

## **Coastal Holiday Newsletter for 2019**

**By Jim Blackburn**

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There's a lot happening on the Texas Coast and as usual, I again will offer a few observations and comments at the end of another year. As many of you know, I started writing this newsletter decades ago to report on a series of settlements that I was involved in with Formosa Plastics. Those agreements were frame breaking; they were unlike any agreements before or since, and they were successful in helping to greatly improve the performance of the Formosa Plastic's Plant at Point Comfort by the end of the 1990s relative to air, water and solid waste toxic releases, worker safety and process safety management. This 2019 newsletter is dedicated to frame breaking on the Texas coast – to getting ourselves as a community out of our comfort zones and making important, positive things happen.

If you like what you read in this document, please send it to others who might like it. And thanks for being interested in the Texas Coast.

### **Frame Breaking**

Dr. Henk Mooiweer, my partner in a commercial venture called Soil Value Exchange, is an advocate for frame breaking and has helped me understand better what I have been pursuing out of necessity throughout my career as an environmental lawyer and planner. As one of my students said on an exam in my sustainable design course at Rice, frame breaking is not just out-of-the-box thinking but destroying the

box. It is about questioning why we are being told that things cannot change and then figuring out how to change them. It is about solving seemingly impossible issues.

The concept of frame breaking is best summarized by Albert Einstein who said, “The world we have created today as a result of our thinking thus far has problems that cannot be solved by thinking the way we were thinking when we created those problems.” Frame breaking is about thinking differently and that applies to each and every one of us. It is a challenge, a solution and an absolute necessity.

The time has come to break the frame of thinking on the Texas Coast from an environmental/conservation perspective, an industrial perspective and a governmental perspective. I am continuously pushing myself to break my frame of thinking on the Texas coast in many ways. We are facing a climate crisis that is profound, one that has already affected us through increased rainfalls – one that will threaten us in the future with higher temperatures, bigger storms and rising sea levels – issues that we barely discuss except after a flood for a short while. We have an industrial community that is living in the past and thinking as they did in the past. We as a coastal community are in denial about our economic future as well as our environmental future. The environmental and business and governmental communities are often unwilling to engage in meaningful dialogue with those with whom they disagree. We are stuck within our frame and need to get out.

So, you ask, “what is frame breaking?” It is about asking “why not?” It is about refusing to accept standard responses. It is about viewing issues through a different lens. For example, consider an environmental issue such as protection of our ecological systems. Seldom do we discuss money and ecology. I have found that I can talk

to any audience on the Texas coast about ecology if I use a graphic linking ecology and money as illustrated in Figure 1. Some environmentalists seem to believe that it is morally wrong to talk about money – that it's off limits – that it's dirty in some way. Many believe that companies and individuals should act out of spiritual or stewardship concerns about our ecological system – our Earth. But that is not how corporations think. They respond to money, and they can implement change much faster than individuals if they are in pursuit of it. Combining money and ecology is but one frame breaking concept. There are many others.



Figure 1. An example of a frame breaking approach to inserting ecological concerns into corporate thinking

Frame breaking involves risk – about the potential of ridicule and attack, about standing out from your peers, about being away from the herd. But in our current societal situation, frame-breaking thinking represents our best chance for a successful future for all of us. And that is the point – it is not about us versus them – but rather it is about all of us succeeding. We all need to rethink and reconsider.

In order to act effectively to ensure a successful future on the Texas coast, we all need to be open to breaking our frames of thinking. And we all need to get a bit uncomfortable because when we are all relatively uncomfortable, progress will happen. No exceptions. So, come and join me on a frame breaking journey on the Texas coast.

## **Our Changing Climate**

Let me start with the punch line – to make money in the 21<sup>st</sup> century, you are going to have to understand and talk about climate change. Period. It will be the defining issue of the future. So, don't tune out.

I have been told many times that I should not talk about climate change – that it will diminish my credibility – that serious folks don't talk about climate change on the Texas coast. And there is truth in that statement - for the most part we don't talk about it. The question is – why not? Why shouldn't we talk about it? It is the single biggest threat to our economic future. It is the single biggest threat to our coastal fisheries. The storms worsened by the heat may destroy our manufacturing infrastructure. It will define our future.

Climate change will transform life on the Texas coast. And yet we don't talk about it and most of us know relatively little about its projected effects on the Texas coast – on us. In my opinion, that is not smart, and we are going to have to be smart to succeed – to make money - in the 21<sup>st</sup> century.

There is a very interesting graphic that caught my attention a few years ago. This graphic, which is shown in Figure 2, is about sea level rise and shows the number of days in the future when tidal flooding will

occur in Port Isabel. As shown on the graphic, by 2030 (just ten years from now), about one third of the year will experience tidal flooding, meaning low lying roads will be flooded. By 2060, most days will experience tidal flooding. And Port Isabel will not be alone in experiencing this phenomenon. It will happen throughout the coast. And keep in mind that the infrastructure – the roads, the chemical plants – that we are building today are certainly expected to last 40 years, yet are we designing them with these sea level changes in mind? I think not.

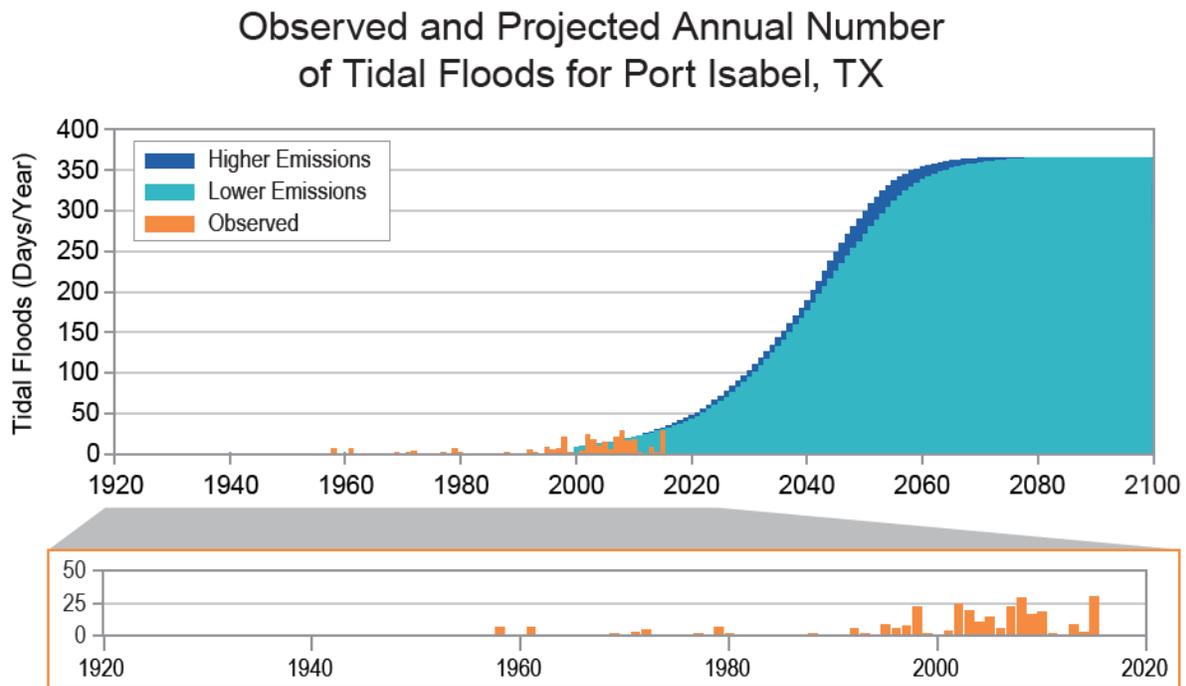


Figure 2. Observed and projected annual number of of tidal floods for Port Isabel, TX. Graphic from National Oceanic and Atmospheric Administration, 2017.

Or consider rainfall. The upper Texas coast has been hit again and again by record-breaking rainfalls. The 100-year flood is a joke when

you get several 500 year+ storms in a few years. As shown in Figure 3, the 100-year rainfall for the Houston area is currently estimated by NOAA to be about 18 inches in 24 hours, up from 13 inches in 24 hours that is used in our current flood plain maps which are, by the way, obsolete. That NOAA update does not look into the future but rather is a statistical report as of the end of 2017 and will soon also be obsolete. At our SSPEED Center flooding conference in October, Larry Dunbar, a noted hydrologist and engineer, stated he thought that our 100-year rainfall amount might be closer to 30 inches in 24 hours based on recent storms. Our roads, our hazardous waste sites, our industries and our cities are being designed based upon obsolete maps. We need to look forward and predict the rainfalls of the future to shape our built environment. We only have so much public and private capital to spend. We need to make what we spend work for us, not against us.

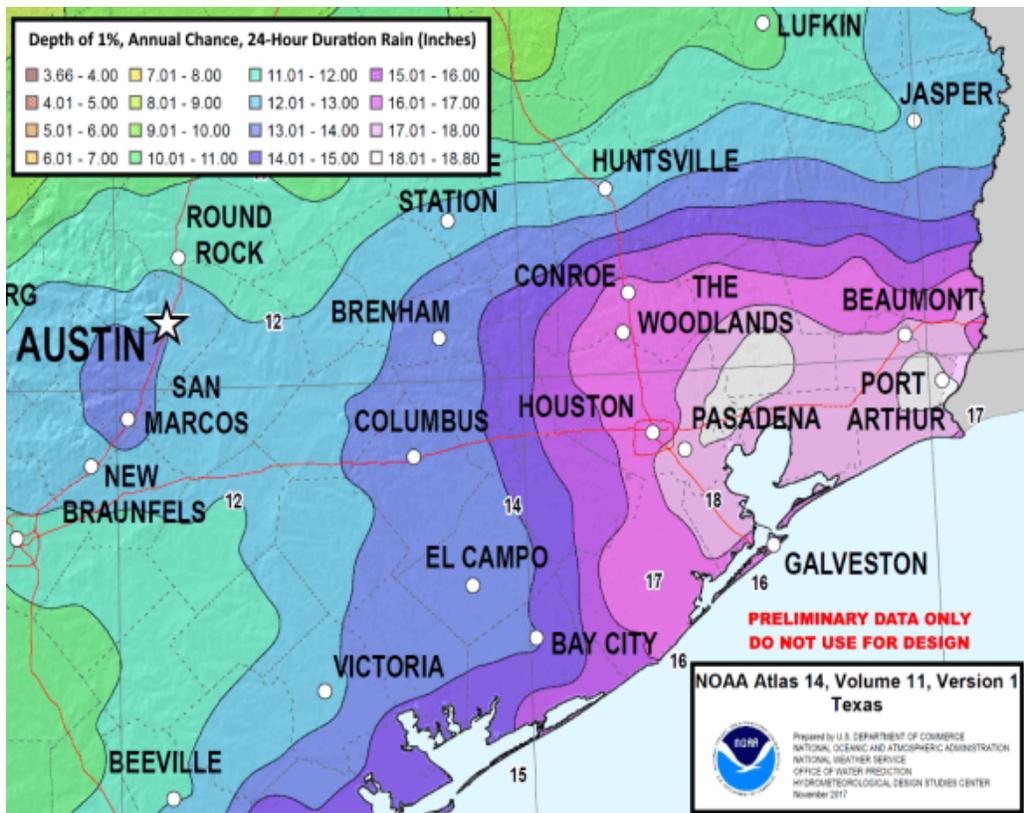


Figure 3. NOAA Atlas 14 revised 100-year rainfall amounts for the Texas Coast. Source: NOAA Atlas 14.

It should not be considered frame breaking to consider facts and act accordingly. Yet, we have been unwilling and unable to do just that. So, as your first frame breaking task, I ask you to consider trying to understand the basics about our changing climate. There are several recent documents out there that contain excellent information. The most recent is the Fourth National Climate Assessment published by the Trump Administration.

[https://nca2018.globalchange.gov/downloads/NCA4\\_Report-in-Brief.pdf](https://nca2018.globalchange.gov/downloads/NCA4_Report-in-Brief.pdf)

So, why don't we start being honest about this important issue and quit hiding our collective heads in the sand.

## **Texas Coastal Exchange**

The Texas Coastal Exchange (TCX) is up and running, and it offers a frame-breaking approach to coastal surge damage reduction and ecological protection while offering a pathway for corporations and individuals to address their contribution to climate change. TCX came from work initiated over a decade ago at Houston Wilderness led by Elizabeth Winston-Jones and me. This concept migrated to the SSPEED Center at Rice where Elizabeth and I searched for ways to create an economic approach to coastal surge damage prevention because regulation to reduce such damage was not going to happen in Texas. Over time, we created TCX as a non-profit 501(c)(3) organization that will become an important land conservation tool for the Texas coast as well as a model for other parts of the United States.

The basic idea of the Texas Coastal Exchange is that landowners are compensated for the ecosystems that they maintain or expand that offer important services to the Texas Coast. Among the services that our coastal marshes, bottomland hardwoods and prairies offer are flood storage, carbon storage in the wood and soil, fish and wildlife production and, further inland, water supply enhancement. Of these, we discovered that storage of carbon dioxide removed from the atmosphere and stored in wood and the soil had the most potential for generating income for landowners because that is how we signal value – through money.

The TCX system works as follows. Industries and individuals emit carbon dioxide from daily activities like driving a car, operating furnaces and air conditioning equipment, heating water, etc. This CO<sub>2</sub> enters the atmosphere where the carbon dioxide concentration has increased

beyond acceptable levels. However, nature has a carbon cycle and atmospheric CO<sub>2</sub> is removed by trees and grasses through photosynthesis and is stored in either the wood or the soil. Each year, our coastal marshes store carbon dioxide in the soil, year after year, as do coastal prairies and our bottomlands store carbon in the wood of the trees. This natural carbon cycle is the key to the Texas Coastal Exchange and is illustrated in figure 4.

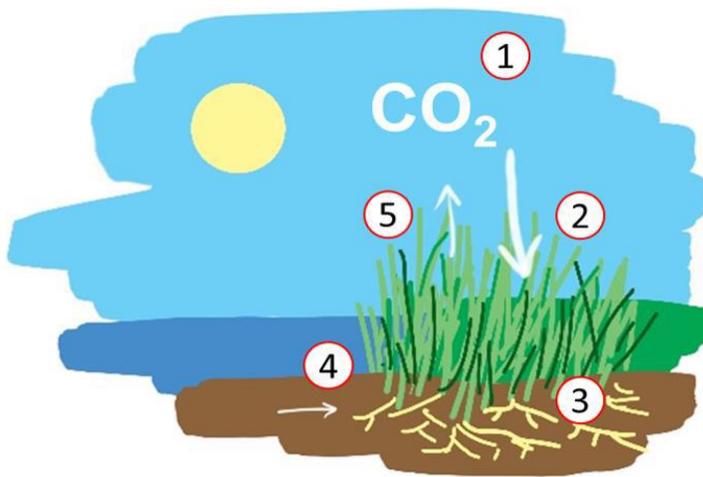


Figure 4. Conceptual diagram of the carbon cycle in a coastal marsh. The carbon dioxide in the atmosphere (1) is taken in by photosynthesis (2) and transported throughout the plant and into the root system (3) where some remains in the soil (4) and the rest goes back to the atmosphere as respiration. The amount of carbon dioxide stored in the soil as carbon increases every year and is the basis of the Texas Coastal Exchange. Diagram by Dr. Azure Bevington for TCX.

In late 2018, the Texas Coastal Exchange made its initial carbon transaction involving Kirksey Architects – the entity wishing to remove its carbon footprint from the atmosphere – and the Galveston Bay Foundation – the entity with the capacity to store the carbon footprint in the Pierce Marsh off of West Bay in the Galveston Bay complex.

Since that time, TCX has developed a web site and has made agreements with the Galveston Bay Foundation and Scenic Galveston as well as two private landowners - one west of Sabine Lake and one on East Matagorda Bay - to provide carbon dioxide storage capacity for citizens and corporations of the Texas Coast. Our current capacity stands at about just over 13,000 tons of carbon dioxide storage for 2019 with that number set to expand significantly in 2020.

All of us have a carbon footprint – the amount of carbon dioxide that we put into the atmosphere in a year. On average (not counting plane flights) an individual living in the Houston region generates about 9 tons of carbon dioxide per year. A family of four with two cars is responsible for about 27 tons per year. Because it is a non-profit, rather than buying and selling carbon storage, TCX asks that you donate \$20 for each ton of CO<sub>2</sub> that you generate. This donation is divided between TCX (\$3 per ton) with the remainder being passed on to the landowners (\$17 per ton). Landowners agree to pooling of the carbon credits, and at the end of the year, donations are divided on a pro rata basis among the participating landowners, with the money being disbursed as grants to maintain and expand these ecological systems.

TCX was created because a suitable system for rewarding landowners for being good stewards and sequestering carbon did not exist. We questioned why it did not exist and decided to create our own system, one that we intend to improve over time. We refused to accept that such a system could not be developed. We simply did it. As far as we know, no other non-profit in the United States is working with landowners to protect ecological systems in this way. We started with coastal marshes because the literature is robust. Our chief scientist, Dr. Azure Bevington, has determined that we should make grants on the

basis of two tons of carbon dioxide storage per acre per year based on this literature. Our intent is to expand into coastal bottomland forests and coastal prairies in 2020. We have generated great interest among coastal landowners and hope to expand our working relationships to include many more landowners throughout the upper Texas coast next year.

This market for carbon storage will serve a very important coast-wide function going forward. The expansion of our coastal marshes as our sea level rises is absolutely necessary to have viable fishing on the coast in future decades. Landowners may be inclined to block the expansion of marshes inland due to the fact that little to no income is realized from marshland. However, if there is the potential of an income stream – a carbon market - then the incentive will be to allow the marshes to expand inland with sea level rise rather than attempting to push it back. In this way, we can preserve and expand our existing carbon sink that is our coastal wetlands.

TCX's system is straightforward. If you like what we are doing, please donate in the amount of your carbon footprint and we will store it in the soil of the Texas coast. We use a block chain system to allocate and maintain our carbon donations and grant payments. We are transparent and clear in our operating system. We are about protecting the coast and using carbon footprint donations to fund that protection. The landowner maintains control of their land. We work with the landowners. We do not own or want to own land. Our role is to simply make these transactions easier and defensible. Our primary focal area is shown in Figure 5. The boundaries correspond to the high-risk surge zone of 20-foot elevation on the upper coast, and the ecological systems within the coastal counties are shown in Figure 6.

And these systems and money are indeed what we are talking about at TCX.

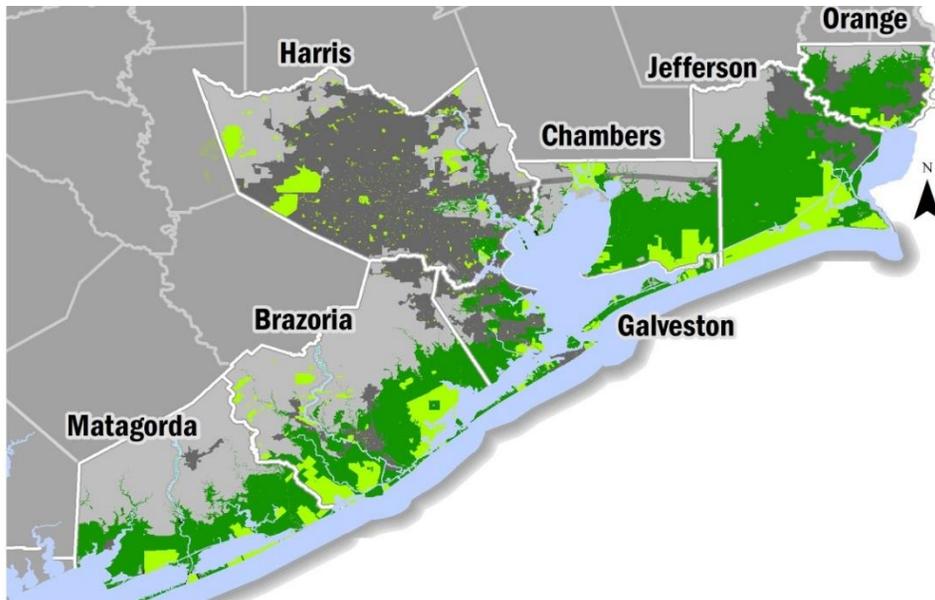


Figure 5. The target area for the Texas Coastal Exchange is shown in dark green with the lighter green representing areas along the coast that are already protected. Image by Christina Walsh.

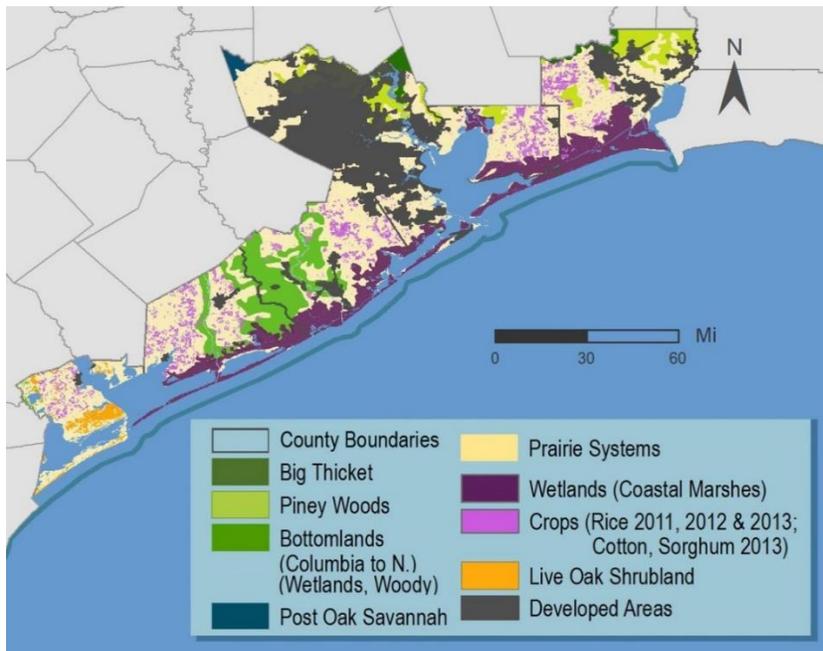


Figure 6. Ecological systems of the upper Texas coastal counties. The coastal marshes are shown in dark purple, the bottomland forests in bright green, the coastal grasslands in light yellow, the cropland in light purple and the developed land in dark gray. These coastal ecosystems will be part of a Texas approach to addressing climate change. Image by Christina Walsh from *A Texan Plan for the Texas Coast*.

So, for your second frame breaking challenge, go to the web site of the Texas Coastal Exchange and calculate your carbon footprint. And then, to really break your frame of prior thinking and action, send a donation to Texas Coastal Exchange in an amount sufficient to pay a landowner to store your carbon emissions in their soil. The website can be found at <https://www.texascoastalexchange.org/>. Or to really break the frame, consider giving someone a holiday gift of their carbon footprint stored in the soil of a marsh on the Texas Coast through TCX.

### **Whooping Cranes and the Guadalupe Blanco River Authority**

An innovative agreement was negotiated in 2016 between The Aransas Project (TAP) and the GBRA that continues to yield surprises. This agreement came after TAP had won a huge victory in federal court in Corpus Christi which found that the state has killed 23 whooping cranes with the water allocation process on the Guadalupe River. These deaths were related to the reduction in freshwater inflows to San Antonio Bay which changed the salinity regime which reduced the supply of blue crabs upon which the cranes depend. The decision by Judge Janis Jack ordered the development of Habitat Conservation Plan to develop a system to better protect the endangered whooping cranes. This decision, however, was reversed by the 5<sup>th</sup> Circuit Court of Appeals. To those of us fighting on behalf of the cranes, it seemed as if

all was lost when the U.S. Supreme Court refused to review the case, and then the improbable happened.

Molly Cagle, the attorney for GBRA, Bill West (then General Manager of GBRA) and I met in Seguin and struck an agreement to work together to try to develop a plan to benefit whooping cranes and the health of San Antonio Bay. Shortly after this agreement was negotiated in 2016, Bill West retired and Kevin Patteson became the general manager, and Kevin and I negotiated a second agreement that focused on four key issues – (1) working to expand whooping crane dedicated habitat, (2) working to improve the Guadalupe River delta into San Antonio Bay, (3) development of a concept of a so-called refugium to ensure that San Antonio Bay would always have a protected estuarine zone and (4) exploration of the applicability of the Texas Coastal Exchange to restoring grasslands and seeps and springs for base flows in Guadalupe River.

About two years into the process of working on these issues, GBRA hired Nathan Pence to take over the implementation of this agreement. In turn, Nathan also began working with U.S. Fish and Wildlife Service and proposed to the board of GBRA in the spring of 2019 that GBRA develop a Habitat Conservation Plan that covers not only the whooping cranes but also the various endangered mussels and salamanders that exist in the Guadalupe River basin up into the Hill Country. This proposal was affirmed by the board in May 2019.

At this time, GBRA is putting together the financing to implement a habitat conservation plan for the Guadalupe River and San Antonio Bay. This is an unprecedented activity, and there is much work yet to be done. However, the important point is that this agreement came out of two strong parties on opposite sides of a key coastal issue – the

ecological integrity of the San Antonio Bay estuary and the long-term viability of the last wild flock of whooping cranes on the Earth. To these ends, we have found a way to work together, something the betting odds would have been against back in 2011 when the litigation was first filed.

The will to fight is important in protecting the coast. For some organizations, a decision to litigate would be frame breaking. For others, it is the only path forward. Regardless of why, or even if, the hardest issue in fighting is knowing how to win. Winning is not necessarily putting a stake in the other side's heart; indeed, this seldom happens. Winning is moving forward on our large-scale coastal goals – healthy coastal ecosystems, productive estuaries, industrial plants that perform competently, a future with jobs, a coast that can absorb big storms with minimal damage, talking about climate change. And perhaps most of all, winning will result in a coast that we can deliver from our generation to those that come after us – one that is ecologically, economically and socially sound.

Today, GBRA finds itself in another difficult situation. Several dams built on the Guadalupe well over 50 years ago have either failed or are at risk of failing. This in turn has engendered lawsuits and hard feelings. I understand those feelings. However, I have this to say to those of you caught in this situation. We at The Aransas Project have been able to work with GBRA and Kevin Patteson and his staff. They have kept their word with us. I would hope that you would give them a chance to work with you on this difficult situation. We were in a similar difficult situation, and we have had good results so far.

## **Formosa Plastics**

Once again, the Texas Coast owes a thank you to Diane Wilson of Seabrook, a continuing, powerful advocate for the Texas Coast. Diane recently led a legal fight that resulted in a judgment against Formosa Plastics of Point Comfort in federal court for violating its wastewater discharge permit for discharging more than trace amounts of plastics in its water discharge. She was represented by Texas Rural Legal Aid and attorney Amy Johnson who did a great job as well. The bottom line is that a \$50 million agreed judgment was negotiated that will be funding projects in Matagorda and Lavaca Bays for several years to come, another excellent outcome.

This case was about plastics in our waterways, an important new focal point in the evolution of modern industry, an issue that is doubly relevant along the Texas Coast due to the ongoing, massive expansion in the plastics industry. This case was not about the various types of air, water and solid waste toxics that were the focus of the settlements with which I was involved in the 1990s, and it was not about plant safety or explosions; instead, it was about pellets floating in the storm and wastewater - pellets that are often referred to as nurdles - pellets that are but one of many aspects of the plastics that are accumulating around the world - plastics that are unacceptable in our water - plastics that must be addressed differently in the future.

In direct response to the litigation, Formosa is building a large detention pond that will hold all stormwater runoff and allow the plastics that are picked up in rainfall runoff to be removed from the stormwater that will be recycled rather than discharged into Lavaca Bay. Beyond that, Formosa is investigating zero discharge of

wastewater, a move that has been advocated by Diane and me since the 1990s. And it might just happen yet, an event that would represent a true frame-breaking approach for the Texas coast.

After the judgement was entered, I learned that Ken Mounger, the plant manager at Formosa when the various settlement agreements were negotiated and implemented in the 1990s, had been promoted to lead Formosa Plastics in the United States. Ken and I had worked well together during a very difficult period dating back twenty-five years, and recently we reached an agreement for me to undertake research at Rice University about the future challenges for the plastics industry and to identify the options that exist for responsible plastics operations in the future.

I hope to have more to report on this as we move forward. But one thing is clear. The economic realities surrounding the plastic industry are changing. Supply chains – those involved in either supplying manufacturing inputs or buying products – are a huge part of the change that is coming to all business sectors in the future. If major buyers begin to ask that things be done differently by their suppliers, it can have a huge impact. In this regard, there are at least three key issues – climate change, the circular economy and the seventeen sustainable development goals of the United Nations – that will define the future of the plastics industry. These three subjects and the ramifications of these subjects throughout the supply chain will change United States and global business in the future. The companies that survive will be the companies that understand these changes and embrace them for that is where the money will be found.

These are the issues that Formosa has asked me to research – not just for them but for public use and dissemination. It promises to be quite interesting. Stay tuned.

### **Matagorda Bay Foundation**

As promised in the last coastal newsletter, the Matagorda Bay Foundation is changing. In this last year, Bill Balboa has joined us as our full-time Executive Director, and it has made a difference. Bill is focused on restoration and enhancement of the bay, and he is starting by addressing damage done by a relatively small hurricane in 2003 named Claudette. Claudette destroyed several important reef systems that in turn protected wetlands. When the reefs were lost, the wetlands went soon afterwards. As a result, Bill has secured two grants to reconstruct the reef complex at Oliver Point – Coon Island Bay and to create the Redfish Lake-Salt Lake Living Shoreline project off of Carancahua Bay. The location of these projects is shown in Figure 7.



Figure 7. Location of the Oliver Point – Coon Island Bay project and the Redfish Lake and Salt Lake project.

Regarding Oliver Point, the Matagorda Bay Foundation was recently awarded funding from the Texas General Land Office CEPR program, and the U.S. Fish and Wildlife Service Coastal Program to begin the engineering, design and permitting of a project to protect shorelines, and restore important oyster reef and marsh habitats in West Matagorda Bay. The project site is located at Oliver Point, a few miles south of Palacios, Texas near the confluence of Tres Palacios and Matagorda Bays. The area is an extraordinary example of central Texas estuarine diversity and is characterized by the uniquely proximal locations of several important estuarine habitats including oyster reef, tidal marsh, submerged aquatic vegetation and fragile shell ridges at Oliver Point and Coon Island Bay. Decades of tropical storms and strong, wind-driven waves have resulted in significant shoreline loss at Oliver Point, catastrophic damage to Oliver reef, a large nearshore

oyster reef, and now threatens fragile habitats in the adjacent Coon Island bay system.

The restoration of Oliver reef and construction of a living shorelines breakwater will not only protect and enhance the tidal marsh habitats at Oliver Point, it will also restore the structural, physical, and biological functionality of the area and provide critically needed protection to the remnants of the fragile shell ridge habitat, shallow vegetated areas and wetlands in Coon Island Bay. The shell ridges at Coon Island have a long history as a nesting area for Black skimmer and American oystercatcher, and as significant loafing and foraging areas for brown pelican, terns, gulls, and coastal wading birds. The juxtaposition of submerged oyster reef with tidal marsh, shallow bay and submerged aquatic vegetation creates extraordinary opportunities for recreational anglers seeking spotted seatrout, red drum, sheepshead, and tripletail. This is our first foray into the coastal habitat restoration and enhancement arena, and we want to identify and engage partners interested in working with MBF to help us realize the full potential of these projects. If you are interested in participating in this effort please email [bbalboa@matbay.org](mailto:bbalboa@matbay.org) or if you'd rather assist through a donation to the cause, our donor site is <https://matbay.org/donate-page/>.

Our second project involves Redfish Lake and Salt Lake which are small, highly productive coastal lakes located near the mouth of Carancahua Bay in the Matagorda Bay ecosystem. The bay shores are fringed with tidal marsh, and the bottoms are covered with a unique combination of shallow water oyster reef and submerged aquatic vegetation and seagrasses. In 2003 hurricane Claudette created a deep scour channel at the location of a shallow wash over into Redfish Lake.

Over the past 16 years, the scour channel has grown deeper and wider and collateral damage to shallow oyster reef and seagrass habitat in Redfish Lake has grown proportionally. The destructive effects of the growing scour channel have recently extended into neighboring Salt Lake through a breach in the narrow peninsula that separated Redfish Lake and Salt Lake.

This area was identified as a high priority project in MBF-directed strategic planning efforts and subsequently added to the Texas General Land Office's Statewide Coastal Resiliency Master Plan published in 2019. The MBF partnered with the Texas General Land Office, USFWS, Texas A&M University, Freese and Nichols Engineering and Texas Parks and Wildlife to study the area and identify effective techniques to prevent further habitat loss and address the growing scour channel into Redfish Lake. During the spring of 2019 we engaged a cadre of volunteers from the Matagorda CCA and Port Alto Association and funded an effort that placed >100 cubic yards of oyster shell into the breach between Redfish and Salt Lakes.

On another note, for years, the Matagorda Bay Foundation has been litigating against the Lower Colorado River Authority (LCRA) over water for Matagorda Bay. This is perhaps the most important issue to the future of Matagorda Bay, and the Matagorda Bay Foundation is breaking its own frame and trying a different approach. In 2020, MBF will make a concerted effort to engage and work with LCRA in a totally different manner than in the past. Under the leadership of board member Mark Rose, MBF will attempt to create a working relationship with LCRA that will make a difference to the future of Matagorda Bay. We are hopeful that the LCRA will be open and willing to work with us on this effort.

Matagorda Bay is an underappreciated asset on the Texas coast. How many of you have actually been to Matagorda Bay? Come visit our web site at <https://matbay.org/who-we-are/>. In fact, to practice frame breaking, why not visit Matagorda Bay? Come to Palacios and stay at the Peaceful Pelican. Get a fishing guide out of Sargent or Matagorda or Port O'Connor. Or perhaps birdwatch down at the mouth of the Colorado River where it runs into the Gulf. This is an amazing place with some of the most beautiful wetlands on the Texas coast. So, come on down and visit.

### **Galveston Bay Park Plan**

In the last several coastal updates, I have discussed a concept for protecting the industry and people on the western shoreline of Galveston Bay called the Galveston Bay Park Plan. This plan was developed at the SSPEED Center of Rice University and proposes the construction of an in-bay levee system along the Houston Ship Channel – a levee that would extend from the Texas City levee system on the south to Houston Point in Chambers County to the north. The concept of the Galveston Bay Park Plan is shown in figure 8. The material to build the levee is proposed to come from widening the Houston Ship Channel from a proposed 700 feet to 900 feet and environmental and recreational features will be added.

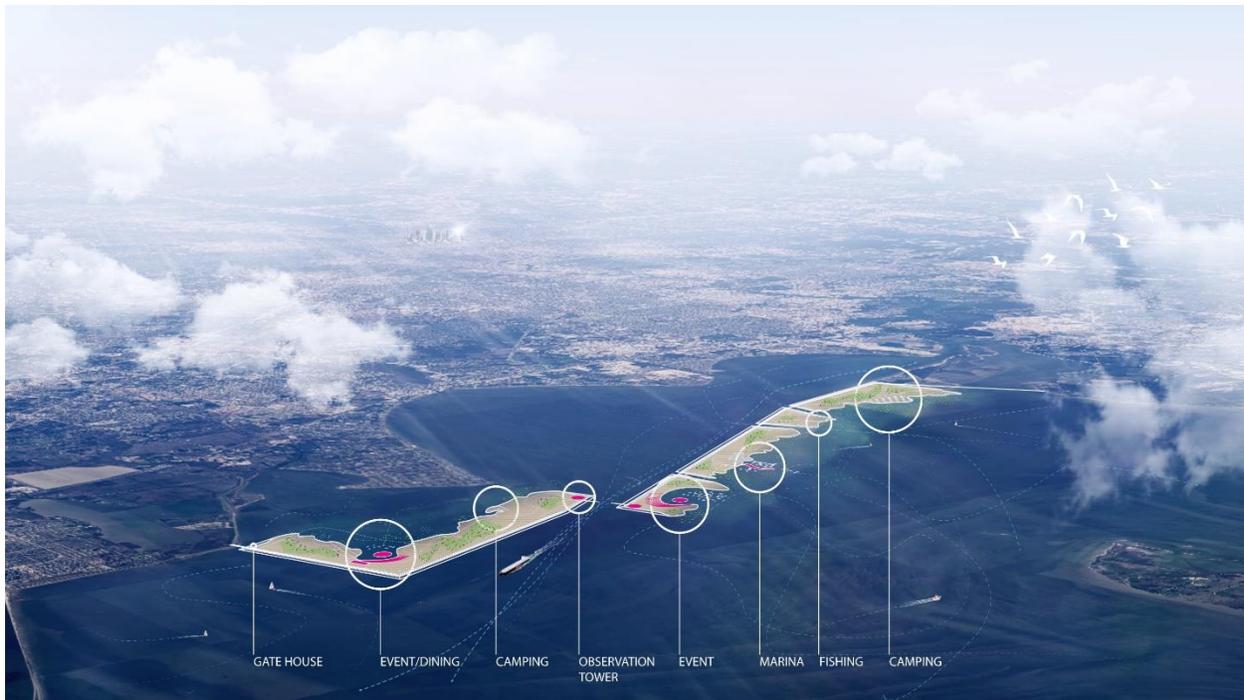


Figure 8. A conceptual rendering of the Galveston Bay Park Plan is shown above. The levee is constructed from clay dredged from Galveston Bay in order to widen the Houston Ship Channel. The cells behind the levee are filled over time with dredge material to create wetlands and recreational areas that would offer significantly improved public access to Galveston Bay. Image by Rogers Partners for SSPEED Center.

The Galveston Bay Park Plan is a frame breaking concept in many ways. First, as someone who has spent decades fighting to protect Galveston Bay, it was extremely hard for me to accept structural intervention into the bay, yet because of the severe storms of the future and the industries and population that would be impacted, I felt we had to take some affirmative action. Doing nothing will only guarantee the ruin of Galveston Bay from the release of toxic materials and oil from the storage tanks destroyed by the storm surge. Second, the integration of flood protection, navigation improvement, ecological restoration and recreation into a single project is unprecedented in the

United States. Third, this flood protection/navigation project is not proposed as a federal project but rather as a local governmental project to be constructed under permits issued by the Corps, something very new. Fourth, the Galveston Bay Park Plan has been identified as being compatible with the Corps of Engineers coastal barrier project in a press release issued jointly by the Corps, the General Land Office of the State of Texas and the SSPEED Center at Rice, another first. And fifth, it is proposed to be financed using innovative financing methods such as social impact bonds never utilized on a project such as this – one that is preliminarily projected to cost \$3 to \$6 billion.

At the current time, both Harris County and the Port of Houston are evaluating whether to proceed with funding detailed engineering design and permitting of this project. At the same time, the Corps is re-evaluating its coastal barrier project and has determined to propose the construction of sand dunes rather than levees along the Bolivar Peninsula and the West End of Galveston Island. Additionally, the Corps is redesigning the proposed gate structure across Bolivar Roads between Galveston and Bolivar to reduce the impacts of the gate on tidal flows and marine productivity. These revisions should be forthcoming in 2021.

Unfortunately, with or without the Corps' coastal barrier, the Galveston Bay western shoreline remains unprotected from hurricane storm surge. With the coastal barrier, sufficient water exists in Galveston and Trinity Bays to generate a 15 to 20-foot surge. Without the barrier, a 22 to 25-foot surge is a reasonable expectation. The flood depth from a 20-foot surge in the area surrounding the Bayport Industrial complex and Clear Lake is shown in Figure 9. This area would

certainly be flooded without the barrier and could be flooded by a surge of up to 20 feet with the barrier, depending upon the storm.

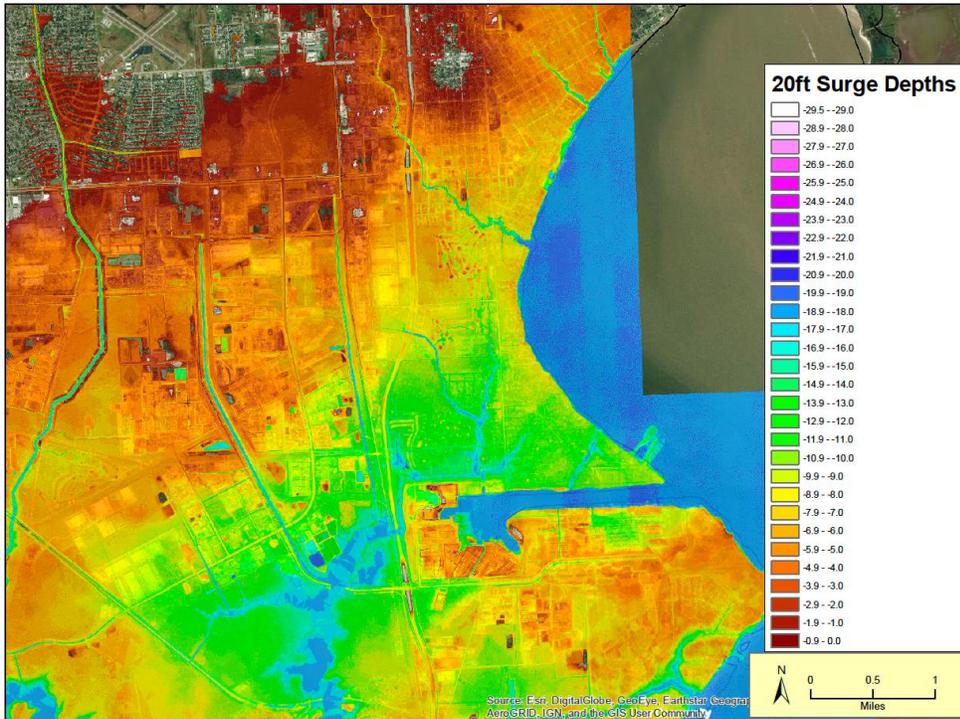


Figure 9. The flood depths from a 20-foot surge in the vicinity of the Bayport Industrial Channel which is also shown in Figure 9. The areas in green will be inundated between 10 to 16 feet in depth and the yellow and orange areas will experience flooding of from 4 to 9 feet. The areas in red will experience flooding inches deep to up to 4 feet. For reference, State Highway 146 is the north south road just to the left of the end of the Bayport Channel. Source: SSPEED Center, Rice University. Graphic by Rik Hovinga.

No area is more vulnerable to significant environmental damage than are the various tank farms that exist in Bayport and along the Houston Ship Channel. As we review more and more evidence of the destructive nature of these big storms, it is clear that the floatation of storage tanks by storm surge may be one of the largest dangers.

Perhaps more important though is the movement of containers by the storm surge. As can be seen in figure 10, containers were found in the debris field of hurricane Dorian in the Bahamas. If the containers from Bayport were floated by a 20-foot surge and moved inland, note the tank farm just to the west of those containers shown in Figure 11. If a container were being moved by a large wave, it is doubtful that most of these tanks could withstand a direct hit by that container.



Figure 10. Image of the destruction after Hurricane Dorian in the Bahamas. Note the containers amidst the debris.



Figure 11. Aerial image of the Bayport industrial channel showing the proximity of container storage (center right) to a major tank farm (center left).

These are the issues that bother me each time hurricane season rolls around. My greatest concern is the fact that there does not seem to be any sense of urgency to solve this extremely risky problem – an issue again related to our attitude about climate change. I can't remember how many times I have been told "But we've never had a storm that big before"! However, there is a sense of urgency within the oil and gas community to expand the ship channel to allow two-way traffic, and therein lies the chance for the construction of the Galveston Bay Park Plan. Sometimes you simply have to find the wave that is coming and ride it.

## **Lone Star Coastal National Recreation Area**

The Lone Star Coastal National Recreation Area is another frame-breaking concept that is being implemented today on the Texas coast that was conceived through the green think tank of Houston Wilderness led by Elizabeth Winston-Jones and me. For over a decade, this concept has been studied and developed by the SSPEED Center, the National Parks Conservation Association and most recently the Lone Star Coastal Alliance. It promises a different type of economic activity here on the coast.

The basic concept of the LSCNRA is to create flood-resilient economic activity in the low-lying areas of our coastal counties. The original idea was to create a unit of the National Park Service called a national recreation area that would be quite different than the traditional national park unit. Instead of ownership by the National Park Service, the idea here was to link the 200,000+ acres of existing protected lands into a network of eco-tourism sites that would be marketed as a national park destination by the National Park Service under an agreement with the owners of these different protected lands such as national wildlife refuges, state parks, state wildlife management areas and non-governmental organization lands, all of whom would continue to own and manage the lands under their own guidelines.

Among the best-kept secrets of the Texas coast is its birdwatching which is truly world class. How many of you reading this are aware of the wonderful birdwatching that surrounds Houston, as well as the coastal kayaking/paddling and fishing? Our bays and our coastal ecosystems should be our playground, and they are not for most people living in the Houston region, much less those from around Texas

and the nation. In fact, most are not even aware of this world class asset. I was recently birdwatching in England and ran into a group of about ten birders watching hawks and five of them had made the trip to the Texas coast to birdwatch. All of us should know High Island, the Bolivar Flats, the Columbia Bottomlands, the Quintana Neotropical Bird Sanctuary and many other locales where we can see fabulous birds during most times of the year but especially in the spring.

The goal of the LSCNRA is to establish an organized infrastructure to begin to realize the economic potential of eco-tourism on the Texas coast. The LSCNRA itself has proven difficult to get off the ground due to the fact that it requires the passage of federal legislation. However, there is now interest on the part of the LSCNRA coalition, which includes upper Texas coastal counties, cities, CVBs, chambers of commerce, civic organizations and non-governmental organizations in moving forward with a regional collaboration focused on tourism and coastal resilience under the stewardship of the Lone Star Coastal Alliance. This collaboration promises to jump-start eco-tourism on the upper Texas coast, and it may stimulate Congress to move forward with passage of the enabling legislation.

The important point is that there is both viability to and interest in an economy arising from our ecological system. This economy requires low to no infrastructure, thereby avoiding destruction by storms, and it recovers faster after the fact. It is mobile and resilient. And it breaks the frame of our economic thinking.

## **Port Aransas and Harbor Island**

Port Aransas and Harbor Island are in extreme ecological, economic and social jeopardy from oil and gas-related expansions arising from West Texas shale development. Several projects have recently been announced that would cause significant environmental impact to Aransas and Corpus Christi Bays and cause significant disruption to this peaceful coastal town that so many of us enjoy. And it simply does not have to happen.

As shown in figure 12, the Port of Corpus Christi has proposed to deepen the Corpus Christi Ship Channel to 78 feet in order to allow supertankers to come into Harbor Island which is where the ferry lands. Additionally, a desalination plant is also proposed to be constructed on Harbor Island and the “reject water” – the concentrated brine and other concentrated materials removed from sea water – is proposed to be disposed in the ship channel and the pass that is a key part of the ecology of Aransas and Corpus Christi Bays. The location of the two terminals are shown in Figure 13, leading to a total of 4 supertankers docking at Harbor Island. The path of the desal discharge is also shown on Figure 13.



Figure 12. Map showing proposed 78-foot deep water channel into Harbor Island by dotted line and the 50-foot deep Corpus Christi Ship Channel in white. Also shown are the Texas Gulf Terminals offshore monobuoy in blue and the Bluewater Texas Terminal monobuoy in pink. Image by Sustainable Planning and Design.



Figure 13. The VLCC terminal (pink) and the Axis terminal (red) are proposed for Harbor Island where the ferry lands (black dotted line). The proposed desalination “reject” discharge is shown in yellow. Image by Sustainable Planning and Design.

The frame breaking point of this situation is that there are two offshore monobuoys that are also proposed. I joined the team in support of the Texas Gulf Terminals project because I have learned that in Texas, it is not sufficient to simply oppose a project. You also have to solve the problem which in this case is providing for the export of oil from West Texas. As a frame breaking concept, I propose that the environmental community and the government support these two offshore terminals as well as a third one proposed off of Freeport. There is no need to suffer the environmental harm from the deepening of the ship channel or from the onshore port. Offshore monobuoys have operated safely for decades. Given that some export facility will

be constructed, we should all support these offshore monobuoys because they promise the least possible damage to the Texas Coast.

The Port Aransas Conservancy is fighting these Harbor Island projects and needs all the help that they can get. You can find their web site at <https://portaransasconservancy.com/>. Please consider making a donation help them. Donation can be made directly to their fiscal agent, The Aransas Project, at 4709 Austin St., Houston, TX. Please note that the donation is for the Port Aransas Conservancy but make checks payable to The Aransas Project.

### **Religion, Spirituality and the Texas Coast**

While I am in a frame breaking mood, I may as well venture into religion and spirituality. For me, an outing on the Texas coast is spiritual. It renews my soul. It connects me to something larger than myself. By being submerged in nature as a part of life and living things, I am affirmed as alive. I am defined by that spiritual essence. It and I become one, and it restores me.

Although we don't hear much about it, there is a very strong Christian literature in support of the protection and enhancement of the "garden". In Genesis, God made the Earth and it was good. Who are we to destroy that which is good? Earthkeeping has emerged as a pivotal concept in this literature which dates back to the mid-1980s. The Psalms are often cited in support of the celebration and protection of the Earth. In the New Testament, the concept of stewardship emerges which is the concept of care of the home. Interestingly, both the words ecology and economics have their origin in the Greek word *oekonomia*, which means care of the household, which is also the

concept of stewardship. There is even a concept of the Trinity which interprets the Earth as the manifestation of the Holy Spirit, a really interesting and humbling concept.

However, nothing is quite like the encyclical *Laudato Si* put out by Pope Francis in 2015. In this document, Pope Francis clearly establishes the protection of the Earth as part of Catholic dogma, but he goes well beyond that to discuss climate change and the need for all to address this global issue. He is particularly concerned about the impact of climate change on the poor who are least able to respond to these challenges. He clearly discusses faith, ecology, human duties and climate change in a new and different way. And according to a theologian I consulted, the Pope's proclamations are due significant deference and respect as the final authority on issues of faith and morality within the Catholic Church. Powerful stuff. If you are interested, you can access *Laudato Si* at the following address: [http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco\\_20150524\\_enciclica-laudato-si.html](http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html).

The point here is that in addition to not talking about climate change, we also don't talk or hear much about the Christian theology of environment. I would love to hear the voice of religion enter the discussion about appreciation and protection of the Texas coast. I would welcome religious institutions to begin to talk about climate change from the perspective of their institutional beliefs, which do vary quite a lot. If these discussions are occurring in churches, I would like to hear about it. Contact me at [jbb@blackburncarter.com](mailto:jbb@blackburncarter.com) and let me know about it. And if your church or congregation would like to really break their frame of thinking, talk to me about sequestering their carbon footprint.

## Conclusion

In closing, let me wish all a happy holiday season. And with great holiday cheer, I want to return to frame breaking and urge you to break your frames. Talk about climate change with someone. Do something outside of your normal patterns and thinking. Push your comfort zones. What if we all started pushing these boundaries? It is only by having a large group of us take these steps can we achieve the changes that are going to be necessary. This is a stepwise process – one foot after another at your own pace. The point is that you have to pick that foot up and step out of your frame. If you don't start, you will not get there.

As usual, I will conclude with some poems about the coast that I love, and I have added the beautiful art work by Isabelle Scurry Chapman which is featured in our new book *Hill Country Birds and Waters: Art and Poems* which is an excellent holiday gift selection (contact me a [jbb@blackburncarter.com](mailto:jbb@blackburncarter.com) and I will provide as many copies as you wish at \$22 per copy plus postage). Or how about sending someone the holiday gift of their carbon footprint stored in the soil of the Texas coast. Just go to <https://www.texascoastalexchange.org/> and donate to sequester your footprint. That will ensure happy holidays (with apologies for the shameless merchandising at the end).

## **Unknown Warbler In The Marsh**

On the back side of the Matagorda Peninsula  
Wade-fishing on a stormy day.

The sky is dark, the wind blowing hard,  
The sky spitting down rain every now and then,  
A day that finds me wading down a bayou  
Cut by storms of long ago,  
A bayou lined by marsh grass that is full  
Of finger mullet and shrimp and crabs  
That find sanctuary in the stems and roots  
That hide them from the redfish  
That is just as much a predator as is  
The lion of the Serengeti  
Or the Grizzly bear of the mountains.

My eye catches a bird fluttering against the wind,  
A small brown and yellow bird that is failing  
In its attempt to fly,  
A bird that spirals down to the marsh grass  
Where its spread wings become lodged,  
A bird exposed to the elements, to me,  
A bird so tired that it cannot fly any further,  
A bird that I slowly wade past as its eyes  
Watch my every move,  
A bird that I leave behind to rest,  
To find its way.

And later when I return, the bird is gone,  
Strength revived, the will to live  
Pushing it on to its nesting grounds  
A thousand miles to the north.

Today years later I see the eyes of that warbler,  
So vulnerable, needing a place to rest,  
Needing food and water to continue on  
And I redouble my efforts to save that which is natural  
And wonderful on the coast of Texas  
That I love.



Figure 14. Image of fallen warbler by Isabelle Scurry Chapman.

### **The Purple Gallinule**

At Anahuac National Wildlife Refuge in the fog.

The fog lies gently on the flat marshland,  
Moving slowly as if the breath of East Bay,  
Floating droplets moving through the grasses  
Rising up from the dark fresh water that is home to  
The furry nutria and the scaly alligator,

Water caressed by plants that lie upon the surface  
To be glided upon by the purple bird of the marsh  
That barely ripples the surface as the long toes  
Spread and land on one plant after another,  
A pathway walked upon the water.

Oh my. The smell. The sight.  
To feel the essence of life – raw, primeval,  
Like it was at the beginning,  
The Earth and life coming together,  
Sucking me into the marrow of marsh,  
Within what some Christian faiths believe to be  
A part of the Trinity, the Earth and the Holy Spirit,  
One together, not apart, one and the same,  
And I am cleansed by the water of the marsh  
That floats on through the leaves,  
To once again shroud the purple leaf walker,  
Leaving me whole.



Figure 15. Purple Gallinule by Isabelle Scurry Chapman

### **The Green-winged Teal**

The sky blooms purple and gold,  
The sun still hiding beneath the rim,  
Twenty or so wildly flying bodies  
Streaking down the bayou pathway,  
Wildly weaving from side to side,  
Banking as if to land,  
Only to blast away  
To do it again and again.

Such a beautiful wisp is the green-winged teal,  
All air and sound and speed  
Epitomizing that which defines alive,  
Articulating by action the inalienable right  
That belongs to all Earth residents -  
The right to continue to exist  
Through the time of humans.

And later when I see the mixed flock  
Of big ducks and their smaller partners,  
I smile as I think of the lovely little one  
Giving nothing away to its cousins,  
Flying beat for beat with the mallard  
And the pintail and the grey duck,  
Making them jealous of red and green majesty  
And the ability to turn on a dime  
To land in that secluded place  
Away from the maddening crowd  
Where they find peaceful rest.



Figure 16. Greenwing Teal by Isabelle Scurry Chapman

### **The Tree Swallow**

On the road leading into the Brown and Root Ranch  
On the northern shore of East Bay with Glenn Olsen.

The sun has risen over the Gulf  
That is just beyond the edge of our vision,  
The light reflecting upon the prairie snow,  
The plants covering the field as a white blanket,  
And I breath in the air of life and living things  
That permeates my soul and am transported.

The small birds rocket past just above our heads,

Greeting us along with the day,  
Most with the red collar of the barn swallow  
But then one that is different,  
More white underneath, no red, a darker back  
And Glenn yells that a tree swallow has just passed,  
A different visitor and as my eyes grow accustomed  
I see another and another and yet another.

Such is the way with nature – subtle yet open  
To those who look, to those who search  
For the mystery within the obvious,  
For the details that reveal a complexity beyond  
Our comprehension, beyond our ability to design,  
An ecosystem – a system of living things working  
Together to support and maintain – to sustain –  
Life of the collective -  
A collective that includes a jewel that is  
A tree swallow revealed flying across the  
Snow-covered prairie on a hot September day.



Figure 17. Tree Swallow by Isabelle Scurry Chapman.

### **The Wood Duck**

Deep in the San Jacinto River bottomlands  
On a cool clear day in February.

My uncles called them squealers,  
The beautiful little duck of the bottomlands,  
Decorated by Picasso,  
Green, white, maroon, gray, black, blue –  
Oh my – such a bird.

The squeal explodes into the timber,  
And echoes down the meander lake,  
Echoing the disdain of being disturbed,  
Echoing concern about the fate of this land  
That lies directly in the path of space city,  
A relentless goliath on the move,  
A goliath with an insatiable appetite  
For more land, for more growth,  
Yet goliath could have a green underbelly,  
A green reality of bayous, rivers and streams,  
Waterways made up of living things and recurring floods,  
Waterways that demand with amazing frequency  
That goliath respect some limits.

The squeal becomes a message –  
A communication about the need for urgency  
And creativity and persistence -  
About the need to find a way to merge  
The needs of the squealer and the goliath,  
A plea delivered on a cold day in the winter  
In the San Jacinto bottomlands.



Figure 18. Wood Duck by Isabelle Scurry Chapman.