

Holiday Coastal Newsletter 2018

By Jim Blackburn

I hope that you enjoy this 2018 version of my holiday newsletter that presents various issues that have occurred along the coast in the last year. Our coast is an important and wonderful resource to have for ourselves and for those who come after us, but only those of us living today can take steps to ensure its future. This newsletter is dedicated to preserving that future and to inspiring all of us to work for the coast.

This report has several separate sections that include reporting on (1) Formosa Plastics update, (2) climate change and the Texas coast, (3) the GBRA-TAP Agreement on San Antonio Bay, (4) the restructured Matagorda Bay Foundation, (5) the Texas Coastal Exchange, (6) the Oil Boom and the Coast, (7) Protecting the Houston Ship Channel, and (8) Concluding Comments and Some Poems.

I hope that you enjoy this newsletter. If you do, please forward to someone else who might appreciate it. Happy holidays!

1. Formosa Plastics

This newsletter started as a report on the original settlement agreement reached between Formosa Plastics and me in the mid-1990s as well as subsequent agreements signed with Formosa by Diane Wilson of Seadrift and me. Due to these agreements, Formosa's compliance and safety record showed significant improvements that have been maintained and improved over the last two decades. However, that does not mean problems do not occur. Recently, an issue has emerged regarding the release of plastic pellets which are

known as “nurdles”. These pellets, which are shown in Figure 1, are not toxic per se but mar our shorelines and can be deadly when ingested by fish and wildlife.



Figure 1. Nurdles collected from a beach. Photo courtesy of sustainable coastlines.

<https://www.flickr.com/photos/sustainablecoastlines/24895585669/>.

The release of these pellets is often the result of loading and unloading operations for rail cars and trucks as well as from poor handling and housekeeping practices by truckers and plants rather than manufacturing plant problems and upsets typically associated with toxics issues. This situation has led to the filing of a new federal lawsuit, *San Antonio Bay Waterkeeper and Diane Wilson v. Formosa Plastics*, <https://www.courthousenews.com/wp-content/uploads/2017/08/FormosaPlastics.pdf>. Diane lives on San Antonio Bay and is a long-time environmental activist formerly involved with commercial fishing and a fearless protector of the bay.

In the work done under the various agreements with Formosa, the issue of nurdles was never addressed. Instead, the focus was upon toxic air and water releases, hazardous waste management, process safety management and plant safety and health practices. Today the good news is that those issues appear to be much better managed and controlled, but the continued release of pellets from Formosa or any other plastics manufacturer or transporter is simply unacceptable. Time will tell whether the federal court will find against Formosa or not, but an often-overlooked benefit of filing federal litigation is that it brings the focus of many different agencies and citizens on worthy issues. Nurdles have been overlooked in the past and focus upon this important issue hopefully has been achieved.

This issue is particularly important given the unprecedented expansion of ethylene plants and new plastics facilities along the Texas coast. Plants are under construction or in permitting up and down the coast from Corpus to Beaumont-Port Arthur (see Section 6 of this report). Nurdles could certainly become a much bigger problem and need to be addressed now. When you are on the water, check out the shorelines and debris piles. Look for these nurdles and report any major build-up to either Texas Parks and Wildlife game wardens or other personnel or the Texas Commission on Environmental Quality. This is a problem that can be corrected, but only with attention and vigilance by all of us, companies most of all.

2. The National Climate Report

The long-awaited Fourth National Report on Climate Change was released November 23, 2018 by the federal government, and it is a

blockbuster. <https://nca2018.globalchange.gov/>. Apart from stating that our climate is changing and that humans are responsible due to burning hydrocarbons, the report has an entire section devoted to the Southern Great Plains which include Texas. Among other things, the report includes the graph below about flounder abundance, an issue I have been following for some time. It has been reported that Texas Parks and Wildlife has been finding fewer and fewer juvenile flounder in their surveys. Flounder require certain low temperatures to be reached/maintained in order to successfully reproduce, and climate change is raising the water temperature. Many of us seem to think we are exempt from the effects of climate change. We are not, and certainly not if you fish the coast.

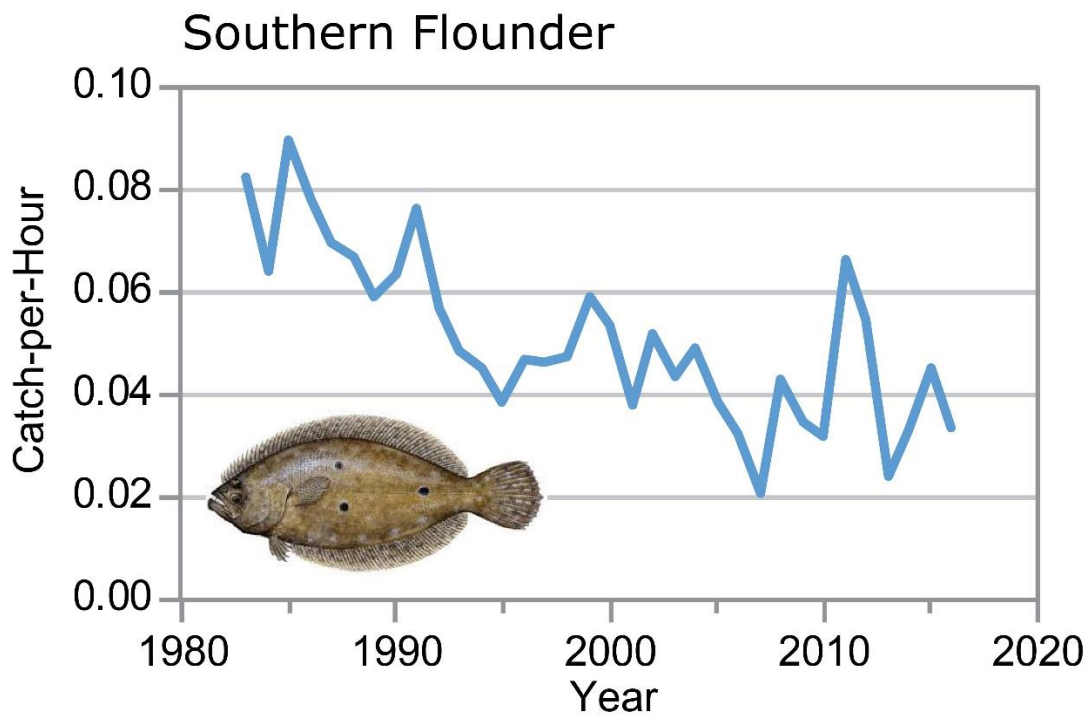


Figure 2. Graph of flounder abundance from the Fourth National Climate Assessment, Southern Great Plains Regional Assessment, which was originally Figure 23.9: Climate Winners and Losers

(Gray Snapper and Southern Flounder). Gray snapper, which is expanding in numbers, is omitted from this image.

We don't talk about climate change in Texas, and that attitude needs to stop. We must be honest about this issue if we are to have any chance of successfully adapting and responding to alter current carbon dioxide emission rates and atmospheric build-up. Our economy is tied to hydrocarbons, particularly here on the coast, and we need to carefully consider our economic future given the certainty that pressure to reduce carbon dioxide emissions will increase. Later in this newsletter I discuss the oil and gas boom and its impact on the coast (see Section 6). The question is – how much harm is going to be inflicted to our coast in what may well be the last boom of hydrocarbon era? At the least, we should make sure that where we have alternatives, we push for the adoption of the least ecologically harmful one to be pursued, such as offshore mono-buoys for oil export rather than onshore deep-water channels and ports.

Irma and Maria and Harvey – the superstorms of 2017 – were storms made more powerful by the changed climate. At SSPEED Center at Rice, we conducted computer modeling of Hurricane Ike where we increased wind speed by 15% and changed the impact point to near San Luis Pass on the south end of Galveston Island, representing a bad fact situation for damage to the Houston Ship Channel from surge flooding associated with the storm moving ashore. Ike was a unique storm, one that had maximum force winds extending out at least 40 miles, much further than normally seen with a category 2 storm. Regarding the SSPEED Center's modeling, I was told by "experts" that a storm like Ike, with such a large wind field, could not exist with Category 3 winds or higher because those higher winds physically could not be maintained

over such a large area. Maria, as it turns out, was a Category 4/5 storm with a wind field more extensive than seen with Ike. So much for the theory that such winds cannot be maintained over such a large area.

We have never seen such a storm, but it is in our future, just as we had not seen a Harvey which dumped a year's worth of rain in four days. If we had modeled Harvey prior to 2017, we would have been derided as fearmongers. Unfortunately, these storms are real.

In the sections which follow, climate change is an underlying thread. The GBRA-TAP agreement (Section 3) was necessary because of reduced freshwater inflows to San Antonio Bay due to droughts and negative impacts to the endangered whooping crane which will be influenced by sea level rise and habitat loss. The Texas Coastal Exchange discussed in Section 5 is being developed to provide options to sequester carbon dioxide and to help individuals, institutions and companies reduce carbon dioxide emissions and become carbon neutral. Section 6 is about the oil and gas boom that is currently occurring, but for how long and at what cost to the environment of the Texas coast? And section 7 is about the need to erect a barrier to protect the Houston Ship Channel industries from the destructive force of hurricane surge that will become more severe due our changing climate.

We can solve these problems, but only if we talk honestly about them. Denial doesn't help any of us. We are better than we are currently behaving. It is time for us to grow up in this era of the changing climate and become responsible adults.

3. The GBRA-TAP Agreement Update

In 2011, The Aransas Project (TAP) filed a federal lawsuit against the Texas Commission on Environmental Quality (TCEQ) Commissioners over the death of 23 endangered whooping cranes. The suit, *TAP vs. Shaw*, sought to require the TCEQ to develop a habitat conservation plan (HCP) to address the potential harm that occurred to the whooping cranes from a decrease in water inflows to the bay in 2011. This suit was decided by federal judge Janis Jack in favor of TAP in 2014 but in 2015 was overturned by the 5th Circuit Court of Appeals. After the U.S. Supreme Court refused to hear the case, an improbable agreement was reached between TAP and the Guadalupe-Blanco River Authority (GBRA). The first agreement was signed by Bill West, the General Manager at the time, and me, and a second agreement was subsequently signed between me and the new general manager, Kevin Patteson.

I am pleased to report that this agreement appears to be leading to significant long-term positive developments in the Guadalupe River watershed and San Antonio Bay. Perhaps most significantly, GBRA has recently hired Nathan Pence to lead our joint efforts to address some important long-term management issues raised by these agreements as well as to work on GBRA watershed-wide stewardship issues. Nathan comes to GBRA from the Edwards Aquifer Authority where he was responsible for implementing the Habitat Conservation Plan (HCP) established to manage and protect the endangered species at the Comal and San Marcos springs. Nathan's hiring is a very positive step that follows the completion of an implementation study prepared by Ross Strategic for GBRA and TAP under funding from the Cynthia and George Mitchell Foundation.

The GBRA-TAP agreement is focused on several issues that either led to or were implicit in the initial dispute in federal court including (1) freshwater inflow for San Antonio Bay, (2) water flows through and habitat within the Guadalupe Delta, (3) habitat expansion for the whooping crane flock and (4) long-term measures to increase water flow in the Guadalupe River through prairie restoration. These issues are discussed sequentially.

Freshwater inflow to San Antonio Bay was the key focal point of the litigation federal court filing and remains the central but not sole issue going forward. Freshwater inflow is the life-blood of an estuary like San Antonio Bay and is essential in the life cycle of blue crabs, the key food source for whooping cranes, as well as virtually all fish life in the bay. Without freshwater inflow, we would have no coastal recreational and commercial fishing. It is simply essential, yet in very short supply, as the Guadalupe and every other Texas river are simply overallocated to users during times of drought. Here, the key issue to be attacked is insuring that there is a certain amount of freshwater that will get to the bay during times of drought. Nueces Bay was killed because insufficient freshwater inflows got past Choke Canyon Reservoir and Lake Corpus Christi. We must keep that from happening to other estuaries, starting with San Antonio Bay, and the key here is to define and maintain a “refugia”, a refuge that will be maintained and protected during drought times. How much water that will require and when that water needs to be delivered will be determined moving forward.

Work is also being undertaken on the expansion of the whooping crane flock to bays in addition to San Antonio, Espiritu Santo, Mesquite, Carlos, Aransas and St. Charles where crane territories currently exist.

The long-term goal for the last remaining wild flock of whooping cranes is to expand their numbers, and if this is successful, then this wild flock will require new wintering habitat and territories. Crane numbers are up since the deaths in 2008-2009, and cranes have been observed in several locations including the northern and western portions of Copano Bay, near Port Aransas on Mustang Island and on Matagorda Bay at Powderhorn Lake and Oyster Lake (east of Tres Palacios Bay). The concept here is to identify key areas for expansion and to work with landowners and the U.S. Fish and Wildlife Service to create safe harbor agreements whereby the landowners agree to enhance crane habitat but are exempt from prohibitions that otherwise might attach under the Endangered Species Act. Such agreements are a win for both landowners and conservation, and there is a possibility that landowners can be paid for this expansion by windfarm developers in the Midwest who need to obtain permits under Section 10 of the ESA to prevent them from being liable for the unintended death of an endangered whooping crane. This possibility could be addressed by the Texas Coastal Exchange as discussed in Section 5 of this report.



Figure 3. Stars indicate areas where whooping crane usage has been observed and/or is suitable for expanded usage by these cranes, including Copano Bay, the Guadalupe Delta, Powderhorn Lake, Lavaca Bay and Oyster Lake.

A third area of interest is the Guadalupe Delta, the place where the freshwater enters the bay. This area is critical to the health of the bay but is a maze of multiple hyacinth-clogged channels along with multiple permitted water withdrawals and a salt water barrier just up from the Highway 35 bridge. Computer modelers must estimate how much water flows into the bay due to the location of flow gauges upstream rather than within the delta which is affected by tidal exchange. Further, the habitat within the delta is and will continue to change due to sea level rise over time. We need to understand this area more, both for its habitat potential as well as to ensure that the

water hopefully allocated to the bay in the future does, in fact, enter the bay.

Fourth, research indicates that changes in land management practices within the Guadalupe River watershed may increase the flow of water during droughts and reduce flooding at Victoria and other downstream urban areas. Specifically, the restoration of natural prairie grasslands is getting attention due to this issue as well as the ability of natural prairie soils to sequester large amounts of carbon dioxide. Anecdotal evidence and some research suggest that management practices such as adaptive multi-paddock (AMP grazing) can increase ranching profitability while restoring native prairies, also increasing carbon sequestration in the soil and the inflow of rainfall into the soils, decreasing runoff during storms and enhancing seeps and springs that provide the base flow for our rivers. The work under the GBRA-TAP agreement is tied into the Texas Coastal Exchange concept being developed at the SSPEED Center at Rice University and is the subject of section 5 of this update.

Nathan started working in August 2018 and has hit the ground running, talking and meeting with stakeholders, researchers and agency personnel throughout the watershed and trying to get a handle on these tricky issues. Nathan's plan is to present information about numerous environmental programs, including the GBRA-TAP agreement, at a GBRA Board meeting in early 2019. This information will be a first step in establishing implementation strategies to address the four elements of the TAP agreement. Nathan has discussed these environmental issues and some potential implementation strategies with me; given some time, I'm confident that the GBRA TAP agreement will result in a better San Antonio Bay for the whoopers. Nathan has

also agreed to a meet and greet with Stakeholders, so please stay tuned for that meeting announcement.

4. The New and Different Matagorda Bay Foundation

The Matagorda Bay Foundation (MBF) has been in existence for over twenty years. Over that time, the primary focus has been litigation and administrative law hearings trying to ensure freshwater inflows to Matagorda Bay. The time has come to broaden the focus and actions of the Matagorda Bay Foundation, a decision by the board made easy by the potential availability of Bill Balboa of Palacios to join us as executive director. Bill knows Matagorda Bay and the people living, working and playing on the bay. Simply stated, the right person at the right time has appeared, and we at MBF are quite happy with the prospects for the future.

The vision that is being pursued by MBF is one of a full-service advocacy group for Matagorda Bay – a group that restores marshes and oyster reefs, a group that works to enhance research into the bay, a group that works to educate the children and adults about the benefits of Matagorda Bay - a group that is willing to stand up and fight for the bay when and if it is necessary. However, the intent is to focus upon building physical infrastructure in the bay – reefs and marshes – as well as building relationships inland. That will include all parties who are willing to join with us to realize the potential of this great bay system, the most underappreciated on the Texas coast and one of the most valuable.

There are many actions that are coming together. The Comptroller of the State of Texas, Glen Hegar, has hired Robert Gulley

to oversee the endangered species program that the Comptroller's office has overseen in Texas since Susan Combs was in office. Robert Gulley has met with us at Matagorda Bay Foundation along with his Deputy Meghan Hope, and they have determined that studying Matagorda Bay is an excellent focus for their office in trying to understand landscape-scale issues in protecting endangered species and keeping rare species from becoming endangered. To date, their office has issued a request for proposals to study the impacts of flooding and sea rise on the habitats of the at-risk species and to contribute to knowledge of the state of Matagorda Bay. In going forward with this work, Matagorda Bay Foundation will work with the Comptroller's office to hold stakeholder meetings and other forms of public outreach to discuss the research and learn the stakeholders' concerns about protecting Matagorda Bay.



Figure 4. An endangered Kemp's Ridley sea turtle – one of the species being studied by the Comptroller's office - laying eggs on the Texas coast. Photo from National Park Service.

Additionally, Matagorda Bay Foundation is adding members to its board of directors. To date, three new directors have been added to the board – Fred Beck of Palacios and Austin, Clive Runnells IV from Austin and Matagorda County and Mark Rose of Bastrop County. Each of these individuals brings talent, knowledge and enthusiasm to join with Henry Hamman of Houston, Al Garrison of Matagorda and me on the board of MBF. We intend to reach out to people throughout the bay community, particularly when Bill joins with us full time. Bill is committed to restoring oyster reefs and marshlands and has a list of projects that will require several years and millions of dollars to build. If you are interested in joining with us in this effort, please email me at jbb@blackburncarter.com, and we will find a way to get you involved and keep you informed going forward.

5. The Texas Coastal Exchange

Almost a decade ago, Elizabeth Winston Jones and I came up with a concept to buy and sell ecological services along the Texas coast as a way of conserving important ecological areas and to help landowners stay on their land. Ecological services are the “goods” provided by nature that are incredibly important but often undervalued or not valued. Some of these goods such as timber, cattle grazing and hunting are well understood and represented in the marketplace. However, many important functions such as taking carbon dioxide out of the atmosphere, helping us reduce flooding, augmenting surface and

groundwater supplies, removing pollutants and providing essential habitat that support fish and wildlife are neither well known nor compensated.

The initial concept developed at Houston Wilderness and then at the SSPEED Center at Rice University was called the Lone Star Coastal Exchange and proposed a system to pay landowners for the ecological services that their land produces. This concept has proven elusive to implement, but plans are unfolding to start buying and selling ecosystem services in the spring, 2019. There are also two companion systems that are under development, the Soil Value Exchange (SVX) and the Louisiana Coastal Exchange (LCX). Each have roles distinct from TCX, yet they are interrelated.

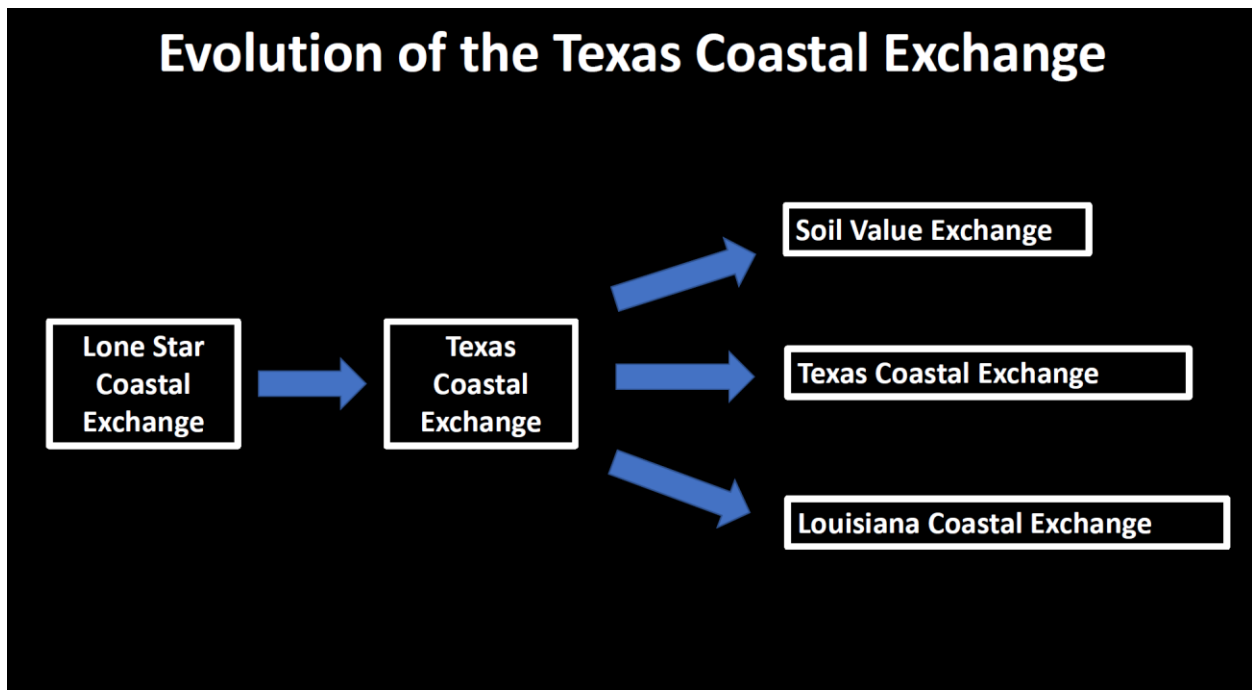


Figure 5. The early concept of an ecological transaction system has morphed into three systems currently being developed – two in Houston and one in Louisiana.

The TCX system proposed to be implemented in 2019 is very simple. First, this concept protects property rights. If you produce an ecological value for society, you may sell it if you own the land or have an interest in the land. The system is not based on regulation but is voluntary. A landowner may sell as many services as can be documented as occurring on the property. All transactions are transparent and are based on reported literature values. No measuring or restrictions are required. If the buyer is willing to accept these conditions, a transaction may occur. All prices will be established by TCX, and the transactions will be registered with TCX.

TCX intends to sell several types of ecological services. There is an emerging market for the service of removing carbon dioxide from the atmosphere, and nature performs this service extremely well. Marshes, forests and prairies all remove carbon dioxide, but the owners are not compensated for such public service at this time. We hope to change this situation. Further, oyster reefs provide wonderful fishing and shore protection, marshes provide thousands of shrimp and crab per acre and help buffer storm surge, and native prairies soak up rains and reduce downstream flooding while making water supplies go further and last longer. Similarly, land owners are not paid for these services either.

TCX is being set up as an entry-level transaction system intended to meet regional demand. There are well established but difficult to meet international standards for sequestering carbon that have many requirements that seem punitive and not intended to be helpful to landowners or ecological enhancement and conservation. The Soil Value Exchange (SVX) is attempting to develop a carbon transaction system that will either meet these international standards or establish a

broadly-acceptable trading system for corporations and others who need to offer a higher level of certification than is offered by TCX. On the other hand, TCX is intended to sell carbon to local non-governmental organizations, churches and faith-based organizations, individual families and local corporations that wish to be carbon neutral and purchase their carbon offsets locally but are not concerned about meeting international protocols. TCX will also be offering flooding abatement services and fish and wildlife benefits from oyster reefs and marshes around Galveston and Matagorda Bays. On an as-needed basis, TCX will also provide habitat credits associated with whooping crane, ocelot, golden-cheeked warbler and other endangered species.

At the same time, the Soil Value Exchange (SVX) will be developing a more sophisticated concept for buying and selling carbon storage credits. SVX also is landowner-friendly and voluntary; however, the carbon it sells will be measured and documented rather than based upon literature values. SVX will focus on grazing lands (e.g., prairies) employing soil-health-targeted, high-yield cattle management practices that generate more tons per acre of sequestered carbon than does land involved with conventional cattle grazing. The goal of SVX is to supply the market of corporate customers who need a more robust carbon-accounting methodology. SVX plans to develop a core of corporations that will supply capital to help offset the cost of carbon measurement and develop of a long-term, large-scale carbon dioxide storage to which they will have preferential access. Such funding will also allow SVX to provide experts to assist landowners wishing to adopt rotational grazing practices that sequester more carbon and help restore native prairie grasses. SVX plans to sequester at least 100 million tons of carbon dioxide by the 2025-2027, an ambitious goal.

A third variation of the ecological services valuation process is provided by the Louisiana Coastal Exchange (LCX) being developed by Val Marmillion of America's Wetland Foundation. LCX is not initially focused on sales but rather upon voluntary efforts by corporations and foundations that create ecologically-significant projects. LCX will start with registration and recognition of such projects, and then will begin to certify the ecological values associated with these projects. This certification could be used by companies in corporate reports and other similar materials. Finally, as a third step, sales of these values may occur, but that is not the primary purpose, differentiating LCX from both TCX and SVX.

The Texas Coastal Exchange is new and exciting. It could be a major new conservation tool, perhaps the first breakthrough conservation concept since the advent of non-governmental organizations to manage fee simple and easement lands. However, its success depends upon buyers emerging – buyers who want to be carbon neutral - buyers who want to support fishery habitat around our bay systems – buyers who are willing to try new flood management concepts.

I am often asked – what can an individual do about something as overwhelming as climate change? Well, this is one situation where each of us can and should act. Each of us have a carbon footprint (to calculate yours, go to <https://www3.epa.gov/carbon-footprint-calculator/>). Each of us can act to offset our carbon emissions by storing them in the soil or in trees. For years, I have paid Galveston Bay Foundation for sixty tons of carbon dioxide storage capacity in their marsh restoration and protection projects, enough to allow me to make my law office as well as my wife Garland and me carbon neutral. TCX

will be offering local carbon credits. If you want to buy carbon storage rights to offset your footprint, send me an email at blackbur@rice.edu. I will take your order and place it with one or another of our carbon storage suppliers through TCX.

6. The Oil Boom and the Coast

The oil boom in the Eagle Ford and Permian fracking fields is beginning to have major negative impacts on the Texas coast. Some of these projects are ill-considered and portend major negative changes ahead. Others are more benign and acceptable, at least from my perspective. There are individuals and groups that decry any oil and gas-related development as negative, and I understand why, but I am convinced from forty-plus years of coastal battles that such a focus just will not work in Texas. Instead, I believe that we need to identify the projects that are most destructive to the coast and attempt to stop them.

The worst situation to my mind is the potential onshore oil export facility at Harbor Island just inshore from Port Aransas. The Port of Corpus Christi is proposing this project that will require the deepening of the Port Aransas channel to 75 feet as well as potentially expanding that channel to the northern shoreline of Corpus Christi Bay. A deeper channel at this location will bring more salinity into Corpus and Aransas Bays, further negatively affecting an area that has already been severely negatively affected by impact of Choke Canyon and Lake Corpus Christi reservoirs that have led to Nueces Bay being declared essentially ecologically dead. To make matters worse, the Port is also seeking a wastewater discharge permit for a desalination facility that is

proposing the discharge of highly saline “reject” water directly into the Port Aransas channel used by countless larval and juvenile shrimp, crabs and finfish. To my mind, this reject water is not suitable for disposal into an extremely important fish and shellfish migration zone, but that is what is currently proposed.

Alternatives exist that would reduce these impacts significantly. It is possible to construct offshore mono-buoys to export oil and gas. Several such mono-buoys have been proposed for the Texas coast, and I believe these offshore facilities to be much better from an environmental standpoint. Similarly, the salty reject water can be discharged offshore into much less important fish and shellfish migration areas.

Texas lacks effective leadership on coastal impact issues. The truth is that it is up to individuals and groups to take up the fight. In Port Aransas, a citizens’ group has formed called the Port Aransas Conservancy, a group dedicated to protecting fish and wildlife resources as well as the life-style of Port Aransas. This group is in a bona fide David vs. Goliath fight with the Port of Corpus Christi and needs help from all of us concerned about the coast. They are opposed to both the discharge of reject water into the channel at Port Aransas as well as the plan by the Port to deepen the channel at Port Aransas to 75 feet to create a deep-water facility on Harbor Island not far from where the ferry lands. Please visit their web site at <https://portaransasconservancy.com/> and make a donation. They need our help, and we all need them to succeed.

This is not the only problem that is occurring because of the available of oil and gas. There are numerous chemical plants that have been proposed or are under construction due to the large amount of

natural gas now available at relatively low cost. The world's largest ethylene cracker is proposed for the Portland area on Corpus Christi Bay and is being opposed by Portland Citizens United and Texas Campaign for the Environment. Given that the air permit is required for construction, that is the most important permit to oppose in order to prevent the plant from being constructed, and a contested case hearing is underway at this time. In addition, a wastewater permit application has been filed proposing the direct discharge of treated effluent into the Corpus Christi Bay system and discharge of stormwater into Copano Bay. This is another important potential impact to Corpus Christi and potentially Aransas Bays, adding to the cumulative risk to these bay systems.

Rumors abound about a new facility to be located near Collegeport which is located on the eastern shoreline of Tres Palacios Bay across from the town of Palacios. This is a very important area for migratory waterfowl, with the Clive Runnells Family Mad Island Marsh Reserve of the Texas Nature Conservancy being just to the south along with Texas Parks and Wildlife's Mad Island Wildlife Management Area. Similarly, whooping cranes were observed using Oyster Lake immediately south of Collegeport during the winter of 2017-2018.

Similarly, liquified natural gas export facilities are being proposed at numerous locations including the Port of Brownsville in far south Texas which is among the most environmentally sensitive locations on the Texas coast. Here, the Laguna Atascosa National Wildlife Refuge and the habitat of the endangered ocelot are immediately adjacent to the port. Generally, LNG export facilities have performed well along the Texas coast, but they do take up land that can be important habitat.

The bottom line is that this "last boom" of oil and gas industry is

beginning to take a toll on a coastline that has been heavily impacted over the years. With a few notable exceptions, like the demise of Nueces Bay and the superfund sites on Lavaca Bay and in the San Jacinto River, our bays and estuaries have emerged reasonably strong. That positive assessment will continue only if we demand that the worst of these projects not be permitted.



Figure 6. Sites of major proposed petrochemical expansions. Orange stars are proposed offshore oil export facilities, red square indicates proposed onshore deep-water oil export facility, yellow four-pointed stars are proposed LNG export locations and blue X connotes areas of permitted and/or proposed petrochemical expansion. Base map by Christina Walsh from *A Texan Plan for the Texas Coast*. Locations based upon various reports and mapped by Jim Blackburn.

7. Protecting the Houston Ship Channel

Hurricanes are horrifying natural disasters that do and should strike fear in the hearts of Texas coastal residents. Galveston was the economic kingpin of Texas until it was devastated by the 1900 storm, an event that led to the emergence of Houston and its massive petrochemical complex. However, that complex is extremely vulnerable to today's superstorms that have the potential to generate a 25-foot (or larger) surge up Galveston Bay and into the Ship Channel. Such a storm has been predicted by the SSPEED Center at Rice to generate a spill of historic proportions, flooding up to 2200 storage tanks and causing the release of an estimated 90 million gallons of oil and hazardous substances. If this occurred, the economy of our region and of the nation would be severely damaged and Galveston Bay's ecosystem would be devastated.

To address this issue, the Corps of Engineers has proposed a dike and gate system known as the Ike Dike, or coastal spine, that will extend from the southern end of Galveston Island up to the existing sea wall, span Bolivar Roads with an 11,000-foot navigation and environmental flow gate and then extend up the Bolivar Peninsula to about High Island. This system has been described in a Draft

Environmental Impact Statement (DEIS) released by the Corps of Engineers. This project currently is estimated to cost from \$14 to \$20 billion and is proposed to be completed by 2035. Opposition to this proposal is emerging on Bolivar Peninsula and within the environmental community, and public hearings will be conducted during December. Those interested in commenting have until early January to file written statements.

There is another project known as the Galveston Bay Park Plan that is complementary to this larger project. The Galveston Bay Park Plan offers protection from a 25-foot surge to the developed western shoreline of Galveston Bay including the Bayport Industrial complex and the Houston Ship Channel complex and costs about \$3 billion. This project could be constructed with local and/or state funding and would need a permit from the Corps of Engineers. Such a project could be constructed in about 5 years. If the larger dike gets approved and funded, this internal dike is a necessary additional layer of protection. If the larger project is not completed and this Galveston Bay Park Plan were constructed, the Houston area could have protection in place, potentially as early as 2025, ten years before the coastal spine, and at a reasonable cost.

This Galveston Bay Park Plan was developed by the SSPEED Center at Rice University and is shown in Figure 7. This barrier is proposed to be constructed to an elevation of 25-feet and run parallel to the Houston Ship Channel. It will connect the Texas City levee system on the southern end with western Chambers County on the northern end, protecting Baytown, the Houston Ship Channel and eastern and southeastern Harris County and northern Galveston County. This Galveston Bay Park Plan proposes to extend the ongoing beneficial use

dredge disposal project being pursued by the Port of Houston and expand that concept into a world-class recreation-oriented facility providing public access to the bay as well as newly created wetlands and marine habitat. This proposal will include a navigation gate at a location roughly across from Eagle Point in northern Galveston County.

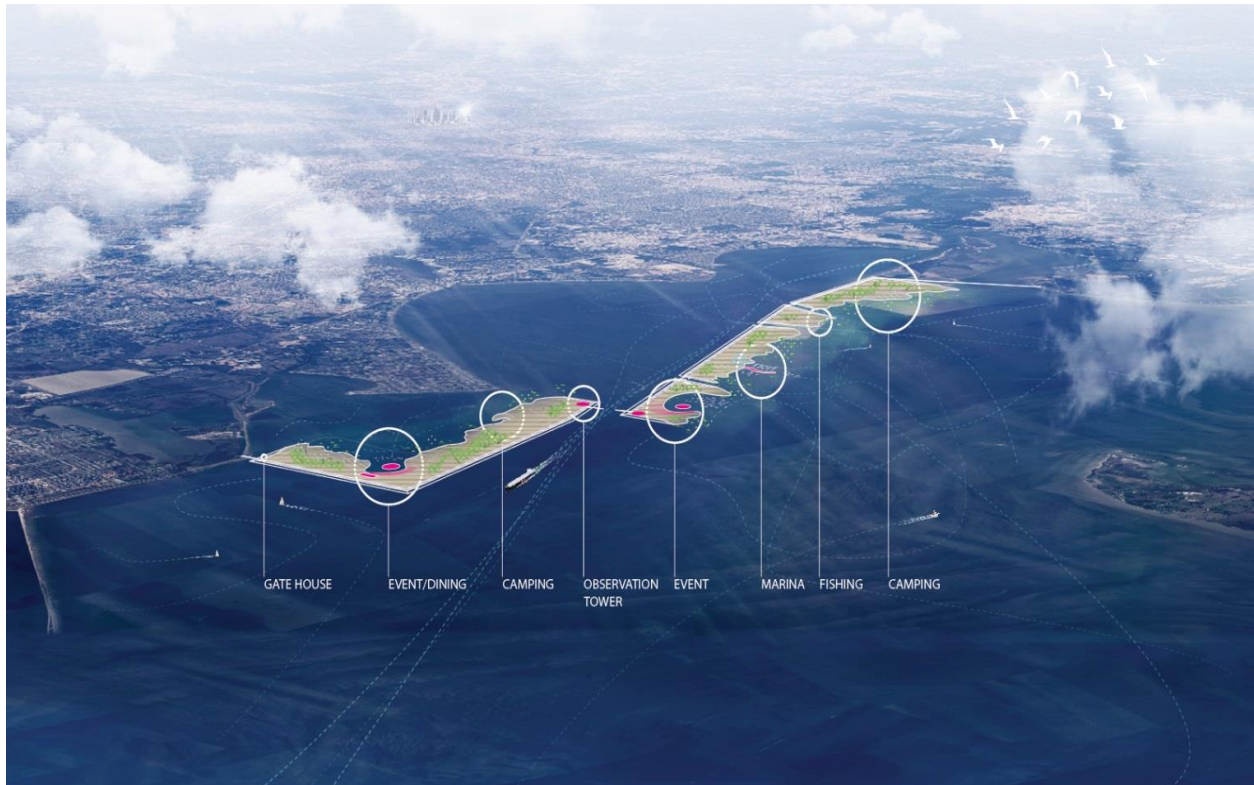


Figure 7. Proposed Galveston Bay Park Plan. Graphic prepared for SSPEED Center by Rogers Partners Architects and Urban Planners.

From an environmental standpoint, the Galveston Bay Park Plan will have impacts, but they appear to be manageable. This system will not obstruct Bolivar Roads and will leave Trinity, East and West Bays open to the pass and the Gulf of Mexico. It will impact oyster reefs along and adjacent to the Houston Ship Channel, but oysters have been and can be successfully restored at a cost of about \$100,000 per acre. About \$50 million of the \$3 billion budget for the Galveston Bay Park Plan has been designated for oyster mitigation. Initial modeling of bay

circulation and salinity indicates only minor impacts because of the key role of the Ship Channel in funneling circulation into and out of the San Jacinto River estuary zone, and that channel will not be obstructed except very rarely during storm events.

It is worth noting that an early version of this concept was initially proposed by the late Tom Colbert, an excellent urban planner and Professor of Architecture at the University of Houston. In the early days of the research at SSPEED Center, Tom proposed the creation of a surge protection system that would create a world-class amenity for the Houston-Galveston region. I am sorry that Tom is not with us today to enjoy the emergence of this excellent design by Rogers Partners Architects and Urban Designers for SSPEED Center. He would be proud.

The future of the Galveston Bay Park Plan is unfolding as this is written. The possibility exists that one or more local government entities could propose to construct this protection system under permit from the Corps of Engineers. Such a permit application would take two or three years to process and would include environmental review. If industry could assist in the financing of this system, that would represent a major step forward to implementing this system.

8. Concluding Comments and Some Poems

In closing, I want to remind everyone that my second book about the Texas coast titled *A Texan Plan for the Texas Coast* has been published by Texas A&M Press and is available from them directly as well as from Amazon and various book shops around Texas. This book focuses upon private sector action and creative thinking to discover new ways to protect this wonderful coast of ours that we cannot

depend upon our state government to protect. The reality is that we must take responsibility for its future. That's just the way it is in 2018 on the Texas coast. Also, for those of you who enjoy my bird poems and the art of Isabelle Scurry Chapman, we have a new book of bird poems and paintings titled *Hill Country Birds and Waters: Art and Poems*. This book is about Hill Country birds and the springs and seeps upon which they depend, the same springs that provide water needed for freshwater inflow to our bays and estuaries. Please contact me at jbb@blackburncarter.com to find out about getting a copy which should be available in early January if not before.

Every year, I close my Coastal Newsletter with some poems that are not yet included in any of these books, and this year I have added a couple of paintings by Isabelle Scurry Chapman. I hope you enjoy these. And if you liked this newsletter, please pass it on to others. Happy holidays.

Black Tern

At the flats behind Rollover Pass in the spring
With environmental lawyer Oliver Houck.

The wind is blowing strong, in from the Gulf,
Pushing water though the pass,
Creating turbulence and feeding flats
For the beautiful dark tern that dives
Into the water and pops up swallowing.

A banquet of birds sits on the sand spit -

Avocets and plovers, gulls and terns,
A white phase reddish egret running here,
The great blue heron fishing there,
All part of the chapel I call Earth Church,
A place where I come to renew my soul,
Reopening the clotted arteries,
Circulating into the essence that is me,
Spiritual nourishment I inhale
To realign my compass in the hope
Of clearly seeing the path forward
To make better use of this gift of life
Given to me upon arrival on Earth,
A holy place I share with the black tern
That helps me in ways I cannot explain,
And I recommit to protect this church
That I rejoin at Rollover Bay in the spring 2018.



Figure 8. Black tern by Isabelle Scurry Chapman.

Chestnut-Sided Warbler

On South Padre Island during migration
In the spring of 2018.

The island is full of warblers of all description,
Small birds of varied yellows and grays,
Birds often hard to tell one from another,
But then the small bird lands above my head
And my eyes feast upon a slash of chestnut color
Along the breast, below the wing,
The chestnut side proclaiming the name of the bird.

My mind leaps from the chestnut stripe
To what is often missing from society,
The ability to believe in what one sees,
A gift seldom to rarely found among humans,
Honesty and its partner integrity, descriptive
Terms of who and what I seek to be,
Honesty and integrity often missing from
The day-to-day hustle of Houston post-Harvey,
Honesty that would lead us to call out the crooks,
The sycophants, the false voices pursuing money
In spite of harm to others,
In spite of harm to the environment,
In spite of our best information,
In spite of knowing better.

I turn back to gaze at the chestnut slash
And smile that today I found honesty
In the name of the migrating warbler
And it made me feel better
On South Padre Island in the spring.

The Black Rail

The sound comes from within the marsh,
Answered immediately by a kindred soul
In the tall wet grass on the other side of the bayou,
Luring the shy little marsh chicken into the air,
The relatively small black form awkwardly flapping
Across the bayou to quickly hide away again.

The black rail is threatened, struggling to survive,
Challenged by the loss of habitat,
Challenged by the sea level that is rising slowly,
Creating the need for the marsh to expand
Into the adjacent land that is claimed and occupied,
A conflict between the past and the future,
A conflict that the black rail may not survive,
A war being played out across the Earth
That we have changed by our actions,
The warming climate evidence of the harm
Done by my species, done by me and us all,
A change that reaches far and wide.

The black rail calls again, asking me to act,
Asking me to find the spiritual strength to
Push the oil giants and the gas producers and
All of us to do better, to be
Stewards of the Earth that gives us gifts
Like the black rail flying to meet its mate
On the other side of the bayou.



Figure 9. Black rail by Isabelle Scurry Chapman.

Marsh Hawk (nee Harrier Hawk)

At Anahuac and again at Atwater National
Wildlife Refuge, searching for my spirit
As the wind blows across the prairie grasses.

The light hits the tops of the brown grasses,

Amplifying the color, telling me it is winter,
The time of retreat, of shelter, of refuge,
Cold weather trying to keep me from the outdoors
That I love and will not abandon during the short
Days in the time of the remote sun.

The hawk flies low over the grasses,
Eyes fixed for any movement indicating food,
Wings caressing the air, floating in motion,
Coaxing buoyancy from the nothingness,
Then altering its feathers and crashing down
To land upon an unsuspecting, foraging field mouse.

The marsh hawk speaks to me
Of the timelessness of nature,
Of the absence of clocks,
Of the absence of records,
Representing constancy,
Reminding me of when I was a boy who saw
The low-flying hawk with the white-banded tail,
A hawk that talked to my soul
About connection, about linkage, about life,
A hawk that today speaks to my spiritual essence
In a language that I understand but cannot explain,
My spiritual-self contacted, resurrected and revitalized
By the simple sight of the marsh hawk flying over
The golden prairie grasses in the winter.

Until next year. Blackburn