



800-435-5727 www.IRCitrusLeague.org

Indian River Citrus League

PO Box 690007 Vero Beach, FL 32969-0007



INDIAN RIVER

Where the world's finest
grapefruit grow.



INDIAN
RIVER
AREA

LAKE
OCHLOCKNEE



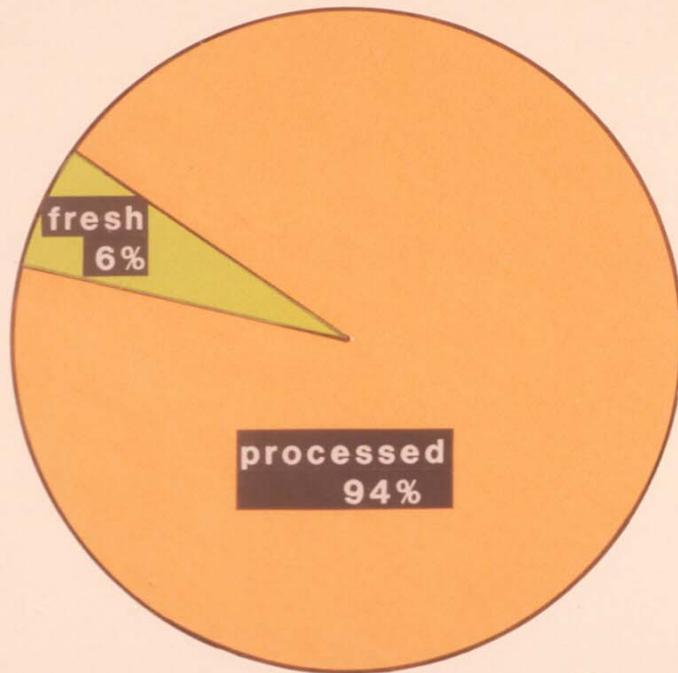




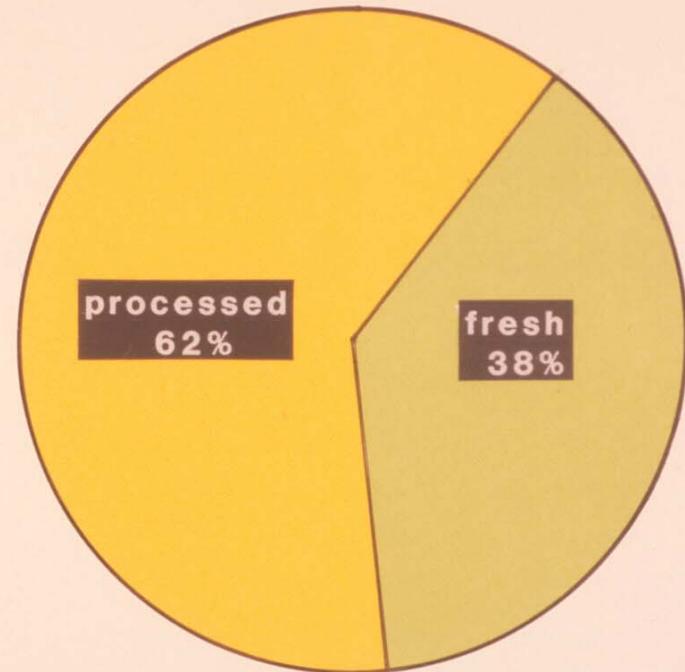


Florida Utilization

Orange



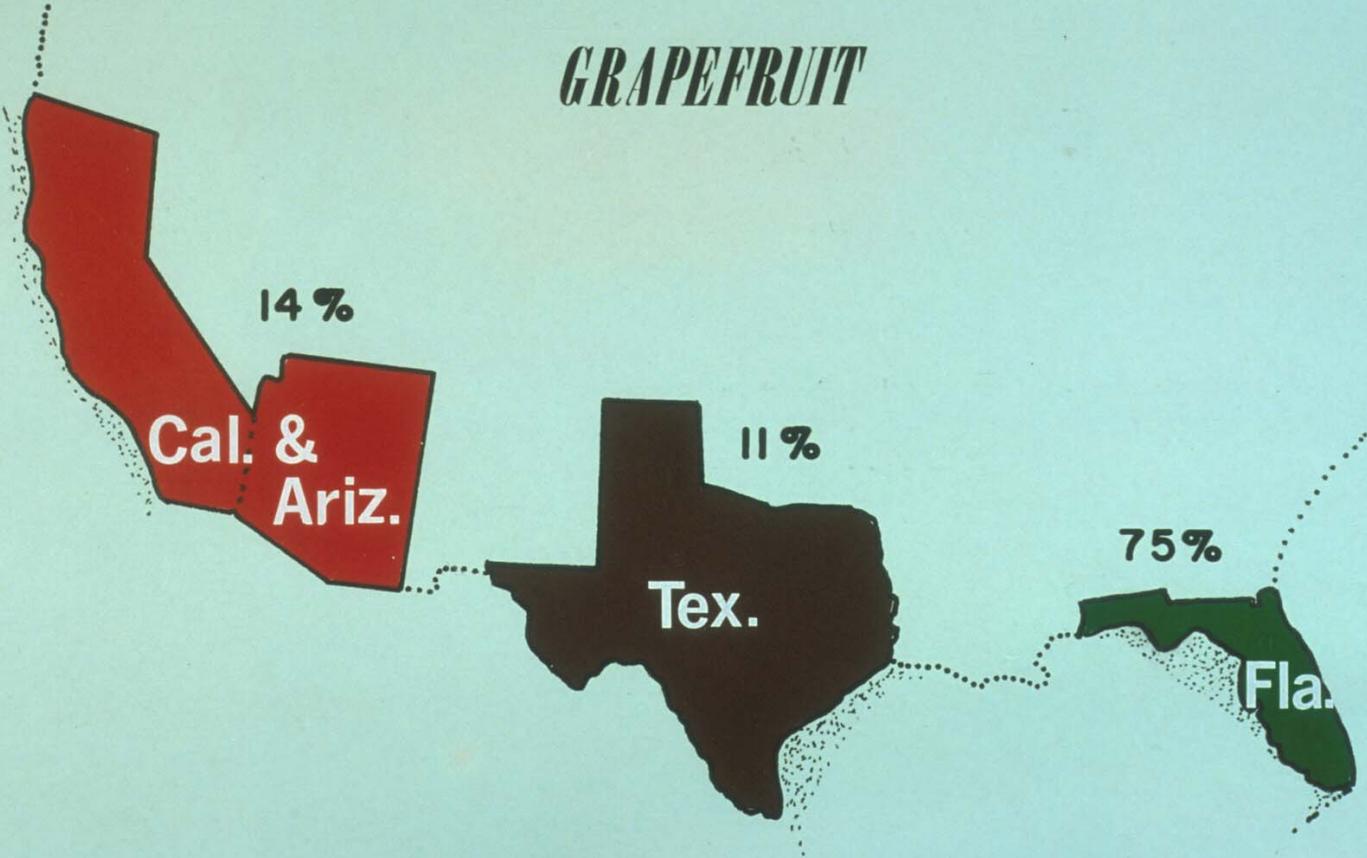
Grapefruit



5 year average



GRAPEFRUIT



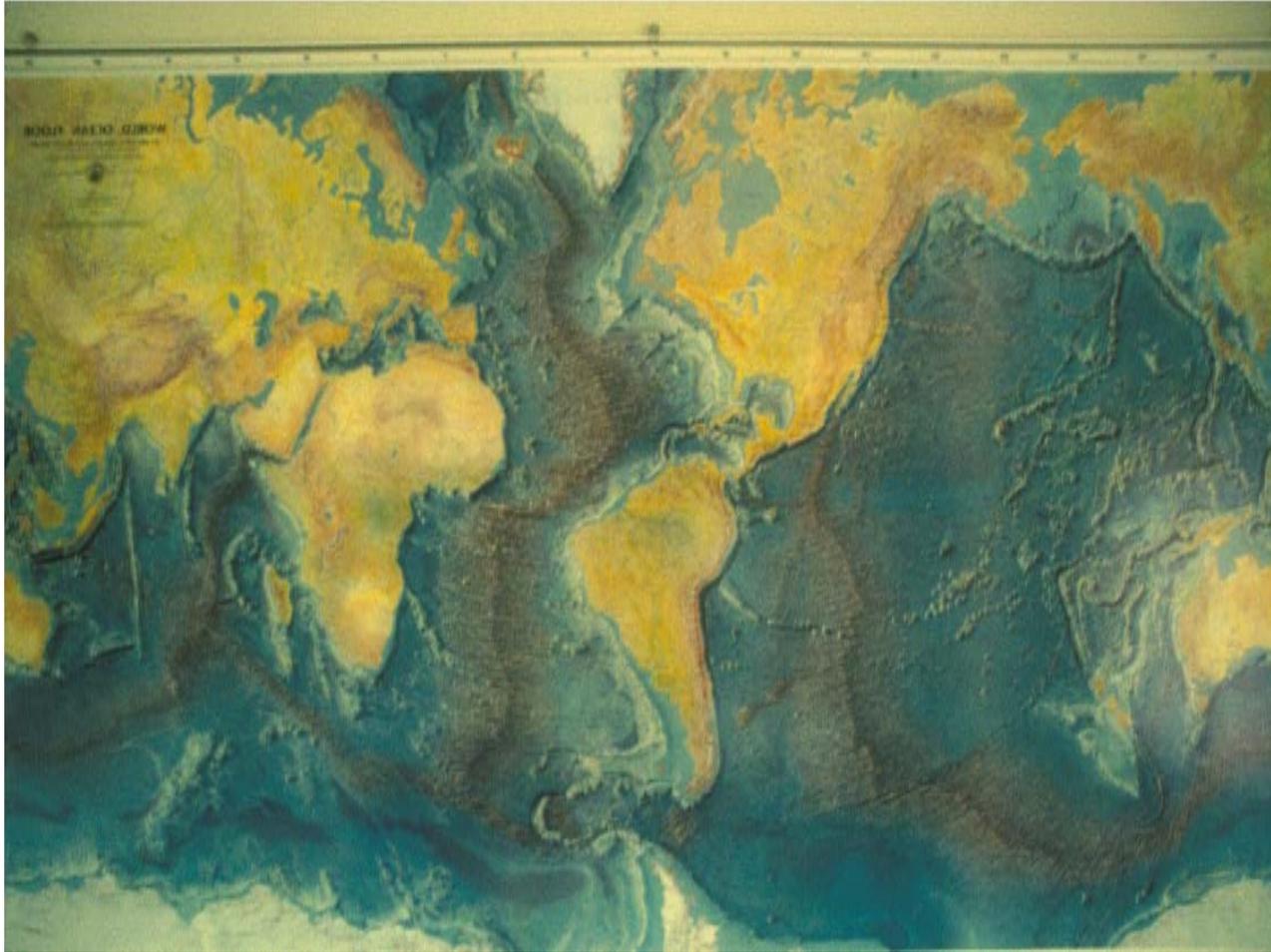










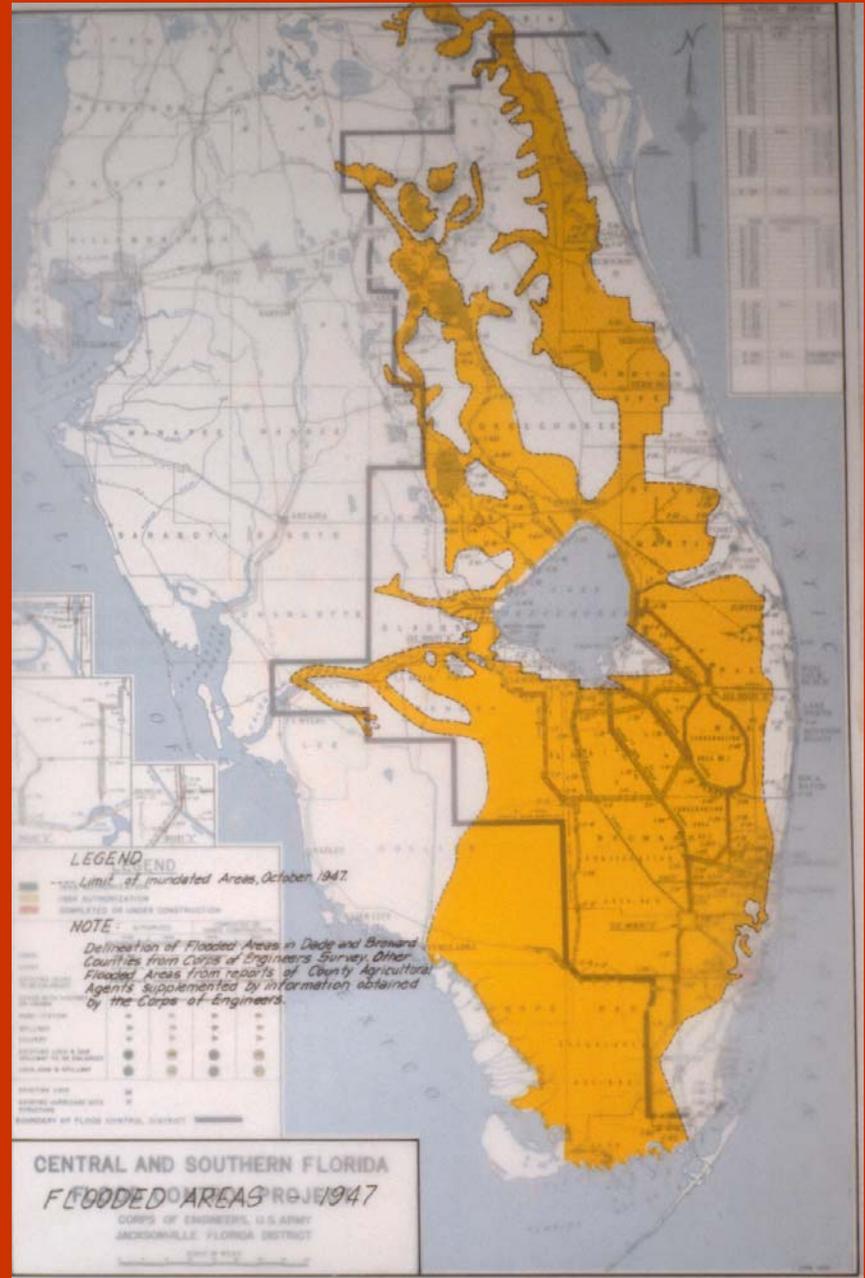


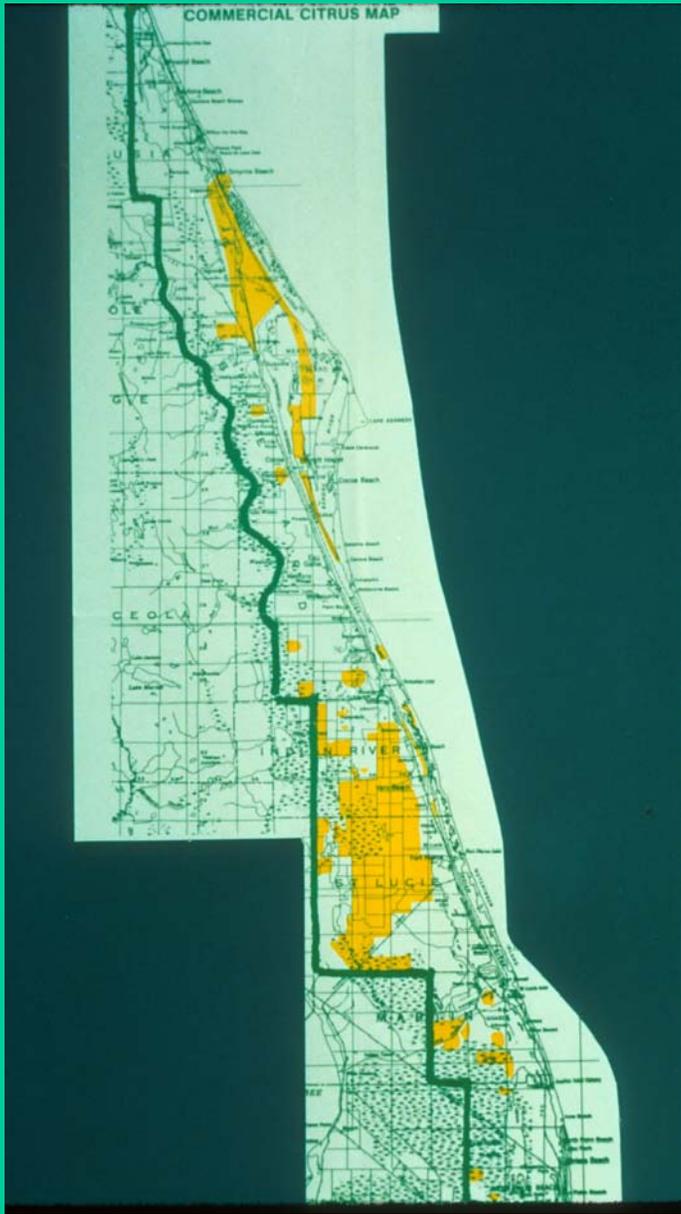
CURRENT (1988) DISTRIBUTION OF NATURAL COMMUNITIES



- DEVELOPED/BARREN
- AGRICULTURE
- OPEN WATER
- WETLANDS
- SCRUB
- PINELANDS
- COASTAL STRAND

SOURCE: FLORIDA GAME AND FRESH WATER FISH COMMISSION



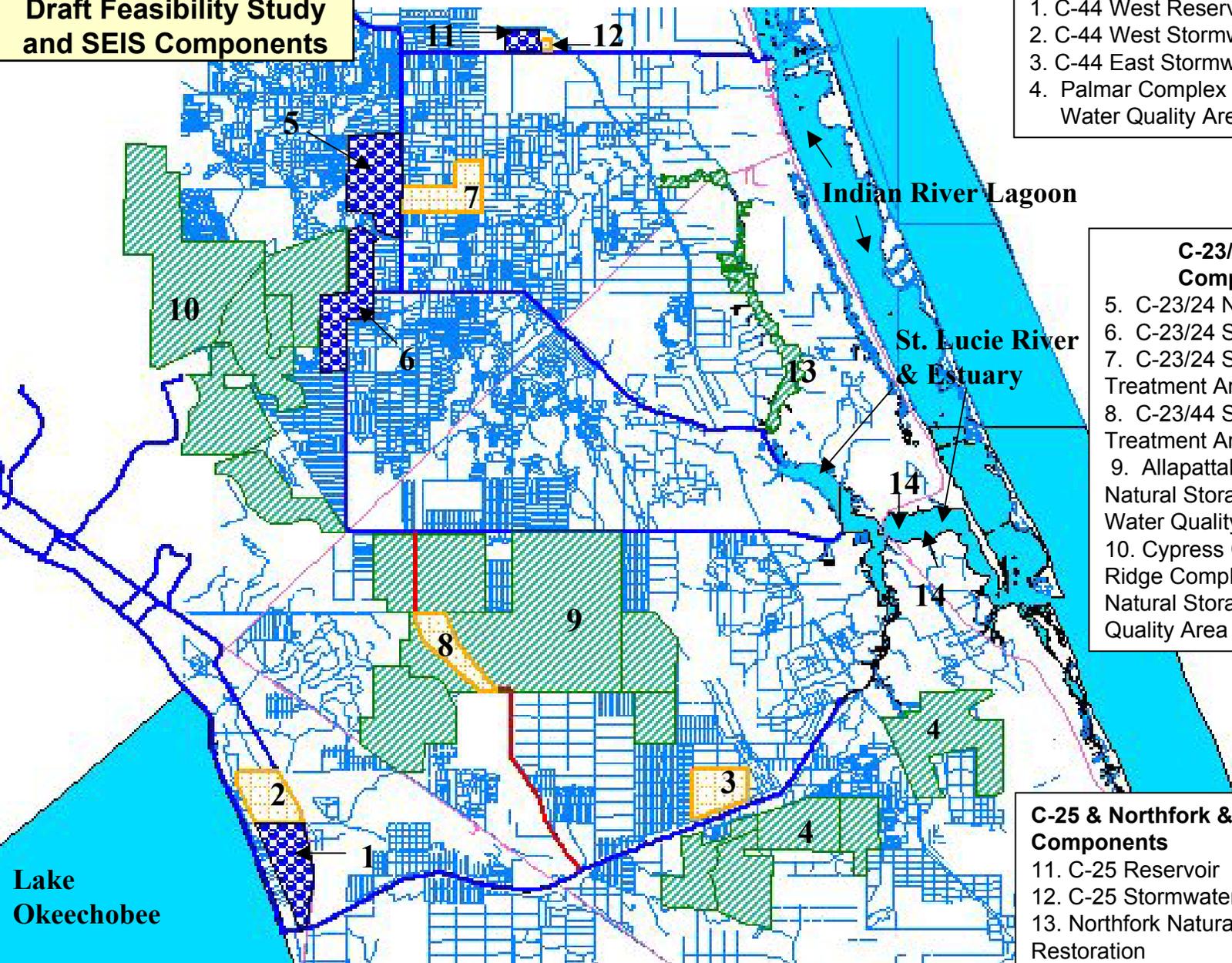


**Indian River Lagoon
South
Draft Feasibility Study
and SEIS Components**

- C-44 Basin Components**
- 1. C-44 West Reservoir
 - 2. C-44 West Stormwater Treatment Area
 - 3. C-44 East Stormwater Treatment Area
 - 4. Palmar Complex - Natural Storage and Water Quality Area

- C-23/24 Basin Components**
- 5. C-23/24 North Reservoir
 - 6. C-23/24 South Reservoir
 - 7. C-23/24 Stormwater Treatment Area
 - 8. C-23/44 Stormwater Treatment Area and Canal
 - 9. Allapattah Complex Natural Storage and Water Quality Area
 - 10. Cypress Creek/Trail Ridge Complex – Natural Storage and Water Quality Area

- C-25 & Northfork & Southfork Basin Components**
- 11. C-25 Reservoir
 - 12. C-25 Stormwater Treatment Area
 - 13. Northfork Natural Floodplain Restoration
 - 14. Muck Remediation & Artificial Habitat

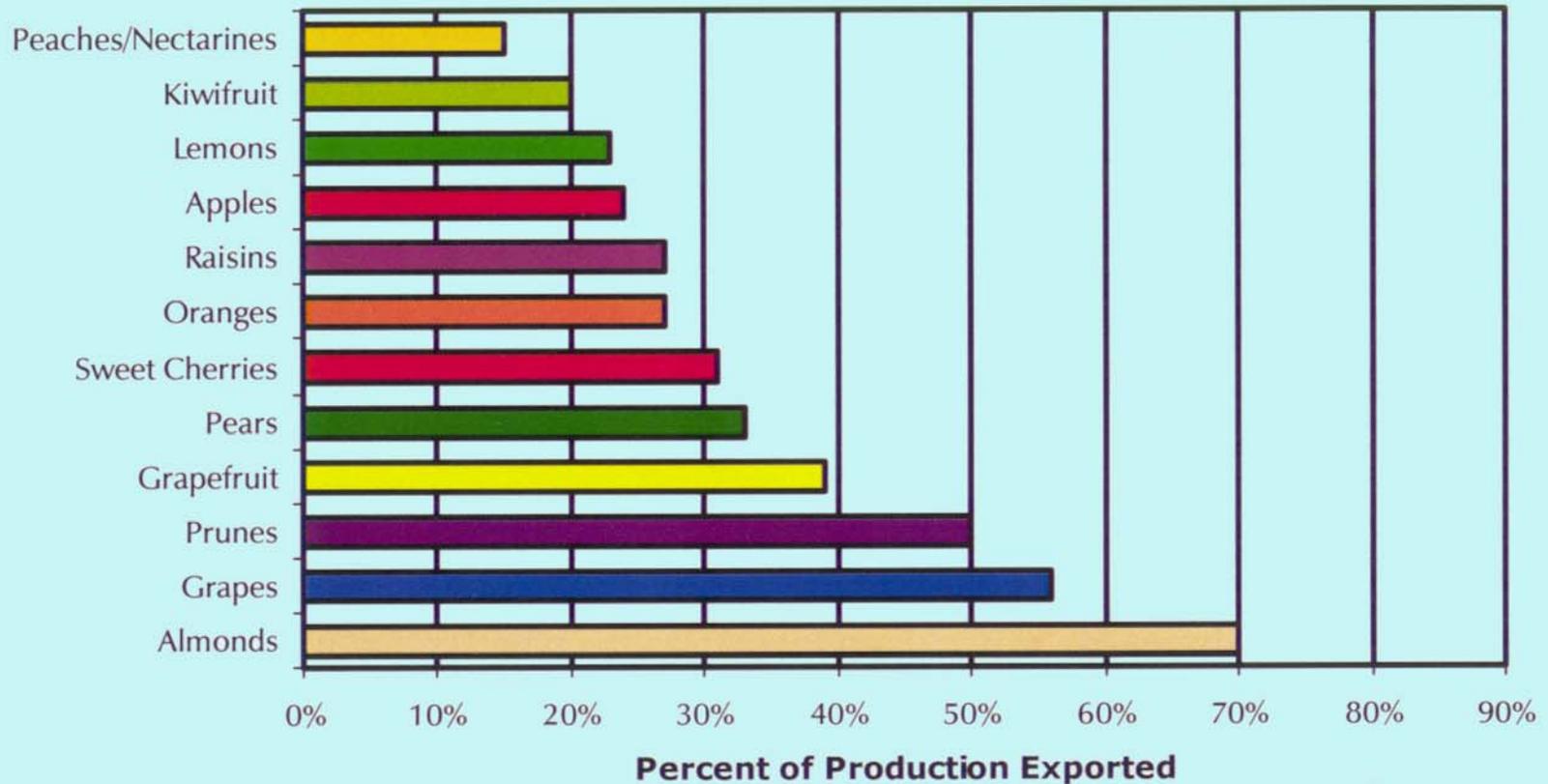


Indian River Lagoon

St. Lucie River & Estuary

Lake Okeechobee

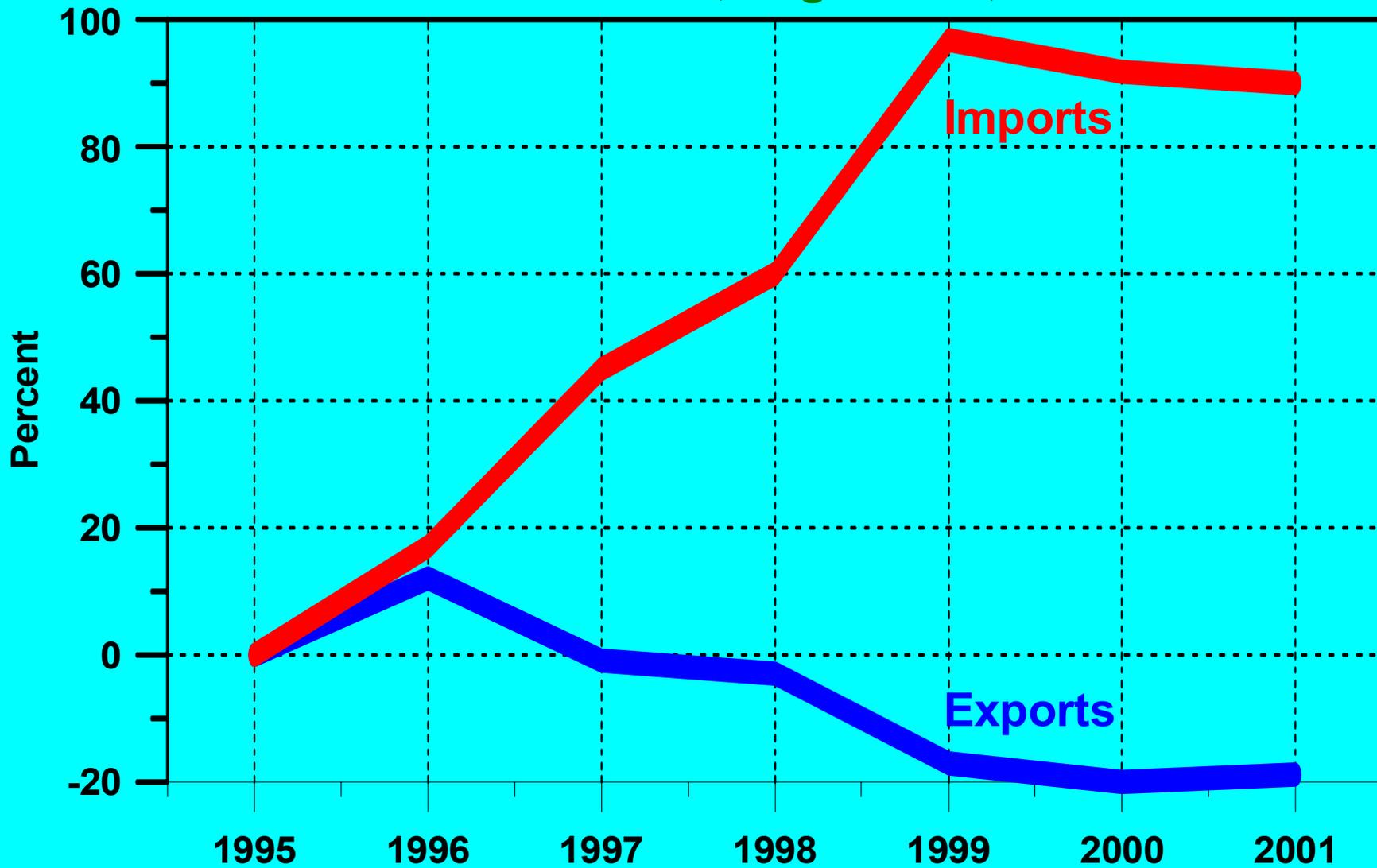
Importance of Exports for Selected U.S. Horticultural Products



Source: U.S. Bureau of the Census

Note: Percentage of production exported is defined as the volume of exports divided by the volume of production for fresh use. The volume of production going to processing is not considered in the equation. Export and for fresh use production estimates represent the averaged of exports and for fresh use production during marketing years 1999/00-2001/02.

U.S. Exports to the EU Compared to Imports for Fresh Fruits, Vegetables, and Nuts



Key features of initial US Offer

- ❖ Offer on every product – entire tariff universe subject to negotiation
- ❖ Offer conditional on comprehensive offers by others

FTAA Timeline

- ❖ Feb 16, 2003 Exchange initial offers
- ❖ Jun 15, 2003 End period for requests
- ❖ Jun 25-27, 2003 TNC (vice ministers)
- ❖ July 15, 2003 Tabling of revised offers
- ❖ Nov 20-21, 2003 Miami ministerial
- ❖ Jan 1, 2005 Negotiations conclude

Structure of Offer

- ❖ Four staging baskets
 1. Immediate
 2. Up to 5 years
 3. Up to 10 years
 4. Longer
- ❖ Base rates – MFN applied





Nutritive Values of a 4” Diameter Grapefruit

DIETARY FIBER:	1.44 grams
FOOD ENERGY:	90 kilocalories
	380 kilojoules
PERCENTAGE OF FAT:	0
CARBOHYDRATES:	24 grams
POTASSIUM	225 mgs.
FOLATE	52 mgs.
VITAMIN “C”	88 mgs.



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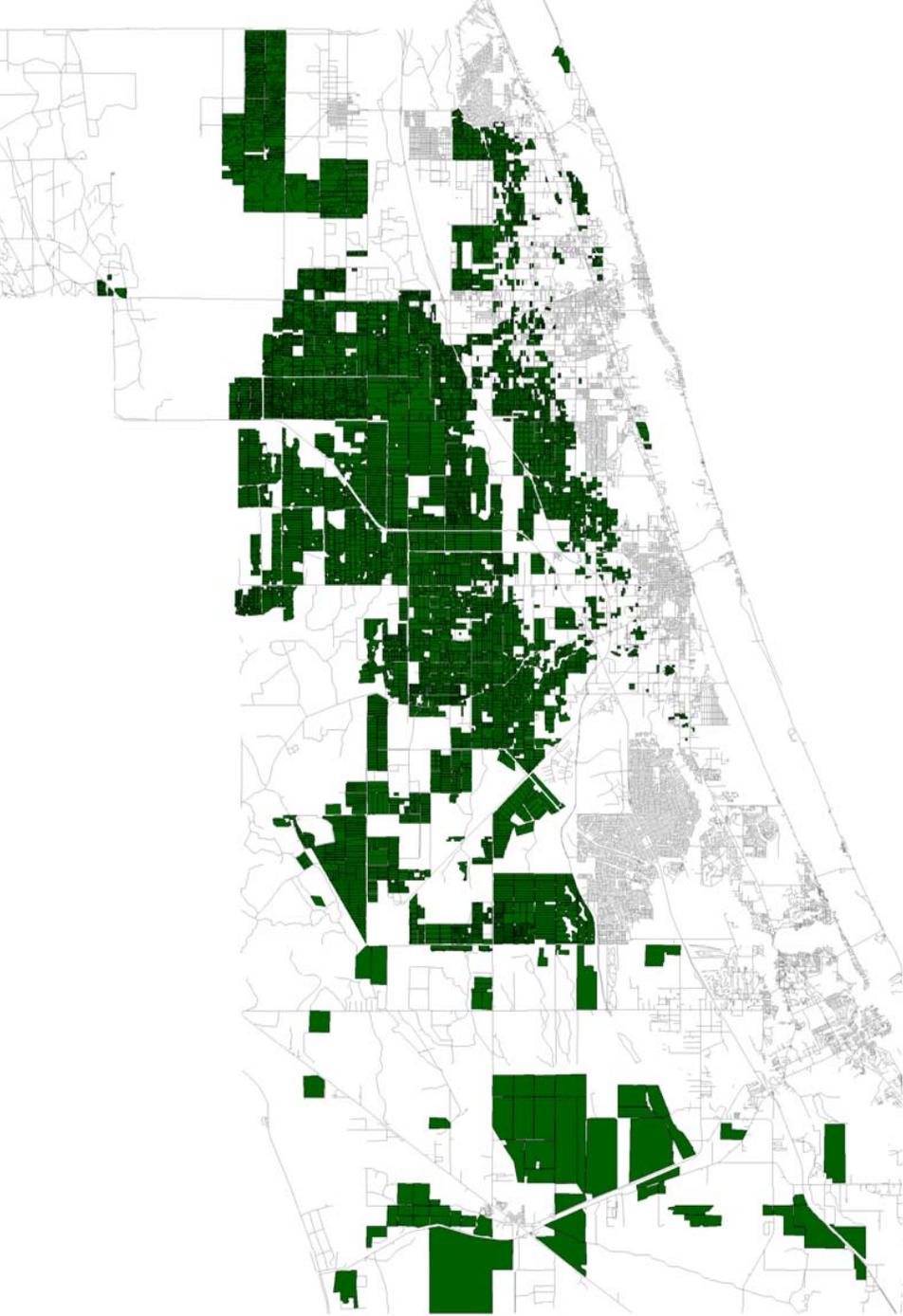


Indian River Citrus

220,000 ac in 7-county area

Grapefruit marketed throughout world

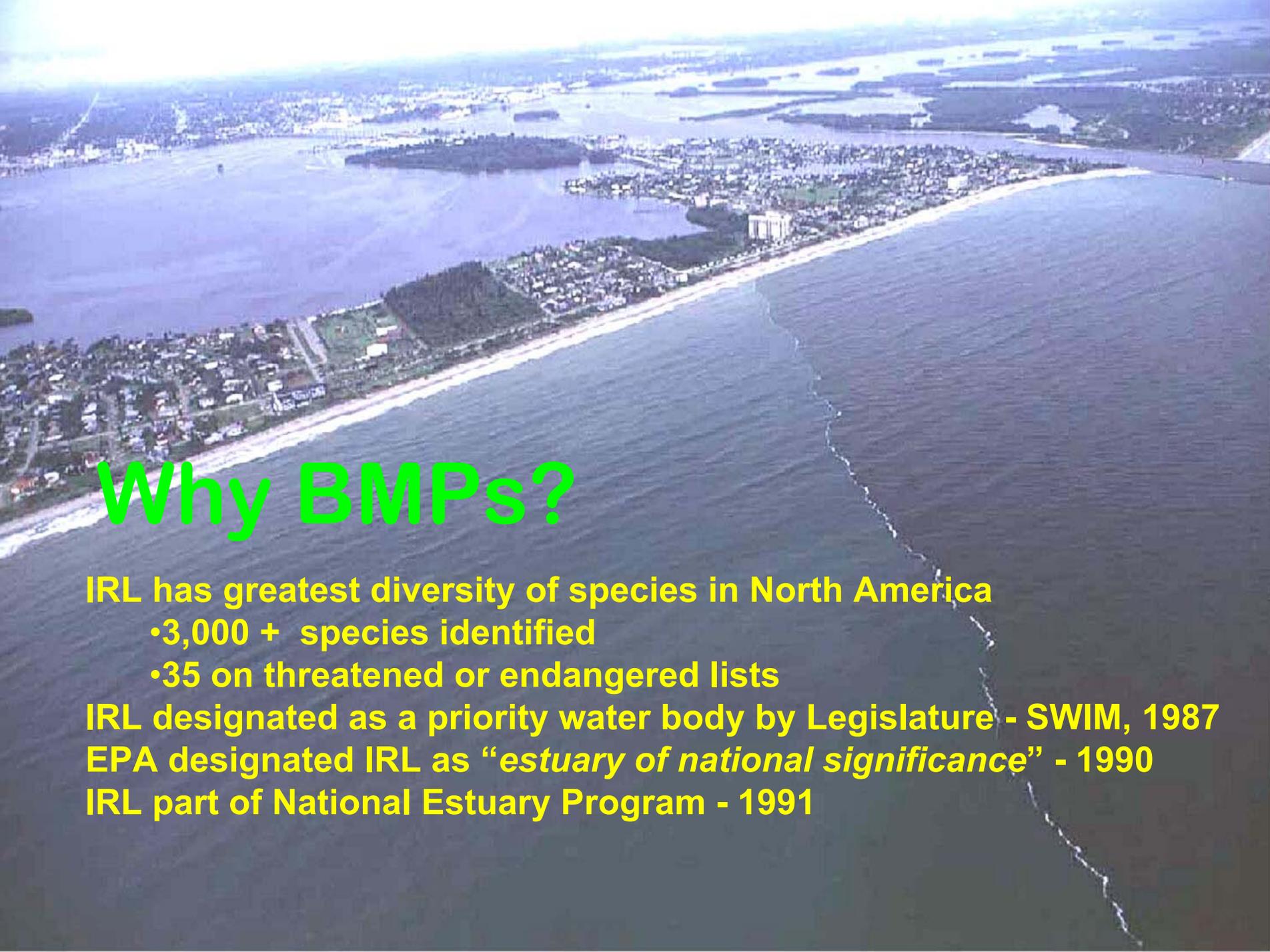




Bedded Citrus
Shallow Rooting
Variable Soils
High Water Table





An aerial photograph of a coastal region. In the foreground, a wide, light-colored sandy beach runs along the edge of a dark blue body of water. Behind the beach is a residential area with numerous houses and buildings. Further inland, there are green spaces and a road. The background shows a large expanse of water with many small islands and peninsulas, suggesting a complex estuarine or coastal environment.

Why BMPs?

IRL has greatest diversity of species in North America

- 3,000 + species identified**
- 35 on threatened or endangered lists**

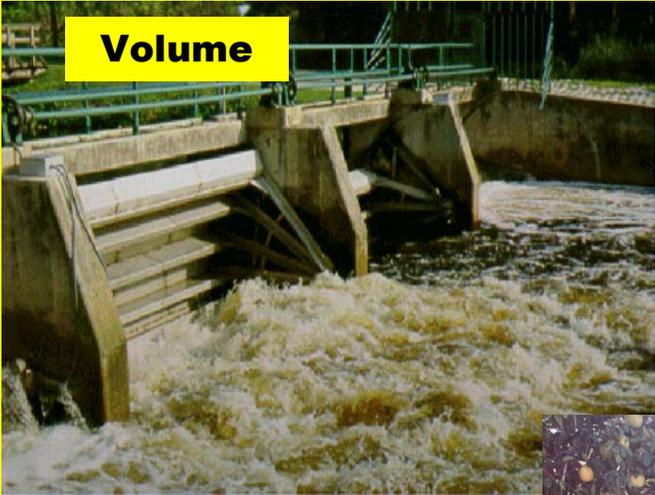
IRL designated as a priority water body by Legislature - SWIM, 1987

EPA designated IRL as “*estuary of national significance*” - 1990

IRL part of National Estuary Program - 1991

More importantly, as Stan
Carter is fond of saying . . .

**“BMPS are the
RIGHT THING
to do!”**



Volume



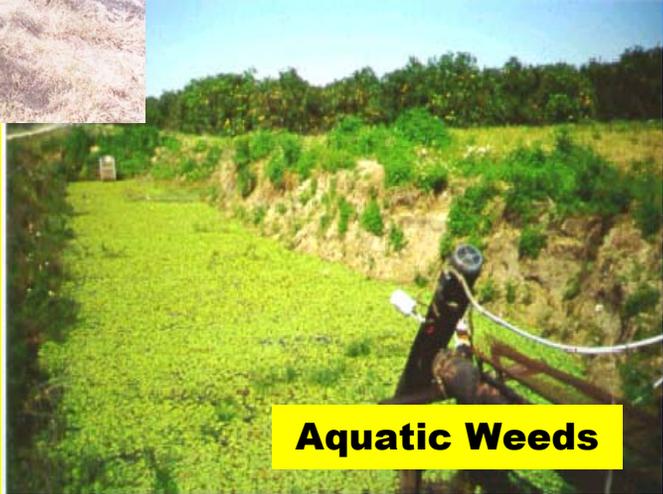
Sediment



Fertilizer



Pesticides



Aquatic Weeds

BMP Definition

! BMPs defined as: *on-farm operational procedures that are designed to achieve greatest agronomic efficiency in food and fiber production, while limiting the off-site effects of agricultural operations and simultaneously maintaining an economically viable farming operation for the grower.*

! If the cost of implementing a BMP puts an excessive financial burden on the grower, such practices can only be considered BMPs if external funds are available.

BMP Development

Dec 98 - Mar 99: Production Committee of IRCL (with FDACS and UF/IFAS) began BMP development

- 6-page draft developed
- Presented to interested groups on Mar 26

Apr 99 - Feb 00

- Subcommittees formed to develop/refine BMPs.
- Initial members appointed by the Ag. Commissioner
- Subcommittee had grower-chairman plus 8-10 members representing various interested agencies and groups
- As interest in the BMP process increased, the number of people involved increased to over 60

May 00: Document adopted by Steering Committee

Aug 00: Approved by EPA

Sep 00: EPA 319 funds obtained to print document by DEP

Oct 00: Document released to growers

Jun 02: Adopted by Rule (FDACS)

01-03: Implementation and Education activities

Water Volume

***Travis Murphy, River Country Citrus**

Brian Boman, UF-IFAS
Doug Bournique, IR Citrus League
Hugo Carter, Martin County
Paul Driscoll, Driscoll Citrus Service
Boyd Gunsalus, SFWMD
Jack Hebb, UF-IFAS
Dick Hellstrom, LBFH
Don Loving, SFWMD
Linda McCarthy, FDACS
Victor McDaniel, SJRWMD
Esa Ontermama, A. Duda and Sons
Tom Stopyra, Diamond R
Gene Swearingen, Consolidated Citrus
Ed Weinberg, SLR Initiative
Paul Whalen, SFWMD
Chris Wilson, UF-IFAS
Mike Ziegler, Ag. Resource Mgmt.

Pesticides

***Stan Carter, McAuthur Groves**

Calvin Arnold, UF-IFAS
Brian Boman, UF, IFAS
Paul Driscoll, Driscoll Citrus Service
Jane Foos, FDACS
Greg Graves, FDEP
Mary Ann Gosa, Florida Farm Bureau
Boyd Gunsalus, SFWMD
Jack Hebb, UF-IFAS Extension
Tom Hill, Florida Farm Bureau
Carol Johnson, FDACS
Victor McDaniel, SJRWMD
Esa Ontermama, A. Duda and Sons
Richard Pfeuffer, SFWMD
Ron Polumbo, FMC, Inc.
Max Quackenbos, SLR Initiative
Gary Roderick, FDEP
Dommonick Scotto, D.L. Scotto Co.
Liberta Scotto, UF, IFAS
Patti Sime, SFWMD
Donna Smith, USDA-NRCS
Tom Stopyra, Diamond R Fertilizer
Ed Stover, UF-IFAS IRREC
Paul Whalen, SFWMD
Chris Wilson, UF-IFAS
Mike Ziegler, Ag Resources Mgmt.

Nutrients

***Mike Ziegler, Ag. Resource Mgmt.**

Robert Adair, Kerr Center
Calvin Arnold, UF-IFAS
Brian Boman, UF-IFAS
Doug Bournique, IR Citrus League
David Calvert, UF-IFAS
Paul Driscoll, Driscoll Citrus
Al Goldstein, SFWMD
Greg Graves, FDEP
Boyd Gunsalus, SFWMD
Kevin Henderson, SLR Initiative
Tom Hill, Florida Farm Bureau
Charles Holtzhower, Tampa Farm Serv.
Carol Johnson, FDACS
Greg Knecht, FDEP
Lex Kromhout, IR Citrus League
Victor McDaniel, SJRWMD
Esa Ontermama, A. Duda and Sons
Gary Roderick, FDEP
Liberta Scotto, UF-IFAS
Kim Shuggar, FDEP
Pete Spyke, Arapaho Citrus
Ruth Stanbridge, Indian River Co. Comm.
Tom Stopyra, Diamond R
Gene Swearingen, Consolidated Citrus
Winston Tooke, USDA-NRCS
Marc Von Canal, SJRWMD
Paul Whalen, SFWMD
Chris Wilson, UF-IFAS
Mike Ziegler, Ag Resources Mgmt.

Sediment

***Paul Driscoll, Driscoll**

Citrus Service
Brian Boman, UF, IFAS
Jim Collins, SLR Initiative
Boyd Gunsalus, SFWMD
Jack Hebb, UF, IFAS
Esa Onterman, A. Duda
Liberta Scotto, UF, IFAS
Donna Smith, USDA-NRCS
Pete Spyke, Arapaho Citrus
Bob Ulevich, SFWMD
Don West, St. Lucie County
Paul Whalen, SFWMD
Chris Wilson, UF, IFAS

Aquatic Weeds

***John D'Albora, J. D'Albora Co.**

Michael Adams, Adams Ranch
Calvin Arnold, UF-IFAS
Brian Boman, UF-IFAS
Boyd Gunsalus, SFWMD
Jack Hebb, UF-IFAS
Johnny Moose, Citrus Grower
Esa Ontermama, A. Duda & Sons
Talmage Rogers, Rogers Bros.
Vernon Vandiver, UF-IFAS
Paul Whalen, SFWMD
Chris Wilson, UF-IFAS
Mike Ziegler, Ag. Resources

Agencies Represented in BMP Development

- ③ Florida Citrus Mutual Services
- ③ Florida Department of Agriculture and Consumer Services
- ③ Florida Department of Environmental Protection
- ③ Florida Farm Bureau
- ③ Florida Fertilizer and Agricultural Chemical Association
- ③ Indian River Citrus League
- ③ South Florida Water Management District
- ③ St. John's River Water Management District
- ③ St. Lucie River Initiative
- ③ University of Florida, Indian River Research and Education Center
- ③ University of Florida, Cooperative Extension Service
- ③ USDA Agricultural Research Service
- ③ USDA Natural Resource Conservation Service

BMP Manual



Water Quality/Quantity BMPs for Indian River Area Citrus Groves



Introduction - why
important?

Chapters for 5 areas
Appendices

Reference List

Emergency Phone Nos.

Non-emergency Nos.

Spill Reporting Req.

177 pages -tables,
photos, diagrams

800+ distributed to
growers, production
managers, chemical
company reps.

Implementation Committee

Appointed by Steering Committee in May 2000 to guide the implementation process - meet monthly

- ③ Corporate citrus organizations
- ③ Citrus care-taking operations
- ③ Family owner/operators
- ③ Production managers
- ③ IFAS Extension & Research Bureau
- ③ SFWMD
- ③ FDACS
- ③ FDEP
- ③ USDA-NRCS
- ③ FL Farm

BMP Manual adopted as Rule by FDACS



DRAFT INDIAN RIVER CITRUS BMP RULE

February 14, 2000

5M-2 INDIAN RIVER CITRUS BEST MANAGEMENT PRACTICES

5M-2.001 PURPOSE: This rule adopts the *Water Quality/Quantity BMPs for Indian River Citrus Groves*, (published May 2000) as provided by Chapter 403.067(7)(d), Florida Statutes (F.S.), for the counties of: Brevard, Indian River, Martin, Okeechobee, Palm Beach, St. Lucie and Volusia. It also establishes record keeping requirements for the purpose of verifying implementation, and procedures for submitting a notice of intent to comply.

**Adopted
June 2002**

BMP Checklist

63 questions to assess BMP implementation status

CITRUS GROWER BEST MANAGEMENT PRACTICES CHECKLIST

I. INTRODUCTION

The following checklist is designed to assist Indian River Area Citrus Growers in identifying the appropriate Best Management Practices (BMPs) or group of strategies for their specific site and growing conditions. The results should be kept on file and reviewed annually to document implementation of BMPs, and to determine whether further practices may be appropriate. Providing the information requested below for the Introduction Section is not mandatory, but listing this voluntary information will help the grove manager select BMPs that are appropriate for their specific grove configuration

Grower Information: Please fill in below.

A.) Property Owner: _____

B.) Grove Name: _____

C.) County: _____

D.) Tax ID Number: _____

Section: _____

Township: _____

Range: _____

E.) Grove Acres: _____

F.) Bed Configuration: _____

G.) Tree Spacing: _____

H.) Rows Per Bed: _____

I.) Number of Trees Per Acre: _____

J.) Irrigation Method: Drip Micro Flood

Note:

A YES answer for any question indicates that the grove being surveyed is in compliance with the referenced BMPs. A NO answer indicates that the referenced BMPs might improve the environmental performance of the grove, but implementation of all BMPs so referenced is not required. Review BMPs listed for questions that were answered NO. Select specific BMPs from those indicated by a NO answer that are appropriate for application to the grove unit surveyed. These BMPs to be implemented should be listed in Section VIII (BMP's to be implemented). (Note: Implementation of all BMPs indicated blank with a NO answer is not required.)

Use the comment section at the end of this document (Section VI) to explain why certain BMPs from questions that were answered NO will not be implemented. The comment section can also be used to elaborate on any items or questions that may be unclear or ambiguous, or to explain particular grove conditions. Comments should be referenced to the specific section and question number of the survey. N/A may be used if the question or section does not apply to that particular grove.

Numbers listed next to the answers are the BMPs for Indian River Area Citrus Growers.

Grove Evaluation Date: _____

II. WATER VOLUME Irrigation Practices

1. Are irrigation events scheduled based on evapotranspiration, rainfall events, water table wells, or other scientific data? YES NO N/A **A1, D15**

Infrastructure

2. Can on-site detention or storage be provided using the present system of canals and ditches? YES NO N/A **A6, A7**

Drainage Management

3. Are pumps and/or discharge structures set up to achieve uniform drainage throughout the grove? YES NO N/A **A2, A3**

4. Following intense rainfall events are drainage rates and volumes considered when releasing water minimizing off site impact? YES NO N/A **A2, A1**

5. Are attempts made to adjust the rate of lateral movement of water throughout the soil, lessening turbulence? YES NO N/A **A3, A2**

6. Are practices used to maintain bottom slope on furrows between beds to achieve uniform drainage? YES NO N/A **A4**

Water Table Management

7. Are water table wells and/or tensiometers used to avoid excess moisture depletion? YES NO N/A **A2, A1**

8. Do you follow a well written drainage management plan that provides specific directions based on levels of rainfall? YES NO N/A **A6, A2**

9. Are groundwater levels monitored to meet tree water demands and prevent root pruning? YES NO N/A **A1, A2**

III. SEDIMENT

Drainage Structures:

10. Are culverts with functional riser/sinker boards installed on appropriate lateral and side ditch connections? If so are they being maintained properly? YES NO N/A **B1**

11. Are settling basins maintained in front of drainage inlets within water furrows? YES NO N/A **B2**

Ditch Infrastructure

12. Are there settling basins or sumps to trap sediment at field ditch connections to laterals and other main canals prior to discharge? If so are they being maintained? YES NO N/A **B2**

13. Are ditches and canals constructed with proper side slopes? YES NO N/A **B3**

Checklist available as Excel spreadsheet

Notice of Intent

NOTICE OF INTENT TO IMPLEMENT

In accordance with Florida Statute 403.067(7)(d) and Rule 5M-2.005 FAC the following information is hereby submitted as proof of my intent to implement *Water Quality/Quantity Best Management Practices for Indian River Area Citrus Groves*. Contact the BMP Implementation Team at 772-468-3922 ext. 171 if you have questions or would like assistance completing the Checklist or this form.

Grove Name _____ Grove Acres _____

Property Tax ID # _____ County _____

Authorized Local Contact _____

Local Contact Address _____

Local Contact Telephone _____

Grove Owner or Leaseholder _____

Grove Owner or Leaseholder Address _____

Complete the *Citrus Grower Best Management Practices Checklist* and use the results to fill out the Notice of Intent to Implement. Submit the completed Notice of Intent to Implement to the Department of Agriculture and Consumer Services at the address below. **Keep the completed Grower Checklist in your files along with a copy of your completed Notice(s) of Intent.** You must complete the Grower Checklist and submit the Notice of Intent if you wish to receive a presumption of compliance with state water quality standards. A submitted Notice of Intent is also a requirement to be eligible for some sources of BMP cost share funding.

Signature of Grove Owner or Lease Holder _____

Date _____

Note – Please submit one form for each Grove location or Tax ID Number.

Mail the completed form to: FDACS – OAWP
1203 Governor's Square Boulevard
Suite 200
Tallahassee, Florida 32301

Candidate BMP Checklist

Instructions: Using the Indian River *Citrus Grower Best Management Practices Checklist*, check "yes" for all BMPs currently practiced and "no" for BMPs not currently implemented. For those BMPs that will be implemented in the near future, enter the year you plan initiate the BMP in the "year" column. Enter N/A in the "year" column if the practice is not applicable to your operation or if it conflicts with other BMPs that have been implemented. See the latest version of *Water Quality/Quantity BMPs for Indian River Area Citrus* for details on particular BMPs listed.

EXCESS WATER

yes no year

- ___ A1. Water table management.
- ___ A2. Scheduling irrigation and drainage.
- ___ A3. Moderate discharge rate.
- ___ A4. Water furrow maintenance.
- ___ A5. Monitor soil moisture.
- ___ A6. Drainage management plan.
- ___ A7. Drainage rate and volume.
- ___ A8. Discharge Structures.
- ___ A9. Detention.

SEDIMENT TRANSPORT

yes no year

- ___ B1. Riser board water control structures.
- ___ B2. Sediment settling basins in all ditches.
- ___ B3. Ditch construction.
- ___ B4. Stabilize bare soils.
- ___ B5. Ditch bank vegetation maintenance.
- ___ B6. Aquatic plant management.
- ___ B7. Ditch cleaning program.
- ___ B8. Ditch bank contours.
- ___ B9. Protect ditch banks.
- ___ B10. Vegetative stabilization (water furrows).
- ___ B11. Herbicide Applications (water furrows).
- ___ B12. Water furrow maintenance.
- ___ B13. Settling Basins (sumps).
- ___ B14. Water furrow drain tiles.
- ___ B15. Take precautions during construction.
- ___ B16. Sediment traps upstream of pump intake.

PESTICIDES

yes no year

- ___ C1. Reduce spray drift.
- ___ C2. Timing of application.

- ___ C3. Turn sprayer nozzles off at row ends.
- ___ C4. Equipment calibration and maintenance.
- ___ C5. Training.
- ___ C6. Integrated pest management.
- ___ C7. Pesticide spill management.
- ___ C8. Precision Application.
- ___ C9. Maintain soil pH.
- ___ C10. Read and understand the label.
- ___ C11. Pesticide application equipment washwater.
- ___ C12. Prevent backflow to water sources.
- ___ C13a. Mixing and loading activities (permanent location).
- ___ C13b. Mixing and loading activities (temporary location).
- ___ C14. Pesticide container management.
- ___ C15. Pesticide selection.
- ___ C16. Pesticide record keeping.
- ___ C17. Pesticide storage.
- ___ C18a. Excess pesticide mixture.
- ___ C18b. Excess formulation (raw product).

NUTRIENTS

yes no year

- ___ D1. Education.
- ___ D2. Nutrient management.
- ___ D3. Employ tissue and soil analyses.
- ___ D4. Use appropriate application equipment.
- ___ D5. Equipment calibration and maintenance.
- ___ D6. Apply materials to target sites.
- ___ D7. Avoid high-risk applications.
- ___ D8. Fertilizer storage.
- ___ D9. Spilled fertilizers.
- ___ D10. Use caution when loading near ditches, canals, and wells.
- ___ D11. Alternate loading operation sites.
- ___ D12. Use backflow prevention devices.
- ___ D13. Split applications throughout season.
- ___ D14. Erosion control.
- ___ D15. Irrigation management.
- ___ D16. Incorporate organic materials.
- ___ D17. Well protection.
- ___ D18. Use appropriate sources and formulations.

AQUATIC PLANTS

yes no year

- ___ E1. Physical control (barriers, traps, baffles, mechanical means).
- ___ E2. Biological control (carp, insects, disease)
- ___ E3. Chemical control

Indian River Citrus BMP Implementation Team

Contact: University of Florida,
Indian River REC

Phone: 772-468-3922 ext 171

- Grove Evaluation
- BMP Checklist
- BMP Recommendations
- Cost Share Funding
- Demonstrations
- Employee Training

7/13/03: 175,000 acres evaluated



Educational Programs

- Education is the key factor for ensuring the success of BMP effort
- Workshops and demonstrations covering all BMPs areas
 - Why are the BMPs are important
 - What is expected from them
 - How specific practices should be implemented
 - Potential benefits to be realized by adopting the BMPs.

Indian River Citrus BMP Workshops

Objectives:

- !See BMPs demonstrated
 - !Discuss industry experiences
 - !Target grove owners and production mgrs
-



- Dec 10 – Efficacy & runoff of pesticides
- Jan 10 – Mapping, scouting, records
- Feb 11 – Aquatic weeds
- Mar 10 - Irrigation
- Apr 7 – Drainage
- May 7 – Fertilization

Riser Board Structures



Aquatic Weed Control





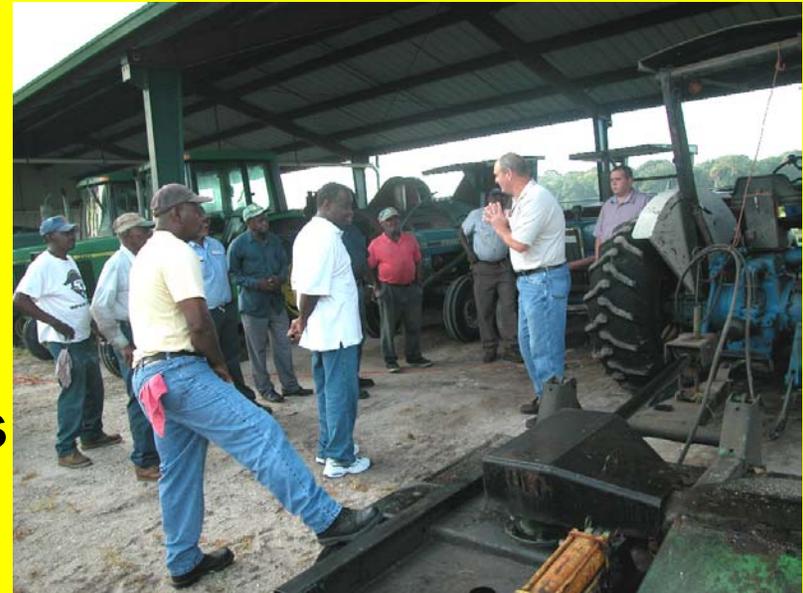
Precision Application Equipment



Sprayer Calibration



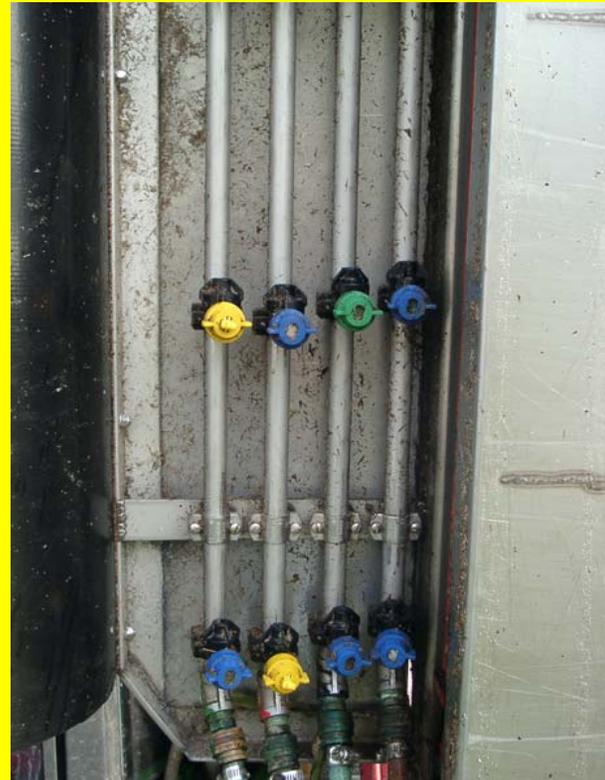
BMP Programs for field workers



- **At grower's request**
- **Conducted for grove employees**
- **Taught mainly on-site at grove**
- **Programs in English and Spanish**
- **BMPs, WPS, Safety**
- **Over 3000 ag laborers per year taught**
(typically 1 laborer for each 100 acres)



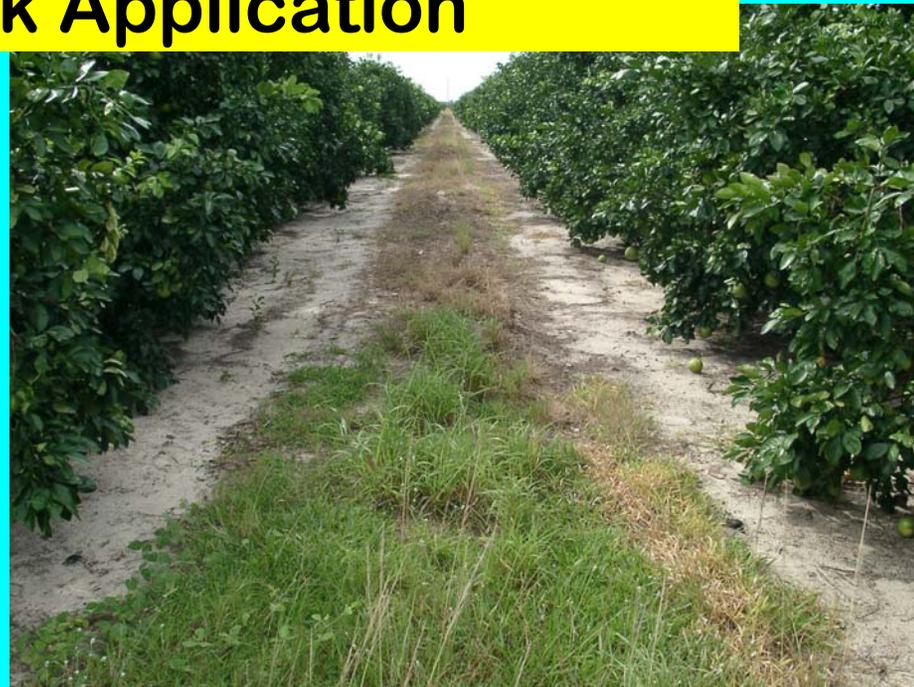
Prescription Weed Control







Piggyback Application





Self-Contained Fill Station

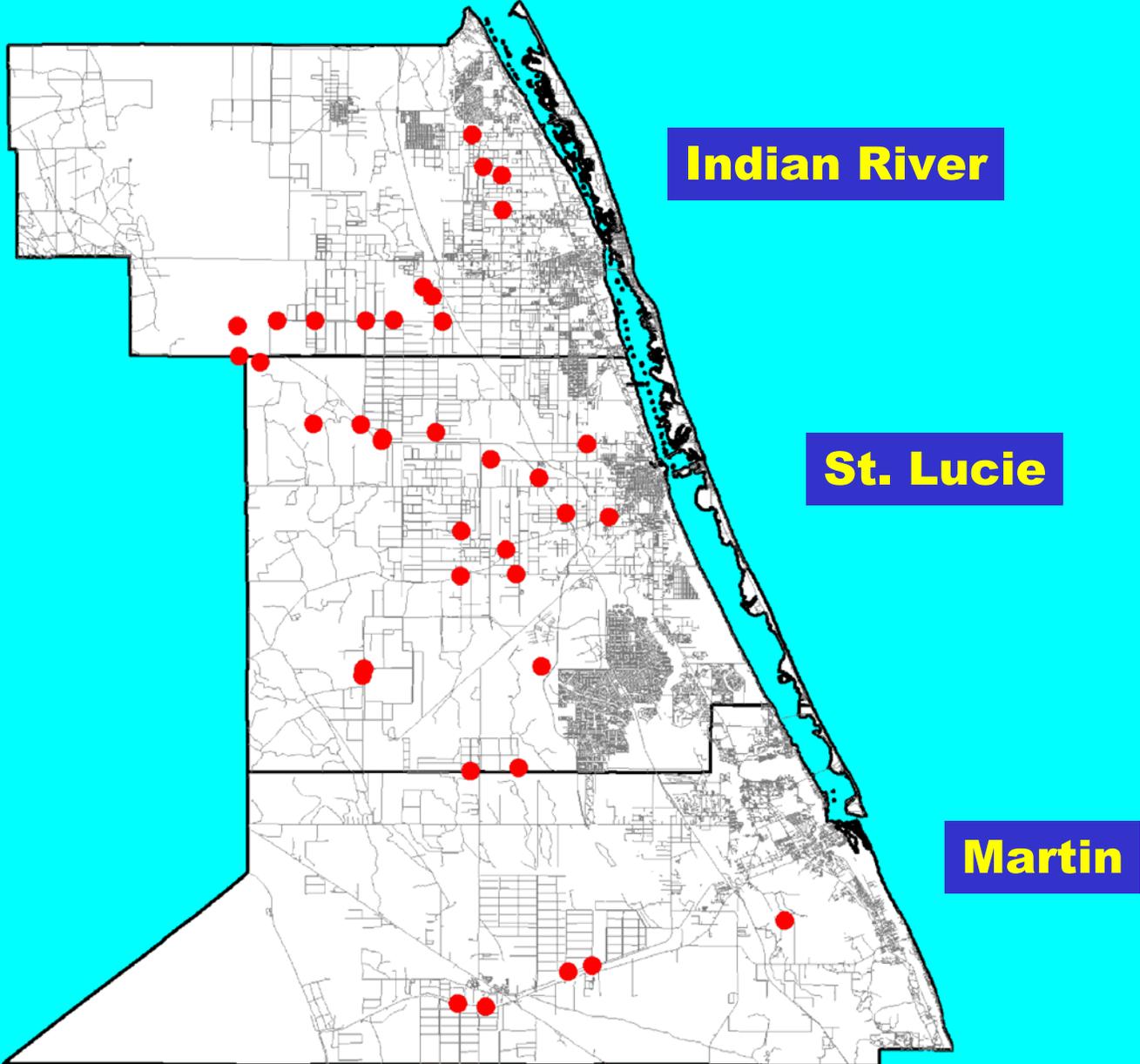




Clientele	1999	2000	2001	2002	2003*
Growers, Consultants, Prod. Mgr.	1,226	1,239	3,151	5,007	1,681
CEUs	1,858	1,829	12,334	5,930	2,919
CCAs	680	540	1,680	2,548	833
Ag workers	3,208	3,219	2,670	3,505	1162
Non-ag	961	1,316	400	839	775

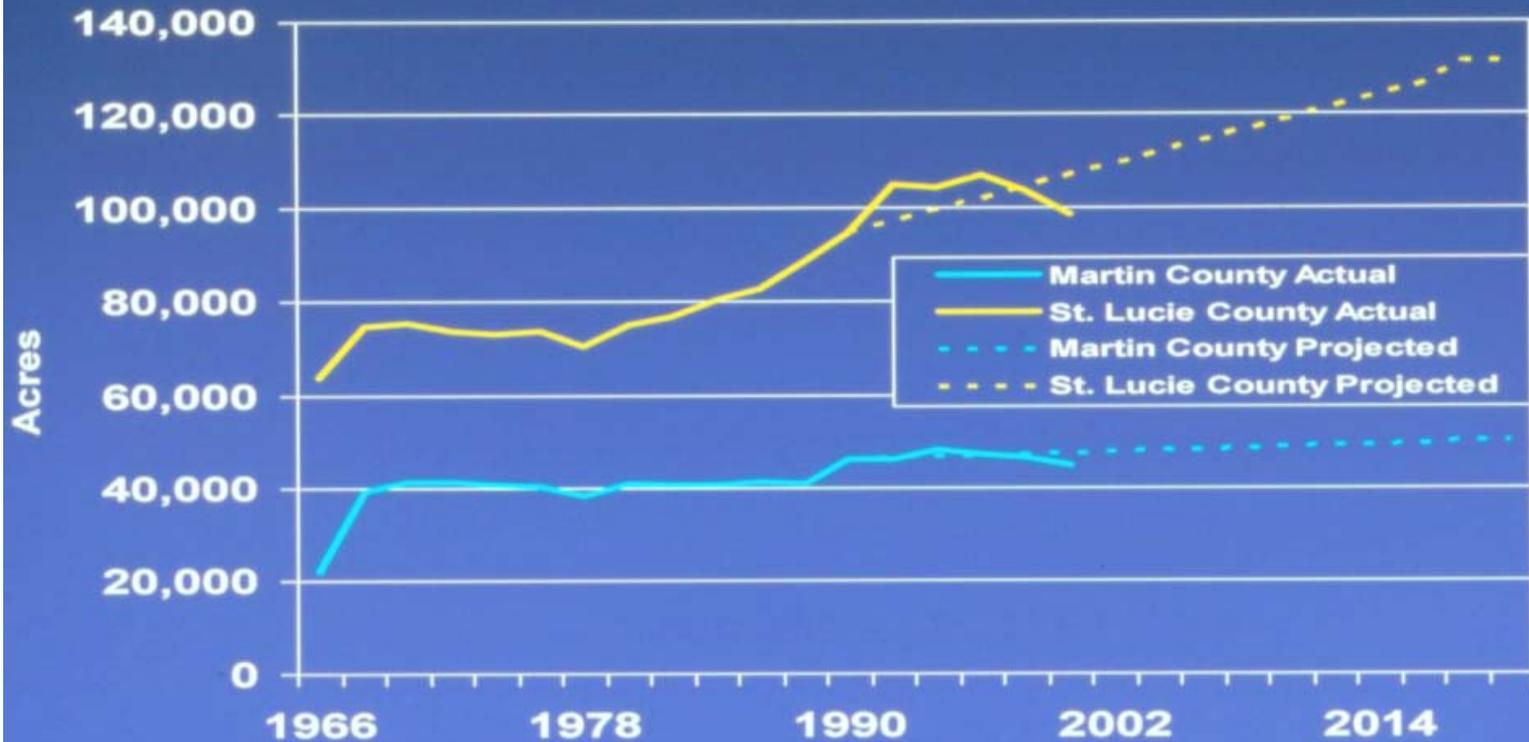
*** Through Sept. 2003**

Canal Watch Monitoring Sites





Citrus is the most significant crop in the Upper East Coast



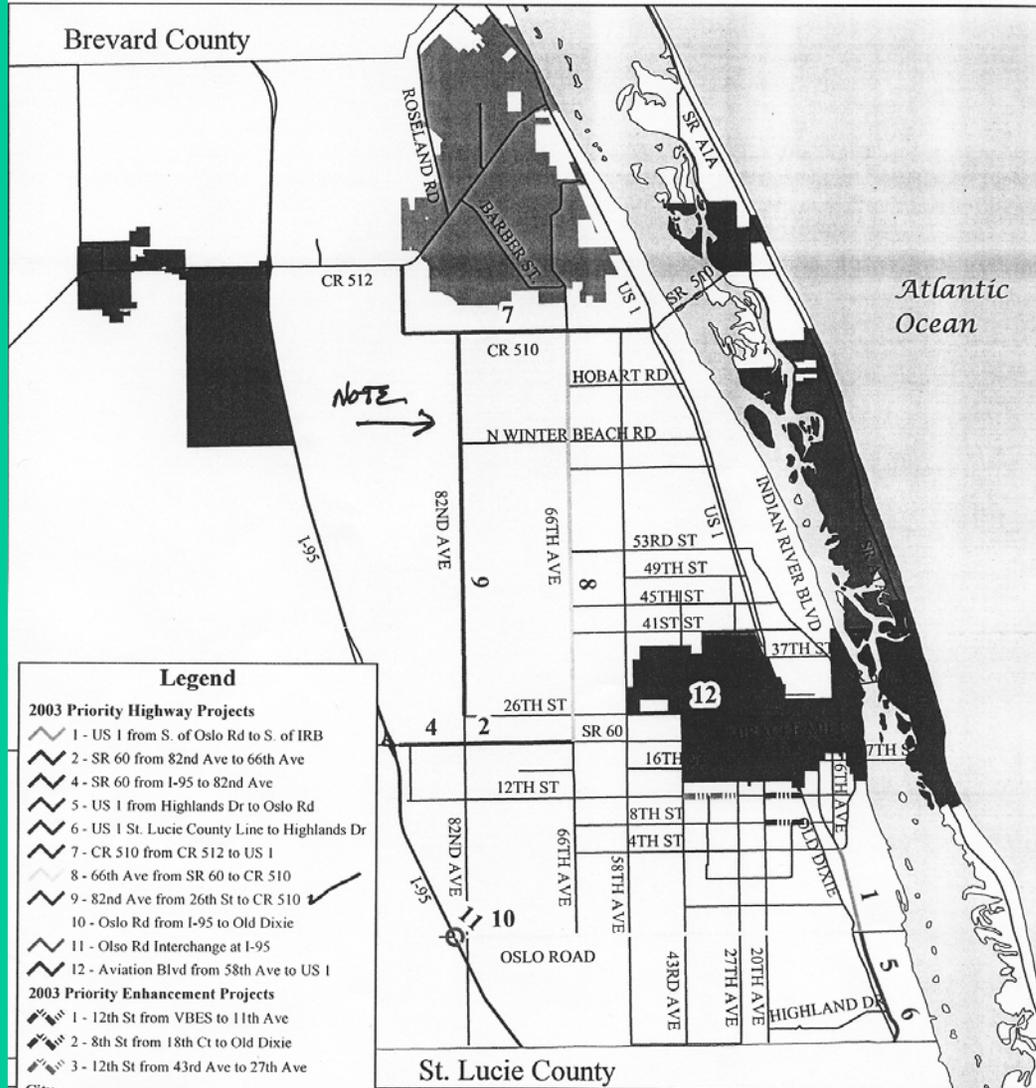
2003 MPO Highway Priority List

Rank	Street	Location		Improvement Type
		From	To	
1	US 1	South of Oslo Road	South of Indian River Blvd.	Widen from four to six lanes
2	SR 60	82nd Avenue	66th Avenue	Widen from four to six lanes
3	Indian River County	Countywide	---	traffic signal computerization
4	SR 60	Interstate 95	82nd Avenue	Widen from four to six lanes
5	US 1	Highlands Drive	Oslo Road	Widen from four to six lanes
6	US 1	St. Lucie County Line	Highlands Drive	Widen from four to six lanes
7	CR 510	CR 512	US 1	Widen from two to four lanes
8	66th Avenue	SR 60	CR 510	Widen from two to four lanes
9	82nd Avenue	26th Street	CR 510	New construction of two lanes
10	Oslo Road	Interstate 95	Old Dixie Highway	Widen from two to four lanes
11	Oslo Road	---	--	Add interchange
	Interchange at Interstate 95			
12	Aviation Blvd	58th Avenue	US 1	Widen from two to four lanes



#9 highway priority. When complete, the project will provide an alternative route from CR510 to SR60.

2003 Priority Highway & Enhancement Projects



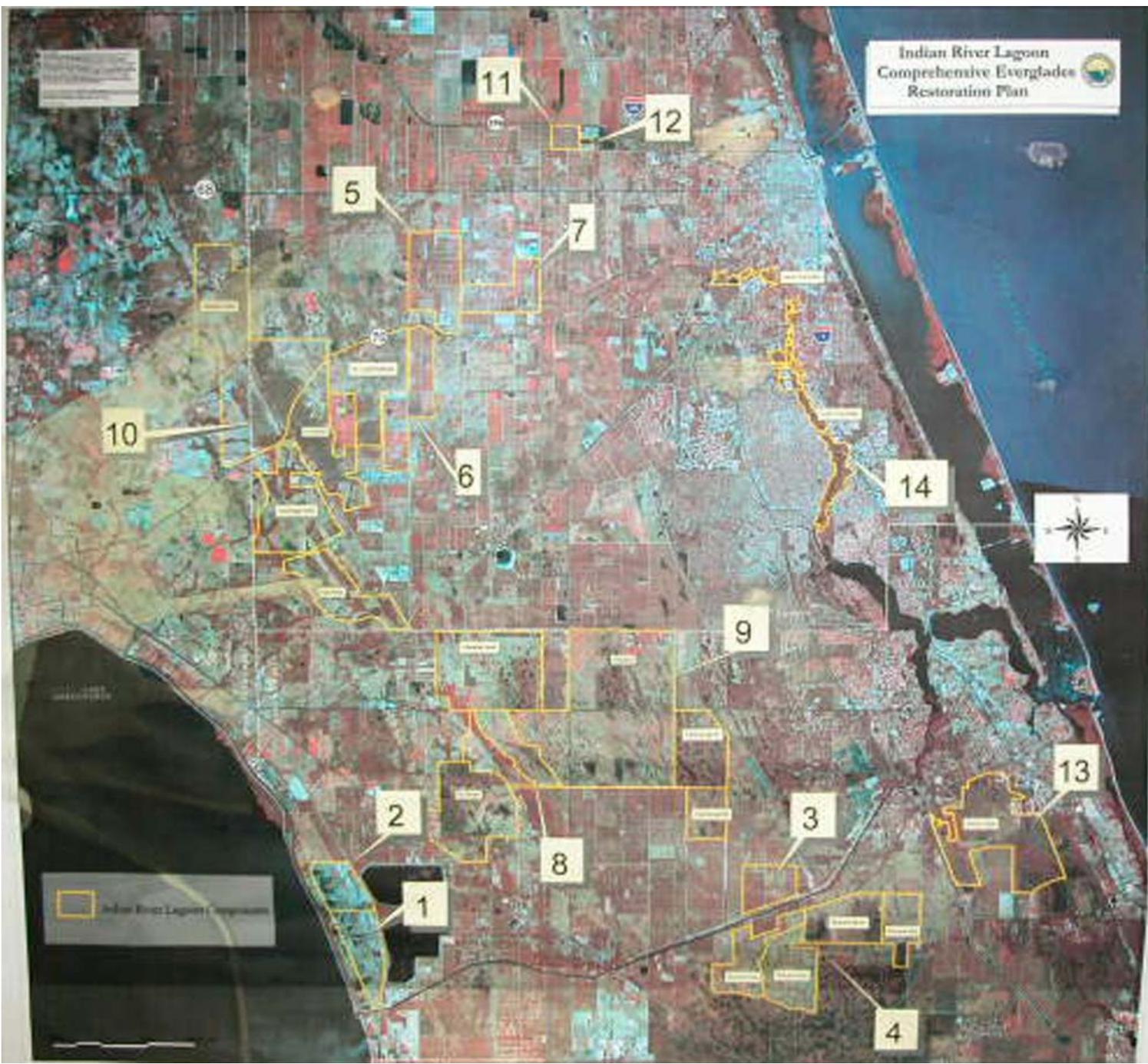
St. Lucie County

Vero Beach

Note - Highway Priority Project 3 is not depicted on the map because it is a countywide traffic signalization project.



Indian River Lagoon
Comprehensive Everglades
Restoration Plan



Indian River Lagoon
Comprehensive Everglades
Restoration Plan

Indian River Lagoon
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Restoration Plan

Scale bar

C-25 Canal Project Area and Properties

