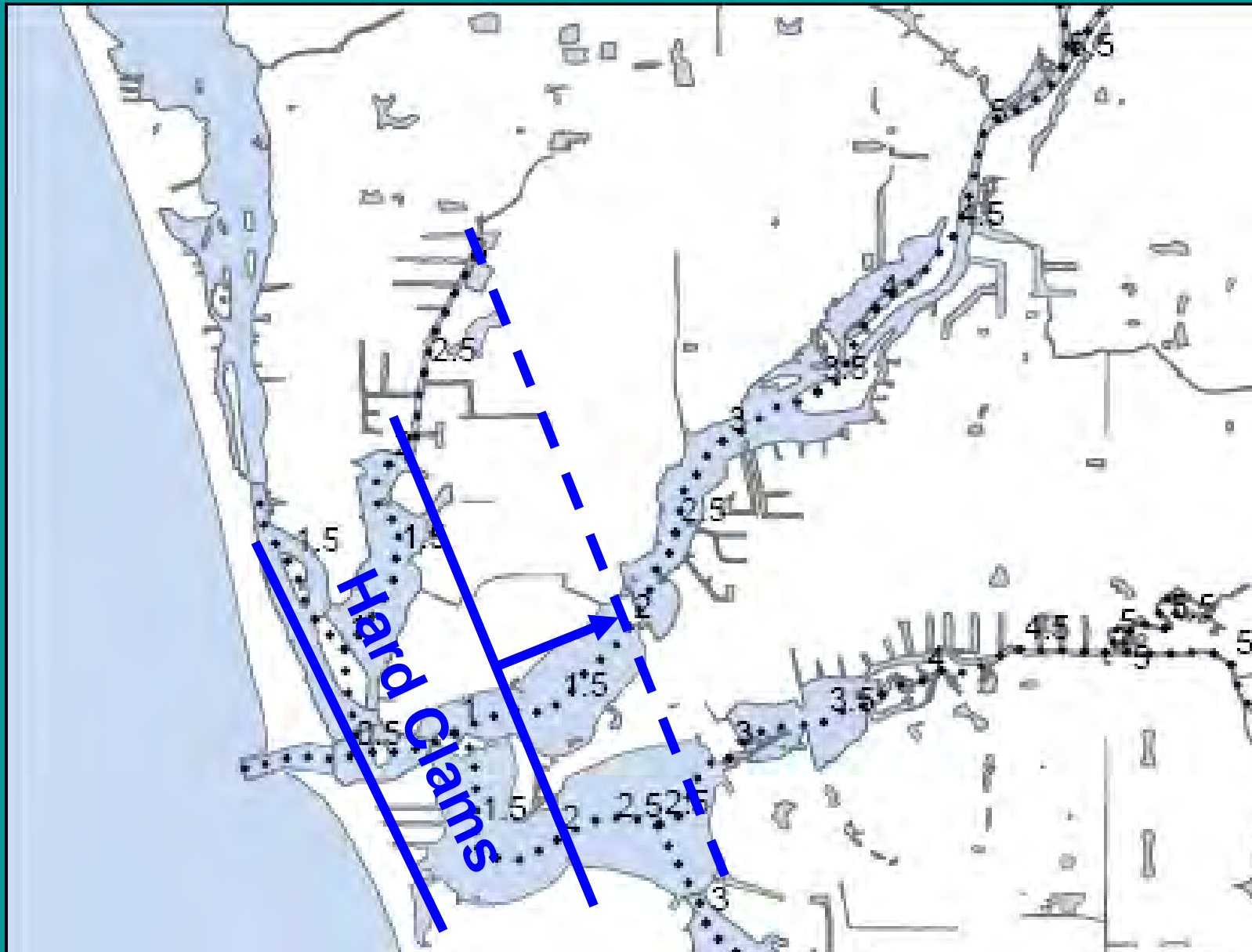
Establishing Salinity Regimes Conducive to:

- Seagrasses
- Hard Clams
- Oysters
- Fish (spotted sea trout, snook, red drum)

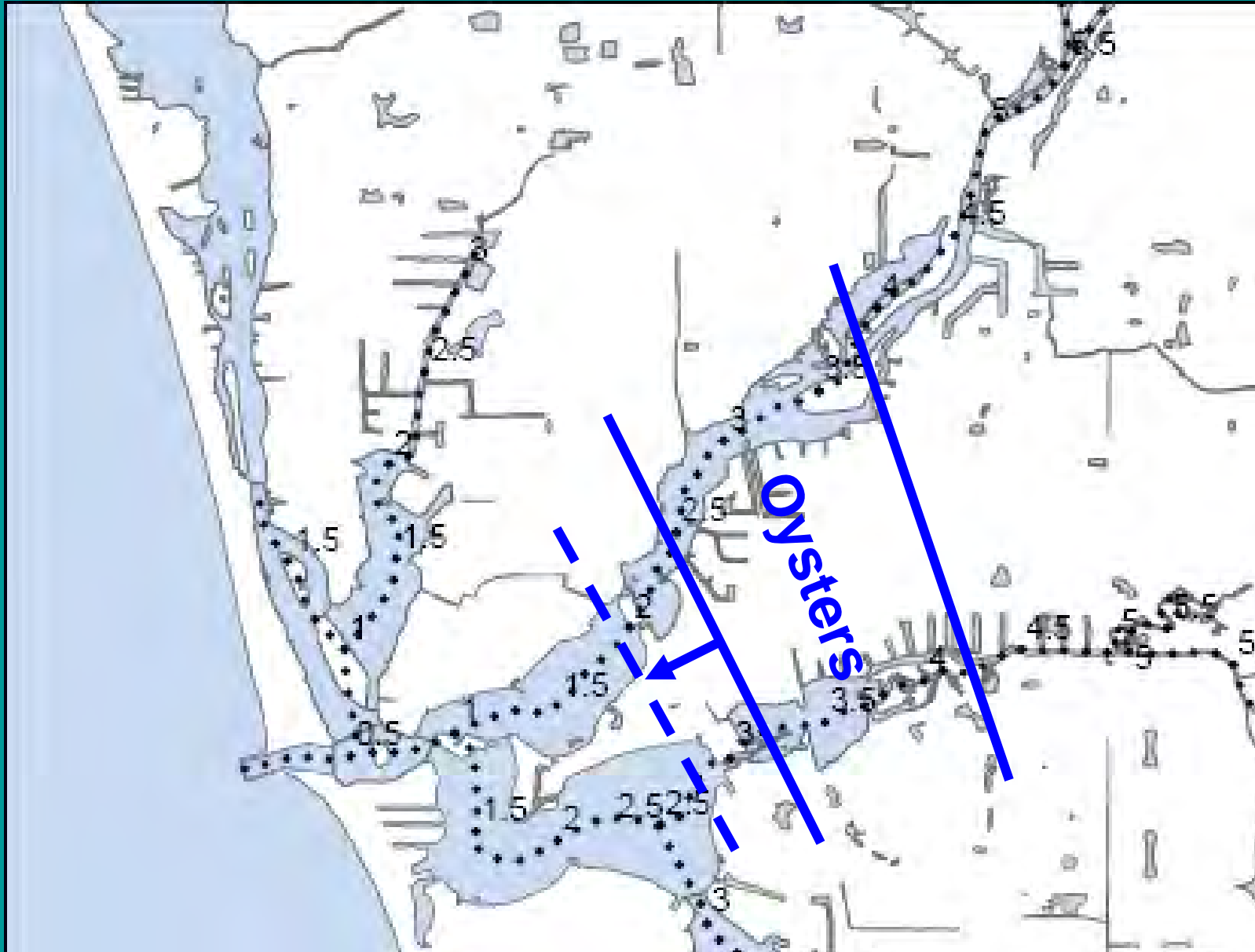
Dona Bay Watershed Management Plan Biological Indicators



Dona Bay Watershed Management Plan Biological Indicators

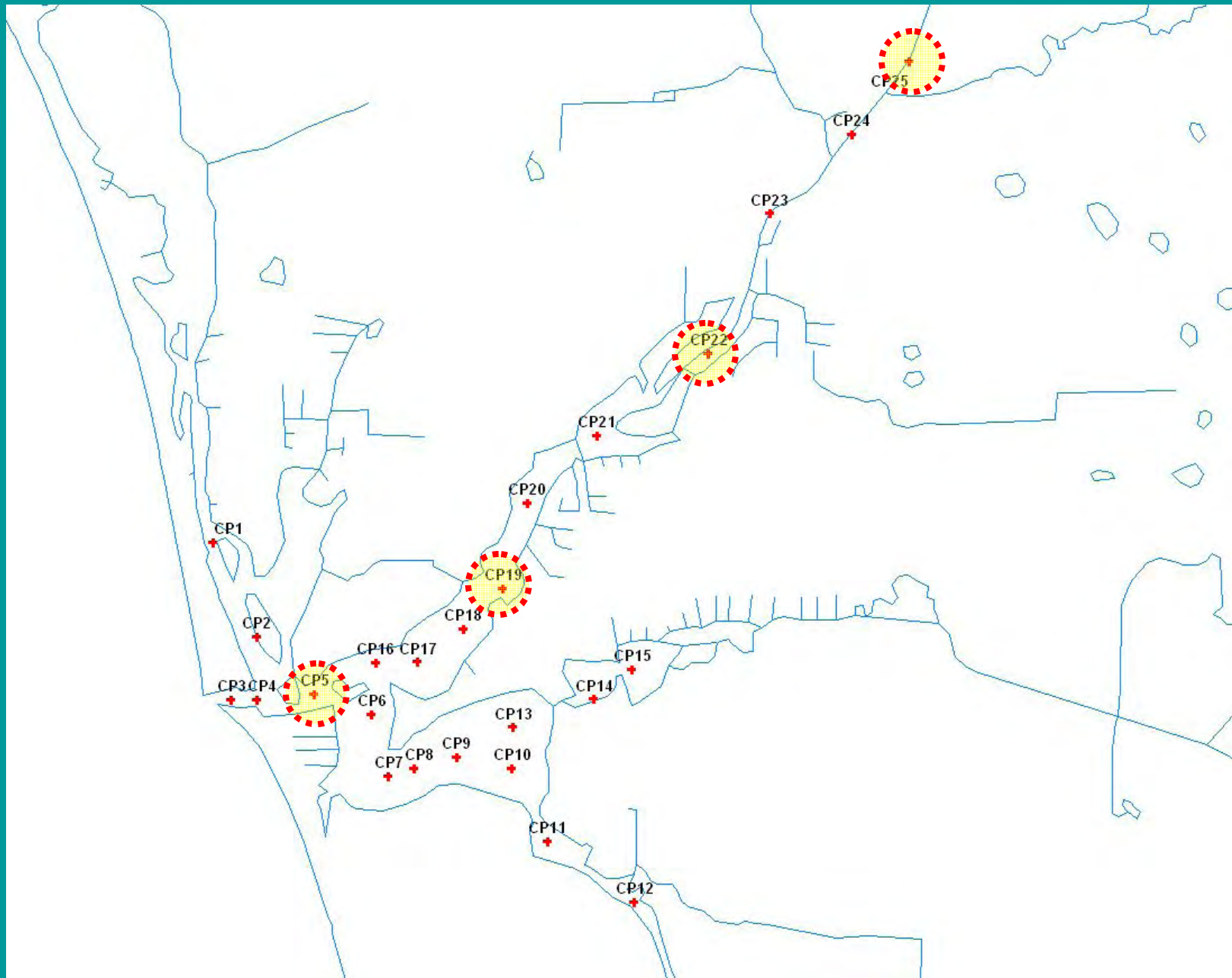


Dona Bay Watershed Management Plan Biological Indicators



Potential flow reductions can be used to predict potential changes in downstream salinity ranges.

Examples from Stations 25, 22, 19, and 5



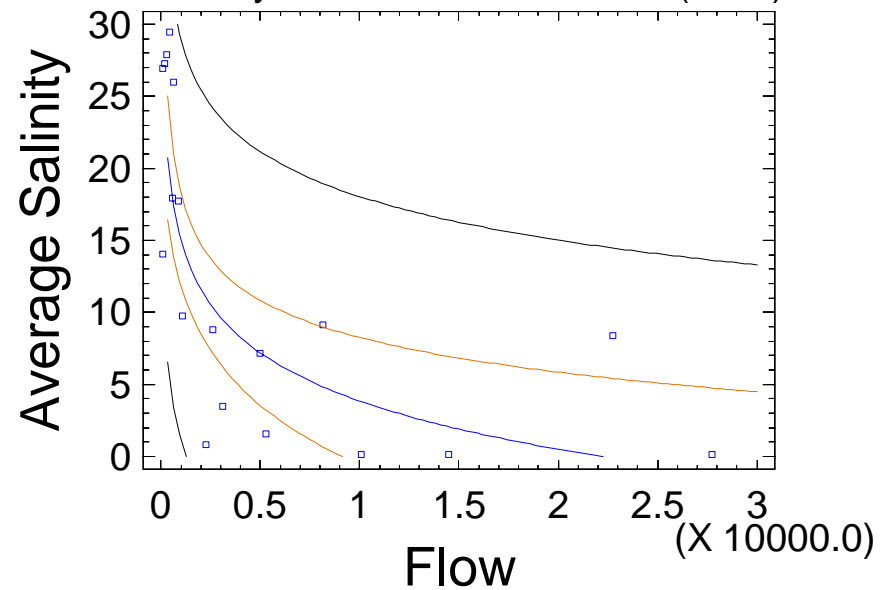
Station 25

Comparison of Alternative Models

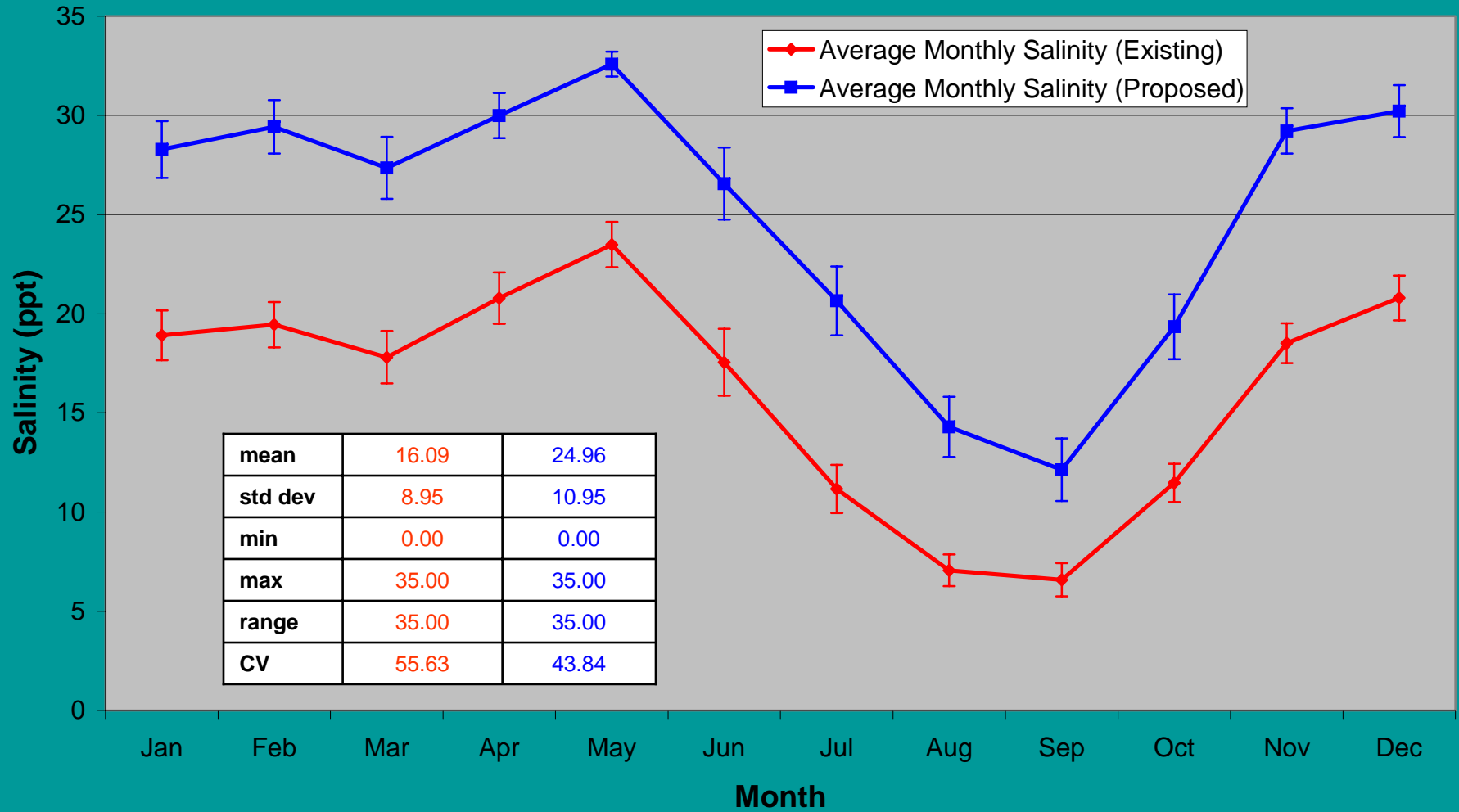
Model	Correlation	R-Squared
Logarithmic-X	-0.8147	66.37%
Square root-Y logarithmic-X	-0.8092	65.48%
Squared-Y logarithmic-X	-0.7643	58.41%
Logarithmic-Y square root-X	-0.7407	54.87%
Multiplicative	-0.7380	54.47%
Square root-X	-0.7174	51.46%
Reciprocal-Y	0.7022	49.31%
Reciprocal-Y square root-X	0.6932	48.06%
Exponential	-0.6640	44.09%
Squared-Y square root-X	-0.6526	42.59%
Reciprocal-Y squared-X	0.6465	41.79%
Reciprocal-Y logarithmic-X	0.5863	34.37%
Reciprocal-X	0.5849	34.21%
Linear	-0.5724	32.76%
Squared-Y reciprocal-X	0.5638	31.79%
Square root-Y reciprocal-X	0.5568	31.00%
Logarithmic-Y squared-X	-0.5407	29.24%
Squared-Y	-0.5061	25.61%
Square root-Y squared-X	-0.4658	21.69%
S-curve model	0.4620	21.34%
Squared-X	-0.4103	16.83%
Double squared	-0.3508	12.31%
Double reciprocal	-0.2917	8.51%

Plot of Fitted Model

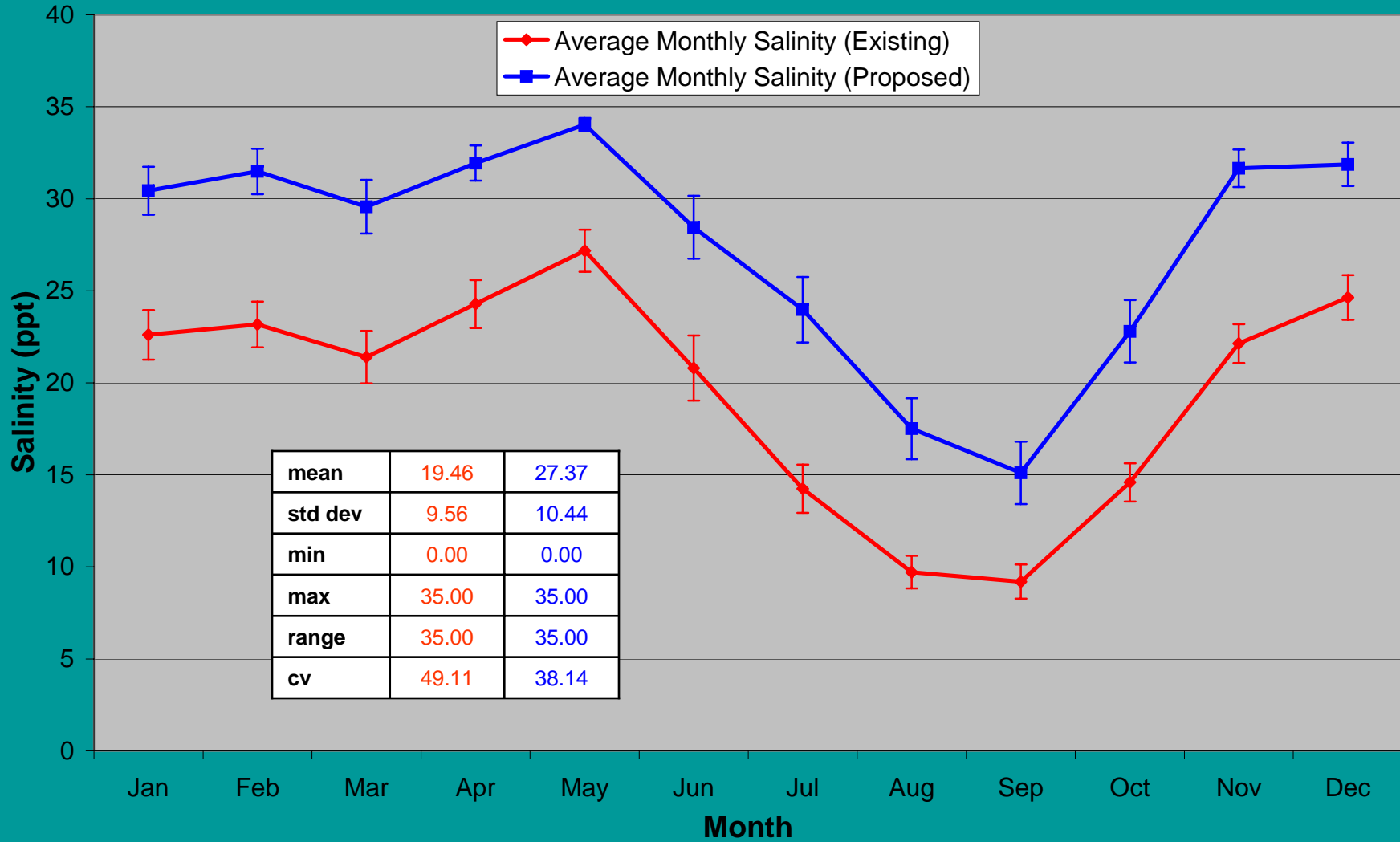
$$\text{Salinity} = 48.1825 - 4.81374 \cdot \ln(\text{Flow})$$



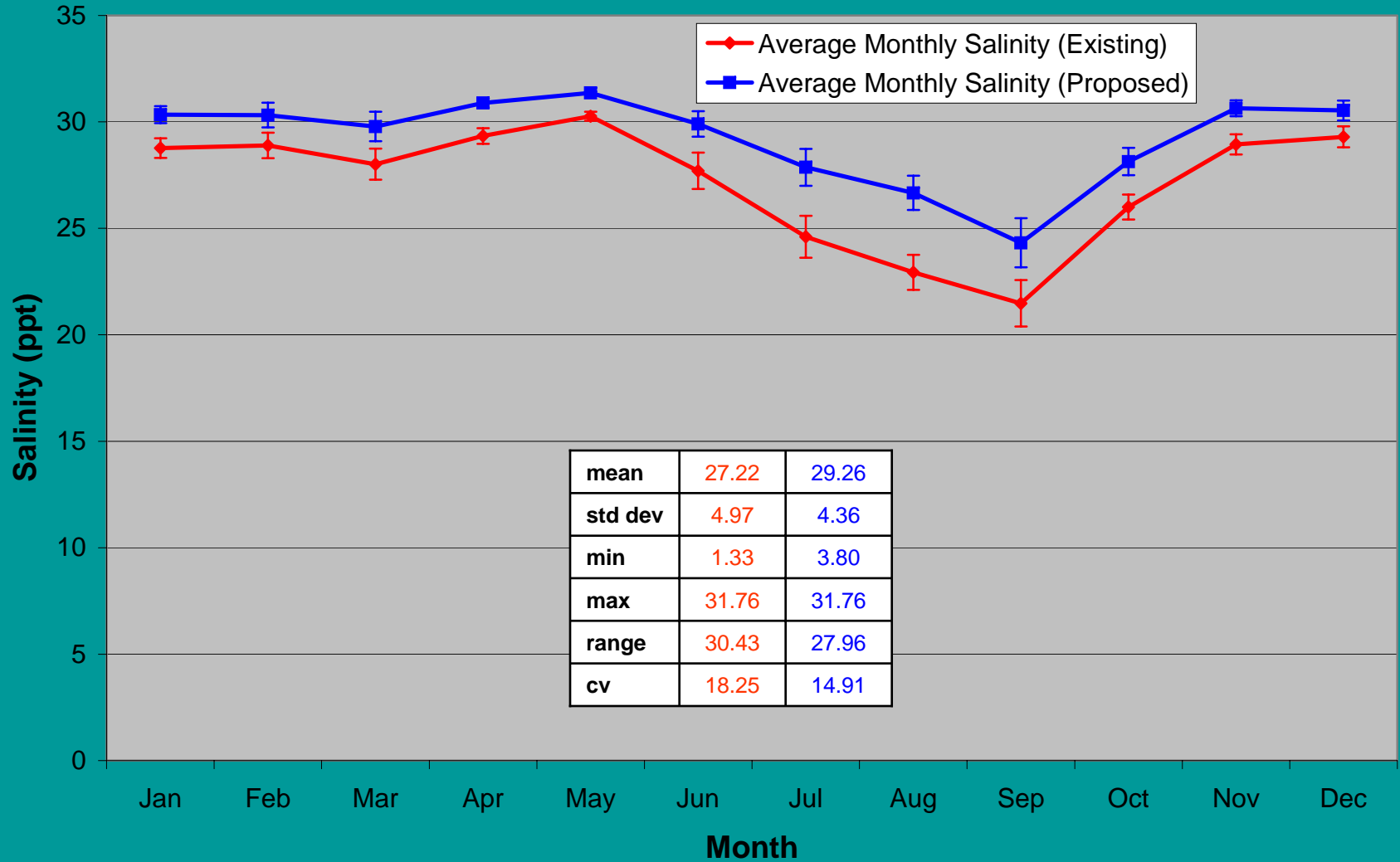
Station 25 Salinity Comparison



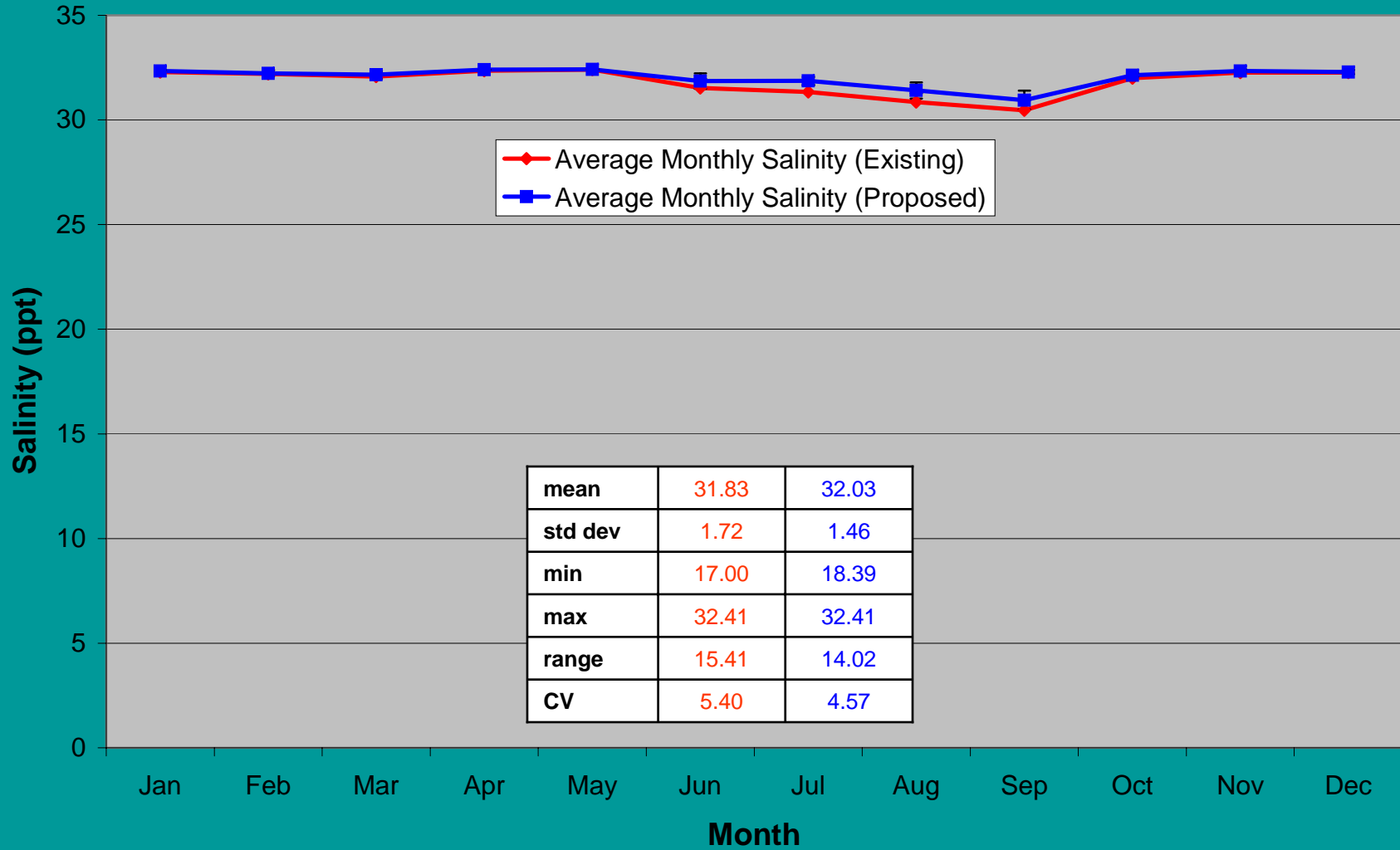
Station 22 Salinity Comparison



Station 19 Salinity Comparison



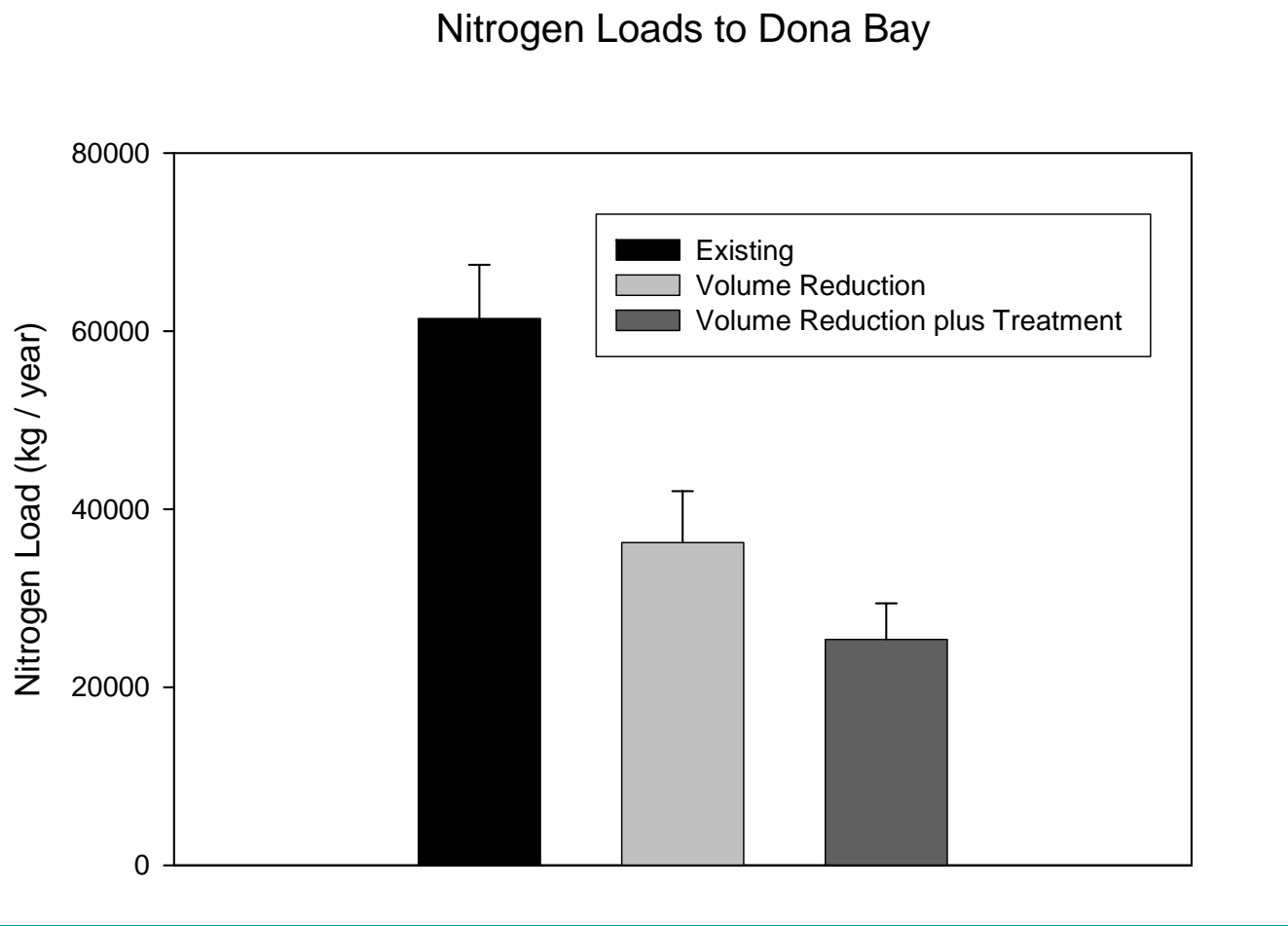
Station 5 Salinity Comparison



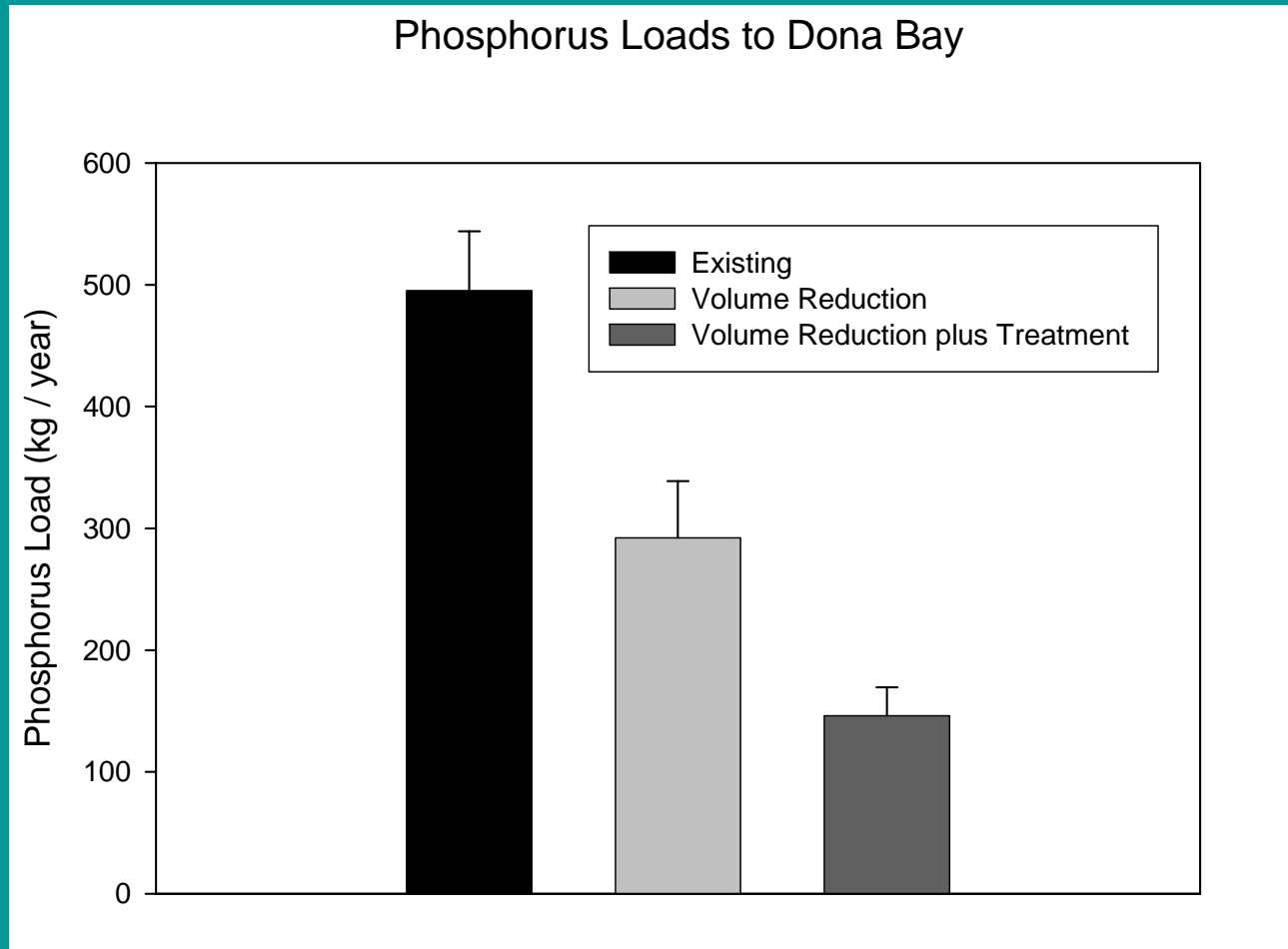
Any reductions in the amount of “excess” freshwater would not only be expected to help restore a more natural salinity range, but pollutant loads to Dona Bay would be reduced as well.

Pollutant reductions can be achieved by volume reductions and by increased treatment.

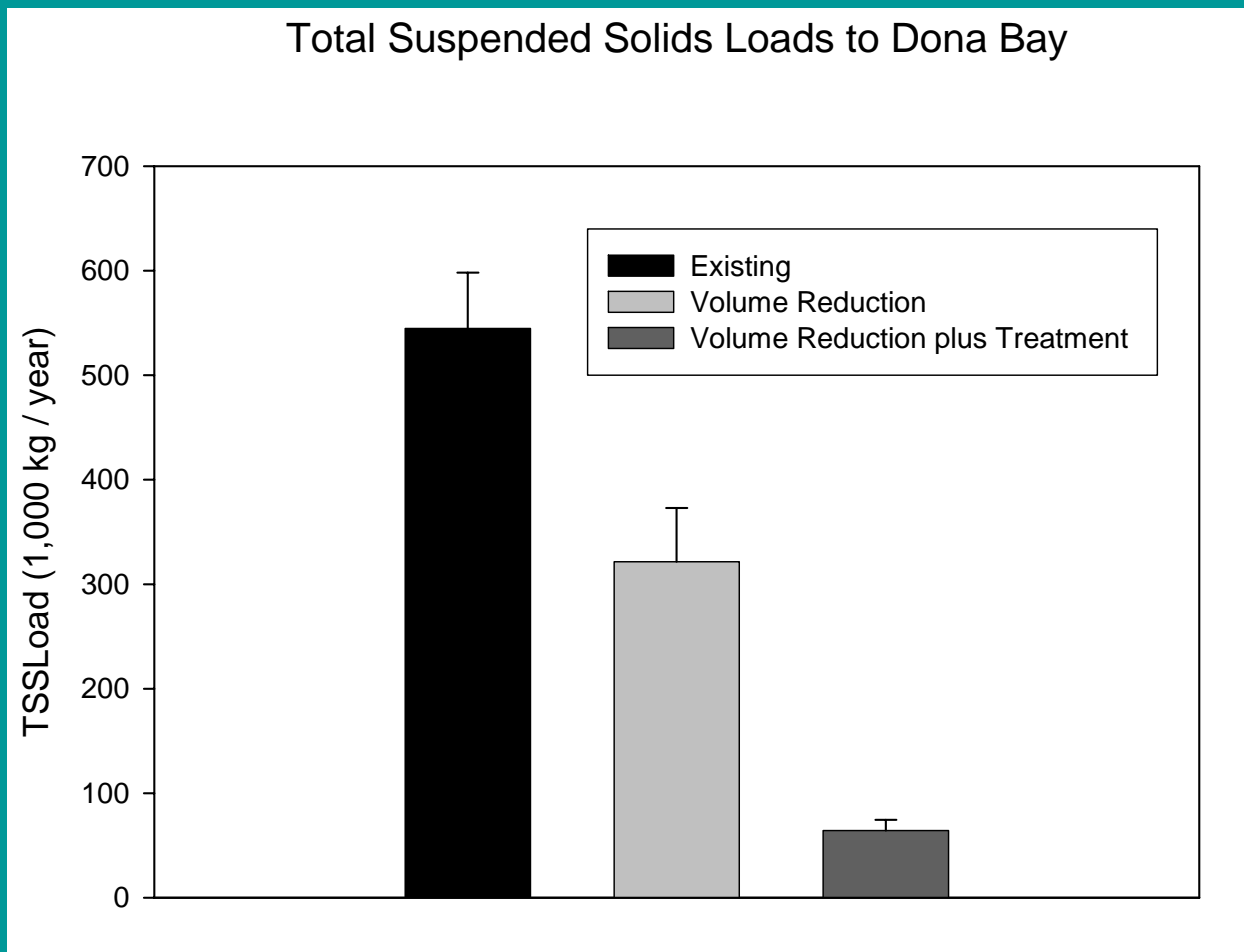
Nitrogen loads could potentially be reduced by 40 to 59 percent



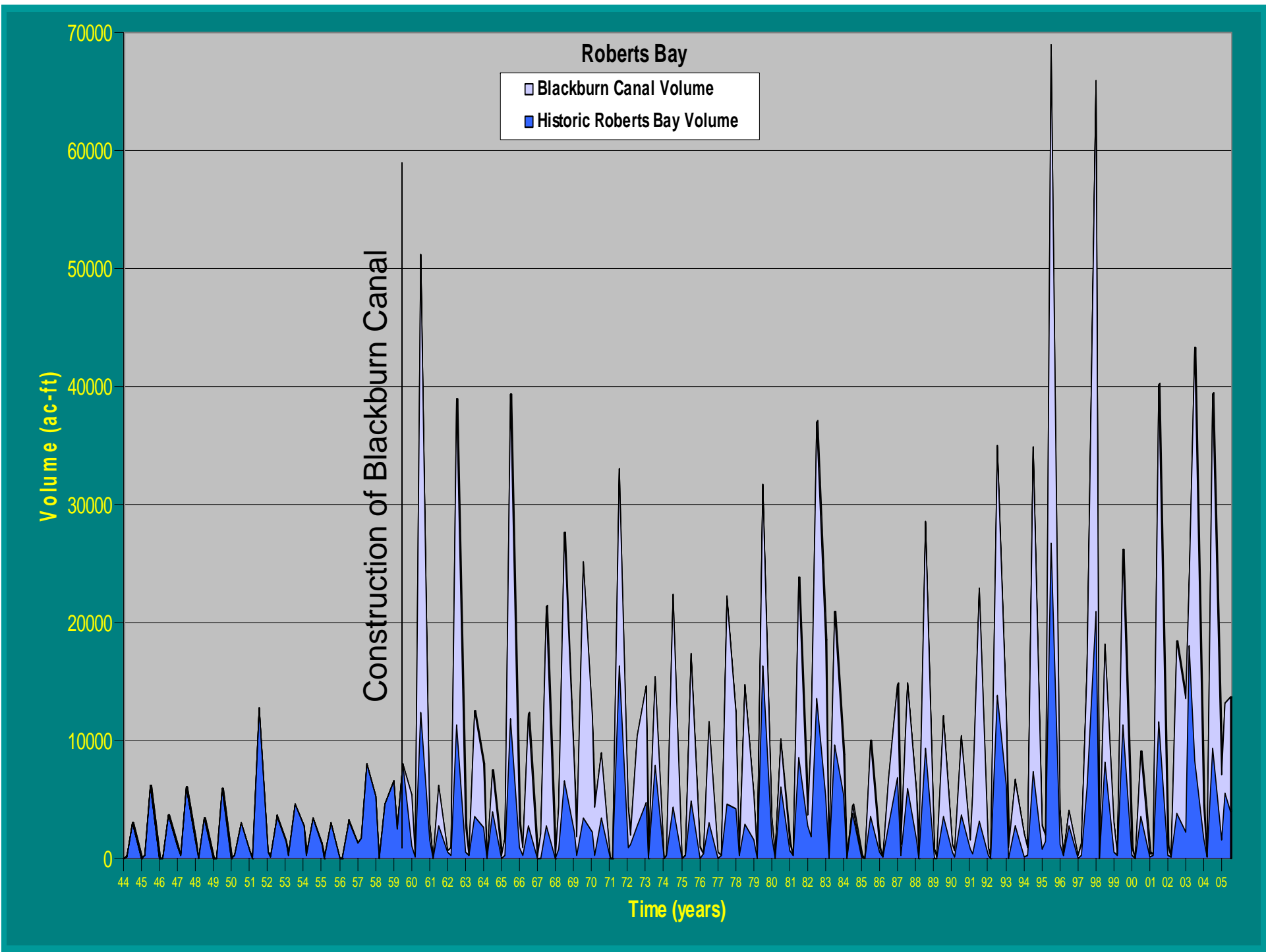
Phosphorus loads could potentially be reduced by 40 to 70 percent

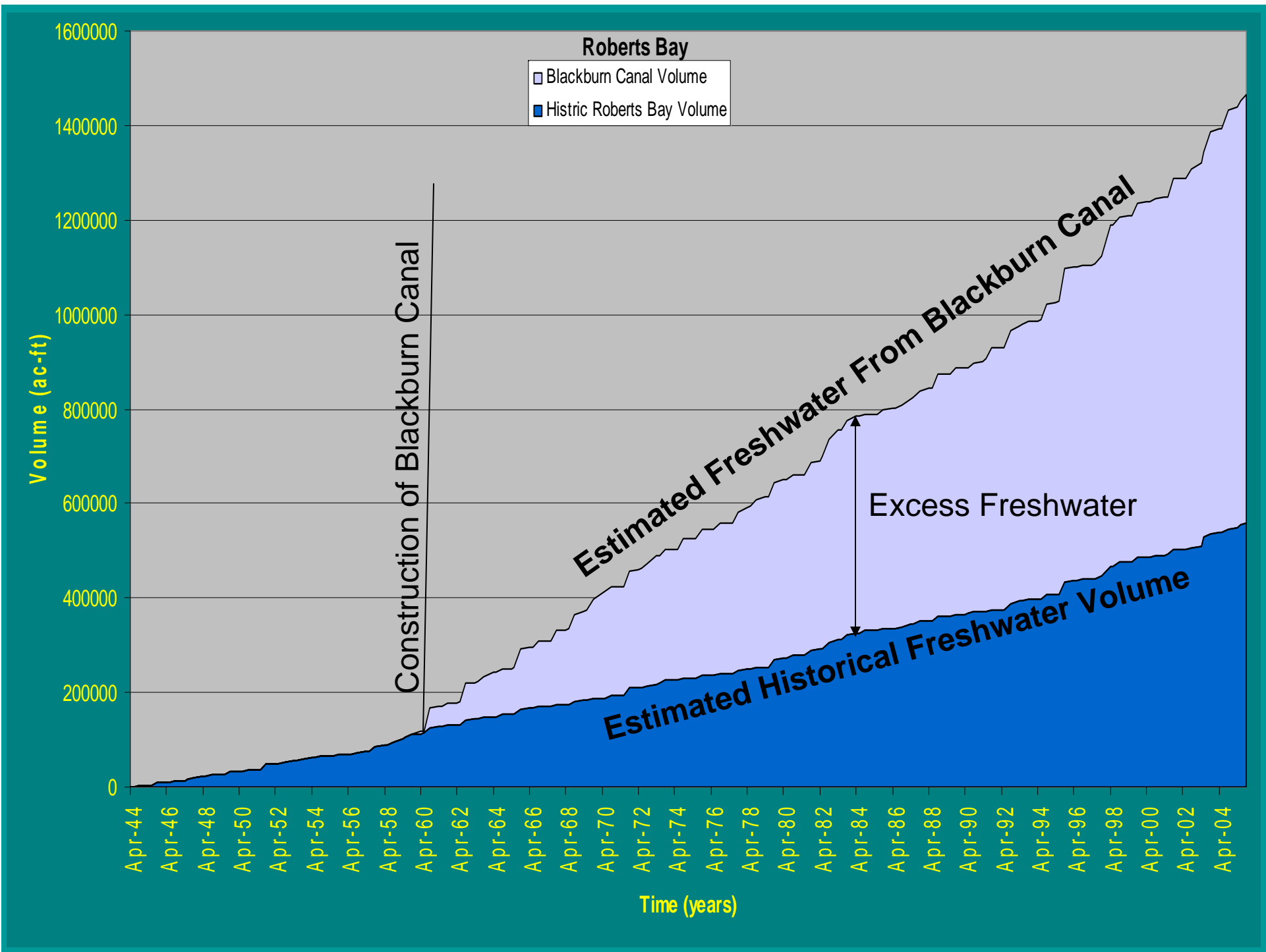


Suspended solids loads could potentially be reduced by 40 to 88 percent

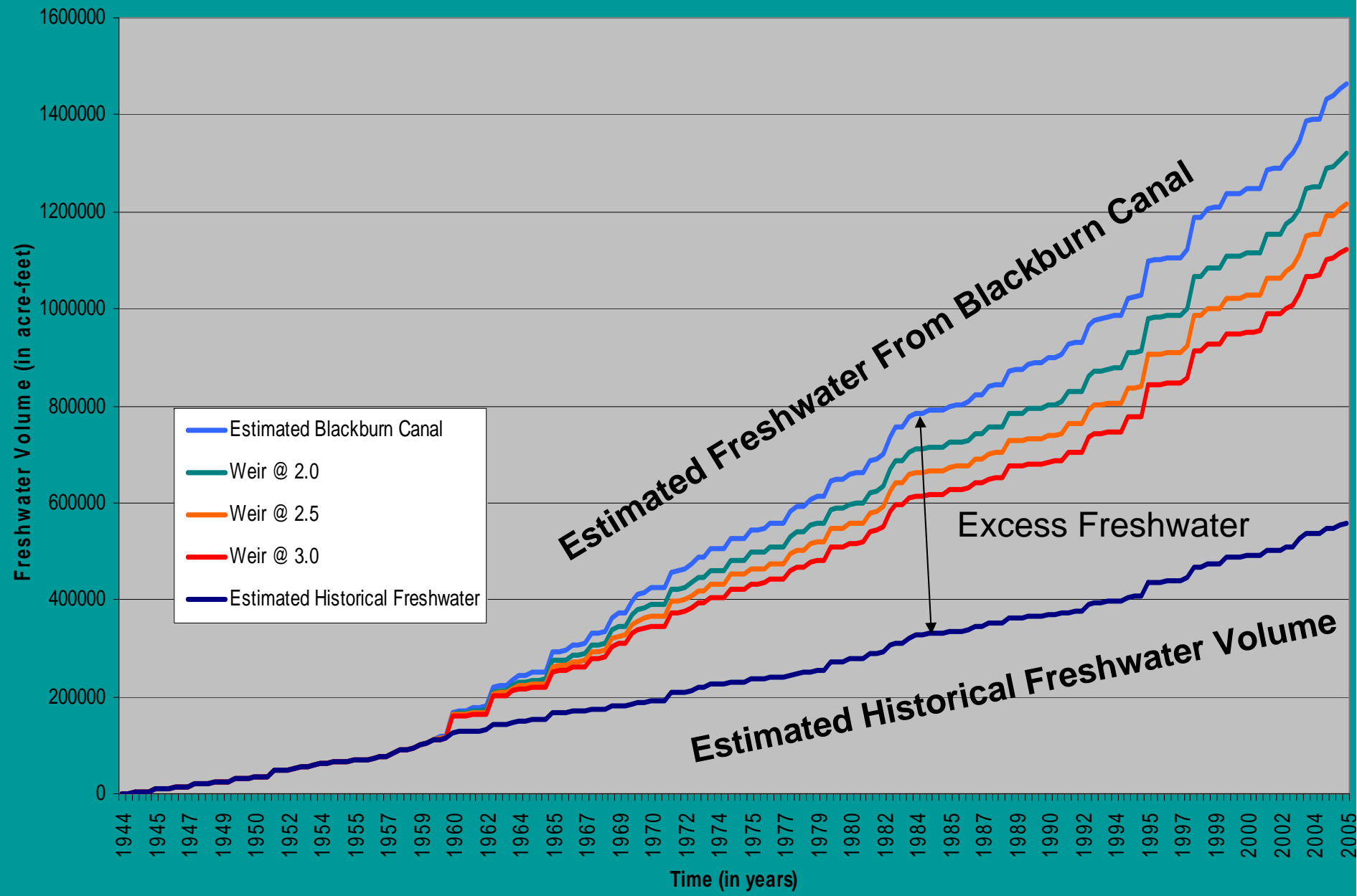


WHAT ABOUT ROBERTS BAY (South)?





Roberts Bay Watershed Management



NEXT STEPS

DONA BAY WATERSHED MANAGEMENT PLAN

1. Complete Watershed Management Plan – 60 days
2. Phase 1 Timeframe – 5 to 10 years
3. Phase 2 Timeframe – 15 years
4. Phase 3 Timeframe – 20 years

ROBERTS BAY SOUTH WATERSHED MANAGEMENT PLAN

Because of the connection between Roberts Bay South and the Myakka River via Blackburn Canal, the Roberts Bay South Watershed Management Plan will be developed subsequent to the Myakka River Watershed Management Plan.

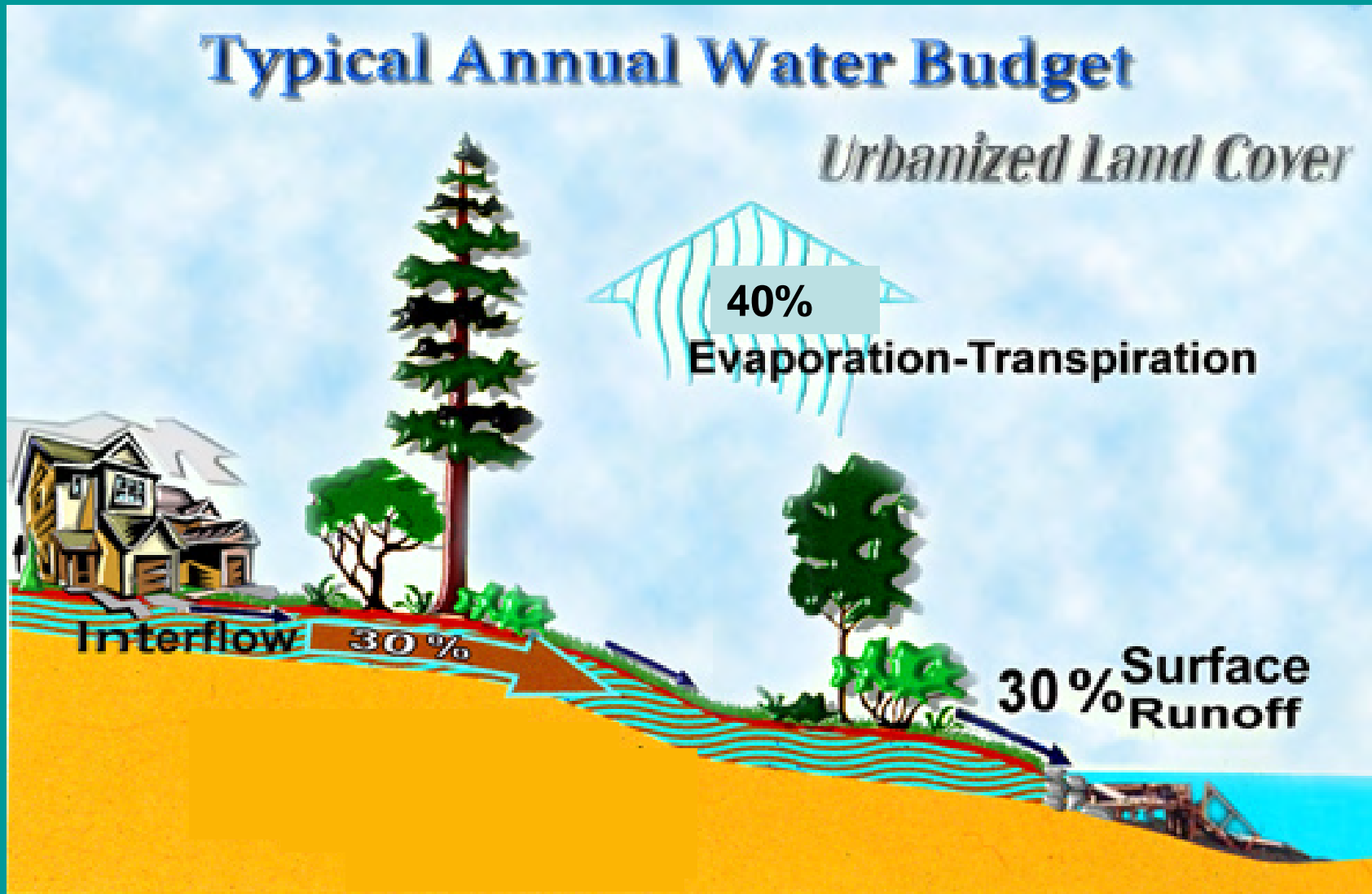
Creek, Estuary and Bay Restoration is a Team Effort. You are part of this team.

- Low Impact Design
- Manage Your Surface Water Runoff
- Reduce Your Pollution Contribution
- Manage and Protect Your Yard and Shoreline
- Neighborhood Environmental Stewardship Teams (NEST)

Natural Conditions

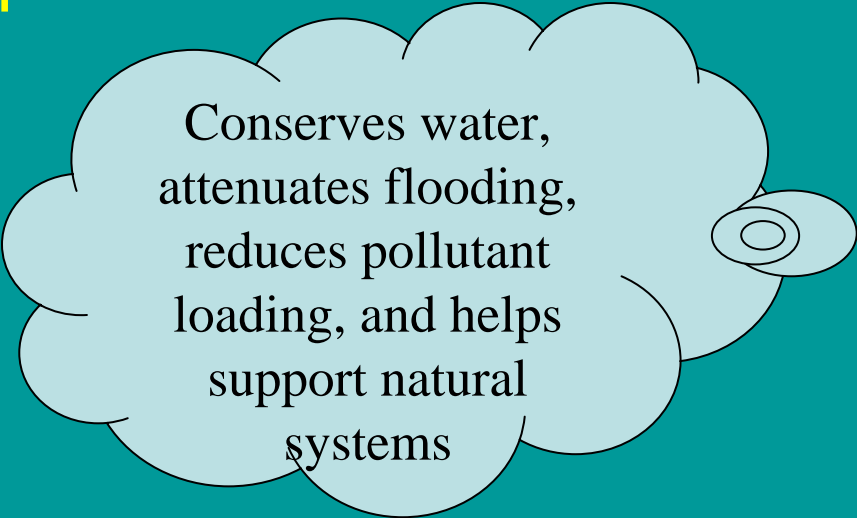


Developed Conditions



What is LID?

- Low Impact Development (LID) is an innovative approach to stormwater management in which an attempt is made to duplicate the hydrologic regime of an undeveloped watershed.



Conserves water,
attenuates flooding,
reduces pollutant
loading, and helps
support natural
systems

Rain Barrels



Total Water Management

Runoff use
Consumption reduction
Save on water costs



This was an art project



Residential Rain Gardens



Protect and Manage Your Shoreline (Estuaries and Tidal Creeks)

Vegetated shorelines

- Absorb nutrients
- Prevent erosion
- Buffer wave action
- Attract wildlife



Protect the Shoreline, Wetlands and Watercourses

Naturally Vegetated slopes

- Buffer wave action
- Absorb nutrients
- Prevent erosion
- Attract wildlife

Reduce pollutant/fertilizer in our waters

- Proper use of fertilizer
- Remove pet droppings
- Properly dispose of yard waste





Figure 15. This is BAD! Never direct clippings into the street where they can enter the storm drain system.

Neighborhood Environmental Stewardship Teams

NEST program 861.5000 or www.sarasota.wateratlas.org



PACE-EH

(Protocol for Assessing Community Excellence in Environmental Health)

- PACE-EH is a community-based approach to solving environmental health concerns.
- The goal is to allow the voice of the community to be heard and response to be given in the form of action plans to protect and preserve the environmental health of our coastal communities.

The End

- Manage Our Yards
- Enhance Our Individual Shorelines
 - Become a NEST Volunteer
 - Get Involved in PACE EH

• www.sarasota.wateratlas.org

The Dona Bay Watershed Management Plan is a cooperative effort of the Southwest Florida Water Management District / Manasota Basin Board and Sarasota County Environmental Services.