Coastal Holiday Newsletter 2017

By Jim Blackburn

It is again time for my end of the year, holiday coastal newsletter. The Texas coast continues to survive various problems and continues to be an excellent place for recreation and nature, at least for another year. But if I have learned one thing on the Texas coast it is that you cannot take anything for granted. Each new year should simply be viewed as the time to renew commitments to work to protect this wonderful place that is the Texas coast. If you are not willing to work and fight for the coast, you will lose it.

This newsletter started as a report on the agreements that I reached with Formosa Plastics, a chemical giant that was just beginning to expand when Diane Wilson and I opposed it back in the late 1980s. Over the years, the performance of Formosa has improved even as the facility expanded. That does not mean that the performance is perfect or without problems. Today there is a lawsuit pending against Formosa for the release of plastics pellets into Lavaca Bay. Additionally, Formosa, like many plants, had some issues during Harvey with air releases during shut-down and start-up operations.

I plan to get with Formosa in the coming months to discuss ideas about running a 21st century chemical plant. A lot of excellent work was done over the last three decades to improve the performance of this facility, and I believe that these recent issues and others will be addressed. Formosa has a new plant manager these days, and I feel confident that he will move forward on commitments made decades ago. We'll see how 2018 unfolds.

I hope you enjoy this newsletter as well as the holiday season. And please forward this newsletter to someone else who might enjoy it.

Hurricane/Tropical Storm Harvey

All of us living on the coast know the devastation that Harvey brought from Port Aransas and Rockport north to the Louisiana border. Harvey is an example of the "new normal" of severe storms. If we at the Severe Storm (SSPEED) Center at Rice had modeled a tropical storm like Harvey, we would not have been believed. Harvey came ashore as a Category 4 storm and stopped after devastating Port Aransas and Rockport, then reversed course and dipped back to the coast, and then moved north over the Houston region as a tropical storm. The rains from Harvey are the stuff of legend, dropping 40+ inches of rain in four days from Fort Bend county all the way to the Louisiana border, hitting Nederland with 60 inches over that time and setting United States rainfall records. It was a storm for the ages, that was then followed in the Caribbean by both Irma and Maria that also became storms for the ages. Three record-setting storms in one year – that should catch everyone's attention.

In my opinion, our policies regarding severe storms along the coast are obsolete, as are the standards that are based upon our analysis of past storms. This is particularly of concern for hurricane surge planning. As is discussed in the section on Galveston Bay, computer modeling completed by the SSPEED Center indicates that a 25-foot surge is a reasonable one for planning purposes within

Galveston Bay and a 20 foot surge on the Upper Coast, both of which are likely too low looking into the next few decades.

We, as a coast, are vulnerable. Much of our coast lies below the 20-foot contour line, and we could face a storm more devastating than the Galveston storm of 1900 if we don't get serious about this issue.

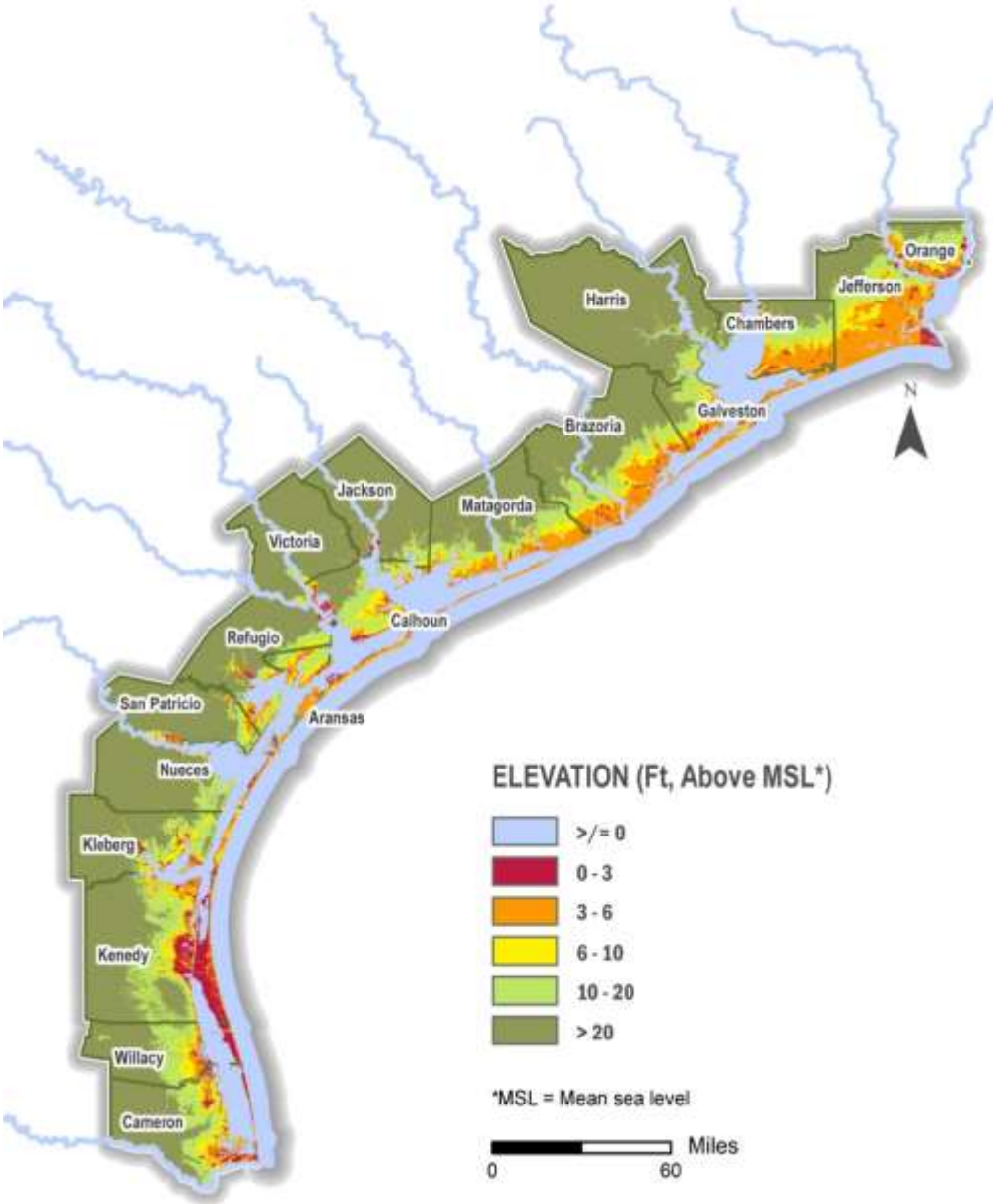

Figure 1. This map from A Texan Plan for the Texas Coast shows the elevation along the Texas coast. As can be seen, much of the coast is below the 20-foot elevation line, showing the vulnerability

of upwards of 1/3 of our coast to surge events. Graphic by Christina Walsh.

My heart and best wishes go out to those in the Aransas Bay system who were pounded by Harvey as well as to the rainfall flooding victims throughout the upper coast. But as bad as Harvey was, it was not the worst-case storm. Harvey should be considered as a warning shot that tells us that the storms of the future will not be like the storms of the past. We are dealing with a Gulf that is getting hotter each year, and we are dealing with storms that are fueled by the heat of the ocean and the water that is evaporated by higher temperatures in the water and the air. We are facing unprecedented storms. Many people have viewed the computer modeling completed by SSPEED Center with disdain, saying "We never had a surge this high before. You guys are making this stuff up". To which I now respond, "We had never seen a Harvey before."

I know some of you don't want to hear this, but climate change is a reality. The sooner we admit it and start understanding it, the better. I have no doubt that Harvey and Irma and Maria were climate-change-influenced storms. Our current thinking is inadequate to deal with this new norm. And I might add, our current economic base will be rocked by these same issues, both physically by the storms and economically by the societal response. The sooner we understand these issues, anticipate them and get ahead of them, the sooner we will be physically and economically resilient. And that is going to take some work, so we better roll up our sleeves and get after it.

Matagorda Bay and Matagorda Bay Foundation

There is a lot happening with the Matagorda Bay Foundation. For over two decades, MBF has been primarily dedicated to litigating important issues facing Matagorda Bay with its primary focus upon freshwater inflows. Starting in 2017, MBF decided to focus upon two key elements – changing the primary focus of the organization to habitat enhancement and restoration and to expansion of the membership base around Matagorda Bay. It is time for a full-blown bay foundation to emerge. We at MBF think the interest is now there and that the timing is right for this expansion.

At this time, Bill Balboa is working with the Matagorda Bay Foundation as the "local coordinator". Bill has worked on Matagorda Bay for years, first with Texas Parks and Wildlife for 12 years and now with Texas Sea Grant/Texas A&M Agrilife Extension Service. Bill has identified numerous new projects that are very important, and he has identified potential sources to fund these projects which include habitat restoration and enhanced freshwater inflow over time, potentially through purchase of water rights. The first grant application has been submitted to construct an oyster reef in Salt Lake near Carancahua Bay on the north shoreline of Matagorda Bay. A map showing the location of this proposed reef is attached as figure 2. Additionally, Bill plans to develop a demonstration oyster reef on the waterfront in Palacios.

Figure 2. This google map shows the location of the proposed Salt Lake oyster reef proposed to be constructed by Matagorda Bay Foundation. Image from Bill Balboa.

More generally, Bill has identified upwards of twenty specific projects to restore and enhance habitat in Matagorda Bay. One of these projects involves mapping and understanding the existing water delivery infrastructure along the north shoreline of both east and west Matagorda Bays, with the potential goal of buying and delivering freshwater inflow through this canal system to the bayous and marshes that line this shoreline. Several projects involve restoration of oyster reefs. And after the massive siltation associated with Harvey, a serious

new look needs to be taken at the situation at the Mouth of the Colorado River including the potential of re-opening Parkers Cut.

It is worth revisiting Parker's Cut for a moment. Prior to the construction of the Colorado River diversion channel, Parkers Cut connected the Colorado River channel near the jetties at Matagorda to the south shoreline of Matagorda Bay. This cut was closed when the Colorado River was re-routed into Matagorda Bay at the Gulf Intracoastal Waterway (GIWW), essentially isolating that portion of the old river channel from the GIWW to the Gulf. Over the years, this section of the channel has lost circulation and has become a location of recurrent fish kills due to low dissolved oxygen levels in the summer. Similarly, the upper end of Matagorda Bay near the diversion has become dominated by freshwater at times to the point that the fishery can be negatively affected. And on top of all of that, the siltation pattern after Harvey has created even further problems. In short, there are many issues at the mouth of the river, all of which need to be addressed.

Bill and I and others such as fishing guide and MBF board member Al Garrison believe that re-opening Parker's Cut will bring back vitality and ecological production to the old river channel and the eastern section of the south shoreline of Matagorda Bay and will be helpful in addressing sediment build-up. Most importantly, circulation negatively affected by the diversion will be restored. MBF is looking for partners to move forward on this effort to restore this section of Matagorda Bay.

MBF is also looking for members and participants. With the decision to spend much more effort on habitat enhancement comes a similar commitment to reach out to the community around the bay, including the county government, the port and the Lower Colorado

River Authority, among others. We are looking for individuals and groups to join with MBF and help us achieve our mission. We will be undertaking an organized effort to reach out in the community, including an expanded board of directors, after the first of the year. If you are interested in becoming involved further with MBF, contact me at jbb@blackburncarter.com.

San Antonio Bay

The whooping crane litigation by The Aransas Project (TAP) against the officials of the Texas Commission on Environmental Quality officially came to an end when the U.S. Supreme Court refused to hear TAP's appeal in 2015. Subsequently in early 2016, Bill West, then the general manager of the Guadalupe-Blanco River Authority (GBRA), and TAP reached an agreement to work together to try to protect whooping crane habitat and provide freshwater inflow to San Antonio Bay. Bill then retired as General Manager of GBRA and was replaced by Kevin Patteson, and a revised agreement was signed in late 2016 by Kevin Patteson and myself, now as a board member of TAP, along with Ann Hamilton and Henry Hamman.

Together, GBRA and TAP received a grant from the Mitchell Foundation to develop a plan for implementing this ambitious agreement wherein we agreed to work together for the good of the whoopers, the bay and water users within the basin. Late this fall, this conceptual plan was completed by Ross Strategic, a planning firm with offices in Austin. The work by Ross Strategic sets the stage for future progress on four key work areas.

Expanding Crane Habitat

The first of these work areas is to take action to expand the habitat of the whooping cranes. Recently, the whooping crane numbers have been increasing, leading to estimates of over 300 birds in the only wild flock of whooping cranes in the world, up from less than 20 in the late 1930s. Here, the challenge is to understand and expand upon the current usage of the marshes around Copano, St. Charles, Aransas, Carlos, Mesquite, San Antonio, and Espiritu Santo Bays and now even Matagorda Bay around Powderhorn Lake.

On the one hand, as the flock grows, the need for additional territories increases while at the same time sea level is increasing, inundating existing habitat over time. The challenge is to identify and set in motion processes for protecting additional prime habitat and on the other hand understanding how to assist marshes in expanding inland with sea level rise. This task will require partnerships between GBRA and TAP and adjacent landowners, federal agencies such as United States Fish and Wildlife Service, state and local agencies and other non-governmental organizations such as the International Crane Foundation and will likely begin with an outreach program to adjacent landowners along with creative market mechanisms to support habitat protection and expansion.

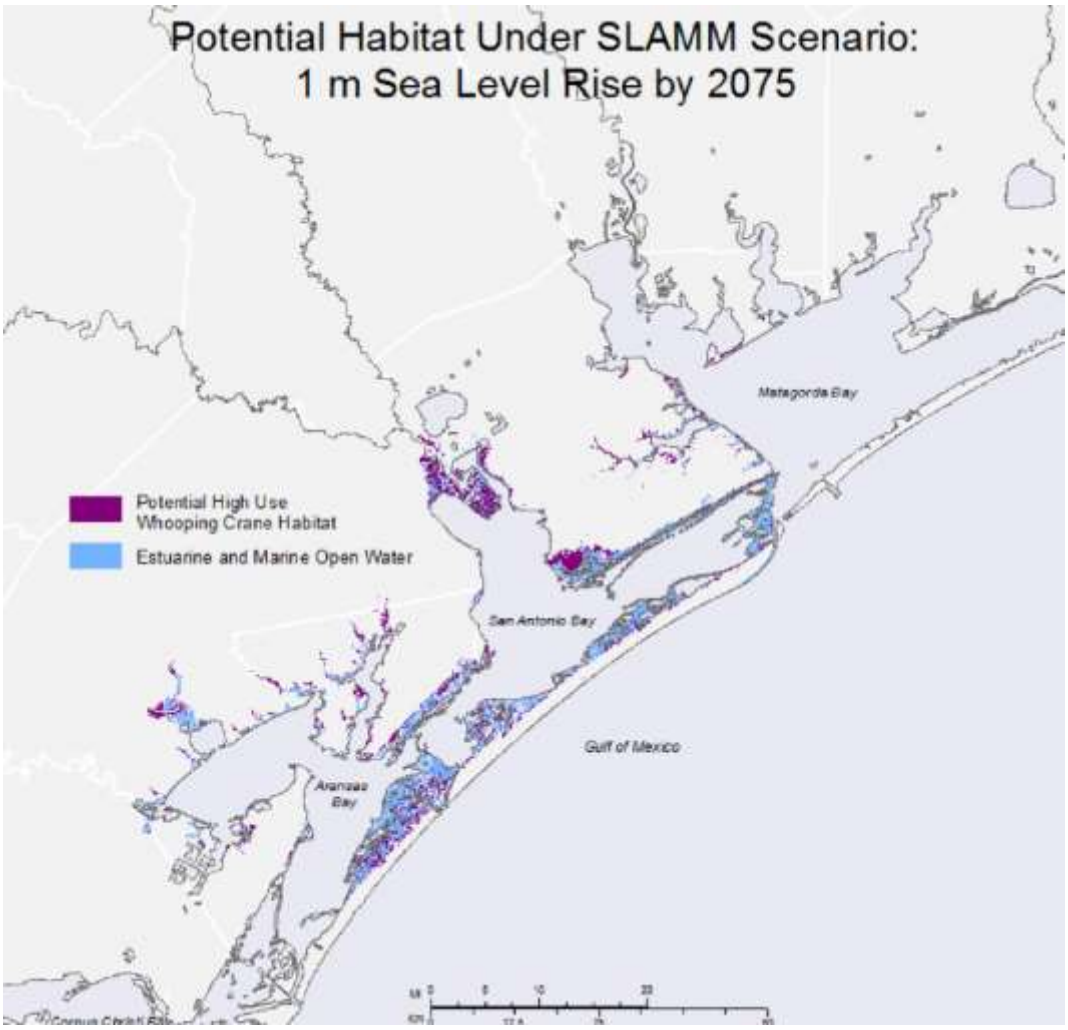

Figure 3: Map of the whooping crane wintering grounds showing the areas subject to conversion by rising sea level from the SLAMM model that predicts these rising sea levels and the prime areas for habitat expansion given sea level rise. Map courtesy of Liz Smith, International Crane Foundation.

Refuge Concept of Freshwater inflow

The second work area involves freshwater inflow to San Antonio Bay. A potential breakthrough concept has emerged that involves obtaining sufficient water for inflow during extreme drought conditions. This concept is intended to maintain an ecological diversity

refuge when inflows diminish considerably as they will during extensive droughts such as experienced in 2008-2009 and again in 2011. This concept evolved out of the hard realities of water supply on the Guadalupe River and the need to avoid a worst-case situation where the "seedstock" of the estuary would be heavily impacted such as has occurred in Nueces Bay.

Under this concept, we are investigating the availability of water to be released during key time periods when inflows are substantially diminished. The work under this concept involves both further study of the implementation of this concept as well intensive investigation of the availability, and potential cost, of water rights that could be dedicated to the bay system. This concept and steps forward are based, at least in part, on the work completed by the Environmental Flows Working Group led by the Meadows Center at Texas State University, the National Wildlife Federation, the Harte Research Institute and the Texas Nature Conservancy. We are hopeful that all of these researchers will be involved in the follow-up work under the GBRA-TAP agreement.

Buying and Selling Ecological Services

The third area for further work involves research concerning the application of the concepts developed by the SSPEED Center at Rice University involving the buying and selling of ecosystem services. This system – called the Texas Coastal Exchange (TCX) – involves establishing a system whereby farmers and ranchers are paid for restoring native prairies and marshes on their property. This concept, which is presented in more detail in a later section of this report, is based on

willing participation by ecosystem service buyers and landowner-sellers of these services. Of most interest under the GBRA-TAP agreement is the fact that the base flow of the Guadalupe River could be increased during lower flow times by a restored prairie ecosystem that will increase infiltration capacity of the soil and, if implemented across the watershed, will offer the potential for reducing peak flood events and restoring seeps and springs, thereby enhancing base flow.

As explained in the TCX section below, it is anticipated that cattle ranching and carbon dioxide storage transactions will be the primary source of revenue along with, perhaps, the water-related benefits. Importantly, this concept, if it proves out, will provide a significant boost to the agricultural economy of most counties within that portion of the Guadalupe watershed south of the Balcones Escarpment if not to the whole watershed.

The Guadalupe Delta

Fourth, GBRA and TAP have determined that further study and evaluation of the San Antonio River delta is warranted. This is a fertile ecosystem that is heavily influenced by human water diversions and will be influenced by sea level rise in the future. Through working with landowners and water diverters, there are numerous important subjects that can be explored and illuminated including optimizing inflows of base flows into San Antonio Bay and improving habitat throughout the delta. This will be a longer-term study that must include every major landowner in any work undertaken in the delta.

Figure 4. This map depicts various features of the Guadalupe River delta and San Antonio Bay including the location of the GBRA salt water barrier, the location of various water distribution channels and the location of the refuge area in upper San Antonio Bay. The large water body above the arrow is Green Lake, an area that hopefully will be included in the study of the delta.

These four areas will be expanded in a report on the GBRA-TAP plan to implement the GBRA-TAP agreement which is to be released soon.

Galveston Bay

Galveston Bay is an impressive ecosystem that has survived numerous insults over the years. And as in the past, there are new challenges and issues that threaten Galveston Bay into the future. With

those who are interested working together, we can help stave off these new challenges and provide for future generations to enjoy this fabulous resource literally at the back door of 5-6 million people.

McGinnis Pits on West Bay

As many of you know, two disposal pits were built on the shore of the San Jacinto River by McGinnis Industrial Maintenance Corporation, and these sites have become a superfund site called the San Jacinto Pits due to contamination by both dioxin and PCBs, two very dangerous chemicals. And while progress is unfolding in addressing the San Jacinto Pits, literally no action has unfolded to remove a similar threat from a second set of pits located on the shoreline of West Bay. These are known as the McGinnis Pits which are shown in figure 5.

For years, waste was barged by Gulf Coast Authority (GCA) for disposal in the McGinnis Pits that are located in southwestern Galveston County near Chocolate Bay. At least three of these pits contain dioxin, one of the most toxic substances humans have created - a chemical that was a key ingredient in Agent Orange used in the Vietnam War. This dioxin was created by paper manufacturing on the Ship Channel and was moved by barge to the banks of West Bay where it was discharged into disposal sites contained by earthen levees. The concern is that these levees cannot withstand the continued assault of hurricane surge over the years. We dodged a bullet when Hurricane Ike's heaviest surge came ashore further to the east, but the next one could destroy these earthen pits precariously located on the shore of West Bay. It is doubtful that constructed refineries and chemical plants could survive a 20-foot surge across the west end of Galveston Island

onto the north shoreline of West Bay, much less an earthen disposal site. These pits are a disaster waiting to happen and this situation needs to be fixed.

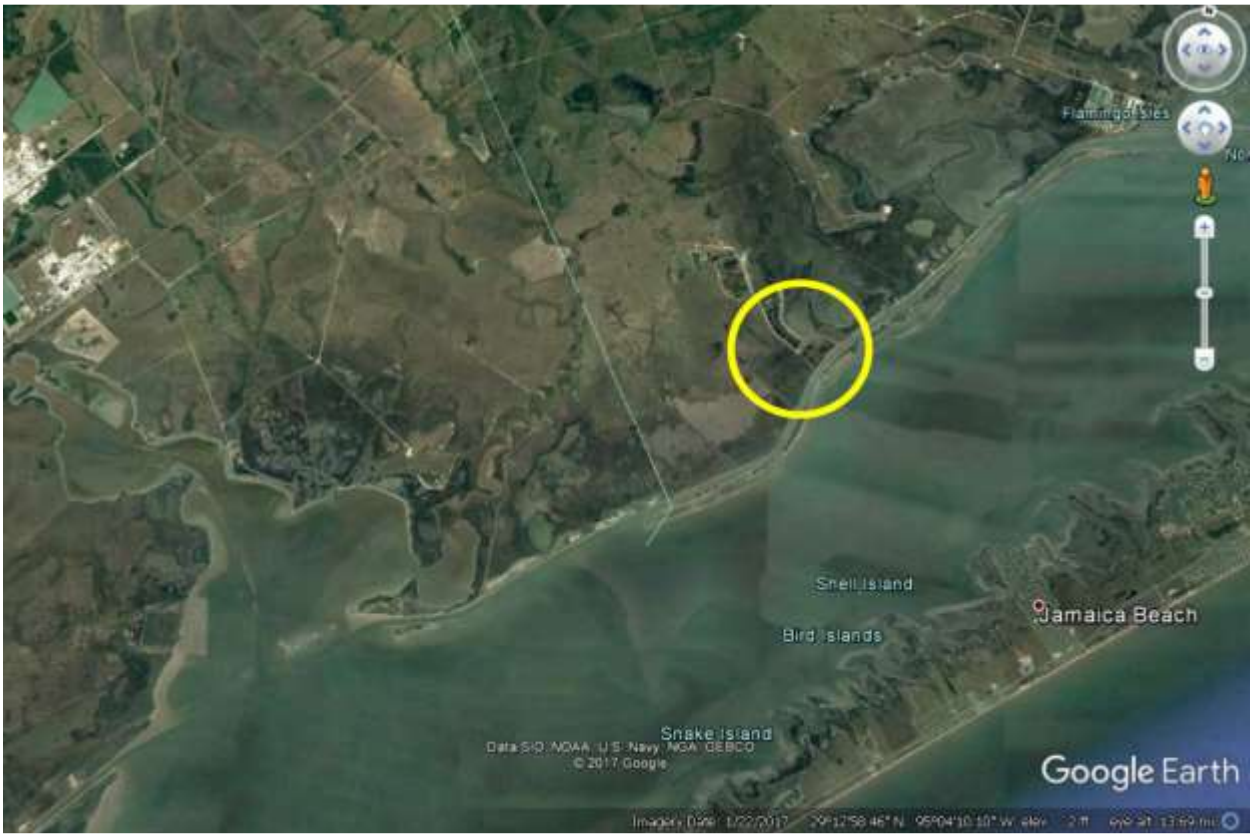

Figure 5: This map of West Bay shows the location of the McGinnes Pits where dioxin was disposed in earthen pits decades ago. As can be seen, these pits are just across West Bay from Jamaica Beach and to the east of Chocolate Bay.

The Galveston Bay Conservation and Preservation Association (GBCPA) has decided to take on the challenge of these pits after taking a break for several years after the Bayport fight. GBCPA is prepared to issue a notice of intent to sue Waste Management, the current owner of the McGinnis pits, as well as other responsible parties, to compel the removal of this toxic hazard from the shore of Galveston Bay. These pits are simply a toxic release waiting to happen, and I am convinced

that they represent an imminent and substantial endangerment to the public if they are not cleaned up now. GBCPA, and hopefully several other groups will issue a notice of intent to sue after the first of the year. If you are interested in further information, please contact jbb@blackburncarter.com.

The SSPEED Center Mid-Bay Alternative

Another major current issue on Galveston Bay involves the potential threat represented by hurricane surge. The SSPEED Center at Rice University has been studying surge flooding since hurricane Ike came ashore in 2008, basically missing the majority of the Houston area. Although many Houstonians believe that we have seen the 'worst case" storm with Harvey in 2017, that is simply not true. Harvey, while certainly potent, was only a rainstorm event in the Houston area, albeit a big one. Work at SSPEED Center indicates that a coastal surge upwards of 25 feet is reasonably foreseeable for the Houston Ship Channel and Upper Galveston Bay, potentially inundating several refineries and well over a hundred chemical plants that SSPEED's analysis indicates would cause the release of almost 100 million gallons of oil and hazardous substances, which is much larger than the 11 million gallons of crude oil from the Exxon Valdez and about half the size of the Deepwater Horizon spill. However, rather than being a spill into open water, this spill would first flow inland with the surge to adjacent residential and commercial areas as well as the plants and then out into the confined Galveston Bay where it would gather in the marshes and shorelines, potentially contaminating the bay for decades. Additionally, a storm of this magnitude would likely destroy well over a

hundred thousand homes and likely kill thousands, depending upon the success of evacuation efforts.

This is both a reasonable scenario and a very frightening one. This is such a significant threat that I am now a supporter of creating multiple structures in and around Galveston Bay to protect both the neighborhoods and the industrial complex from this surge. Although the politicians seem to prefer the Ike Dike which will cost over $10 billion, my preferred alternative, at least in the short term, is the mid-bay alternative which can be constructed for about $3 billion. The mid-bay would extend from Houston point in Chambers County to the existing disposal sites along the Ship Channel which are currently rimmed by 25-foot levees along the channel-side. These existing disposal areas would be extended down to about Eagle Point (across from San Leon) where a deep-water navigation gate would be located and then along the west side of the channel until it could be extended west to connect with the Texas City levee. This project would provide a higher level of protection than would the Ike Dike and could be financed by local bonds. The general layout of the mid-bay alternative is shown in figure 6. During the application process, a full vetting of potential negative environmental impacts as well as positive protection aspects would occur.

Figure 6. The proposed SSPEED Center mid-bay barrier is shown extending from Houston Point south along the Houston Ship channel to a point where it connects to the existing Texas City levee system. As proposed, this $3 billion surge protection system includes a backside levee for the City of Galveston and elevated roads along both the Bolivar Peninsula and the west end of Galveston Island. Graphic courtesy of Rogers Partners architects.

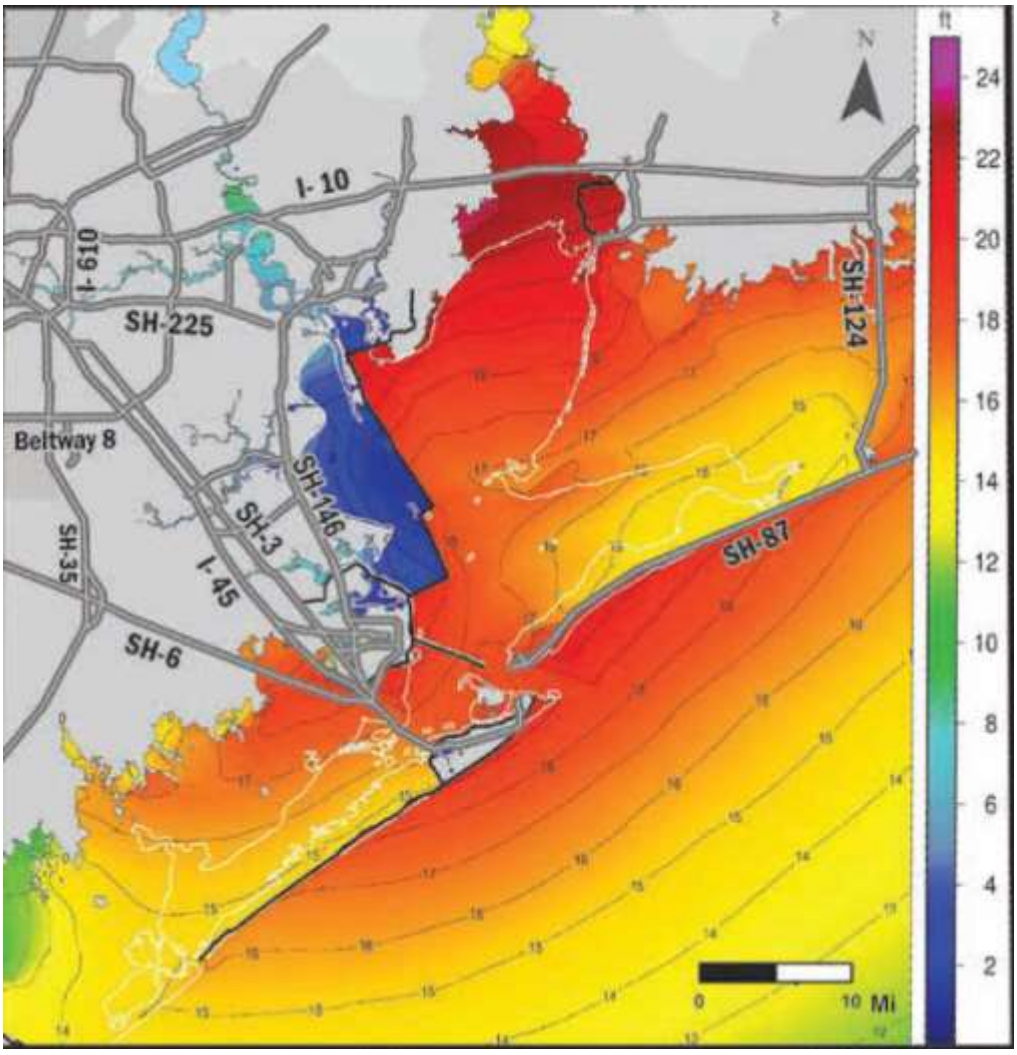

Figure 7: Map depicting the resulting surge levels with the mid-bay alternative in place and the backside levee and sea wall in Galveston at 20 feet. The storm depicted in this image is Hurricane Ike plus 15% wind speed coming ashore near San Luis Pass. Note the substantial protection for the west shoreline of Galveston Bay. Graphic courtesy of SSPEED Center and Christina Walsh.

After Harvey, it is certainly unlikely that $10 billion plus dollars will be provided by Congress given all the potential demands from Texas for federal financial aid. We need a reasonable alternative that can be built. At the least, a permit application to build this alternative should

be submitted to the Corps of Engineers ASAP. In this manner, at least one alternative could become doable in the not-too-distant future, and we need more than one pathway to address this urgent problem. And by the way, one design concept for the mid-bay alternative won a design award from the Texas Society of Architects. We need to think big and demand quality. And we need to protect the bay.

Figure 8. Rendering of potential multiple use aspects of the mid-bay alternative. Concept and rendering by Rogers Partners Architects.

The Texas Coastal Exchange

The Texas Coastal Exchange (TCX) is a concept developed by the SSPEED Center at Rice University and is based upon ideas developed by Elizabeth Winston Jones and myself while we were leading the Green Think Tank project at Houston Wilderness. This is a concept for buying and selling ecological services, including carbon dioxide sequestration, water supply enhancement, peak flood reduction and storage, bird watching and hunting. All of these services can be enhanced while at

the same time undertaking cattle ranching, making this idea compatible with many Texas landowner's current practices.

The TCX project has progressed substantially in the last few years to the point where a detailed plan of the rules and implementation concepts governing the exchange have been developed. At the current time, the basic idea is that a landowner can register to sell key ecological services, including carbon dioxide sequestration, by just indicating a desire to join the program and undertaking field testing to establish baseline soil carbon conditions as well as indicators for ecological diversity and water storage and enhancement (which are in the process of being developed). An example of the approach adopted by the Texas Coastal Exchange is shown in figure 9 below.

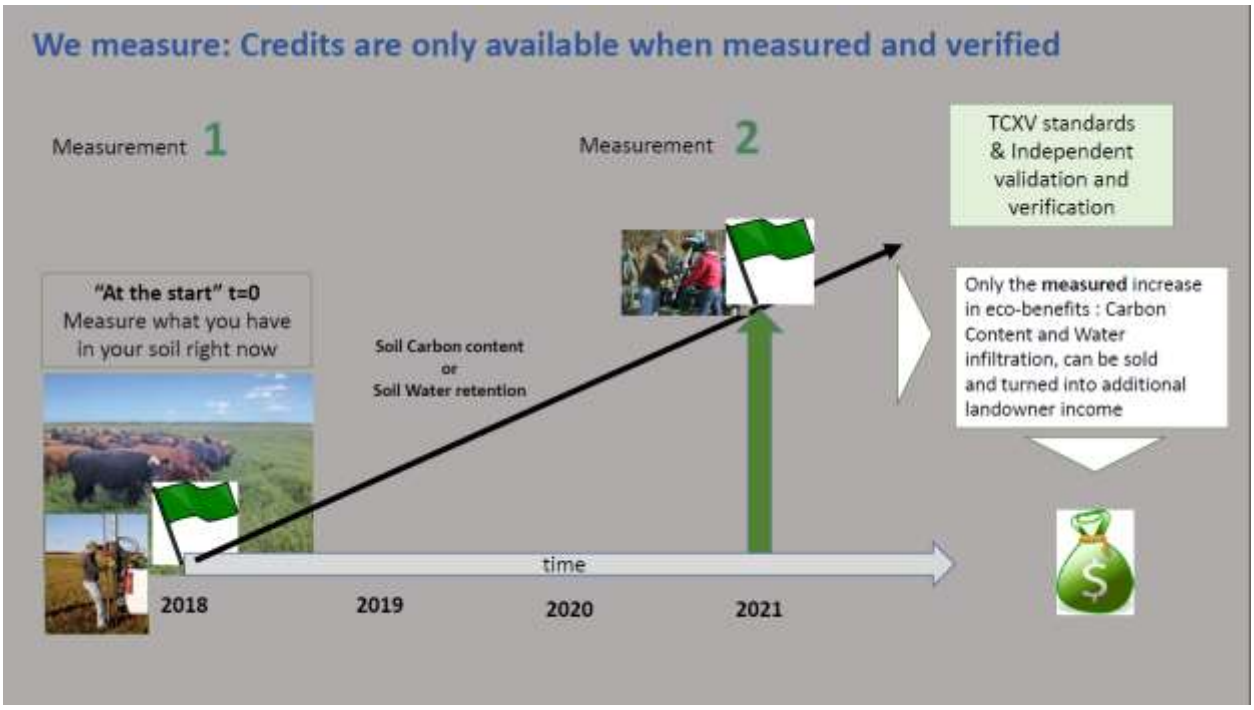

Figure 9: The Texas Coastal Exchange is a different from other exchanges in that it recognizes property rights to ecosystem services created by the landowner and only allows the sale of measured

increases in the content of carbon or water stored in the soil. Graphic courtesy of Dr. Henk Mooiweer, SSPEED Center, Rice University.

Over the several years of working on this project, many people have asked “How does carbon sequestration work”? And the answer is, it is a natural process whereby the plants, in this case prairie and marsh grasses, remove the carbon dioxide from the atmosphere by photosynthesis and turn it into carbohydrate which becomes leaves and root material and ultimately gets stored in the soil as carbon. This is a natural process that can be aided by certain types of cattle grazing that replicate the pattern and function of the bison herds of the past. A view of the root system of native prairie grasses is shown in figure 10. Note that some of these roots extend 15 feet into the subsurface.

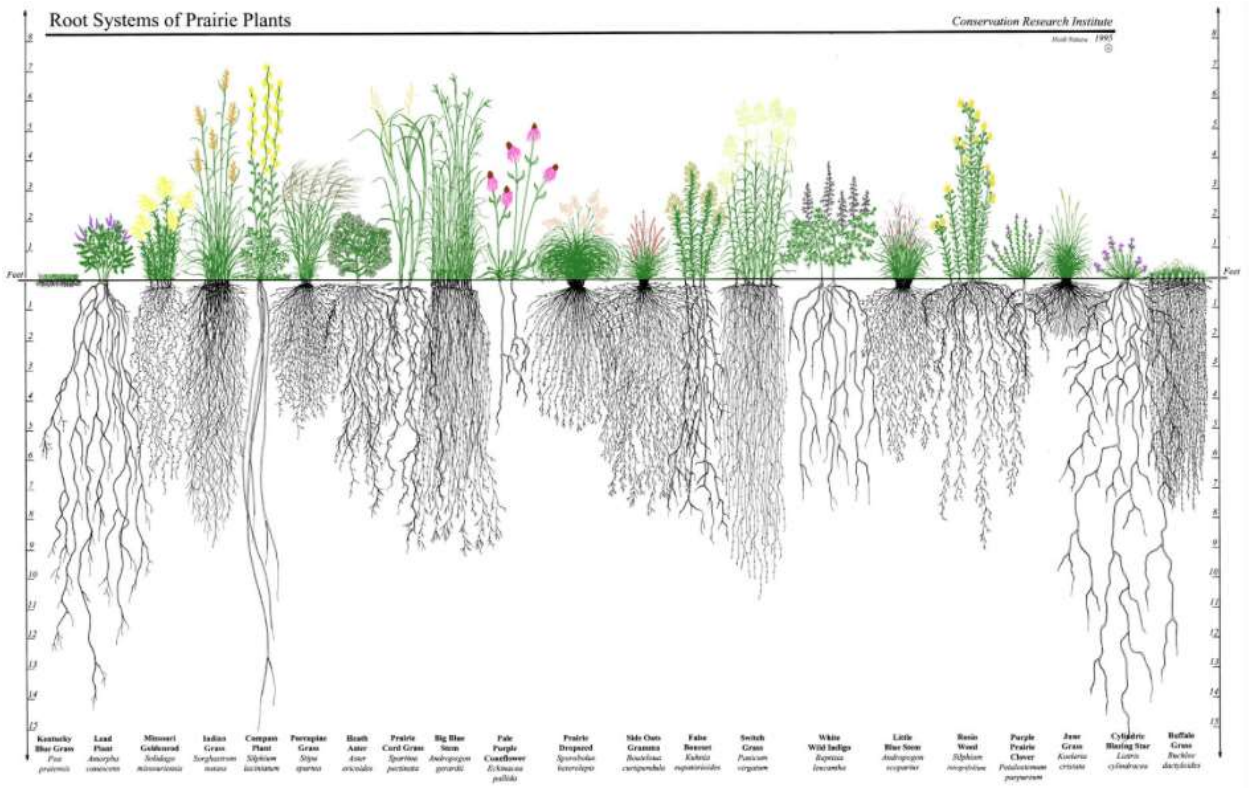

Figure 10: A diagram showing the depth of the root system of various prairie plants. The scale on the edge goes from 0 at the land surface to

15 feet below ground surface. Graphic from Conservation Research Institute.

Unlike other carbon exchanges, the Texas Coastal Exchange attempts to simplify the qualification and transaction rules. We believe carbon storage in the soil to be a property right and that carbon and other ecological services can be sold without the requirement of a permanent easement or a 100-year dedication of the land to conservation. Instead, we are proposing the use of a commodity contract with a term of ten or twenty years to meet initial concerns about carbon being retained in the soil. Additionally, we do not tell the landowner what management practices they have to follow. Instead, we allow the landowner to follow whatever practices they wish. If an increase in carbon or ecological services can be shown through testing, then it can be sold on the exchange.

At this time, this voluntary system is beginning to unfold. After the first of the year, carbon testing will be initiated along the Texas coast, with the extent dependent upon funding and landowner participation. We hope to obtain sufficient funding from potential buyers to create a "sellers club" to assist landowners wishing to participate in this program. During 2018, a number of seminars will be held to fully inform the farm and ranch community of the potential income that might be realized through ecosystem service transactions. At the same time, buyers are being solicited to join the "buyer's club" which will provide preferential access to sequestered carbon which is expected to be a limited commodity in the next decade.

Another common question is "Why would a company voluntarily buy carbon dioxide credits"? This question goes to the heart of the dilemma of many companies today. All major users of hydrocarbons

know that their carbon dioxide emissions add to the concentrations in the atmosphere and are the target of global concern, and they all keep metrics on these emissions. There is a substantial movement under way whereby companies, cities and individuals are attempting to become carbon neutral. In order to become carbon neutral, both direct and indirect hydrocarbon must be calculated and then this usage must be avoided, reduced and/or offset by buying credits. Over the next decade, more and more companies will move toward becoming carbon neutral, and those who move first to offset these emisisons will have a priority position on this limited resource.

As a country, we are not going to be able to offset all existing emissions, but we can offset a significant percentage of them. Over time, we believe that grasslands have the potential to sequester over a billion tons of carbon dioxide, a piece of the almost 8 billion tons of CO2(eq) emitted by the United States. And all of this will be accomplished using the market system. Stay tuned.

A Texan Plan for the Texas Coast

I have also written a new book that has just been released by Texas A&M Press titled *A Texan Plan for the Texas Coast*. This is a book about the future of the Texas Coast, one that every coastal fisherman, birdwatcher, and nature advocate of the coast should enjoy. It is beautifully illustrated by photographs by Kathy Adams Clarke, Geoff Winningham and Jim Olive. The cover is shown below, followed by an excerpt from the introduction.

Figure 11: Cover photo by Geoff Winningham from A Texan Plan for the Texas Coast as well as a fine photo of the author by Alfred Lee Kaufman. Graphic courtesy of Texas A&M Press.

Excerpt from the Introduction to *A Texan Plan for the Texas Coast*.

"The Texas coast is my place, a place of soft mud and hardheaded people. It is a place of natural wonder, of neotropical songbirds and endangered whooping cranes, a place of marshes and shrimp, a fisherman's paradise. It is also the global center of the oil, gas, and plastics businesses and home to major real estate development in and around Houston. This region is facing long-term problems that threaten its ecology as well as its economy and social structure. It lacks resilience on all levels. Yet on a good day, I see solutions to these challenges, solutions applicable throughout the United States and the world. And today is a good day.

We are living in a time when the Earth is filling up with humans and human impacts, yet we have value sets, policies, and thinking

that were developed during a time when the world was relatively empty of people and impacts. My favorite economist, Herman Daly, wrote about the distinction between empty-world thinking and full-world thinking. The empty world is what our parents and especially their parents and grandparents were born into — a world that was relatively empty of humans and human impacts, a world where there was always a perceived frontier.

Today there is a different type of frontier. If we are to flourish over the next century, we will need to adapt to the realities of the "full world." We will need to "settle" this new frontier.

The Texas coast will be affected by these "full world" realities. If we are opportunistic and apply ourselves, this transition to the full world will open up opportunities for actions and strategies that can lead to long-term coastal protection and even enhance the coast over its current situation, moving from minimization of impact to regeneration. But like many aspects of life, realizing these opportunities will require leadership and creativity and bold action.

This new frontier — the full world — is one where resources are limited, where every gallon of water counts, where every ton of carbon dioxide is tracked, where the successful companies are those that combine economic, ecological, and social thinking. Today, our systems and our thinking are still firmly rooted in a time of expansion, whereas our reality is becoming quite different. Our challenge will be to sustain and maintain an

economy that creates optimism and maintains our quality of life, and our values generally, as the game changes.

The Texas coast is different in some aspects from other areas of the U.S. as well as different parts of the world. We on the Texas coast cannot depend on government regulation to solve these problems (if it could). Texans don't like regulation and are unlikely to pass new government regulations to protect the coast. If we are going to save this wonderful resource for future generations, it will be because we are creative and nimble, something that government regulation often is not. We in Texas may be in a better position to accept this change than those in many other parts of the world simply because we are so obstinate about government and so accepting of independent thinking and entrepreneurship.

By understanding and talking about money and economics as well as water, ecology, climate change, eco-play, and spirituality along with the future of the oil and gas business, carbon neutrality, and a circular economy, a path to a healthy Texas coast can be discerned as we head into the future.

Money and economic thinking have key roles to play in the long-term protection and restoration of the Texas coast. I realize this after years of disputes and after years of working with proponents of our coastal assets, both green (natural) and gray (built). In many respects, the future is about the green and gray coming together, merging, cooperating, problem solving together.

I often think that as goes Texas so goes the Earth, because if we can find solutions here, they should work anywhere in the world. And if we fail here, it likely foretells setbacks elsewhere. This view of the world through a Texas lens assumes that in order to address our most pressing global issues, we must find solutions that work for the most dificult and intractable regions. And Texas is such a region.

The problems of the Texas coast are those that come from placing a linear economic system based on use and consumption upon a natural system that works in a diflerent way, a natural system with rhythms, cycles, and limits. When resources and assets were not limited, these issues were not as pronounced, but they are emerging as we face resource and pollution absorption limits. As a society, we are forcing the square peg of our economic model into the round hole of the natural system of the Texas coast, and they do not match well heading into the future.

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Viewed a certain way, this book presents a plan for the future of the Texas coast. But it is different from past plans. [T]his is a plan based on market economics and personal commitment and action. It is about protecting the coast with a set of tools that are consistent with the norms that prevail in Texas and on the Texas coast. In that sense it presents a different and perhaps new view of coastal planning.

A Texan Plan for the Texas Coast can be found at River Oaks Books or Brazos Bookstore or can be ordered from Texas A&M Press or Amazon. This would make an excellent Christmas present for someone who loves the coast, loves birding or loves fishing.

Poetry of the Coast

I have gotten into the habit of ending these coastal newsletters with a few poems that I have written in the last year. Here are a few to close out this coastal newsletter for another year.

The Red Breasted Merganser

On the frontage road of the Gulf Freeway
Coming back from Galveston on a beautiful spring day.

The duck-like bird sits atop the rock groins built
To protect the wonderful marshland that is slowly being
Taken by the bay, a bay that is rising,
Due to humans and requiring a response,
One of many since the climate changed.

The red breasted merganser sits stoicly in the sunlight,
Reflected green head with an unruly top,
A reddish brown slash across the top of the white breast,
The orange dagger-like beak still, at rest, at peace.
Thoughts come unbidden as I gaze upon this bird,

Thoughts about this wonderful place called Earth,
Called the Texas Coast, called Galveston Bay,
A place that pervades my essence and heals my wounds,
Generating joy that restores and rejuvenates,
Joy that simply becomes me.

The merganser rises and gracefully enters the water,
Moving gently, slowly, through the calm waters,
Inhabiting this place that resonates within my soul,
A place to which I am connected in inexplicable ways,
A place that allows my soul to swim with the merganser
On a joy-filled day on Galveston Bay in the spring.

The Pied Bill Grebe

Sitting in Austin reading Pope Francis's Encyclical,
Remembering last week's trip to the High Island rookery.

Spiritual magic leaps from the encyclical,
Written words that transcend the division between religions,
Words that envision a different human reality,
Words that inspire me to be and do better,
Words that attempt to capture the essence of life, of love,
Of human commitment to each other and to the Earth,
An Earth that provides for us,
An Earth pushed well beyond its limits,
An Earth that needs spiritual rescue
As does my kind.

The pied bill grebe floats upon the lake
That separates the nesting sanctuary from predators
Such as the raccoons and coyotes of the world
That would take the newly emerging life if they could,
Predators that abound in other forms and places
And challenge our values and our home.

The grebe disappears, diving for food,
And then returning to the surface, resuming its routine,
Enjoying the sanctuary provided by caring humans
Who set this special place aside,
A spiritual act of recognition and support for the Creation
About which Pope Francis so eloquently writes,
Creation that, he says, manifests the Holy Spirit,
A part of the Trinity, a part of God,
Life and God and Earth, forever, Amen.

At an Austin coffee shop in the morning
Considering the Pope and a bobbing bird
And enjoying every minute of it.

Frigate Birds on Westheimer

After Hurricane/Tropical Storm Harvey.

The rains have come and the flood is here,
The worst-case storm striking once again,

Floodwaters rising, roaring and sneaking,
Homes near bayous tranquil no more.

Magical areas - lush woods and green hues,
Flood plains filling as they always have,
Water without boundaries simply claiming
The space that it needs to reach the sea.

The frigate birds flew down Westheimer today,
The urban street far from the fish-filled Gulf,
The street now prowled by the hovering black bird
With the long scissortail and the serious demeanor,
A predator searching for new feeding grounds,
Brought into town by spinning winds
And all the new water –
Opportunity for the bird,
Horror to the homeowner,
Gulf storms, human dreams, colliding as before –
Indianola and Copano - lost places of past importance,
Galveston - never to rediscover its pre-storm glory,
And now Houston gut shot by tropical rain,
Looking for relief and for a ray of hope
As the frigates fly down Westheimer.

The Roadrunner

In the Hill Country jogging down the asphalt road
On a foggy morning in November.

The morning is silent. The hill is draped
In the soft cloak of moisture that dulls and dims
The color, the shapes, the familiar forms,
Concealing their variety and character,
Rendering them all gray outlines and forms,
When suddenly I hear the cluck of the turkey
And see motion beneath the cedar coming
Into view on my right.

I stop and watch as the long-legged brown bird
Scoots out from beneath the fence
And comes to the middle of the road
Where it stops and looks at me,
First puzzled and then, realizing what I am,
Takes off with the blaze of speed for which it is known.

Oh how I long to be swift like the road runner,
Escaping wily coyote and the other predators
That thrive here in the Hill Country,
Stealing our water, hijacking our springs,
All there for the taking unless we are quick enough
To challenge their science and make them fight
For every drop that they would remove
From these hills for personal gain.

Beep beep, I say, to the crested ground cuckoo
We call a roadrunner,
And I smile because today I feel fast.

Figure 12: The Roadrunner by artist Isabelle Scurry Chapman.

The artist Isabelle Scurry Chapman and I will be publishing a book of bird paintings by Isabelle and bird poems by me in 2018 as a follow-up to our earlier poetry and art collaboration titled *Birds: A Book of Verse and Vision*.

And with that, another coastal newsletter comes to an end. Find some piece of the coast and learn about it, claim it as your own, and act to protect it. And good karma will be yours. Beep, beep. Blackburn.