FINAL

MINUTES OF THE MEETING
of the
HARRIS CHAIN OF LAKES RESTORATION COUNCIL

May 2, 2008

The regular meeting of the Harris Chain of Lakes Restoration Council (Council) was held at 9:00 AM on May 2, 2008 at the Lake County Board of County Commissioners' Chambers, 315 West Main Street, Tavares, Florida.

Members Present	**Members Absent**
Hugh (Dave) Davis II, Chairman	Edward M. Schlein, M.D.
Skip Goerner, Vice Chairman	
Rick Powers, P.G., Secretary	
Keith Farner	
Robert Kaiser, P.E.	
Don Nicholson	
Richard Royal	
Jon VanderLey	

1. CALL TO ORDER

Chairman Dave Davis called the meeting to order at 9:00 AM.

2. INVOCATION AND PLEDGE OF ALLEGIANCE

An Invocation was given by Councilman Bob Kaiser, followed by the Pledge of Allegiance.

3. ROLL CALL

Chairman Davis called roll. Councilman Ed Schlein was absent.

4. APPROVAL OF MINUTES

Chairman Davis called for a discussion of the April meeting minutes. Patrick Hunter, Recording Secretary of the Council described a few minor edits to the minutes suggested by Barbara Bess of the Florida Department of Environmental Protection (FDEP) and member of the Technical Advisory Group (TAG) to the Council. The edits were accepted and no further edits were suggested. The April minutes were approved by unanimous vote.

5. PRESENTATIONS / ACTION ITEMS

Florida Fish and Wildlife Conservation Commission: Bass Radio Telemetry Study Proposal Update

Wes Porak, a Certified Fisheries Scientist with the Florida Fish and Wildlife Conservation Commission (FWCC) working at the Eustis Research Laboratory, provided an updated proposal to the Council requesting funding for the purchase of radio telemetry equipment associated with the stocking of advanced fingerling bass. Highlights of update are outlined below and the complete proposal is provided in Attachment 1 of these minutes.

- The FWCC is not asking for research funding, but support for the largemouth bass stocking program (utilizing advanced fingerlings raised at the Florida Bass Conservation Center – Richloam State Fish Hatchery).
- He reminded the Council that a portion of their funding initiative requested funds for the production and stocking of hatchery-raised fish.
- The funding would assist with the purchase of radio telemetry equipment to monitor bass movements, habits, and success of the program.
- The FWCC will provide hatchery fish for stocking Lake Griffin over the next three years at no charge.
- Additional funding is needed to purchase two hauling trailers for stocking, which cost $60,000 each. Information provided in a handout is included as Attachment 2.

Vice (V.) Chairman Skip Goerner said that historically the Council hasn't funded studies, but believes a partnership between the Council and the FWCC would be beneficial. He also believes the telemetry equipment would aid in the success of the stocking program. V. Chairman Goerner made a motion that the Council assist with $32,460 in funding for the purchase of the radio telemetry equipment.

Councilman Farner seconded the motion.

V. Chairman Goerner explained that he recently received a call from the Governor's office requesting information on the projects in the Council's current $300,000 Legislative Funding Request. He said he was somewhat encouraged by the call, but said they should not count on receiving any funding. V. Chairman Goerner proposed the $32,460 for the FWCC would come from the $308,000 balance, previously received from the Legislature.

Mr. Porak also asked that the Council consider assisting with funds for the hauling trailers. V. Chairman Goerner suggested the FWCC look at partnering with other agencies like the Lake County Water Authority (LCWA). Mr. Porak said they are currently exploring various funding options.

Councilman Kaiser also suggested the FWCC partner with other agencies for funding of the hauling trailers.

Councilman Keith Farner said he supports the hatchery and believes it is important to get their stocking program up and running. He also said the current stocking (relocation) program is very expensive and the hatchery stocking would be much cheaper.

Mr. Porak explained that they continue to work on improving the stocking program and are currently tagging 20,000 hatchery fish raised on pellets in the right cheek and 20,000 raised on live feed in the left cheek. He said they hope to better understand the success rate of the fish.

Chairman Davis asked for clarification; the Council is proposing to use the funds they have already received or from their current $300,000 request. V. Chairman Goerner said they would use the existing funds.

Chairman Davis also asked if the proposed funding is consistent with the purpose of the funds previously received. V. Chairman Goerner explained the existing funds were received through a funding initiative and the Council has the ability to utilize those funds for a variety of projects.

Mr. Porak recalled that the funding received by the Council was for habitat [improvement], stocking, and cypress trees.

Chairman Davis cautioned that the Council not become a funding source for projects which have not been proven successful. V. Chairman Goerner said he understands the Chairman's concern but believes their support [of the FWCC stocking program] would help improve stocking with hatchery fish.

Councilman Farner asked if the hatchery fish would be stocked in Lake Griffin. Mr. Porak said the stocking of Lake Griffin for the next three years has already been approved and the telemetry equipment will help determine the success of the program.

Dr. Dan Canfield of the University of Florida (UF) and Chairman of the TAG explained the Council's current Legislative Funding Request is for $500,000 which includes $150,000 for the hatchery and $350,000 for the UF bass stocking program. He then said he had been contacted by the Governor's office which asked whether the UF stocking program could continue with $300,000 in funding, because the Governor believes there is an economic return on the stocking. Dr. Canfield said it was evident from his conversation with Governor Charlie Crist, that any funding received from the Council's request would be for stocking large fish, not small fish.

Chairman Davis asked what the FWCC hopes to gain from their three year stocking program. Mr. Porak said they hope to learn how to make the stocking of hatchery fish more successful. He further explained they are currently conducting studies on the viability of pellet-raised fish versus live prey-raised fish and have developed a protocol of feeding the pellet-raised fish live prey for one or two weeks prior to being released into the wild. Mr. Porak believes this will greatly improve their chances of survival.

Chairman Davis asked if the telemetry equipment will provide information other than the location of the fish. Mr. Porak explained they hope to map the habitat where the fish are found

and where they are not found, with the goal of improving the habitats where fish congregate. He went on to say that one of the issues with the domestic (hatchery raised) fish is their lack of anti-predatory behavior to escape predation. Mr. Porak said that a future protocol may be to expose hatchery fish to predators before being released.

Councilman Kaiser asked if the fish currently fitted with the micro-wire tags were eaten by predator fish, wouldn't that mean the predators are the ones being tracked. Mr. Porak said that was a good observation and it is something they have considered. He explained one thing they can look at to make that determination is the speed at which the tracked fish are moving, which would be an indication as to the size of the fish.

Mr. Porak also explained that the first year of stocking fish with transmitters will most likely be in Lake Carlton, because it is much smaller and it would be easier to find the fish.

Councilman Richard Royal asked if it is possible to study what happens when fish with transmitters are eaten by other fish or alligators in the laboratory. Mr. Porak said that is part of the first year of the study, in addition to determining the best way to insert the transmitters and how the fish react to the transmitters. He also pointed out that they don't use hatchery raised fish as brood stock, which minimizes the domestication factor.

Councilman Farner asked if the FWCC could make a presentation to the Council on the various research aspects of the program. Mr. Porak agreed.

Councilman Royal asked whether the requested funding would be paid in a lump sum or paid over the three year study. V. Chairman Goerner said his motion is for a lump sum payment.

Councilman Royal suggested the funds be paid each year after receiving a report of the previous years' activities. V. Chairman Goerner said he considered doing that but due to the multi-year nature of the program, they should not cut funding just because the result for any single year is not good.

Councilman Farner also noted the funding is to purchase hardware, so it would be difficult to divide it into payments.

Councilman Rick Powers agreed with Councilman Royal and asked what if a successful implant procedure can't be determined. Mr. Porak explained they will receive "dummy" transmitters from the supplier at no charge, in order to test the implant procedure.

Dr. Canfield reminded the Council of the other projects they are considering which include fish attractors, gravel beds in Lake Eustis, and a Menzi muck remover. He said they should consider actual projects that do something for the lakes, as compared to the research program the FWCC wants to conduct. Dr. Canfield then suggested the Council read a paper written by Robert T. Lackey, a Fisheries Biologist with the U.S. Environmental Protection Agency (EPA), which discusses the politics of research. He said the paper is called *Axioms of Ecological Policy* and he would provide the Council copies of the report.

Chairman Davis asked if the FWCC is budgeting funds for this project. Mr. Porak explained they will have at least four people working on the project, in addition to the 100,000 fish they are requesting. He said they are also seeking federal funding for the project.

Mr. Porak went on to say the research they conducted showed a 2% – 3% survival rate, one year after shocking and relocating fish from one lake to another. The FWCC did not believe that was a viable method for stocking lakes. Mr. Porak offered the Council a copy of that study for their review.

A vote to approve the motion to provide $32,460 in funding to the FWCC for the purchase of radio telemetry equipment in support of the Lake Griffin bass stocking program with hatchery fish, passed unanimously.

Mr. Porak thanked the Council for their support.

Agency Updates

Dr. Canfield provided the following updates to the Council;

- The bass stocking project is complete and 4,623 bass greater than eight inches in size that were tagged and relocated into Lake Dora;
  - 3,000 bass were greater than 10 inches in size
  - 1,090 bass were greater than 14 inches in size (legal catchable size)
  - 237 bass were greater than 18 inches in size, and
  - 105 bass were greater than 20 inches in size

- They have received over 70 reports from anglers catching tagged bass

- They will be (electro)shocking in Lake Griffin to count the tagged bass
  - Many of the bass are located in the canals
  - They will also study mortality rates of the stocked fish

- Maintenance on the mechanical harvester is complete and it is ready to go

- Menzi muck removers can be operated for $50 – $100 per hour in operational costs including maintenance, repairs, operator, etc.

Councilman Farner asked if the Council could get actual maintenance and operational costs per hour for a Menzi. Dr. Canfield said the cities of Lakeland and Winter Haven, or a local dealership, could be contacted for that information.

V. Chairman Goerner said that Mike Perry [LCWA] requested to give a presentation about possibly partnering with the Council to create fish habitat similar to that created by the City of Eustis at Hickory Point.

Dr. Canfield said the TAG has discussed the importance of creating fish habitat because the natural return of vegetation for habitat is moving very slowly. He added that creating habitat would bring "good will" to the Council from anglers.

Jason Dotson, a Biologist with the FWCC provided the following update to the Council;

- The Spring electrofishing and creel counts for large mouth bass on lakes Dora and Beauclair are complete.
  - 10% of the bass sampled in Lake Dora were from Dr. Canfield's stocking program
  - The fishing effort by anglers has decreased
  - The data will be presented when it becomes available
  - Block nets and push nets will be set to determine the availability and size of prey fish on lakes Griffin and Carlton in advance of stocking the advanced fingerlings. This effort will help with the survival rate of the stocked fish.

- The proposed five acre fish attractors may not be large enough to improve fish productivity, but they want to move forward with the research effort.
  - He is working with FWCC management to put together a proposal for presentation to the Council in June
  - Preliminary economic study indicates financial returns from the project after two years.

Councilman Nicholson asked if they still intend to use hardwood for the brush piles (fish attractors). Mr. Dotson said yes.

Walt Godwin, Environmental Scientist VI with the SJRWMD, provided the following update to the Council;

- The water quality graphs provided as handouts have been simplified for easier interpretation.
  - Graphs are 15 year datasets using annual averages, not monthly changes which can be confusing. Copies of the graphs are provided in Attachment 3.
  - The Total Phosphorus–Chlorophyll Correlation graph shows a direct relationship. When total phosphorus goes up, chlorophyll increases.
  - The overall goal of the SJRWMD is to decrease phosphorus concentrations and loading in the lakes, as efforts to improve water clarity.

Chairman Davis asked if chlorophyll equates to algae and if decreased phosphorus would lead to decreased algae. Mr. Godwin said yes and explained that changes in water quality generally takes three years to be seen, after changes of constituents in the lakes. He said the SJRWMD is reducing phosphorus inputs to the lakes by treating discharges with alum, in an effort to achieve the approved Total Maximum Daily Loads (TMDLs).

Mr. Godwin went on to say that whole lake treatment with alum to reduce phosphorus is not recommended by the SJRWMD at this time. He also noted that a handout provided to the

Council outlines the alum expenditures over the past several years. A copy of that handout is provided in Attachment 4.

Councilman Royal asked about alum treatment costs and whether the land treatment within the Lake Apopka North Shore Restoration Area (NSRA) is included in the costs on the handout. Mr. Godwin explained the land application in the NSRA is a non-cost item because they obtain the alum, which is a byproduct of producing drinking water, from water treatment plants at no cost. He said they only pay to truck the alum [to the NSRA] and for the application.

Councilman Royal asked if those costs are substantial. Mr. Godwin said the costs are very low.

V. Chairman Goerner asked what percentage of the dissolved organic phosphorus is removed by alum. Mr. Godwin said the percentage would be very low because the alum primarily works on the particulate phosphorus. However, he noted the fraction of dissolved organic phosphorus in total phosphorus is very low.

Councilman Royal asked if the land being plowed/turned in the NSRA will need to be treated with alum. Mr. Godwin said no because soil profile testing they conducted indicate that phosphorus concentrations are high only in the top few centimeters and very low below that.

V. Chairman Goerner asked about the pesticide levels in the NSRA after the flipping. Mr. Godwin explained that the contractor is obligated to reduce the (surface) pesticide levels by 50% and is actually reducing them by 60%.

Dr. Canfield expressed his displeasure with the slow progress of improving fish habitat in Lake Apopka even though over $100 million, including the purchase of the farms on the north shore, has been spent on restoration.

Councilman Farner asked what Dr. Canfield would suggest for improvement in Lake Apopka. Dr. Canfield suggested possibly limited dredging and/or installing hard barriers so aquatic plants could grow; then let hydrilla grow, controlling it with herbicides. He believes this would help restore habitat and fisheries within a reasonable amount of time.

Continuing the SJRWMD update to the Council, Mike Adams, Intergovernmental Coordinator with the SJRWMD announced that he had accepted a new position and would no longer be facilitating the Council meetings. He said his replacement had not been determined and that Nancy Christman would be filling in for the next couple of months.

Barbara Bess of the FDEP provided the following update to the Council:

- The TMDL Program continues to move along slowly.

- The FDEP website will be updated by a company called Fusion Spark with project information on the State's major river basins. This information will include a description

of the basin along with photographs of projects that are ongoing. This effort is to help the general public who are interested about projects in their area.

6. PUBLIC COMMENTS

Chairman Davis made a call for public comments.

Richard Howley, owner of Spillway Park adjacent to the Burrell Lock and Dam, said he was also representing the Black Bass and Gator Bay marinas; and asked if the Council had written a letter to the SJRWMD requesting the area downstream of the Burrell spillway be considered a public waterway, as discussed at the March Council meeting. He expressed he continued concerns with conditions at the spillway. Chairman Davis said he would write the letter within the next seven days.

Carolyn Dillon of Tavares and member of the Restore Our Waterways (ROW) organization notified the Council that she had posted links to video of the Menzi muck remover on their website. She said that those who did not attend the recent demonstration of a Menzi could see what it can do.

Ms. Dillon also noted that she recently attended a presentation on alum treatment given by Dr. Harvey Harper. She said it was a very good presentation and the Council may like to hear it.

Ms. Dillon also suggested the FDEP could put up signs at current projects that notify the public there is information about the project available on their website.

7. COUNCIL MEMBER COMMENTS

Council Member Comments

Chairman Davis made a call for Council member comments.

Councilman Kaiser suggested the Council consider not meeting for a month or so over the Summer. Councilman Powers agreed saying the Council should not hold meetings if there is not a full agenda.

V. Chairman Goerner made a motion that the Council hold a June meeting to discuss the Legislative budget and plans for habitat restoration; but not hold a July meeting.

After a brief discussion, the motion to cancel the July 2008 Council meeting passed by unanimous vote.

Chairman Davis asked how the Council would be able to advertise the agenda items for the August meeting, keeping with the Sunshine Laws. Mr. Adams said the Council could suggest August agenda items during the June meeting and later email any additional items.

Dr. Canfield suggested topics for presentation at the August meeting;

- General discussion of muck removal, primarily in the canals, that would include the previously Genesis mucking process, the FWCC project on Lake Trafford, and others.

- Continued discussion on stocking with hatchery fish.

Councilman Farner said he favored a presentation on alum treatment by Dr. Harvey Harper.

Councilman Nicholson said he supports dredging as a means of restoration and the Council should seriously consider that option.

Councilman Powers said he could provide a report written by BCI Engineers and Scientists for the SJRWMD, on all the latest dredging techniques available.

No additional Council member comments were made.

Discussion of June 6, 2008 Meeting

After extended discussion, the following agenda items were developed for the June 2008 meeting of the Council:

- Phosphorus-free fertilizers / Urban Turf Rule – Ron Hart of the LCWA

- Fish Habitat at Hickory Point – Mike Perry of the LCWA

- Presentation of the 2007-2008 budget expenditures of the SJRWMD as they relate to restoration of the Harris Chain of Lakes and Lake Apopka

- Agency Update on the Brush Pile Habitat Project – Jason Dotson of the FWCC

8. ADJOURNMENT

The meeting was adjourned at 10:55 AM.

Respectfully submitted by:

_____
Chairman Dave Davis II

_____
Secretary Rick Powers

Attachment 1

Research Grant Proposal

Radio Telemetry Study for

Hatchery Bass Stocking in the HCOL

Wes Porak – FWCC

May 2008

RESEARCH GRANT PROPOSAL

Radio telemetry study of hatchery largemouth bass stocked into the Harris Chain of Lakes

Principal investigators

Wesley Porak, Brandon Thompson, John Benton, and Nick Trippel
Florida Fish and Wildlife Conservation Commission
Florida Wildlife Research Institute
601 W. Woodward Ave
Eustis, FL 32726, (352)742-6438

Introduction

Lake Griffin and other lakes in the Harris Chain of Lakes have suffered a significant loss of sport fish, primarily largemouth bass (*Micropterus salmoides floridanus)* over the last few decades due to lake level stabilization, nutrient enrichment, and related loss of habitat. The demise of the bass fishery has resulted in serious economic losses to the communities and businesses surrounding the Harris Chain of Lakes.

Long-term projects to restore good water quality and habitat in the Harris Chain of Lakes are critical to improving the sport fisheries in these lakes, but the Harris Chain of Lakes Restoration Council has recommended bass stocking as an interim fisheries management tool. The council is hopeful that stocking has the opportunity to mitigate economic losses to the local economy while restoration efforts are underway.

There is still abundant open-water food (e.g., gizzard and threadfin shad) for largemouth bass in Lake Griffin and other lakes in the Harris Chain, i.e., if the bass can grow to a size where they can utilize this food resource. We plan to evaluate whether stocking advanced sizes of hatchery largemouth bass during late spring will allow these fish to feed on young-of-the-year shad and other fish, survive, and recruit into the sport fishery.

We plan to stock advanced fingerling (~3 to 4 inches) largemouth bass into Lake Griffin each spring for three years from 2009 to 2011. This size fish is larger than naturally produced or wild young-of-the-year bass in Lake Griffin. Project biologists plan to conduct pre- and post-stocking evaluations of largemouth bass and the prey species that are eaten by bass. A variety of quantitative fish sampling methods will be incorporated into these studies.

Creel surveys will be used to evaluate if hatchery fish recruit into and improve the bass fishery. A genetic mark (using microsatellite DNA techniques) is currently being developed to differentiate stocked hatchery fish from wild fish during these assessments.

We propose to do a radio telemetry study to evaluate behavior, movement and habitat selection of hatchery largemouth bass, as described in the methods below. However, we need funding to complete this study. We respectively request the use of funds that were allocated by the Florida Legislature for stocking bass into the Harris Chain of Lakes. A budget is outlined on the last page of this proposal.

Study objectives

To evaluate hatchery largemouth bass behavior (i.e., movement, and habitat selection) after being released into a lake, and compare these to wild fish. To ascertain how hatchery fish behavior affects their survival in the wild. To determine if changes can be made in the hatchery culture protocol that would change fish behavior and improve their survival after being stocked.

Justification

Observations of domestication affects of hatchery fish at the Florida Bass Conservation Center (FBCC) have included behavioral (e.g., hatchery bass swim towards people); anatomical (e.g., some hatchery bass have unnatural color); and health (e.g., fatty liver syndrome) alterations in pellet-reared hatchery largemouth bass. Domestication affects that have been reported for other species of hatchery fish include reduced predatory skills, unnatural territorial or homing behavior, reduced breeding success, changes in aggression, and inappropriate habitat selection. Domestication can negatively impact behavior, fitness, and survival of hatchery-reared fish after their release into the wild. We have addressed many of these issues in recent years; however, questions still need further study.

Technological advances in radio telemetry equipment have made it possible to study the behavior of very small animals. Radio transmitters can be obtained commercially that weigh as little as 0.37 grams. For the first time ever, this provides the opportunity to study the movements, behavior, and even survival of hatchery largemouth bass after they have been released into a lake.

The following important questions can be addressed using telemetry studies:

What are the dispersal time, distance, and pattern for hatchery bass?
Are hatchery bass using similar habitats as wild bass?
Are hatchery bass using habitats where prey can be found?
Are hatchery bass using habitats where they can escape predation?
Are hatchery bass using habitats where we typically electrofish?

This information will be useful for biologists to better understand the factors that affect survival rates of stocked fish. It could also lead to better release strategies, which is considered a critical need for improving survival of stocked fish (e.g., stocking fish into desirable microhabitats). This information could also lead to changes in culture protocol at the hatchery, which might positively affect the post-release behavior and survival of fish in the lake.

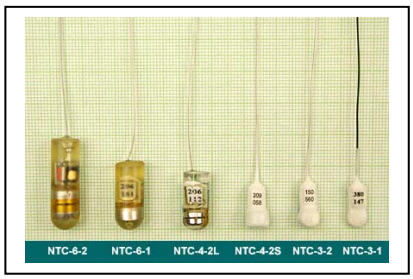
Preliminary assessment of telemetry tags and equipment (Year 1)

Dummy transmitters will be obtained for a preliminary assessment of implantation techniques. Additionally, buoyancy compensation, swimming ability, fish health response, and survival of tagged fish will be evaluated in fish tanks.

These small transmitters have been successfully used to study other species of fish like salmon, but preliminary research needs to be completed on largemouth bass due to differences between the anatomy and biology of different species. Following these lab studies, equipment will be purchased for preliminary field evaluations. Radio transmitter and receiver performance will be measured in a lake with stationary tags to evaluate distance and accuracy of the equipment. Physical structure (e.g., aquatic vegetation, docks, etc) will also be evaluated in the lake to determine how much these obstructions attenuate signal strength. Trials may be conducted with a small number of fish to work out the details and logistics of the radio telemetry study.

Behavior of hatchery stocked bass into a small study lake (Year 2)

With limited knowledge of distance moved by hatchery fish, we are concerned that we could lose radio tagged bass in a system as large as Lake Griffin. Thus, during the first field season, a lake less than 500 acres will be selected for this study to insure consistent and accurate locations of fish, and to work out the logistics and techniques for locating radio-tagged fish. Lake Carlton is being considered as a study lake. We will surgically implant radio transmitters (n = 100) in both hatchery and similar-sized wild largemouth bass for direct comparison of behavior. Hatchery fish will be obtained from the FBCC. Wild fish will be obtained by electrofishing. Each fish will be tranquilized with a sedative (i.e., MS_{222}) and a radio transmitter will be surgically implanted into the abdominal cavity. Hatchery and wild fish will either be released together or released using similar techniques.



Fish locations will be determined three to five times each week for the life of the radio tag, which should last about 10 to 60 days after release. Some diel (24-hour) studies will be conducted to evaluate behavior throughout different times of the day and night. During these studies, fish locations will be monitored every two to six hours.

Spatial and temporal movements, behavioral patterns, habitat utilization, and habitat preference will be characterized for both hatchery and wild fish.

Behavior of hatchery stocked bass in Lake Griffin (Year 3)

During the second field season, both hatchery and wild radio tagged fish will be studied in Lake Griffin using the methods described above.

Proposed Project Budget

	Costs			
	Year 1	**Year 2**	**Year 3**	**Total**
Personnel				
Seasonal technician	$10,000	$10,000	$10,000	$30,000
Equipment				
ATS Receiver (n = 2)	$4,040			$4,040
ATS radio transmitters (n = 100)	$14,000	$14,000		$28,000
ATS antennas (n = 2)	$420			$420
Total	$28,460	$24,000	$10,000	$62,460

The cost of biologist's salaries, equipment (e.g., trucks, boats, and motors), and expenses for equipment operation will be paid by the FWC. Please also keep in mind that this research project is only a small fraction of the total costs of raising the fish, stocking the lake, and conducting stocking evaluations for the next five years.

Attachment 2

3-Compartment Hauling Box Proposal

Wes Porak – FWCC

May 2008

FLORIDA FISH & WILDLIFE CONSERVATION COMMISSION
RICHLOAM STATE FISH HATCHERY
3583 CR 788
WEBSTER, FL 33597

REQUEST FOR BID:

3-COMPARTMENT FISH HAULING BOX

CONTACT: Rick Stout
352-583-3545 ext. 1001
352-583 4854 fax

or

Venus Mikolajek
352-583-3545 ext 1000

The Florida Fish & Wildlife Conservation Commission, Richloam State Fish Hatchery is soliciting vendors to fabricate the following 3-Compartment Fish Hauling Box. This equipment will be mounted on a trailer (not included in this bid package) and used to distribute hatchery-reared fish to water bodies throughout the state of Florida. Please provide written bids (attached) to fabricate a 3-compartment fish hauling box per attached specifications. Fabrication should include the following:

Dimensions: 11 feet long by 51 inches wide by 42 inch tall with three separate compartments. Each compartment contains: hinged hatch with stainless steel piano style hinge, lid brace, two-hold down toggle clamps, 4.75 inch agitator porthole, one 1.5 inch hole for PVC pipe tempering line, one 2.0 inch hole for expansion plug (side opposite knife valve), one 9/16 inch hole for oxygen hose penetration, and one – six inch PVC knife valve. Construction consist of inch stainless steel material; closed cell, double wall construction with insulation foam or panels between outside wall and inside liner. Insulation R-value not less than 11. All pipe and conduits passing through walls must be welded watertight. Floor of each compartment slopes from 4" to 2" to discharge drain.

Door and Hatch Features: Not less than 35.5 inch x 30.0 inch hatch doors to be flush mounted in deck of tank, constructed and insulted with same materials as walls. Two-edge-mounted hold down toggle clamps (stainless steel) installed on each hatch. One jack-knife lid support welded to deck of tank to support hatch when fully open. One-four inch hatch ventilators in center of each hatch, with 3/32 inch drilled holes to permit water and oxygen to vent out of each compartment. Stainless steel handles located on each corner to assist with personnel climbing on trailer. Each hatch with continuous piano-style stainless steel hinges with ¼ inch diameter stainless steel pin. Each compartment to include extruded silicon rubber door gaskets lining edge to seal compartment when hinged hatch is closed.

Tank Hold Down Bracing: 3 inch x 3 inch x ¼ inch structural stainless steel angle hold down welded flush to side of tank to permit bolting fish hauling box to trailer. Three holes drilled in angle to permit ½ inch stainless steel bolts.

Drains: Each compartment to have: one 6-inch drain hole located on the left side of fish hauling box, one 6-inch PVC knife valve which will maintain a watertight seal which connects to a schedule-40 PVC discharge pipeline along the exterior line of the tank. All discharge piping will utilize long-radius fittings to reduce sharp bends in discharge lines. Invert on each 6-inch hole per compartment should be at the same elevation to match floor to provide a smooth transition from floor to drain hole. There should be no obstruction from sloping tank floor through 6-inch drain hole to the knife valve. PVC knife valves should be modified to flush-mount to exterior tank wall and permit room for discharge fittings and piping. Fabricate on the terminal end of discharge pipe one 6-inch aluminum male disconnect fitting and cap.

Agitator Porthole & Penetrations: Each compartment to have fabricated into the top panel: one-4.75 inch diameter porthole equipped with a 2 -inch riser to act as a base for the agitator; one 9/16 inch hole sufficient for standard green oxygen hose; and one 1.5-inch hole sufficient for a 1-inch schedule 40 PVC pipe. Each compartment to have one 2-inch hole located on the right-side of each compartment suitable for an expansion style plug. All pipe and conduit penetrations must be welded and sealed water tight.

Owner Provides: The Florida Fish & Wildlife Conservation Commission will purchase and install all 12-volt agitators, electrical outlets, wiring and conduits, oxygen meters, oxygen hoses, bulkhead fitting / strainers, and one-inch PVC pipe and ball valves shown on drawings. Owner will be responsible for transporting completed fish hauling box following inspection of completed unit.

Vendor Provides: Vendor will be responsible for purchase and installation: all stainless steel materials, welding and metal preparation; 6-inch PVC knife valves and associated 6-inch pipe and fittings, hinges, handles, toggle clamps and silicone hatch gaskets.

Note: Similar model of 3 compartment fish hauling box is available for inspection to assist with bid preparation if required.

PURCHASING REQUEST FOR WRITTEN QUOTATION

P. O. NO.:

FLORIDA FISH AND WILDLIFE
CONSERVATION COMMISSION
620 SOUTH MERIDIAN STREET
TALLAHASSEE, FL 32399-1600

F.O.B.
DELIVERED:

ATTENTION:

PLEASE SUBMIT QUOTES ON THE FOLLOWING:

FABRICATION OF ONE (1) THREE-COMPARTMENT FISH HAULING BOX PER ATTACHED SPECIFICATIONS

SHIPPING AMOUNT OR TERMS *: BPU

TOTAL QUOTE PRICE: $ 59750.00

PLEASE REPLY BY:

QUOTER WILL DELIVER 45 DAYS AFTER RECEIPT OF PURCHASE ORDER.

QUOTER: Keller Mechanical & Eng. SIGNED: B O Keller

FEID OR SOCIAL SECURITY NO: 03-0427246 TITLE: President

ADDRESS: 4442 Holden Rd

PHONE: 863. 646-9372 FAX: 863-648-0606

CITY/STATE/ZIP: Lakeland FL 33811

* FREIGHT TERMS	SPURS CODE
Buyer will pick up	BPU
Freight collect	COL
Freight prepaid and allowed	DFP
Freight included in price	INC
Freight prepaid and charged back	PCB

FWC FORM 159(REVISED 03/18/2004)
WRITQUOT.159

Each vendor doing business with the State shall register in the MyFloridaMarketPlace system in order to submit a quote. A vendor will not be considered for an award, if not registered in MyFloridaMarketPlace. Information about the registration process is available, and registration may be completed, at the MyFloridaMarketPlace website (link under Hot Topics on the State Portal at www.myflorida.com). Interested persons lacking Internet access may request assistance from the MyFloridaMarketPlace Customer Service at 866-FLA-EPRO (866-352-3776) or from State Purchasing, 4050 Esplanade Drive, Suite 300, Tallahassee, Florida 32399.

Attachment 3

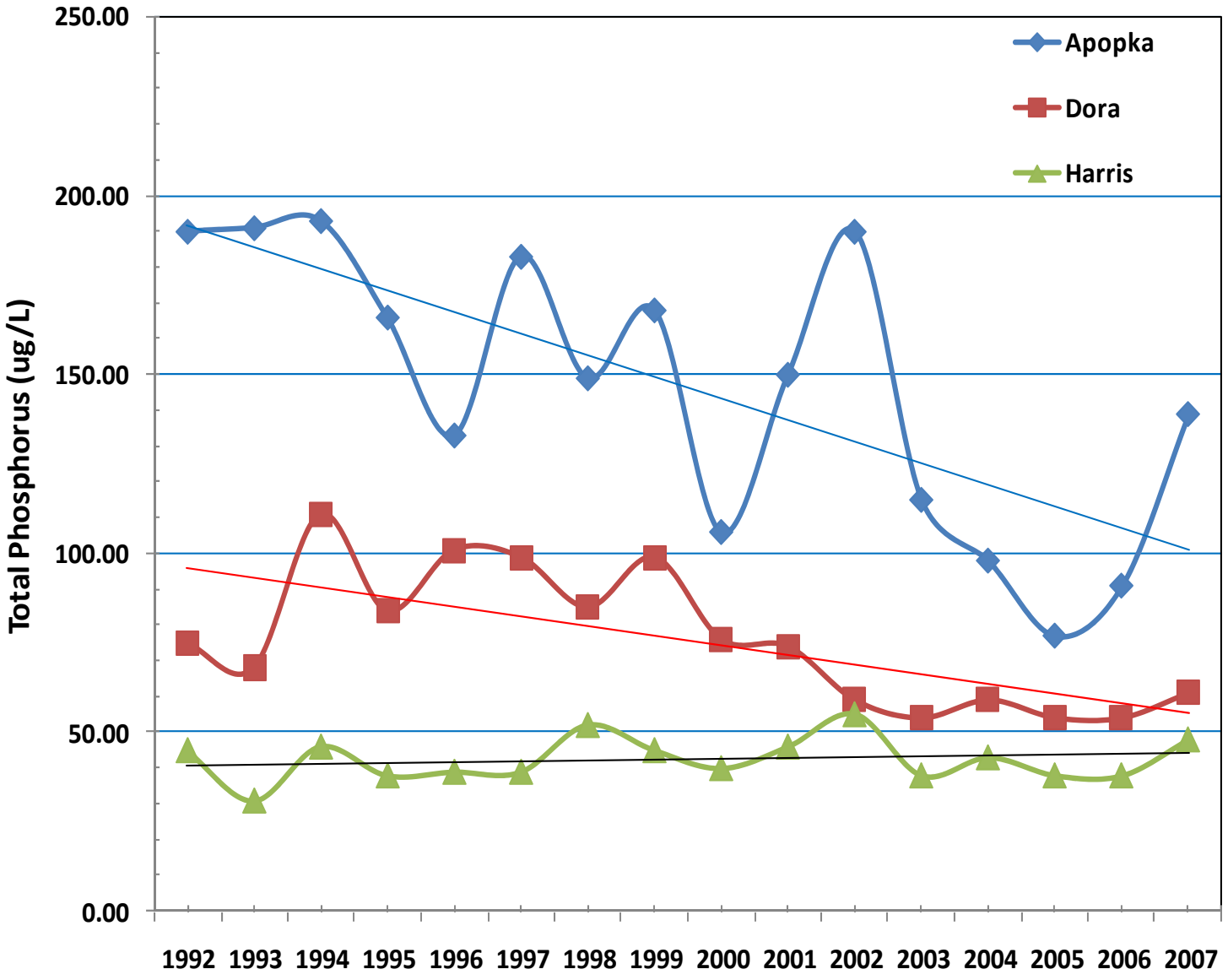
Water Quality Graphs

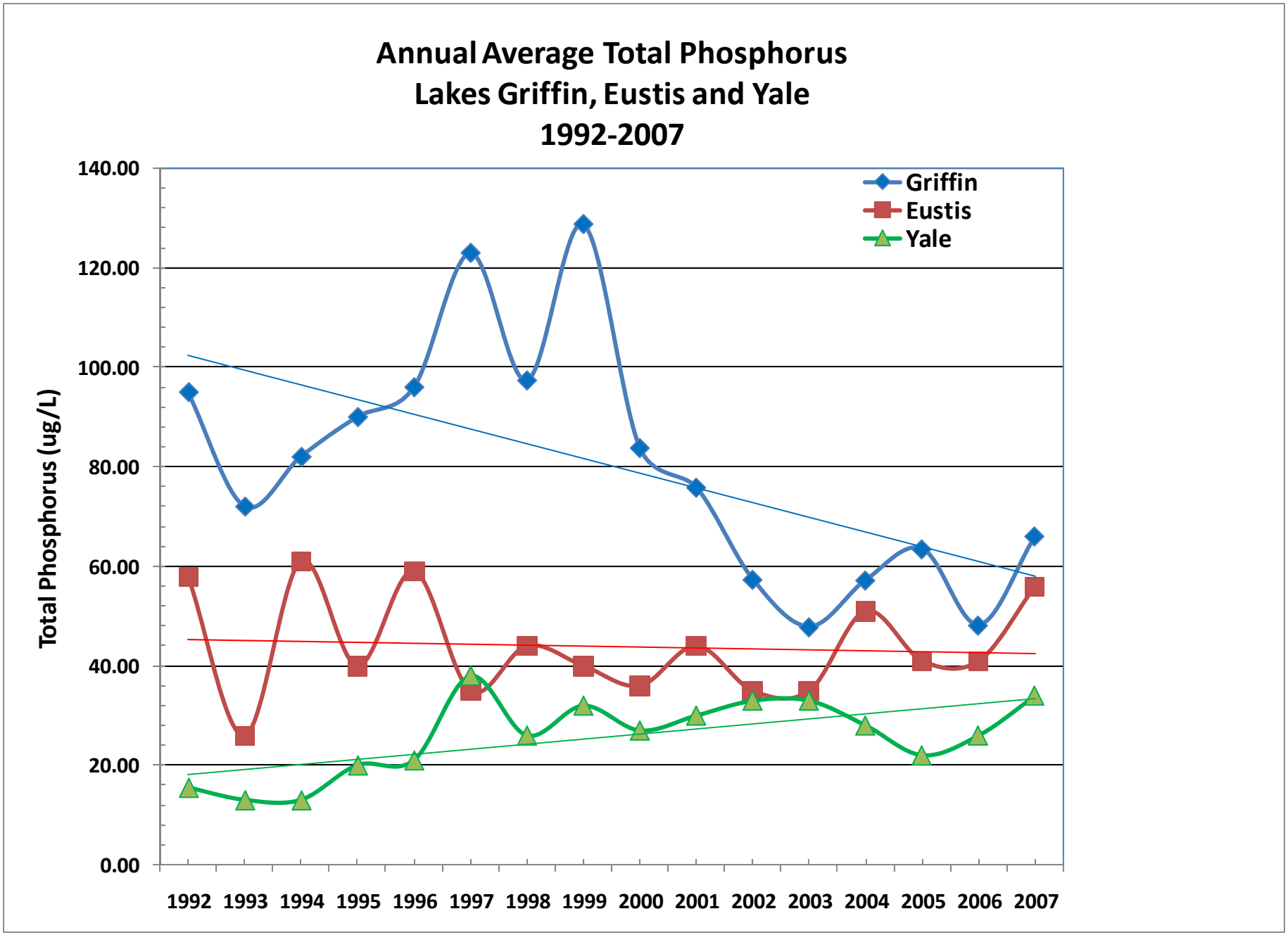
Harris Chain of Lakes

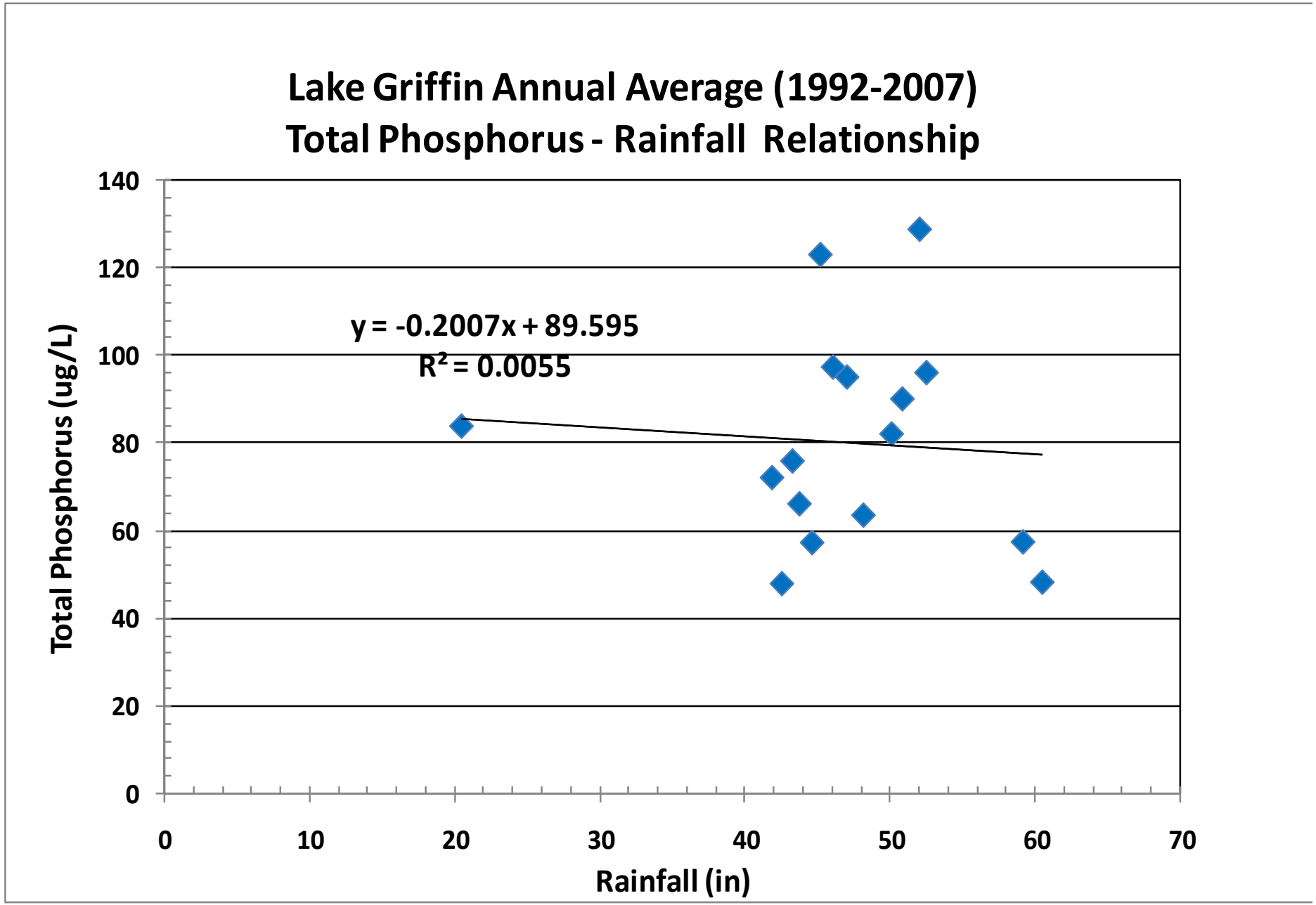
Walt Godwin - SJRWMD

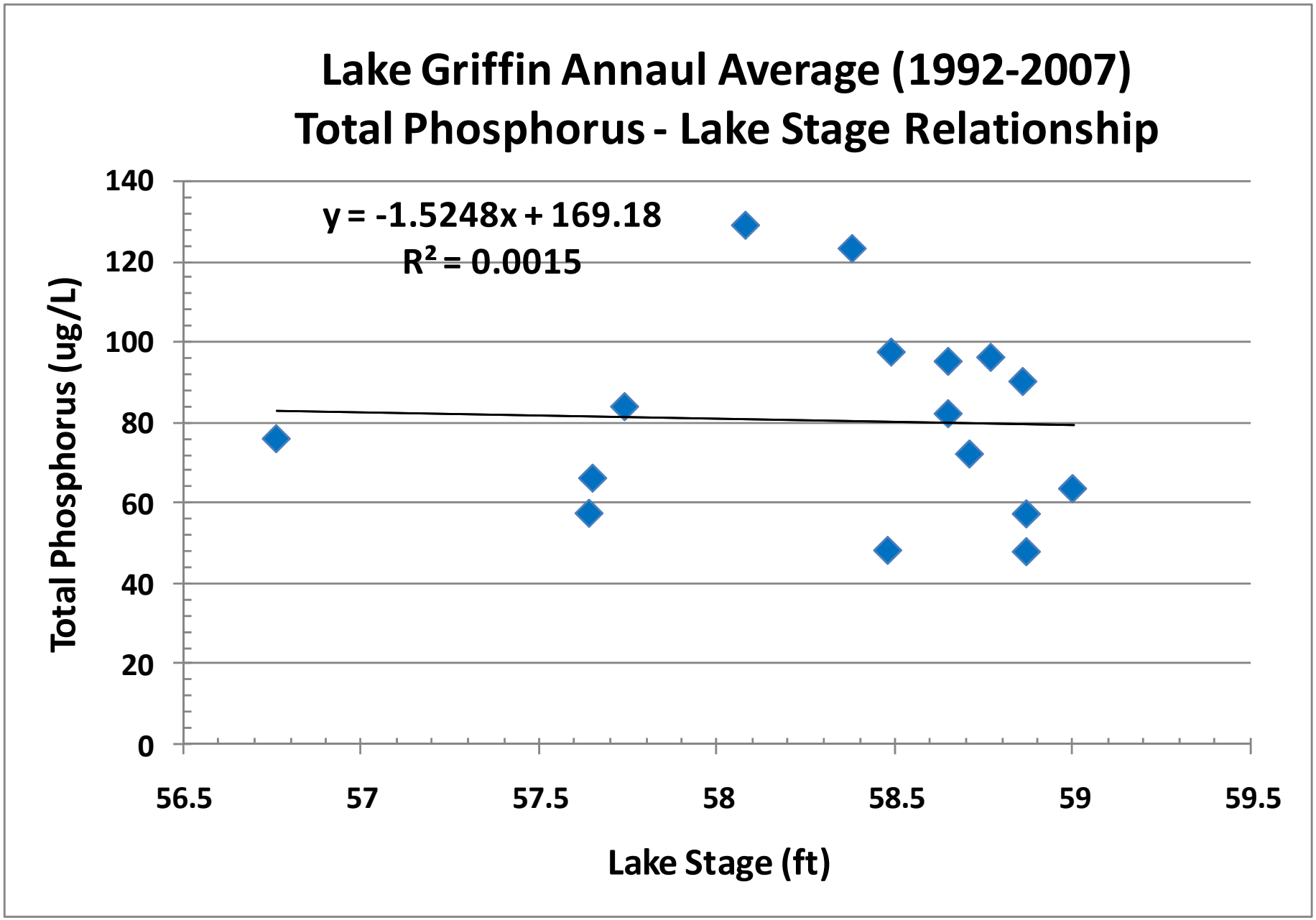
May 2008

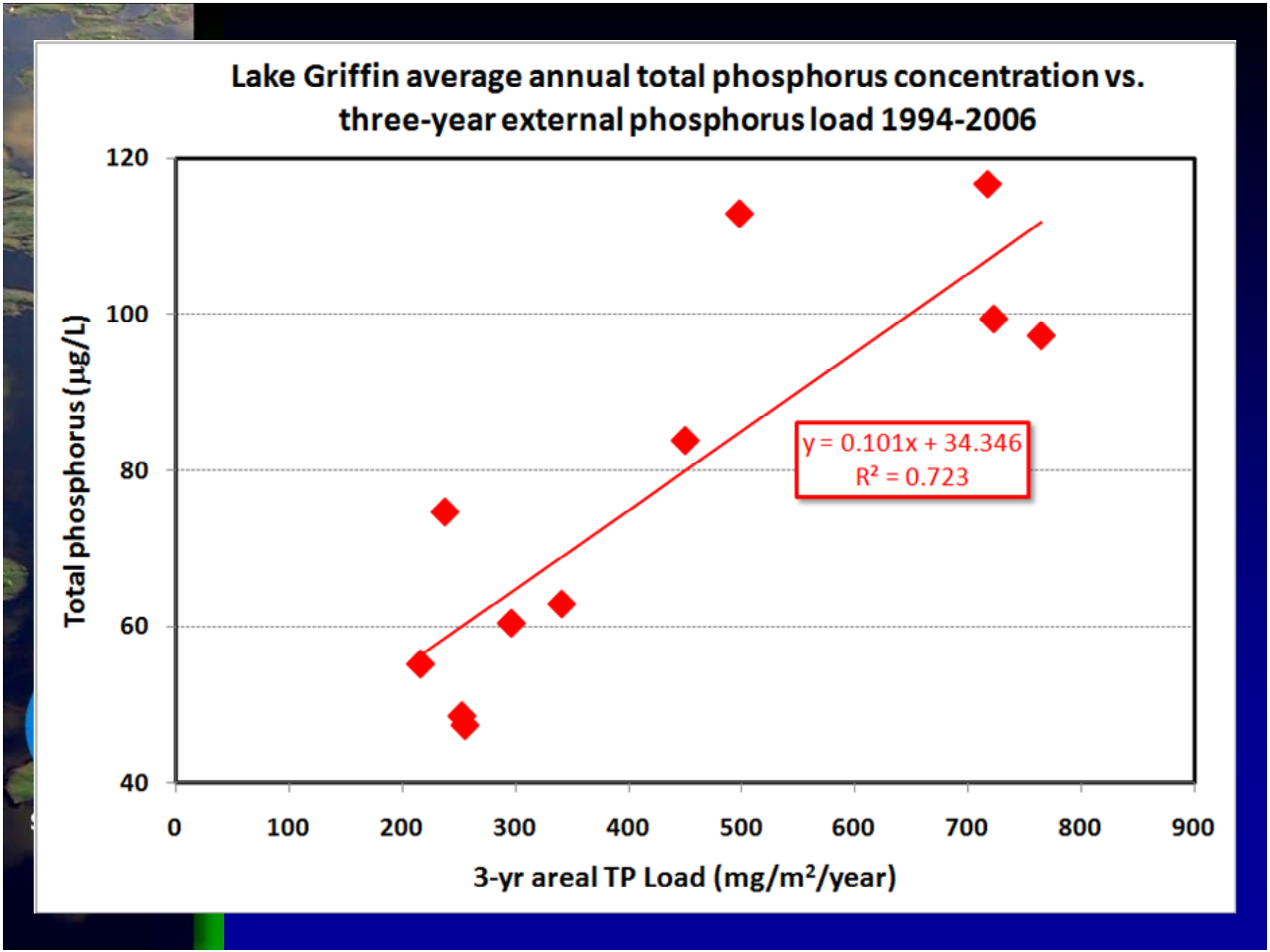
Annual Average Total Phosphorus
Lakes Apopka, Dora and Harris
1992-2007

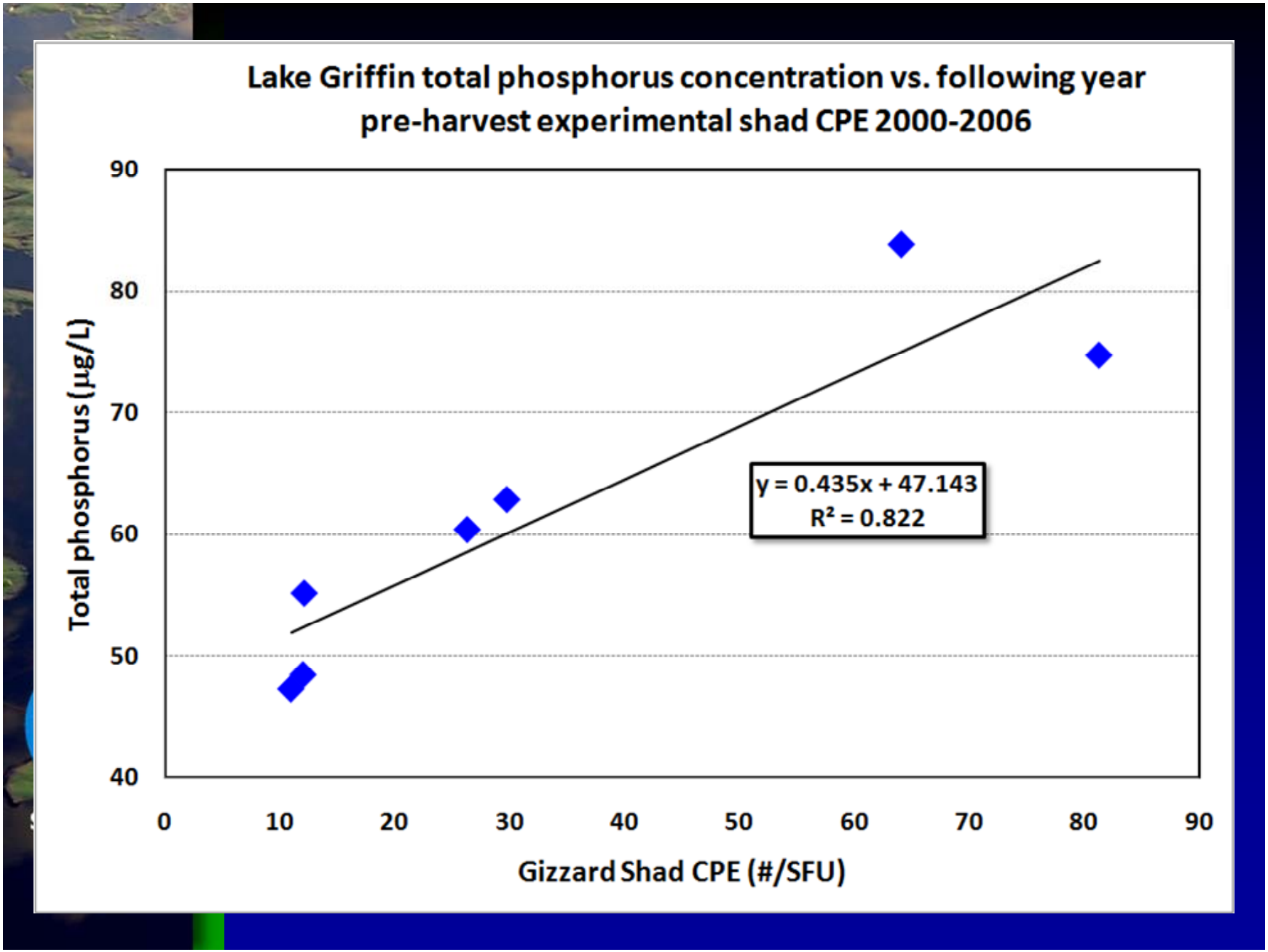


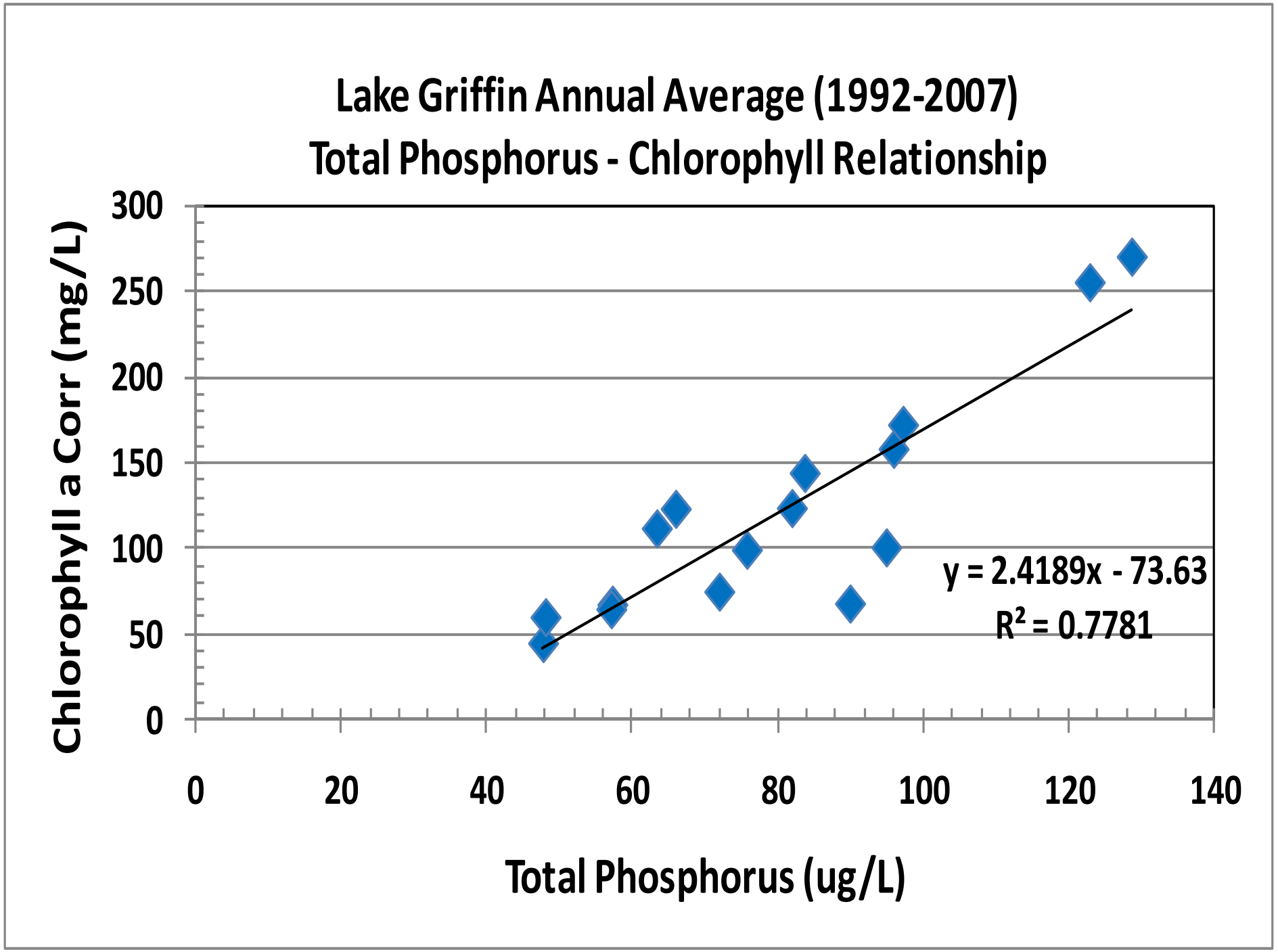

Annual Average Total Phosphorus
Lakes Griffin, Eustis and Yale
1992-2007
Total Phosphorus (ug/L)
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
Griffin
Eustis
Yale


Lake Griffin Annual Average (1992-2007)
Total Phosphorus - Rainfall Relationship
y = -0.2007x + 89.595
R² = 0.0055
Total Phosphorus (ug/L)
Rainfall (in)
0
20
40
60
80
100
120
140
0
10
20
30
40
50
60
70


Lake Griffin Annaul Average (1992-2007)
Total Phosphorus - Lake Stage Relationship
y = -1.5248x + 169.18
R² = 0.0015
Total Phosphorus (ug/L)
140
120
100
80
60
40
20
0
56.5
57
57.5
58
58.5
59
59.5
Lake Stage (ft)


Lake Griffin average annual total phosphorus concentration vs. three-year external phosphorus load 1994-2006
Total phosphorus (µg/L)
120
100
80
60
40
0
100
200
300
400
500
600
700
800
900
3-yr areal TP Load (mg/m²/year)
y = 0.101x + 34.346
R² = 0.723


Lake Griffin total phosphorus concentration vs. following year pre-harvest experimental shad CPE 2000-2006
Total phosphorus (µg/L)
90
80
70
60
50
40
0
10
20
30
40
50
60
70
80
90
Gizzard Shad CPE (#/SFU)
y = 0.435x + 47.143
R² = 0.822


Lake Griffin Annual Average (1992-2007)
Total Phosphorus - Chlorophyll Relationship
Chlorophyll a Corr (mg/L)
300
250
200
150
100
50
0
0
20
40
60
80
100
120
140
Total Phosphorus (ug/L)
y = 2.4189x - 73.63
R² = 0.7781

Attachment 4

Ocklawaha River Basin

Alum Application History

Walt Godwin – SJRWMD

May 2008

Ocklawaha River Basin Alum Application History			
Liquid alum application sites	**Application Date**	**Amount**	
Lake Griffin Flow-Way (EMCA Area 3)	Winter 2002	$87,210	
Lowrie Brown Farm (EMCA Area 4)	Fall 2002	$90,755	
Long Farm (EMCA Area 5)	Spring 2003	$224,500	
Eustis Muck Farm (EMCA Area 7)	Fall 2003	$278,060	
Long Farm (Second treatment)	Winter 2005	$197,774	
Knight North Farm (EMCA Area 2)	Fall 2004	$90,000	
Lake Harris Conservation Area	May-08	$171,000	
TOTAL		**$1,139,299**	
In addition, we treat stormwater discharged to either Lake Apopka or Lake Griffin.			
In 2004 and 2005 we expended $400,000 to $500,000 in the Apopka basin and up to abou			
$150,000 for discharges from the Emeralda Marsh properties. The last couple of years			
have had very low alum expenditures because of the drought conditions.			