



Friends of Perdido Bay

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Tidings The Newsletter of the Friends of Perdido Bay

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www.friendsofperdidobay.com

Thank you for your support

I must start every newsletter with a “Thank you” to you our members for your support all these years. It is your dues which have paid for our testing and kept Friends of Perdido Bay alive. Your (private money) has been able to show how International Paper has been damaging Perdido Bay. Public money from environmental agencies is insufficient to actually protect our bay. Matter of fact, the environmental agencies are actually protecting these polluting industries by issuing them permits and then not having the funds to make sure that the permits they issue are protecting the environment. It is a sad state of affairs and I don’t believe the underfunding situation will get any better. There are just so many other demands on our government that seem very urgent – like funding disaster relief after Hurricane Helene. And just think, climate change and global warming aren’t even mentioned as issues in this year’s presidential election!

Was the Environment Manipulated in Perdido Bay? You Bet!

Way back in August 2000, Dr. Livingston Champion’s environmental consultant wrote “*Perdido Bay in the NE Gulf is somewhat unique in that it is a relatively small system with only one primary source of pollution in the upper bay; a pulp mill.....This combination of factors established upper Perdido Bay as an excellent place to carry out research concerning nutrient loading and eutrophication since the upper bay is small, and relatively free of pollutants other than a single point source of nutrients.*” There it was. Dr. Livingston told us in clear language that there was only one main source of pollution in our bay. So all the changes in life in the bay (or lack of life) had to be caused by the paper mill, especially in the upper bay where I live.

I had been doing research in Perdido Bay since 1983. I have several papers published in journals about the animals which lived in Perdido Bay or once lived in

Perdido Bay. Beginning with the clams which once covered the bottom of Perdido Bay but are no longer here. They just disappeared. Then there were the little snails which crawled up the concrete groins which my father-in-law built in the 1960's to hold our beach. A few snails still exist but mostly have disappeared. It has been a very sad tale.

We have seen the changes come and go. First, there were the massive algae blooms of the 1990's. You may not remember those days but I have pictures of the massive amounts of algae. It covered our crab traps. Our children would ball up the algae and throw it at one another. We don't see those algae any more. What could have happened? Maybe we were supposed to believe that the paper mill had cleaned up. But I believe that the algae blooms of the 1990's were manufactured by the paper mill. Dumping excess fertilizers in the water would certainly produce the drift algae we saw in the 1990's.

But while we were seeing massive blooms of algae in the 1990's, my research was showing a different trend. I had been growing scum (called periphyton) algae on glass plates in Upper Perdido Bay since 1984. I would place these glass plates in the water, allow the periphyton to grow and then place snails on the glass plates. I could then determine how much the snails ate both on a weight basis and calorically. I published this paper in 1991. But in 1995, I became alarmed. The periphyton would no longer grow on the glass plates. The plates just had this black film. What could have happened? That was the year, Champion went to 100% chlorine dioxide bleaching. Of course we were still seeing massive amounts of drift algae. There were other telltale signs that something was wrong. Some of the grass beds which were growing profusely had red fronds, especially the fronds closest to the water surface. I looked at the fronds under a microscope and the chloroplasts were misshapen. I immediately notified the EPA about what I was finding. They wrote back that I was wrong. They said chlorine dioxide quickly broke down and disappeared so that couldn't be the problem.

We decided to check. In November 1995, on two dates, we collected water from the just below Champion's boil into Elevenmile Creek (in those days they were still in the creek) and at the end of the creek where it entered Perdido Bay. This was about a 12-mile run. On both dates, we found chlorine dioxide at a concentration of 0.4 mg/l both at the beginning and at the end of the creek and another chemical, chlorate. Chlorate is known to be a potent herbicide. Chlorate had diminished in concentration from the "boil" to the end of the creek into Perdido Bay, but the concentration of chlorine dioxide had remained the same. EPA was wrong. Chlorine dioxide did not breakdown.

The concentration of chlorate was probably high enough to have caused my little microalgae not to grow. A check of the literature, especially European research, had shown how chlorate adversely affected different types of algae and also animals. It could be toxic as could chlorine dioxide. After all, chlorine dioxide is used as a disinfectant in water supplies. The EPA said nothing and allowed chlorine dioxide to become the bleaching agent recommended in the rules of the Clean Water Act.

What was this doing to the phytoplankton in Perdido Bay? The phytoplankton surveys which International Paper was doing in Upper Perdido Bay from 2012 to 2020 showed a very poor quality of phytoplankton. It was composed mainly of blue-green algae and some phytoplankton known to be slightly toxic. But notably the toxic algae which Dr. Livingston said was killing life in Perdido Bay, *Heterosigma*, never appeared in the phytoplankton surveys done by International Paper from 2012 onward.

The manipulation wasn't over. In 2017, I noticed the pH of Perdido Bay began to become more alkaline (go up). The pH was always more alkaline than I thought it should be. The pH of the Perdido River which provides approximately 70% of the water to Perdido Bay is on the acid side (usually below 7 SU). The Gulf of Mexico which enters Perdido Bay at its mouth is slightly alkaline (7.2 SU). Historically, the pH of Perdido Bay was about 7.4 SU. The slightly elevated (more alkaline) pH was due to the alkaline discharges from the paper mill. But as the pH of upper Perdido Bay started going to 8 SU, I became suspicious.

Friends of Perdido Bay hired a consultant to do a survey of upper Perdido Bay in 2018 and 2021. Although International Paper had hoped that going to a wetland discharge would improve life in Perdido Bay, our studies showed that life just had not come back. Maybe it wasn't nutrients killing Perdido Bay like the paper mill consultants said. However our studies, especially the 2021 study, found something very interesting. The dissolved oxygen in Perdido Bay had gone up and was supersaturated from top to bottom. This was incredible because Perdido Bay had historically suffered from low dissolved oxygen, especially in the deeper waters. How did this happen? International Paper was still dumping high amounts of oxygen-consuming material in Perdido Bay. (This may be less now that IP has shut down one of their pulping lines in October 2023. I don't know.)

I began to examine the bleaching chemical IP was using – chlorine dioxide. The dioxide was a clue – two oxygens on a chlorine. I found the answer in the literature. When the alkalinity (pH) was increased and if there were no other reactive chemicals present, chlorine dioxide would give off oxygen. That was the answer. But there were other breakdown chemicals which could be present, certainly chlorate, the herbicide and maybe hydrogen peroxide. These are difficult chemicals to test for especially in salt water at low concentrations. But the phenomena of supersaturated dissolved oxygens in a bay which had historically been low, was a dead give-away. The other products had to be there also.

Friends of Perdido Bay did an algal productivity test in 2022. The algal growth in Upper Perdido Bay was half of a control test using the alga, *Dunniella*. This indicated herbicidal activity. There were other signs as well – no algae growing on pilings or rip-rap at our beaches. When IP blew up in 2017, small algae growing on pilings was the first thing to reappear. The algae brought in small pin fish and the ecosystem again began to flourish, at least for the three weeks IP was shut down. This is what has happened to Perdido Bay. But according to Florida DEP, IP is no longer bleaching so supposedly there

should be no herbicidal activity. However, there still is. Friends of Perdido Bay is still finding residual chlorine in our monthly tests. We don't know where this is coming from.

The question of how International Paper increased the pH of Perdido Bay is in dispute. I thought that IP was dumping sodium hydroxide from their alkaloid air scrubbers down Elevenmile Creek. DEP said no, IP is not dumping anything down Elevenmile Creek. This is in spite of the fact that I am measuring very alkaline conditions in Elevenmile Creek as the creek comes off of IP's property. And at this same location, we did a toxicity test using mussel larvae and found the water was chronically toxic. IP is supposed to discharge only stormwater down Elevenmile Creek and does not have to test the creek. Friends of Perdido Bay is doing additional testing to try and answer how the pH in Perdido Bay has been raised. So stay tuned.

But it is fairly obvious that so many of the things we have seen over the years from drift algae at our beaches, to no algae, to supersaturated dissolved oxygens, to high pH have been caused by manipulation. It certainly would be nice to have a "normal" bay, free from manipulation.

And Where are the Menhaden?

Menhaden are small fish which eat phytoplankton and live in schools. They spawn offshore in the Gulf and then grow up in estuaries, like Perdido Bay. We used to see large schools of them in the summer in Perdido Bay. They are food for many other fish and animals. Ospreys, in particular, fish for menhaden. This Spring a neighbor called me and asked if I saw all the pelicans diving in the bay. It was a real frenzy. Birds diving in the bay. It was the menhaden coming in the bay for the summer. But what has happened to the menhaden? I don't see the schools of menhaden that we normally see? And how about the osprey? I don't see or hear many of them either. Sad

Membership and Renewals

Tidings is published six times a year by Friends of Perdido Bay and is mailed to members. To keep up with the latest news of happenings on Perdido Bay, become a member or renew your membership. For present members, your date for renewal is printed on your mailing label.

Membership is \$30.00 per **year per voting member**. To join or renew, fill out the coupon to the right and mail with your check to the address on the front.

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