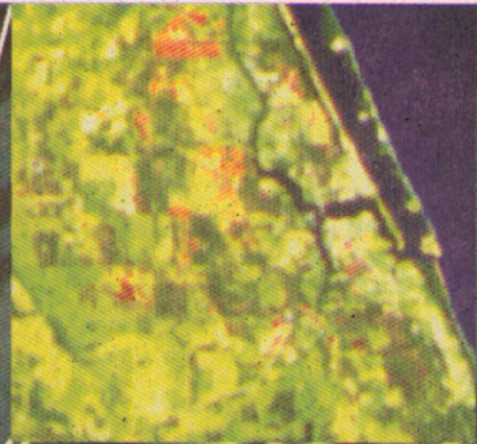




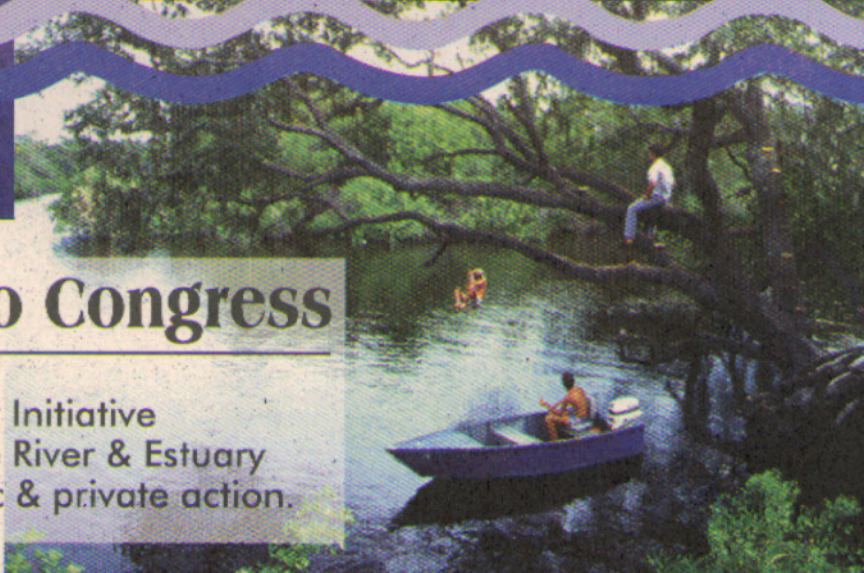
DE-DOOZE IT OR LOSE IT



**Save the
St. Lucie River
& Estuary**

The Citizens' Report to Congress

Produced by the St. Lucie River Initiative
Committed to returning the St. Lucie River & Estuary
to health & productivity through public & private action.





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The SLRI wishes to thank the following Organizations and Companies
for their generous sponsorship in the preparation and production of this report

- Curtis and Edith Munson Foundation
- Elizabeth Ordway Dunn Foundation
- PhotoGraphics of the Treasure Coast, Inc. - Prepress support
- Kinane Corporation, Commercial Printing Division - Design/Layout/Production

1995: A PLEA TO CONGRESS

We represent a large and growing coalition of business leaders and environmentally concerned citizens, government, and civic interests who seek your help in repairing grave environmental damages to the St. Lucie Estuary in the Indian River Lagoon. These damages are caused by four major federally-built canals which drain into the Estuary and Lagoon.

The canals bring devastating deluges of fresh water and sediments during the rainy season, but provide no water at all during the dry season. As a result, our Estuary and Lagoon are stressed to the point that the aquatic life can no longer survive. The food chain is being destroyed: The seagrasses have died, the oysters have died, the clams have died, and the ducks no longer winter here. This is bad for our environment, and bad for the local economy. That is why our unusual coalition of interests is appealing to you for immediate help.

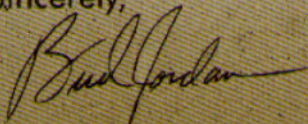
You, the Congress, have authorized the Army Corps of Engineers to revisit the Central and Southern Florida Flood Control Project. This step is one in the restoration of the Everglades and Florida Bay, and it offers hope for our own Estuary.

In its Reconnaissance Report to Congress, the Corps has identified four potential remedies that are crucial to the recovery of the St. Lucie Estuary and the Indian River Lagoon. Two of these projects would end the practice of dumping excess fresh water in our Estuary, which causes environmental and economic havoc. These waters would instead be diverted inland, to make more fresh water available to the Everglades and for release to the Estuary in the dry season when it is desperately needed. The other two projects would begin to properly manage the sediments and ooze that accumulate because of canal discharges, rather than allowing them to continue to smother the aquatic life at the bottom of the Estuary.

We need your help! On behalf of our community, we urge you to support the Army Corps of Engineers projects for the St. Lucie Estuary and Indian River Lagoon to correct the environmental damages done by the old CSF Flood Control Project. We are doing our part at the local, regional, and state levels to better manage water, but the largest scale problems and solutions are beyond local and state resources. We must have federal help.

Our economy, our future, and our children's future depend on a stable and productive estuary. Please help us correct the grievous wrong that has been done so we can all look forward to a sustainable future based on a healthy ecology.

Sincerely,



F.D. "Bud" Jordan, President
St. Lucie River Initiative, Inc.

1991

The birth of the St. Lucie River Initiative -- business, conservationists and civic groups working together

Mission

St. Lucie River Initiative, Inc.

The mission of the St. Lucie River Initiative, Inc., is to press four programs to completion:

1. **Ooze:** Removal of the significant accumulations of flocculent ooze in the two Forks and Middle Estuary of the St. Lucie River to the extent that dissolved oxygen in the water column remains above 5.0 ppm within one foot of solid substrate.
2. **Canalwater pollution:** Regulatory adoption of a program for all major canals, singly and together, which controls the quantity and quality of canalwater discharge to the Estuary so that the overall freshwater inflow is as sensitive to a healthy ecology of the Estuary as it is to drainage for uplands.
3. **Stormwater management:** Implementation of stormwater quality control measures (best management practices) in urbanized and agricultural areas now lacking such measures within the jurisdictions of Stuart, Martin County, Port St. Lucie, Fort Pierce, and St. Lucie County, with permanent funding for maintenance.
4. **Water quality:** Adoption of water quality standards for all freshwater discharges into any conveyance to the St. Lucie River, which standards can be reasonably monitored and promptly enforced in the event the receiving waters are degraded.

When these programs or their equal in practical effect are implemented, the mission of the St. Lucie River Initiative, Inc., is complete and the group will disband.

Why Care About The St. Lucie and Indian River

See page 19 for ans

Community Support

Florida League of Anglers
Treasure Coast Builders Association
Martin County GOP Executive Committee
Democratic Party of Martin County
Ducks Unlimited of Florida
Fort Pierce Sportfishing Club
Stuart Sailfish Club
Men's Garden Club of Martin County
Port St. Lucie Anglers Club
Florida Engineering Society, Treasure Coast
Greater Martin County Board of Realtors
Stuart/Martin County Chamber of Commerce
Palm City Chamber of Commerce
City of Stuart
City of Port St. Lucie
Martin County Commission
St. Lucie County Commission
Martin County Conservation Alliance
Stuart Rotary Club
Friends from Jupiter Island
Martin County Business Development Board
Martin County Economic Council
Florida Zero Population Growth
Port Sewall's Property Owners
LEADERSHIP Martin County Alumni
Marine Industries Association, Treasure Coast
Sunset Estates Property Owners
Manatee Pocket Advisory Committee
Martin County Audubon Society
Treasure Coast Regional Planning Council

Corporate Underwriting

Mobil Land Development Corp.
First National Bank
Outboard Marine Corporation
Barnett Bank
Armellini Express Lines
Florida Power & Light

Foundation Underwriting

Elizabeth Ordway Dunn Foundation
Curtis & Edith Munson Foundation
Francis Langford Foundation



WITNESS TO BETTER TIMES: A long-time resident remembers

Palm City, Florida
August 29, 1994

Mr. Bud Jordan
Stuart, Florida

Dear Mr. Jordan:

I was born in a home that fronted the South Fork of the St. Lucie River. I played and swam in the river before the opening of the St. Lucie Canal. The clear water and sandy river bottom made it possible to watch the fish bite one's hook. If the fish was an unwanted one, the line would be moved.

The inhabitants of the river were many and varied: sailor's choice, sheephead, mangrove snapper, mullet, toadfish, pompano, flounder, crabs, horseshoe crabs, hermit crabs, fiddler crabs, land crabs, sting rays, sand sharks, jelly fish, alligators, manatee (we called them sea cows) trout, oysters.

The water was brackish to south of the Palm City Bridge. When the St. Lucie Canal opened the river began to change, but the greatest change came with the opening of the other canals, 23, 24, etc. and drainage directly into creeks, (with land development) that flows to the river.

This change has come about since about 1917. I know from experiencing it.

Virginia Dyer Brock

Who Is The St. Lucie River Initiative?
Why Are All These Organizations United?
See page 19 for answers

1961

THE STUART (Fla.) NEWS Thursday, April 13, 1961

68 THE STUART (Fla.) NEWS Thursday, April 13, 1961

The Battle for Clean Rivers Continues AND YOUR HELP IS NEEDED TO WIN IT!

★ ★ ★ ★ ★
SUBSCRIBE
TO THE
RIVERS LEAGUE
FOR 1961
★ ★ ★ ★ ★

PLEASE CLIP THIS OUT—MAIL IT IN

Mr. George W. Roth,
Membership Chairman,
S.L.R. Restoration League,
P. O. Box 296,
Stuart, Florida.

I subscribe to the objectives of the St. Lucie-Indian River Restoration League and want to help to protect the rivers from pollution. Enclosed find my subscription of \$1.00 in membership for 1961.

Name _____
Address _____
City _____ State _____ Zip _____

Note: Your subscription can be any amount you choose, from \$1 up. Many subscribe for all members of their families. Membership cards will be mailed promptly.

★ ★ ★ ★ ★
ATTEND THE ANNUAL
ELECTION MEETING
8 P. M., FRIDAY, APRIL 14
AT MARTIN COUNTY COURTHOUSE
★ ★ ★ ★ ★

Martin County Is Gaining Ground and Making Progress!

While the Taxpayers Suit Against the FCD has not yet been decided, our complaints are now being recognized and Funds have been Al-
lotted by Congress for a Comprehensive Survey of our Problems by the U. S. Corps of Engineers.

Annual Report St. Lucie-Indian Rivers Restoration League:

The League has achieved its aims during the past year to correct problems stemming to our aquatic resources.

Problems were defined last summer to focus corrective action, proper pollution and effluents from excessive drainage discharges into the St. Lucie River.

But for injunctive action, direct all water in the St. Lucie River District received preliminary hearings by Judge D. C. Smith of Martin County Circuit Court in November. Counsel for the F.C.D., as defendant, argued for dismissal on grounds that F.C.D. proceedings are in accordance with provisions of the special act of the 1940 Legislature which established the Flood Control District.

Our attorneys, Walsh, Sorenson, Bask & Walsh, Miami, argued that the special act is unconstitutional in that it violates a provision of the State Constitution, adopted in 1940, that specifically prohibits the levy of any tax which is not for the state purposes.

Although additional bills required by the Court from counsel for both parties were submitted in early January, the Court has not yet taken any further action to set a date for further hearings, presumably because of the present crowded calendar. (The Columbus Circuit Court case for example, fully occupied Judge Smith in recent weeks.)

There are encouraging indications that the filing of the suit has already had a very salutary effect. A most significant indication is the refusal in recent months of a comprehensive survey of Martin County's problems by the Corps of Engineers, which held a public hearing in Stuart on December 15, 1960. During recent months, the F.C.D. has developed a highly intensive attitude toward Martin County interests and has this year included in its U. S. Con-

gressional budget request \$1,000,000 for a \$1,000,000 special appropriation to cover the cost of completing the survey study. Added to a prior appropriation of \$15,000,000, this will create a \$16,000,000 fund to finance a comprehensive study.

These and other "scores in the wind" encourage us to believe that the F.C.D. and the Corps of Engineers are at long last disposed to give our complaints the serious consideration that they deserve. The Court's proceedings which we have taken now appear largely responsible for getting preliminary steps toward corrective action. We are determined to pursue this litigation, with appeal if necessary or in defense of appeal by the F.C.D. The continued support of all interested citizens is needed to secure eventual success.

The League was chartered as a non-profit corporation on October 20, 1960. Through League efforts, in connection with Martin County Water Conservancy Commission, the St. Lucie-Wabash League and the U. S. Fish & Wildlife Service, the dead outlet from Lake Okechobee is now awaiting official acceptance as a future solution.

The Colton-Indian River, the West Coast outlet from Lake Okechobee into the Gulf of Mexico, is facing an discharge capacity increased to about 30,000 cfs from a record of 141,000 cfs. Approval for the project, which should provide some measure of relief to the St. Lucie discharge, when that work is completed.

On the negative side, we have been unable to prevent the outpouring of C-24 and C-25 runoff, which will cause increased fresh water flow from a greatly expanded North Fork discharge area. We are advised, however, that

reared works on these canals are better designed to resist salt than on St. Lucie Canal.

We are enclosing our efforts to establish a permanent control lock in C-24 Canal to prevent additional C-25 and St. Lucie River Basin flood waters from being diverted into the St. Lucie River Basin.

The League contacted Mr. Rostin Hill for raising \$11,000 for the canal at the recent Martin County Fair.

The League is deeply indebted to the Jupiter Island Club, Martin County Taxpayers Association, Water Conservancy Commission of Martin County, and service clubs, Stuart Chamber of Commerce, James Beach Chamber of Commerce, the St. Lucie-Wabash League, Martin County Audubon Society, and National Wildlife Federation for support by group and individual actions.

Our Congressional delegation, particularly Senator Stennis L. Hoffman, is at last seeing the seriousness of our plight and has been constructively helpful in arranging the Engineers Corps survey of our situation.

A recent acknowledgment sponsored by the League is a pledge by Representative W. R. Roth that he will introduce legislation to prevent the sale of publicly owned insurance reinsurance, except if approved by public referendum.

On all fronts we will continue to fight to clear up our rivers and stay their pollution, supporting all measures for public conservation, including the growing problem of beach erosion.

Your continued membership and financial support are vital to the League's success.

ROBERT T. BARR, President

We Heartily Support and Endorse the Recommendations of MARTIN COUNTY WATER CONSERVATION COMMITTEE

in the "Study and Report which it prepared at the request of MARTIN COUNTY BOARD OF COMMISSIONERS ON

DAMAGES TO COASTAL COMMUNITIES

FROM CENTRAL AND SOUTHERN FLORIDA FLOOD CONTROL OPERATIONS

Below is a Summary of this 10,000 word report, which has been mailed in its entirety at the direction of Martin County Commission to Governor Farris Bryant, the chairman of the Flood Control District, our South Florida Congressional contingent, the Corps of Engineers and others in position to help solve our water problems.

"At the request of the Public Works Committee of the U. S. Senate and the U. S. Corps of Engineers is now reviewing the Central and Southern Florida Flood Control program to determine the feasibility of modifications to improve adverse conditions in Martin County which were largely omitted from original planning as outlined in the report on Central and Southern Florida published in House Document 643, 85th U. S. Congress, 2nd Session, although Martin is one of the severest counties in need of support of the program.

"The Corps and FCD acknowledge the damage to communities in the District's Flood Control operations, but their previous attitude has been that this is an unfortunate fact which some people are damaged irreversibly in order to achieve a broader public benefit.

"The St. Lucie River Estuary in Martin County with a natural tributary watershed of 750 square miles is now being forced to take 1.4 million cfs of runoff water from 6,000 square miles of watershed area in the St. Johns, Kissimmee River and Lake Okechobee Basins which are naturally tributary to other seaward outlets.

"This right-of-overflow of all flood discharges has been progressively increasing and reached an all time high in 1959 and 1960. This discharge volume Martin County's inland and coastal waterways, deposit widespread mud flow

and thereby, restrict boating navigation, destroy marine life, and seriously impair recreational facilities which are the backbone of the county's tourist industry, with revenues of millions of dollars in annual expenditures.

"The St. Lucie River Estuary is a primary recipient of runoff from the declared basin increases of the over-all Project, especially in relation to the effluents, and salt content of Lake Okechobee, and in addition to prevent further increased flow and drought irrigation to rapidly expanding agricultural and urban activities in the Upper Kissimmee and Upper St. Johns River Basins, and

"This study and report was completed by Martin County Water Conservancy Commission, at the request of Martin County Commission, in parallel, a further analysis and recommendations with the current authorized Engineers Corps survey is going on. If you desire a copy of the full report, write to Capt. Bruce C. Longhorn, Box 261, Stuart.

★ ★ ★ ★ ★
Subscribe and Help Keep
Our Rivers Clean!

St. Lucie-Indian Rivers Restoration League

NOTE: This Advertisement Is Not Paid For By The League, But Is Contributed As a Public Service By A Martin County Taxpayer And Conservationist

Why Do We Care About An Advertisement From 1961?
See page 19 for answer

3 Generations Of Government Officials Have Told The St. Lucie River To Wait.

In reply to the St. Lucie-Indian Rivers Restoration League's telegram to President Dwight D. Eisenhower

January 21, 1954

"...The Corps of Engineers is cognizant of local interests' view that discharge of fresh water down the St. Lucie Canal has an adverse effect on salt water fishing in the Stuart area. In this connection the district engineer is now making studies to determine the effects on fishing of discharges from the lake with a view to incorporating such appropriate safeguards in the Central and Southern Florida projects as may be economically justified.

You may be assured that this office is exerting every effort to improve conditions on the St. Lucie River **as rapidly as possible...**"

Signed,

Robert T. Stevens, Secretary of the Army

Scientist says fresh water killing lagoon

By Jason Brooks
of the News-Post

STUART — It's tough being a clam in the Indian River Lagoon these days. A recent study shows that federally mandated flood control releases of fresh water from Lake Okechobee are hurting the lagoon's sea grasses, which serve as a home for clams and other small saltwater dwellers.

The releases pump the lake's fresh water into the salt water that flows through the lagoon. As this mixture slowly intrudes in salt content, it becomes lethal for the creatures that make the lagoon home.

Dan Hauser, a senior scientist with the South Florida Water Management District, said the problem lies in the unusually large amounts of rain this area has had in the past several months.

"Basically, we've had a wet, dry season and then we had an above-normal wet season," Hauser said. "It's been an extraordinarily wet six months."

The rain bloats the lagoon in two ways, Hauser

said. First, freshwater runoff from surrounding areas empties straight into the lagoons. At the same time, the heavy rains have caused Lake Okechobee to rise to the point of possible flooding, which prompted the largest releases of fresh water from the lake since 1947.

"This story starts back in June and gets worse by supplementing the runoff with lake water releases of 2,500 cubic feet per second for flood control reasons," Hauser said.

Biologists have measured the salinity of the lagoon at 20 parts per thousand. Hauser says he'll become "very concerned" when levels reach 15 parts per thousand.

Kevin Henderson, Stuart's mayor and the co-founder of the St. Lucie River Initiative, is worried now. He has been out in the lagoon and said the effects of the releases are striking.

"I spent some time on the river over the holidays and I was heartbroken," Henderson said. "Up along the Indian River Lagoon and even near the Jensen Beach Causeway, the population of warm-water fish is gone."

The difference between 15 parts per thousand and 20 parts per thousand, in analytical terms is not important.

But as the rains continue, so do the releases. Because the lake still is high enough to be a flood risk, the Army Corps of Engineers will continue to regulate the releases.

If the lake level does not decrease, the corps is bound, by federal law, to continue the releases.

"As long as the lake is above flood level, under federal law there's nothing we can do about the releases," Hauser said. "The big thing we're hoping for is a lack of rain in the next month."

Even if the rains stop, it will take time for the lagoon to recover, Hauser said. The sea life already is "stressed" by the fresh water.

Henderson said the releases would help to continue for at least another month, even if the rains stop. If they don't, the results could be disastrous.

The only way to solve the problem, Henderson said, is to implement what he calls a "three-legged stool." The components of the plan include:

■ Directing the fresh water to another area. Henderson recommends Florida Bay, an area between the Everglades and the Keys that has a dangerously high level of salinity.

■ Creating more storage areas and impoundment ponds to hold the fresh water.

■ Making large property owners more accountable for their storm-water runoff.

But the plan would be effective only if all three options are used together, Henderson said.

"If you look at the way storms occur, reliance on any one of those technologies is not as reliable as all three," he said. "That's the way we're going to get the most impact for the dollar."

Henderson said his group will pressure the corps and the South Florida Water Management District to implement these changes. Although a permanent solution could come soon, the lagoon — and the creatures that call it home — continue to suffer.

"There is more reason for optimism than there ever has been that we can come up with a cost-effective solution to the problem in the part of the state," Henderson said. "Although that's all true in theory, when you get out on the water today, it's just heartbreaking what has happened to the river."

1954
In 1954, when this letter was written, local newspaper pioneer Ernie Lyons and dedicated local citizens were fighting to save the St. Lucie River. Within 6 years, the prediction of harm to fishing was fact, and the glory days never returned.

1970
In 1970, Lyons' paper ran a picture of high school students marking the first Earth Day by "burying" the "dead" St. Lucie River -- embodied by an outboard motor in a casket.

1994
In 1994, Lyons is dead, but local citizens--including younger relatives of those who started the fight in the 1950s and 60s -- are carrying on his legacy through the St. Lucie River Initiative. And government officials still say they're working to improve conditions "as rapidly as possible."

1995: OUR PATIENCE JUST RAN OUT.
THE WAIT IS OVER. ACT NOW.



**1917
to the Present:**

From 1917 until the 1960's, the federal government built canals in our area to control floods & drain land. The canals work well.

It's the downstream impacts that are causing environmental havoc.

The St. Lucie River is one of the great gems of Florida's eastern Treasure Coast. Its health is tied to marine resources of national importance -- the Atlantic Ocean, the Intracoastal Waterway, and the Indian River Lagoon, one of EPA's Estuaries of National Importance, and the most diverse estuary in the nation.

For decades, this estuary supported a commercial fishing industry and sport fishing that lured five different Presidents to vacation in the area.

This estuary system was supported by the slow natural drainage system of creeks and wetlands in central Martin and southern St. Lucie Counties. The waters were clear and rich in fish and wildlife.

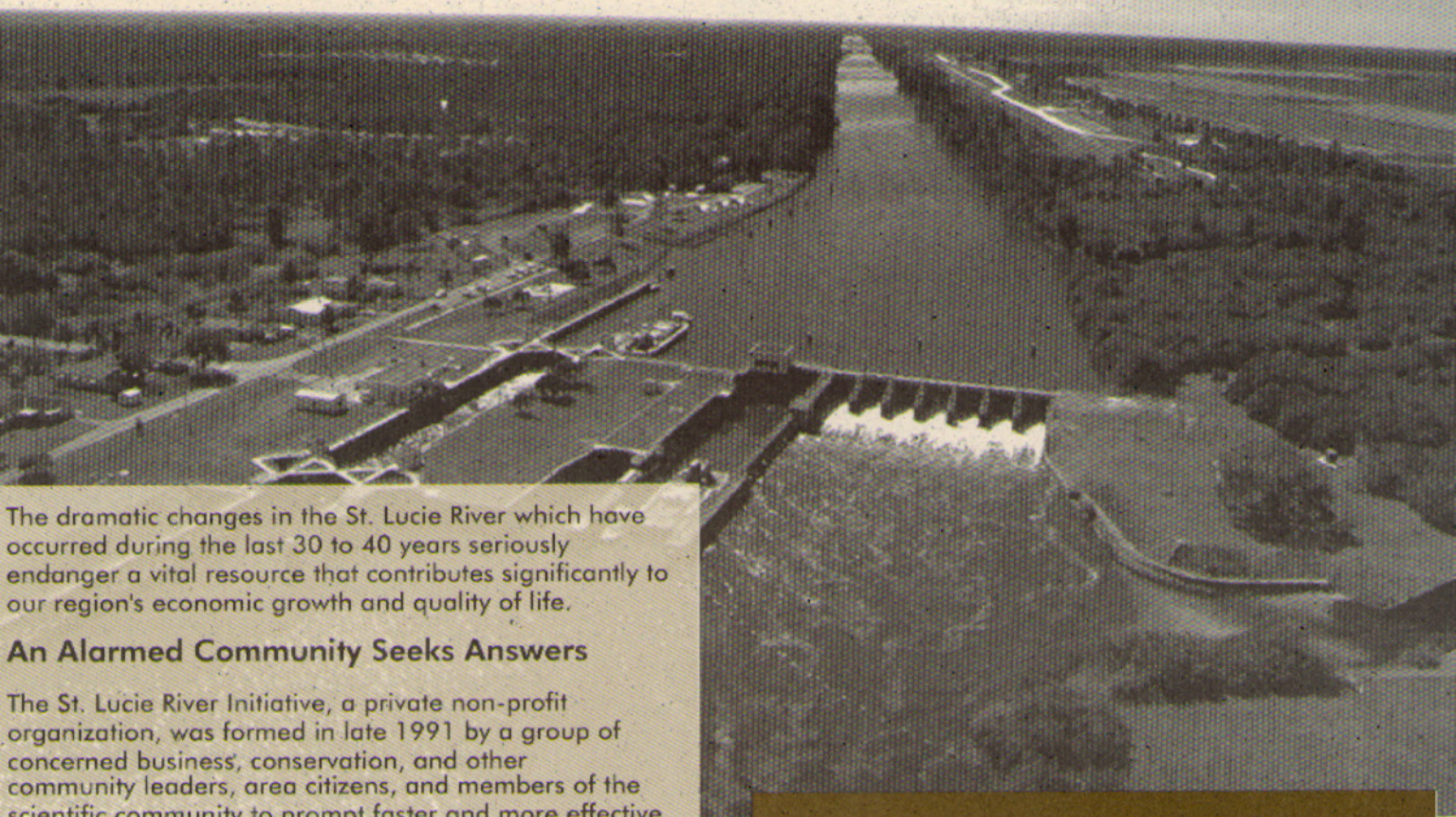
As demand grew for agricultural and residential development, drainage improvements began to create dramatic changes in the ecological balance of this fragile aquatic environment.

In the teens and twenties, the C-44 Canal was dug from Lake Okeechobee to the St. Lucie River. This Canal not only drained western Martin County, it allowed excess drainage through Lake Okeechobee to be diverted via the St. Lucie Estuary to the Atlantic Ocean. In the late 1950s, the C-23 and C-24 Canals were built, to drain more lands in western Martin and St. Lucie counties.

The construction of these drainage canals has drastically altered the natural state, and is the major cause of the decline of the Estuary. These canals threw the river off-balance. In 1991 Congress ordered the U.S. Army Corps of Engineers to reevaluate an old public works project -- the Central and South Florida Flood Control Project -- as part of the restoration of the Florida Everglades. We have a new opportunity to repair damage by major canals in that CSF Project -- the C-44, C-23, & C-24.

THE DECLINE OF THE ST. LUCIE RIVER & ESTUARY

Can The Decline Be Reversed?
See page 19 for answer



The dramatic changes in the St. Lucie River which have occurred during the last 30 to 40 years seriously endanger a vital resource that contributes significantly to our region's economic growth and quality of life.

An Alarmed Community Seeks Answers

The St. Lucie River Initiative, a private non-profit organization, was formed in late 1991 by a group of concerned business, conservation, and other community leaders, area citizens, and members of the scientific community to prompt faster and more effective action among the numerous agencies, departments and organizations responsible for the protection of this fragile ecosystem.

Founding members of the St. Lucie River Initiative observed that despite all of the research, data, studies, policy statements and permitting requirements, over the past 40 years, the St. Lucie River is in a continuing state of decline.

The fact is that although literally millions of dollars have already been spent studying the problem, our river is getting sicker every day. Already, these negative impacts extend further, to the Indian River Lagoon, and to the reefs in the Atlantic Ocean. Marine resources are now being seriously compromised there as well.

We Can Document the River's Decline

A survey of water depth in the St. Lucie River conducted by the U.S. War Department, dated 1884, can be compared to studies completed by the University of South Florida in 1984.

These studies show heavy filling in at the eastern mouth of the C-44 Canal (St. Lucie Canal) at Palm City. Where the depth was 16 feet 100 years ago, now there are sandbars. Over the last 100 years, the entire river has accumulated an average of 3 to 6 feet of sediment. In addition, many areas of the bottom are layered with a floating, "flocculent" ooze that remains suspended in the water.

These obvious physical changes are related to the river's water quality and overall ecology. Over the last 2 to 3 generations we have literally witnessed the disappearance of many plants and animals that were once common to the St. Lucie River ecosystem.

Major Reasons for the River's Decline:

1. Major canal construction.
2. Poor stormwater management
3. Deposits of sediment & ooze that blanket the bottom and smother seagrasses and fish.

Why Focus On Canals?
See page 19 for answer

Stormwater run-off due to coastal development, combined with the removal of shoreline vegetation, has also played a significant role in the degradation of water quality.

Where to Put the Wet-Season Rains

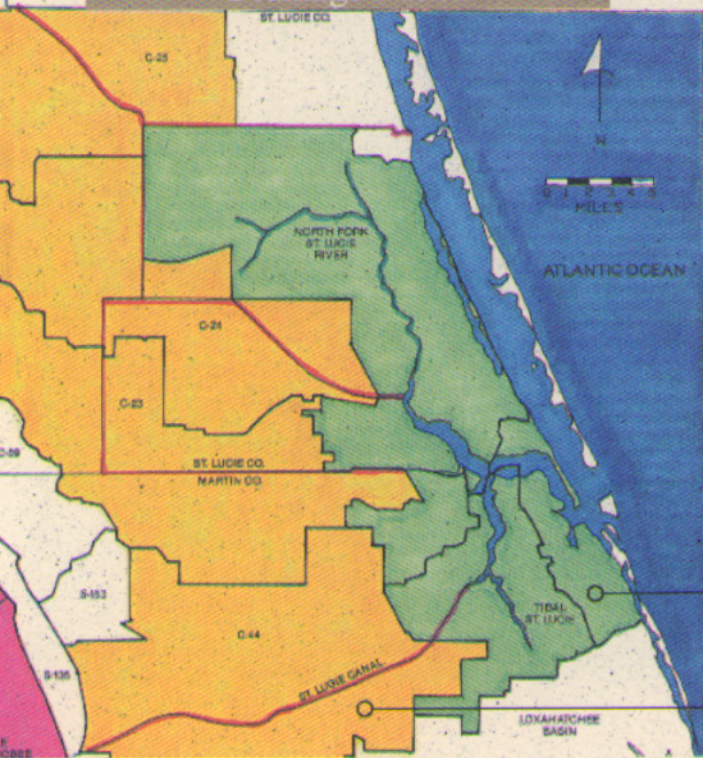
The pattern of rainfall that we experience in South Florida has a lot to do with the problems we now face. Normally, the months of November through May are relatively dry, followed by the rainy season of June through October. Compounding this cycle, when the ground is already saturated we are most likely to experience hurricanes and tropical storm events. As the demand for agricultural products increased, land owners sought drainage relief from wet season conditions.

The CORPS & SFWMD Control the Canals

All of the canals are controlled by gated spillways that open from the bottom. The combined discharge capacity of C-44, C-23, and C-24 is 26,000 cubic feet per second. A level as low as 2,500 cfs is harmful to the estuary, according to South Florida Water Management District studies. This means the canals can dump more than 10 times the harmful levels of fresh water into the River.

The result is a lot more water, and a lot more water-borne sediments and nutrients, than the St. Lucie River can accommodate without serious harm. Smaller quantities of freshwater could be absorbed by a healthy estuary, but the River has not been healthy for decades. Now it is in critical condition, and the wild swings in salinity and turbidity caused by canal discharges repeatedly stress the life left in it. Parts of the River are essentially "dead."

St. Lucie Estuary: Tributaries and Drainage Basins



Natural Drainage Area
Man-made Drainage Area

The Florida Department of Environmental Protection has measured higher suspended solids concentrations in canal C-23 discharges to the Estuary than would typically be found in raw sewage prior to treatment.

The lock and dam controlling discharge for the C-44 Canal have been the focus of much of the physical damage to the River over the years. After this structure was constructed in the 1930's and subsequently improved in the 1940's, it allowed the flood waters of a series of heavy rain events in South Florida to be diverted through the St. Lucie estuary system, which received the brunt of the impact.

Canals Drain Much More Land to the River

The natural drainage basin of the St. Lucie River was much smaller than it is today. The introduction of four man-made drainage canals dramatically altered its size and drainage patterns. From the South, these are: the C-44 which connects the South Fork to Lake Okeechobee; the C-23, which parallels the Martin, St. Lucie County line and empties into the lower North Fork; the C-24, which bisects Port St. Lucie and drains into the upper North Fork; and the C-25 canal drains either directly into the Indian River Lagoon at Taylor Creek in Ft. Pierce or into C-24.

The major canals & the smaller ones that empty into them drain a large portion of Martin and St. Lucie counties into the estuary.

This makes local land use & stormwater management decisions -- & canal management decisions -- very important to the health of the River.

Why Focus On Canals?
See page 19 for answer

Like Rivers, Canals Form Deltas

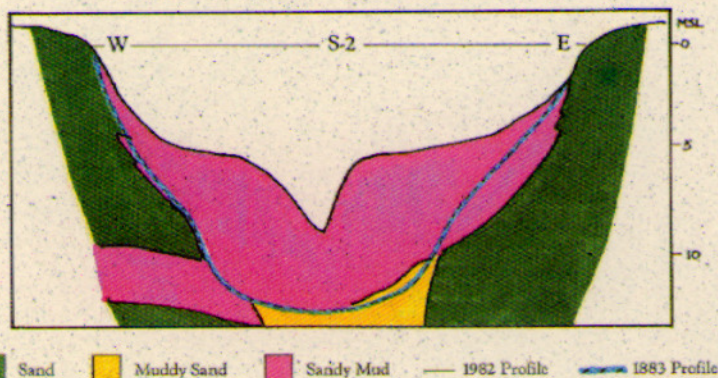
Some may argue that the St. Lucie River would fill in with sediments eventually anyway, so why worry about the sediments entering the River today. But the recent and rapid rate of sedimentation is not at all natural; it is the direct result of the canal system.

20 thousand years ago, the river was a large eroded gully. Due to the ice age at the time, sea level was much lower than it is today. When the glaciers melted, water flooded the valley and natural sedimentation processes began. Most recently, we have experienced additional organic matter sedimentation at a rate that is much higher than in any other period of time.

As a result of a study done by the Department of Geology at the University of South Florida, we have accurate data regarding the amount and types of sedimentation at various cross sectional points along the estuary. These show how sediment is accumulating. The most prominent areas of sediment deposits are near canal discharge areas and in the middle estuary. Looking at specific areas in cross-section more clearly defines present conditions compared to 100 years ago. For example:

In the area just south of the Palm City Bridge, soundings 100 years ago showed the area next to the bridge was 16 feet deep and bowl shaped. Now you can see accumulations of sandy mud and a massive sand bar. The present-day channel through these sediments, which is maintained by dredging, is clearly visible.

Cross Section - Palm City Bridge



These sedimentation patterns indicate that the river is being overwhelmed by the amount of material that is now being introduced into it. Also, the high organic content of these sediments is robbing dissolved oxygen from the water column, and contributing to the obvious decline in water quality.

A related problem is flocculent ooze. Flocculent ooze is very fine particulate matter composed of organic matter and silt. Natural chemical processes cause it to consume the dissolved oxygen in the water and depress water quality. The ooze is resuspended by wind and currents, creating turbid waters which shade out sea grass and smother beneficial animals.

Today, even at its best, the River is host to many species that are highly pollution tolerant.

And after a major canal discharge, even pollution tolerant organisms are reduced in number.

Freshwater Affects Estuary Quality

The sediments are brought to the river by the discharge of large amounts of fresh water, which alters the normal salinity pattern of the estuary. A study completed in 1985 demonstrates the effects of a discharge of 2500 cfs for several weeks from one point source, the C-44 Canal, into the South Fork of the St. Lucie.

After 1 day of discharge, fresh water displaced the normal brackish water of the South Fork.

After 8 days, most of the North Fork was fresh as well. All of the South Fork and Middle Estuary beyond the Roosevelt Bridge were fresh.

After 18 days, fresh water is well past the Roosevelt Bridge and water that is only slightly salty extends down to Sewall's Point.

When the canal discharge was stopped, the return to normal conditions was slow. After 10 days salt water began to come back into the Middle Estuary. Curiously, the North Fork stayed the freshest the longest.

During the study, freshwater pollutant-tolerant organisms, that under normal conditions are not present in the river, became common.

Even when the discharge from C-44 is reduced to only 1,000 cfs, the effect on the river's normal salinity distribution was significant. And C-44 is designed to discharge up to 16,000 cfs.

SFWMD has numerous water quality monitoring stations, which record conditions every two weeks. The amount of dissolved oxygen in the water column is a good indicator of overall water quality. Without adequate dissolved oxygen, many desirable species of River life cannot survive, and either die or migrate to healthier areas. The level of dissolved oxygen improves as one moves away from the areas affected by canal discharges.

Phosphorus is a naturally occurring nutrient that becomes harmful at higher concentrations. Phosphorus at high levels is responsible for such occurrences as algae blooms, which stress the ecosystem. The federal government recently sued the State of Florida for discharging water with excessive phosphorus levels into the Everglades. Estuaries are not protected to the standards of the Everglades, but it is noteworthy that the phosphorus in canal discharges to the Estuary regularly exceeds the Everglades standard by 6 to 10 times.

Why Are Sediments A Problem?

See page 19 for answer

If ooze is so harmful that the thought of removing it from the River sends chills up the regulators' spines, then why isn't a permit required when an agency puts ooze INTO our River?



De-oozing It.

Ooze -- also known as muck, sediments, and that slimy stuff that squashes between your toes -- is choking out seagrasses and other bottom life in the St. Lucie River. It has driven away many of the species that eat the seagrasses, like juvenile fish and manatees.

Dubbed the "blanket of death" by one scientist, ooze covers the bottom and floats in the water, blocking sunlight and using up the dissolved oxygen in the water that fish need to breathe. The combination of ooze and muddy sand covering the bottom is shoaling in the River, creating sandbars, and decreasing aquatic habitat.

Three major issues define the problem:

- Cost
- Technology
- Permitting

We need a reasonably-priced means to remove ooze over a large expanse.

We need technologies that will do little damage during ooze removal, and leave the bottom in a condition that can support the re-establishment of healthy estuarine life -- seagrasses, oysters, clams and fish.

Permitting agencies are reluctant to allow "disturbance" of the ooze by dredging. We need a permitting climate that recognizes the long-term benefits to the environment of removing the ooze that is killing or driving off all but the most pollution-tolerant species.

One way to balance the cost of ooze removal is to find ways to sell and reuse the ooze.

A MINIMUM of
21 GOVERNMENT
AGENCIES & DIVISIONS "MANAGE"
the ST. LUCIE RIVER & ESTUARY

Coast Regional Planning Council

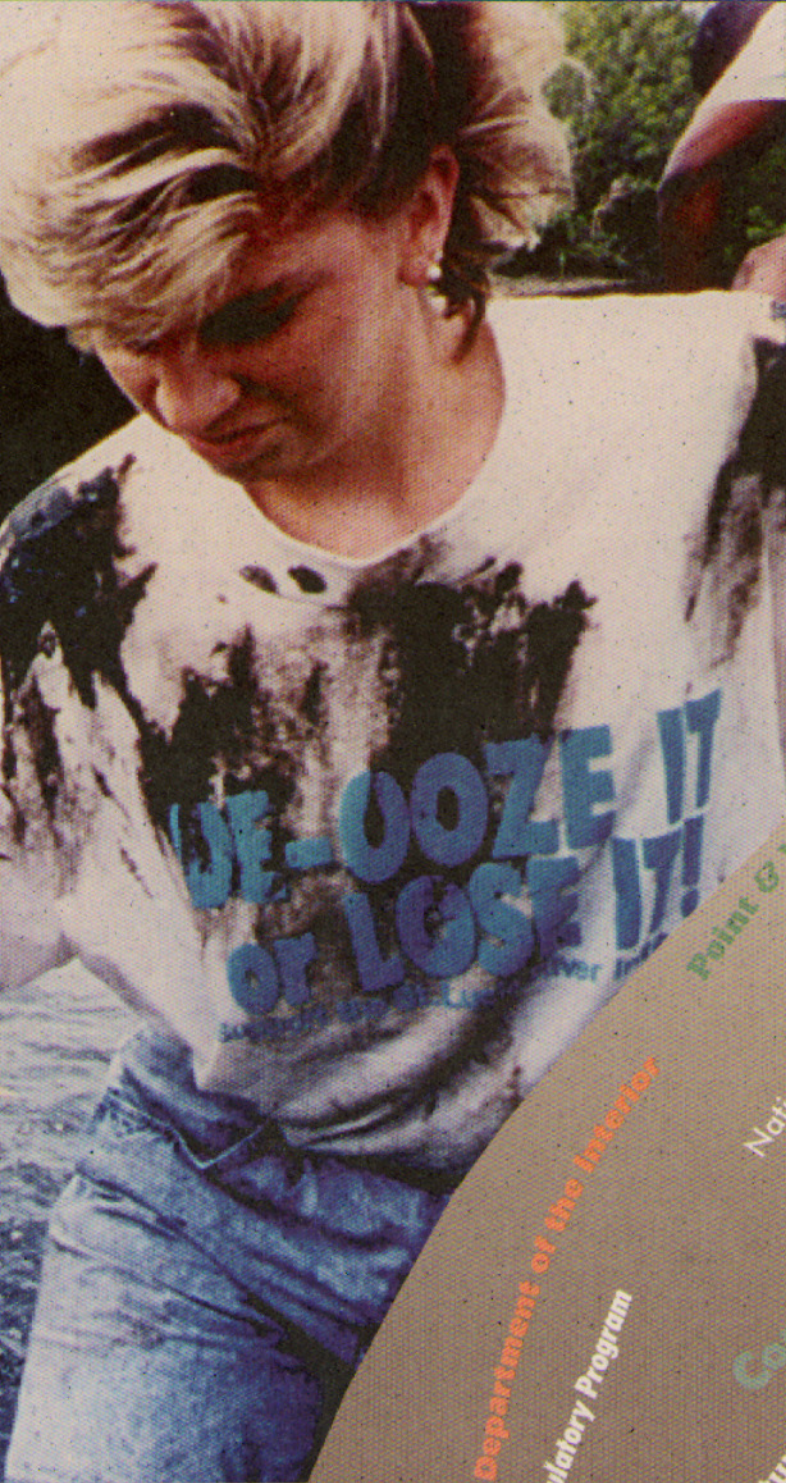
Martin County

St. Johns River Water Management District

Department of Environmental Regulation

The City of Stuart

Why Focus On Ooze
See page 19 for answers

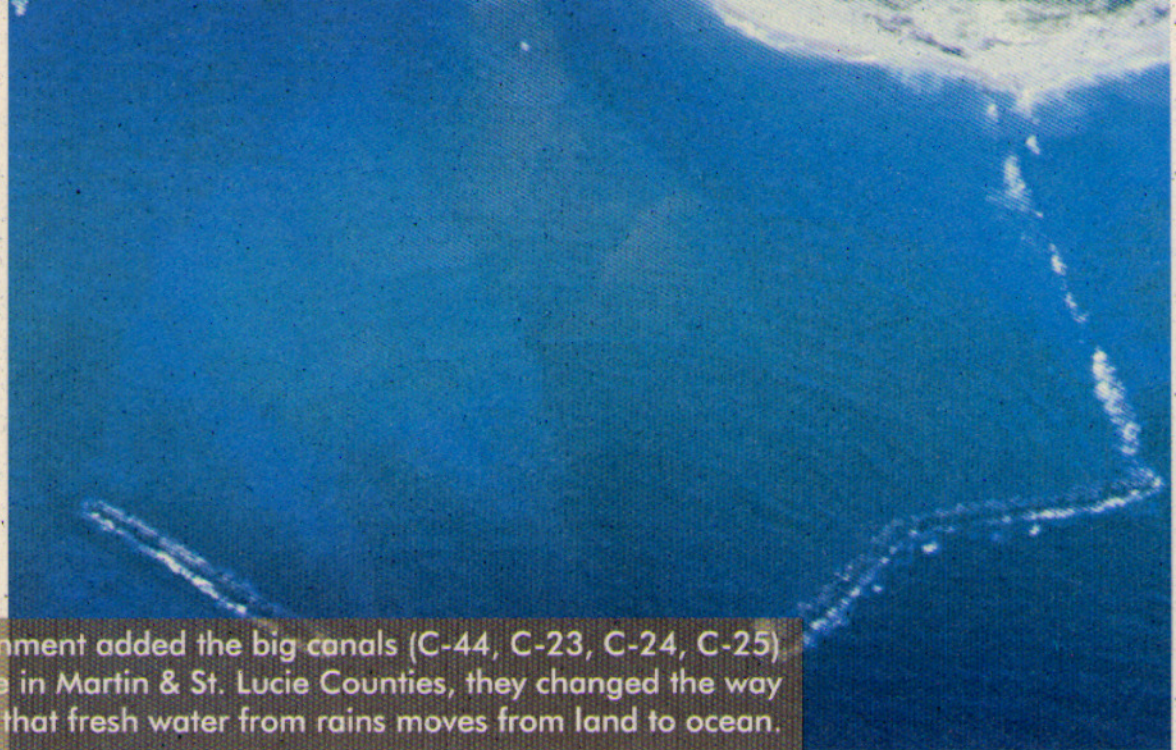


Point & Non-Point Pollution Programs
National Estuary Program, Indian River Lagoon
Special C&SF Restudy of South Florida's Canals
Environmental Protection Agency
ARMY CORPS OF ENGINEERS
Stormwater Management Program
Game & Freshwater Fish Commission
Department of the Interior
Water Quality Regulatory Program
Legislature
Department of Community Affairs
Watershed Management Section
Watershed Management Section

This Estuary is the Foundation of our Economy.
Would You Trust the Management of Your Most
Important Asset to 21 Different Brokers
Located in Fourteen Different Cities?

Why Are 21 Responsible Entities A Problem? See page 19 for answer

Fresh Water Can Pollute



When the federal government added the big canals (C-44, C-23, C-24, C-25) to the landscape in Martin & St. Lucie Counties, they changed the way that fresh water from rains moves from land to ocean.

Because of the canals, our area now receives drainage waters from as far north as Orlando. More water, moving faster, is funnelled through the canals instead of moving slowly across a wide expanse of land. The natural, slow movement allowed much of the water, and many pollutants that it carried, to be absorbed in the ground along the way. The freshwater that gradually reached the River caused relatively mild swings in water quality, and species were adapted to that. Now, drainage of heavy rains causes serious damage. Only now are we beginning to deal with this fact, and attempting to manage the canals differently.

Fresh Water can be a Pollutant in the Estuary

A little fresh water is good. But too much fresh water becomes a pollutant. The decline of the St. Lucie River has largely been the result of too much fresh water entering the system too fast, bringing other pollutants with it. The additional freshwater discharged into the River has ruined its ability to provide a stable habitat for seagrasses, oysters, manatees and many desired species of fish.

Most fish, seagrass, and other marine life prefer a stable habitat -- either saltwater or freshwater. In estuaries, where fresh inland water meets the saltier ocean water, the result is a mix, called brackish water. The salt content in healthy, brackish, estuarine water naturally varies within a certain normal range. There are species of marine life that are adapted to these relatively mild changes from more to less salty and back. On occasion, nature sent a huge rain that caused a major swing in salinity, but this was a relatively rare occurrence, and one that a healthy estuary recovers from rapidly.

Because the canals funnel so much more fresh water to the River than nature did, those rare heavy swings in salinity level have happened much more often, and have lasted for longer periods of time. For weeks at a time during rainy season, the River is completely fresh, and the brackish species are driven out--if they can move. This mean fish migrate to saltier areas. Some species, like clams, oysters, and seagrass, can't move. They die.

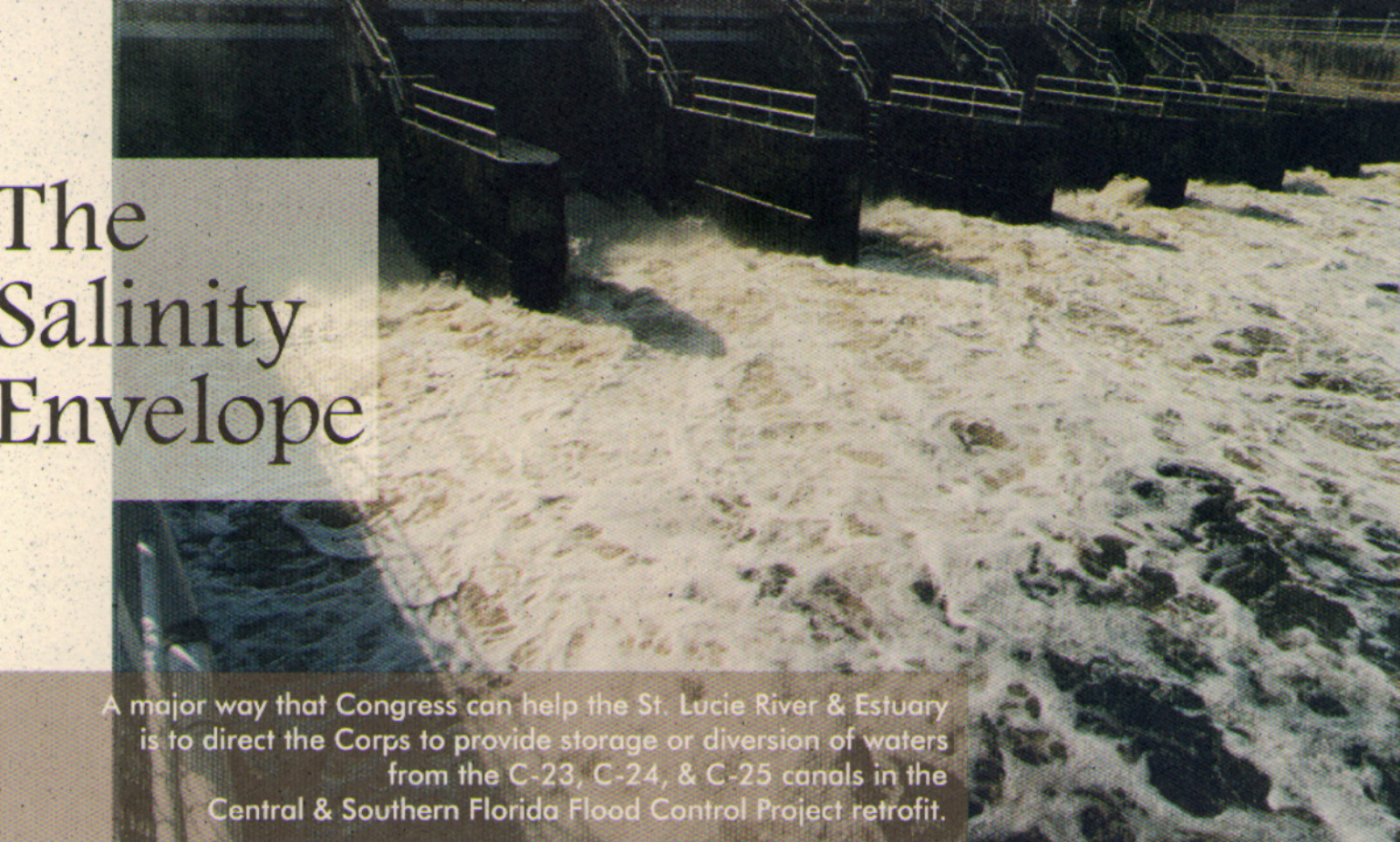
The Federal Government Planned Freshwater Storage

The original plans for our area of the Central and Southern Florida Flood Control Project included a connection to Lake Okeechobee for storage of excess fresh water from the canals C-23, C-24 and C-25. This would have offered some protection for the Estuary, allowing reduced or more gradual release of drainage. This storage connection was never built.

The U.S. Army Corps of Engineers & South Florida Water Management District are testing a slow-release program in the C-44 Canal (St. Lucie Canal) that holds promise for aiding the Estuary's health. The water is held in Lake Okeechobee and released over weeks instead of days after heavy rains. This is a vast improvement, but one that cannot be tried in the C-23, C-24, & C-25 canals because they lack storage facilities.

How Can Freshwater Be A Pollutant?

See page 20 for answer



The Salinity Envelope

A major way that Congress can help the St. Lucie River & Estuary is to direct the Corps to provide storage or diversion of waters from the C-23, C-24, & C-25 canals in the Central & Southern Florida Flood Control Project retrofit.

Water Quality Standards: From Cumbersome to Effective

For years, the health of estuaries in the United States has been measured with an awkward yardstick. These brackish waters -- a mix of salt and fresh that vary by local conditions -- have been monitored using freshwater standards. In the case of the St. Lucie River, major damaging trends were obscured while regulators looked at the wrong kinds of numbers.

In recent years, scientists at the South Florida Water Management District have tested a new way of measuring the health of the St. Lucie Estuary. They call it the "salinity envelope" and in simple terms, it defines just how much fresh water can be introduced into the brackish estuary, before ecological harm is caused.

The lack of practical water quality standards for managing estuaries has hampered efforts to help the St. Lucie. South Florida Water Management District's "salinity envelope" offers a practical and effective management tool to get to the root of the problem. Salinity is easy to measure, relatively easy to model, and can substitute for many of the more esoteric and "arguable" water quality parameters.

2-for-1 Benefits: Slow the Water & Less Ooze Reaches the River

The salinity envelope management approach has a second feature to commend it. Since it accounts for the speed of freshwater released, it can indirectly control the amounts of sediments and nutrients coming into the River. Under the current, inadequate management regime, fast-moving water carries large deposits of sand, silt, organic matter, and fertilizers and pesticides.

What Is A Salinity Envelope?
See page 20 for answer

Progress Report

Despite government's slow pace, community concern is making a difference.

Okeechobee's level remains unchanged

Small releases from Lake Okeechobee into the St. Lucie Canal continue as the lake's level stays steady at 16.83 feet.

Increase in lake's level just a glitch

Water managers probably chased the lake's level to be recorded at 17.02 feet above sea level Wednesday, up from 16.98 feet Tuesday. It's actually about the same. Increases in the lake's level can affect the St. Lucie River because of the Army Corps of Engineers' charge-water from the lake into the St. Lucie Estuary when the lake's level must be dropped for flood control purposes. Water leaves the lake through the St. Lucie Lock, enters the St. Lucie Canal and eventually discharges into the estuary. Large flushes of fresh water turn the otherwise brackish estuary fresh, killing plant life and running off animals that require brackish estuary water. The volume of water cause sand shoals buildup in the river.

Water level in lake goes down slowly

Water managers have been closely monitoring the lake's level since early summer when it started pushing its normal, which is about 17.00 feet at this time of year. Even with little or no rain expected over Lake Okeechobee through Sunday, it will be slow going to lower the swollen lake's level, water managers say. The lake was 17.36 feet above normal on Tuesday morning.

STORMWATER MANAGEMENT

- Local governments have made major strides implementing stormwater utilities.
- Port St. Lucie has a strong program that improves water quality from developed areas.
- Martin County has adopted a St. Lucie River amendment to its growth management plan; begun developing a stormwater program; & included extra drainage features in recent road projects to fix existing water quality problems in surrounding areas.
- Stuart has started a stormwater program. Local creeks are being cleaned up and new management practices put in place.
- The town of Sewalls Point has started a stormwater program.
- St. Lucie County, which has a solid stormwater plan, has intelligently tapped state and federal funds to improve water quality in smaller canals before the water reaches the major canals.
- The City of Fort Pierce is helping with Moore's Creek.

CANAL DISCHARGES

The U.S. Corps of Engineers and the South Florida Water Management District have the greatest responsibility.

- In the C-44 Canal, the Corps is trying to release heavy rains more slowly, to better mimic nature.
- Two agencies are reviewing the practice of chemical aquatic weed control, which creates more organic sediments as the dead weeds settle on the canal and estuary floors. Mechanical harvesting is also being tested.
- Possible diversion of fresh water from the C-44 to the Everglades and Florida Bay instead of the estuary is being studied.
- Fresh water from the C-23, C-24 & C-25 also could be diverted. Or storage, a common feature of most major canals, could be added.
- Better identification of problems and funding sources is underway. Community concern helped protect the funding for these crucial early steps.
- The revised Indian River Lagoon Surface Water Improvement & Management Plan includes a new St. Lucie Estuary section, and ranks the estuary as a top priority. This section highlights the harm caused by the C-44, C-23, C-24 and C-25 canals, and lays the groundwork for solving these problems.

The local media have made the St. Lucie's health a prominent issue

Little rain in the Kissimmee River, this week which could mean a slowdown in water pouring into Lake Okeechobee and good news for the St. Lucie River. The St. Lucie receives large discharges of water from the lake.

Jackie Cartwright, biological technician at the National Weather Service, said today rain is expected in the St. Lucie River. There's a chance of shower.

Lake releases stopped to ease pressure

OOZE REMOVAL

- The Initiative's motto "De-Ooze It or Lose It" has sparked a debate over these harmful sediments. Attack the causes first, or remove the ooze that's already there, smothering seagrass and driving off fish? Government agencies prefer to attack causes first -- to stop creating new ooze.
- The result: Advances in stormwater management, canal management, and water quality standards, outlined on this page.
- So far, no removal.
- The issue has been the rallying point for the public. Anybody with eyes and a nose can tell something's wrong with the River. It's a potent reminder that what's been done to date, is not enough.

WATER QUALITY STANDARDS

In the long run, one of the great strides forward for the St. Lucie may come from this somewhat obscure arena.

- The old water quality standards for River & Estuary health just don't work -- and in fact, mask many of the problems caused by canal discharges of fresh water.
- A new standard is being developed, one which puts the emphasis on how much fresh water is coming into the saltier Estuary, and how fast: The Salinity Envelope.

Are We Making Progress?
See page 19 for answer

1994

CONGRESS & CORPS:

Fix the C-23, C-24, & C-44 Canals as part of the Central & Southern Florida Flood Control Project

THE
ST. LUCIE
RIVER
INITIATIVE



July 15, 1994

Mr. Stuart Applebaum
C&SF Study Section
Jacksonville District, U.S. Army Corps of Engineers
PO Box 4970
Jacksonville FL 32232-0019

Dear Mr. Applebaum,

Thank you for the informative account of the public meetings last December on the Corps' restudy of the Central & Southern Florida canal system. We appreciate the inclusion of C-44, C-23, C-24 & C-25 as problems.

We believe that the Corps and the South Florida Water Management District are on the right track with their work in Lake Okeechobee and C-44 with regulations schedules, and that the Restudy team already is placing significance on those issues. We therefore will take this opportunity to highlight the issues and needs associated with the C-23 & C-24 canals, which should be included as even greater problems than the C-44. We also will highlight the appropriateness of resolving these issues through the C&SF Restudy. Please consider this letter our formal request, and as a written contribution to the second round of meetings, held in June.

The significance of C-23 and C-24 has emerged only in the last year or two. Even now, most users of the River seem to have a quaint jumble of ideas -- first they think the poor quality of River water is caused by Lake Okeechobee discharges and second, that those discharges are controlled by the Water Management District. Part of our local educational effort is to clarify the roles of the District and the Corps, and also to point out the vast improvement in the Lake regulation schedule made since 1978, and the hope for still further and greater benefits that appear to lie in the new schedules that the Corps is now studying. The Initiative is trying to direct agency and public attention to the C-23 and C-24 canals, which are managed by the District.

Our greatest concern now is the discharge, into our River, of rural stormwater through C-23, C-24 and C-44.

For C-23 and C-24, the District established daily flow readings in 1992. For 1992 and 1993 we have calculated from these readings an input of 350,000 acre-feet each year for the two canals together. In contrast, the input to the River from C-44 was about 200,000 acre-feet for each year. Of this, about half came from Lake Okeechobee, and half from rural stormwater entering between Port Mayaca and the St. Lucie Locks (S-80). For the two years of above-average rainfall, the rural stormwater totalled 450,000 acre-feet. The Lake supplied 100,000 acre-feet.

St. Lucie River Initiative, Inc.
Reply to C&SF Restudy Green Questionnaire
July 15, 1994
Page 2

The high pulsing inputs of stormwater have two bad effects: 1.) They cause large swings in the salinity of the River that make the waters inhospitable, or even unlivable, for finfish, shellfish, and grasses. 2.) They bring in suspended particles that deposit on the River bottom as a noxious ooze, or remaining suspended, cause a severe turbidity.

The local office of the Florida Department of Environmental Regulation has documented suspended solids concentrations of over 200 mg/l in discharges from the C-23 canal. These numbers reflect organic matter concentrations higher than typical raw sewage INFLUENT into municipal sewage treatment plants. Yet every time these canals fill with rain, we allow this to flush into our estuary.

These problems and some possible solutions are discussed in the *Indian River Lagoon SWIM Plan, Appendix I, 1994*. This document also presents a number of other actions that will help the estuary recover diversity and environmental integrity. These actions are underway with implementation of stormwater utilities and local water management plans at City and County levels, and with SFWMD salinity modeling of discharges from North and South Fork basins as well as the major canals. However, the ACOE restudy may be our only opportunity in the next decade for dealing with the large-scale canal/basin/water conservation issues which we at the local level cannot hope to address without your help.

The enclosed report developed for the St. Lucie River Initiative discusses C-23 and C-24 flow inputs. (This report was presented in March to the Science SubGroup of the South Florida Ecosystem Restoration Federal Task Force. A number of the issues regarding C-23 & C-24 were discussed at that forum.) We would be glad to supply the daily flow readings for these canals and C-44, if you wish. We also would be happy to provide other comments or material that will ensure that your Restudy addresses rural stormwater runoff through C-23, C-24 and C-44.

Very truly yours,

Max Quackenbos
Board Member
St. Lucie River Initiative, Inc.

1995

CONGRESS & CORPS:

Fix the C-23, C-24, & C-44 Canals as part of the Central & Southern Florida Flood Control Project

GOOD NEWS!!!

The Initial Reconnaissance Report from the U.S. Army Corps of Engineers on the Central and Southern Florida Project includes the concepts and projects needed to restore the St. Lucie Estuary to health and prosperity.

THE
ST. LUCIE
RIVER
INITIATIVE



The St. Lucie River Initiative applauds the decision of Congress to authorize the Army Corps of Engineers to reexamine the Central and Southern Florida (C&SF) Project. The C&SF Comprehensive Review Study does indeed provide the opportunity to address system-wide water resource issues. We commend the C&SF team on using a systems approach to develop plans for environmental restoration, and on including these two general concepts as integral to any south Florida ecosystem restoration plan:

1. MINIMIZING DAMAGING RELEASES OF FRESHWATER FROM LAKE OKEECHOBEE TO THE ST. LUCIE ESTUARY.
2. USING RAINFALL - BASED DELIVERIES WHICH SCHEDULE MORE NATURAL VOLUME AND TIMING OF WATER DELIVERIES TO NATURAL AREAS AND ESTUARIES.

We further commend the C&SF team on including the following specific project elements as potential solutions for restoration of the Indian River Lagoon and the St. Lucie Estuary:

1. ST. LUCIE FLOWWAY TO CAPTURE SOME OF THE C-44 LOCAL RUNOFF NOW RELEASED TO TIDE AND TO DIVERT THE FLOW FOR EVENTUAL USE IN THE EVERGLADES SYSTEM.
2. REGIONAL ATTENUATION FACILITIES TO REDUCE FRESHWATER INFLOWS FROM C-23 AND C-24 TO THE ST. LUCIE ESTUARY.
3. REMOVING ORGANIC SEDIMENTS FROM THE ST. LUCIE ESTUARY.
4. STABILIZING THE ST. LUCIE CANAL BANKS TO REDUCE SEDIMENTS IN THE ESTUARY.

We most strongly urge you, the Congress, to fully support the C&SF Review Study at each stage of the process, and to fund these project elements as soon as they can be implemented in manageable segments as part of the overall plan to restore the ecosystem of the Everglades and Florida Bay.

What Can Congress Do?

See page 20 for answer

Old Promises

1953

November 26, 1953

The Stuart News
"Citizens Organize to Fight
Destruction of Waterways"

This (citizens' effort) will include such projects as:

1. Ways and means of stopping the discharge of mud into the St. Lucie River.
2. Removal of shoals and mud now filling the South Fork bay.
3. The placing of proper anti-siltation controls on such projects as C-23, on which improper controls were built and which has resulted in the siltation fill-in of Bessey Creek.
4. A survey by competent legal authority to determine the rights of this community to protect and preserve its waterways and secure restoration of damaged areas.
5. The stopping of pollution of the rivers in any form, whether by mud, sewerage or the dumping of other wastes.

December 23, 1953

H.W. Schull, Jr., Colonel
District Engineer, Corps of Engineers
in a letter to Senator Evans Crary, Jr., of Stuart

"I do, however, assure you of my interest and efforts in rectification of conditions already experienced, prevention of further undesirable discharge to the maximum extent possible, and an eventual permanent solution to the problem as a part of the Central and Southern Florida flood-control plan. As you may know, that plan has from its earliest inception given consideration to this same problem of St. Lucie Canal discharge."

Citizens' instincts were good in the past. They knew a precious asset was being lost, but the policy makers of the time did not understand that an Estuary could be destroyed by drainage. Ecology was a new science. Natural resources seemed inexhaustable, and the man-made part of the economy was our sole focus.

New Resolve

Today, we understand that the man-made part of the economy depends on matching natural resources. We know what happened to our Estuary, and what it will take to repair the damage. Most importantly, our policy makers today know that investment in a sustainable economy is our best investment. We owe this to our children, and their children.

LET'S DO IT NOW!

Answers

- Page 2 **Why care about the St. Lucie and Indian River?**
A sustainable economy depends on stable and productive natural systems.
- Page 3 **Who is the St. Lucie River Initiative?**
Business people, Environmentalists, Government Leaders & A Coalition of Concerned Citizens.
- Page 3 **Why are all these organizations united?**
The SLRI brings a common sense approach to a complex environmental and economic problem.
- Page 4 **Why do we care about an advertisement from 1961?**
The issues have not changed for decades. Our understanding and ability to address the issues has.
- Page 6 **Can the decline be reversed?**
Definitely. The key is concerted effort at each level; local, state, federal. We are doing it at the local & state levels. Will Congress do its part?
- Page 7 **Why focus on canals?**
Most of the Federal responsibility lies with regional water movements. This is the area local government needs help with.
- Page 8 **Why focus on canals?**
Canals are the continuing source of most of the damage done every year.
- Page 9 **Why are sediments a problem?**
They choke the estuary, reduce aquatic habitat, and shade out beneficial seagrass.
- Page 10 **Why are 21 responsible agencies a problem?**
When there are too many agencies in charge, no one is responsible or accountable. The cost of regulation increases but the results decrease.
- Page 11 **Why focus on Ooze?**
Day in and day out, ooze is the most harmful constituent in the Estuary. It burns up the oxygen, clouds the water, and smothers habitat.



Page 12

How can freshwater be a pollutant?

Too little freshwater, or too much freshwater, and the Estuary is too unstable to support a diverse ecosystem.

Page 13

What is a salinity envelope?

Species such as oysters, once common in the St. Lucie must have a stable salinity to survive. The Salinity Envelope defines the upper & lower limits of life sustaining waters for Estuary species.

Page 14

Are we making progress?

Yes! But more at local and state levels than at the federal level.

Page 16

Are C-23 & C-24 as important as C-44?

Yes! They more frequently disrupt the Estuary than C-44, although large discharges from C-44 are worse when they do occur.

Page 17

What can Congress do?

Direct the Army Corps Of Engineers to design the proposed solutions to the problem, and fund the federal share.

Photo credits

The Noble Family	Front cover
Chris Perry	Page 7
South Florida Water Management District	Front cover, back cover, Inside front & back covers, page 12
The Stuart News	Pages 10, 11, 13
The collection of Thomas & Sandra Thurlow	Pages 3, 6, 19, 20



FOR MORE INFORMATION

The following documents are available from the
St. Lucie River Initiative, Inc., P.O. Box 2082, Stuart FL 34995-2082, or 407/287-8158:

- The C-23 & C-24 Canals, A technical paper describing canal structure, management, and impacts on the St. Lucie River & Estuary, written by Max Quackenbos for the St. Lucie River Initiative, Inc., December 1993. Presented on March 22, 1994, to the Science Subgroup of the Federal South Florida Ecosystem Restoration Working Group, meeting in Vero Beach, Florida.
- The St. Lucie River Amendment for Local Government Comprehensive Growth Management Plans, which outlines the role of local government in improving and properly managing the River & Estuary.
- Issues of the St. Lucie River Initiative's periodic newsletter, THE MUCKRAKER.

Additional information regarding the River and Estuary is available from:

- The South Florida Water Management District, office of the Indian River Lagoon SWIM Plan Coordinator, PO Box 24680, West Palm Beach, FL 33416-4680 (407/686-8800 or FL WATS 1-800-432-2045).
- The EPA's Indian River Lagoon National Estuary Program office, 1900 S. Harbor City Boulevard, Suite 109, Melbourne, FL 32901-4749 (1-800-226-3747). Available: drafts of the Indian River Lagoon Comprehensive Conservation and Management Plan and supporting documents.

Additional copies of this report are available for \$10.00 from
the St. Lucie River Initiative, P.O. Box 2082, Stuart, FL 34995-2082, or 407/287-8158

