

THREATS FACING FLORIDA'S TOURISM DRIVEN ECONOMY

FIELD HEARING

BEFORE THE

COMMITTEE ON COMMERCE,
SCIENCE, AND TRANSPORTATION
UNITED STATES SENATE

ONE HUNDRED FIFTEENTH CONGRESS

FIRST SESSION

AUGUST 10, 2017

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SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

ONE HUNDRED FIFTEENTH CONGRESS

FIRST SESSION

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THREATS FACING FLORIDA'S TOURISM DRIVEN ECONOMY

THURSDAY, AUGUST 10, 2017

U.S. SENATE,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
St. Petersburg, FL.

The Committee met, pursuant to notice, at 1 p.m. at the University of South Florida, St. Petersburg, University Student Center, 200 6th Avenue South, St. Petersburg, Florida, Hon. Bill Nelson, presiding.

Present: Senator Nelson [presiding].

OPENING STATEMENT OF HON. BILL NELSON, U.S. SENATOR FROM FLORIDA

Senator NELSON. This meeting of the Senate Commerce Committee will commence. Thank all of you for coming. This is an overwhelming outpouring of interest in the subject matter of today's hearing. Thank you all very much for coming.

This is an official meeting of the Senate Commerce, Science, and Transportation Committee. It is a field hearing.

As we start the meeting, let's welcome the U.S. Naval Suncoast Squadron's Sea Cadet Corps, and they are going to lead us in the Pledge of Allegiance.

Cadets?

[Pledge of Allegiance.]

Senator NELSON. And if you will remain standing, I'd like to call on Reverend Watson Hayes, Executive Director of the Pinellas County Urban League, for the invocation.

Pastor?

[Invocation.]

Senator NELSON. Well, we are so grateful to our host. I want to have one of them to say a word before we get started in the Committee hearing. Though President Genshaft couldn't be with us, we have several of her very capable colleagues from the University, and a special thanks to the College of Marine Sciences for its high-caliber research into our vast natural resources.

Thanks also to the City of St. Pete, Pinellas County, for hosting us and to our colleagues, Kathy Castor, Charlie Crist, who represent this area so ably in the U.S. Congress. Thank you for being here.

I'm pleased that so many of our colleagues are here—also County Commissioner Janet Long, St. Petersburg Mayor Rick Kriseman, Clearwater Mayor George Cretekos, and Dr. Paul Sanberg from USF.

So I'd like to ask, Dr. Sanberg, if you might give us some words of greeting.

**STATEMENT OF DR. PAUL SANBERG, SENIOR VICE
PRESIDENT, RESEARCH, INNOVATION, AND KNOWLEDGE
ENTERPRISE, UNIVERSITY OF SOUTH FLORIDA; AND
PRESIDENT, NATIONAL ACADEMY OF INVENTORS,
ON BEHALF OF JUDY GENSHAFT, PRESIDENT,
UNIVERSITY OF SOUTH FLORIDA**

Dr. SANBERG. Sure. Thank you, Senator Nelson.

Ranking Member Nelson, my name is, again, Paul Sanberg, and I'm the Senior Vice President, USF, for Research, Innovation, and Knowledge Enterprise, and also President of the National Academy of Inventors. I'm honored to be here on behalf of President Judy Genshaft and the University of South Florida system. It's our great pleasure to host the Senate Commerce, Science, and Transportation Committee for this important field hearing on the threats facing Florida's tourism driven economy.

Thank you, Senator Nelson, for bringing us together here at the beautiful USF St. Pete campus.

I'd just like to ask any St. Pete or USF, in general, system faculty, staff, students to please stand, just to show your support here. [Applause.]

Dr. SANBERG. We would also like to recognize Congresswoman Castor and Congressman Crist for their participation in today's hearing. Thank you also to St. Pete Mayor Rick Kriseman, Clearwater Mayor George Cretekos, and Pinellas County Commissioner Janet Long, who have joined us today. Welcome, everyone.

Across the USF system, researchers work daily on solving global issues, including the health and sustainability of our beautiful natural environment. The people of Florida are served by world class independent research institutions which conduct the most rigorous and credible science possible. The Federal Government is a vital partner in this important endeavor.

Many of you will remember the important role that science played in responding when our tourism economy was threatened because of an environmental disaster, the 2010 Deepwater Horizon spill. Because our state had invested in research vessels operated by the Florida Institute of Oceanography, and because we had advanced instrumentation and world class expertise, researchers from USF and across Florida were among the first to begin an independent analysis of the spill's impact.

In the immediate aftermath of the spill, we are grateful to have had the leadership of Senator Nelson, Congresswoman Castor, and Congressman Crist to sustain and move this massive scientific effort forward. These three public servants played pivotal roles that enabled a robust examination of the spill's impact to continue. As a result, Florida citizens are more informed stewards in our fragile environment.

Our strong partnership in supporting education and research remains one of Florida's most important tools in securing a healthy, safe, and successful future. We are delighted to have the opportunity this morning to share the research our university faculty are working on with the staff from the Senate Commerce, Science, and

Transportation Committee. We look forward to learning more about the Committee's interest during this afternoon's hearing, as well as hearing testimony from the distinguished panelists.

Thank you very much.

Senator NELSON. Thank you so much.

I'd like to introduce and recognize two family members. First of all, my wife of 45 and a half years, Grace Nelson.

[Applause.]

Senator NELSON. And Dr. Charles Crist, Charlie's dad. Would you stand up and be recognized?

[Applause.]

Senator NELSON. Now, we're very fortunate to have our two mayors with us, and I want you all to bring us some greetings.

Mayor Kriseman?

**STATEMENT OF RICK KRISEMAN, MAYOR,
ST. PETERSBURG, FLORIDA**

Mr. KRISEMAN. Thank you, Senator.

Good afternoon, everyone. My name is Rick Kriseman. I'm the Mayor of St. Petersburg, and on behalf of myself and my City Council members, many of which are here with us today, we want to welcome you to the Sunshine City of St. Petersburg and to the beautiful USF St. Pete campus. My thanks to Senator Bill Nelson for his leadership in Washington, his work on this important committee, and his strong advocacy for Floridians every single day.

As everyone knows, tourism is vital to our economy here in St. Pete and to cities big and small throughout the state of Florida. So I thank you, Senator, for addressing threats to our tourism-based economy and for your past and future actions to prevent such threats.

Senator Nelson, Congresswoman Castor, and Congressman Crist all have strong track records on these issues, and I thank them for everything that they've done for our state, our county, and our city. And, in particular, I thank them for being such great partners with the City of St. Petersburg.

Welcome, everyone.

Senator NELSON. Thank you, Mr. Mayor.

[Applause.]

Senator NELSON. Mr. Mayor?

**STATEMENT OF GEORGE CRETEKOS, MAYOR,
CLEARWATER, FLORIDA**

Mr. CRETEKOS. Thank you, Senator. Thank you for being here. Thank you to everybody who has joined us.

You know, Pinellas County, Clearwater, is number one in tourism because we understand how important it is for our tourist industry partners to work with government, and we thank the Federal Government for the leadership that you, Senator, and our representatives, Crist and Castor, have provided, and even Governor Scott, in making sure that our legislature and our residents understand that we are competing not against each other, but we're competing against the world to bring tourists to Pinellas County, to the state of Florida.

We've done a very good job with that, and our industry partners understand that they are in a service industry, that they provide hospitality, and the reason we've been so successful is because they and their staffs do that, and we would appreciate you all taking that message back to Washington and to those in Tallahassee so that they can understand that tourism provides jobs and provides growth in the state of Florida.

One other thing I need to mention. We also have to protect beach re-nourishment and the importance of offshore oil drilling, and, Senator, thank you for your leadership in that regard. We cannot allow rumors to circulate around the world that Florida is contaminated when that has never been the case.

So thank you, Senator, for allowing me to be here today.

Senator NELSON. Thank you, Mr. Mayor.

[Applause.]

Senator NELSON. Commissioner?

**STATEMENT OF JANET LONG, CHAIR, COUNTY COMMISSION;
AND CHAIR, TOURIST DEVELOPMENT COUNCIL**

Ms. LONG. Thank you, Mr. Chair, and thank you to all of you for being here on this glorious afternoon in Pinellas County. Senator Nelson, you have been our champion, and we are so grateful that you are bringing this United States Committee field hearing today on this beautiful campus of USF. As Chair of the County Commission this year and Chair of the Tourist Development Council, I am grateful and sincerely appreciate everyone who is here, taking their time out of their busy schedule to attend what is going to be one of the biggest issues going forward in our county.

Tourism is our number one industry, and not only here, but throughout the state of Florida. This industry provides to us, right here in Pinellas County, 100,000 jobs for our county residents, and it drives—are you ready for this? This is a really big number—\$9 billion, \$9 billion in revenue and economic impact to this county every single year. In July, it was the 47th straight month of year-over-year tourist development tax growth for Pinellas County. But the threats that this county faces in our industry from beach erosion to red tide to the potential of increased offshore drilling, is very real.

So I look forward this afternoon to hearing the testimony and hope to get a better understanding of the diversity and the severity of the threats that face our industry.

So thank you, Senator, for your leadership, and our Federal delegation. What would we do without you?

Senator NELSON. Thank you.

[Applause.]

Senator NELSON. You might be also interested to know that in the midst of everything you see that looks like it's dysfunctional in Washington, Marco Rubio and I actually get along. And, of course, we invited Marco to come. He could not. He's off someplace else. But we do a lot of things together that you never see; the appointment of all the academics, the appointment of Federal judges, the U.S. attorneys, et cetera.

By the way, just a word for you until we get into the subject matter of the hearing. As a result of what you have seen play out over

the course of the last couple of weeks in Washington, with the dramatic vote of John McCain in the middle of the night, with now being able to move on from that subject, there was an immediate response in a bipartisan way of a number of senators coming together—informal meetings, sit-down meetings in each other's offices, and then culminating with a dinner just before we left Washington of 14 of us, evenly divided, seven and seven, who are talking about the fixes to stabilize the existing current law on healthcare.

So maybe, just maybe, we are seeing a change of the way that things have been operated. This being, if successful, a prelude to what else can be done down the road on income tax reform and desperately needed infrastructure in this country. That's not just roads and bridges, but it's airports and seaports, it's broadband, it's sewer plants and water plants, and so forth, that are so desperately needed.

Now, the way the Committee usually operates—the Chairman makes an opening statement, the Ranking Member makes an opening statement, and then the witnesses are introduced, and then we go to questions. I have invited my two colleagues in the Congress to ask questions with me, and we have a star spangled panel today on this subject.

If you think back, now, why are we here? In large part, it has already been addressed by the statements that you've heard. But think back to a quarter of a century ago. Southwest of where we are right now, 330,000 gallons of number six fuel and an additional 32,000 gallons of jet fuel, diesel, and gasoline spilled into Tampa Bay. That was just 24 years ago. Two tank barges and a ship sat disabled due south of Mullet Key, blocking the entrance to the Bay, the main shipping channel. It was closed for nine days.

Oil coated Fort DeSoto Park and Egmont Key almost immediately, and then the winds and the tides carried the bulk of the fuel out into the Gulf until a storm pulled the mess back onto Pinellas County barrier islands, from Redington Shores to St. Pete Beach and Boca Ciega Bay. At that time, more than 2 million visitors used the boat ramp at Fort DeSoto Park each year.

So it's fitting that today, we are hearing about the threats to our state's tourism driven economy and what we can do about it to mitigate the risk. Last year, a record 113 million visitors, both international and domestic tourists, came to Florida. The tourism industry supports about a million and a half jobs in this state. So there's a lot at stake, and I think we'll hear some of that from our panelists today.

You think about our brand. It's sunshine, it's sea breezes, it's white sand beaches, it's family friendly theme parks, and it's world class fishing and seafood. So when red tide comes along or if toxic algae closes a beach, tourism dollars go elsewhere. Hurricanes, oil spills, sea level rise, and Zika threaten our brand. But we can take steps to protect our tourism industry, and that's what this hearing is about.

Ever since your Senator was a young Congressman, I've been in this fight to protect Florida's unique environment and its tourism-dependent economy. Thus, it was quite natural, in a bipartisan way, with a Republican senator, my colleague, Mel Martinez—in

2006, we enacted into law a moratorium on oil drilling off of Florida in the Gulf of Mexico.

[Applause.]

Senator NELSON. That moratorium is the only place in the entire outer continental shelf of the United States that is off limits to oil rigs, and it's off limits until the year 2022. The United States Air Force has asked us to extend that another 5 years to 2027, and they've done so—why? This is the largest testing and training area for the United States military in the world, and it's unfettered in their ability for all of the development of new systems and sophisticated weaponry. They have no impediments.

You take a famous range like the Nevada Test Range. You've heard of the secret area there called Area 51. You superimpose that over the Gulf test range and it's just a little spot. This is the largest testing and training range in the world, and the reason the Air Force has asked us to extend it is they want to invest in very expensive, updated, new telemetry as they are testing these systems, and they want the security of knowing that that investment is going to be there so that they've got that range for at least 10 years. Yet we are in a fight, because the very attempts in the defense bill to get the moratorium extended to 2027 are being vigorously opposed by the oil industry.

So just think back. What were some of the consequences? Remember the spill off of Louisiana? That was way off of Louisiana, but the winds shifted. They started bringing it to the east. They brought the oil as far east as Pensacola Beach, and those sugary white sands of Pensacola Beach were completely covered in oil, and that photograph flashed around the world.

The winds kept coming east, and they brought it to Destin and Sandestin. We kept it out of the pass, unlike Pensacola Pass, because the oil got into Pensacola Bay. We kept it out of the pass at Destin, getting into the very large Choctawhatchee Bay. That was done with booms and buoys. The winds carried it far east—there were tar balls on Panama City Beach—and then the winds reversed, and they started carrying it back to the west.

But the damage was done. When those photographs flashed around the world, they thought there was oil all over the beach, and the tourists did not come to the Gulf Coast beaches all the way down south to Naples and Marco Island for an entire season. That was a consequence of having oil on Pensacola Beach.

You remember back at one point, 36 percent of the entire Gulf was closed to fishing. A recent study showed us estimates that recreational anglers lost \$585 million in fishing opportunities as a result. So the bottom line is if there is an oil spill, it spells disaster for state and local economies.

So what are we going to do going forward? We want to certainly maintain our vibrant tourism economy. We want to maintain our very delicate environment in the bays and estuaries, where so many of the critters come in and the marine life is spawned, and then goes back out to sea.

Another issue that we're going to have to face is Florida's and the U.S.'s Brand USA. Brand USA is a quasi-government private partnership that promotes tourism from foreign countries to the United States. It has had a very positive effect on Florida's econ-

omy. It attracts millions of foreign tourists to the United States, many of whom, of course, come to our state.

The President has proposed in his budget doing away with Brand USA. Eliminating it, I think, is classic definition of penny-wise and pound-foolish, and I know the three of us are going to try to convince our colleagues to preserve this important Federal program. The fact is that it's *de minimis* compared to the other items in the Federal Government, and yet it returns such tremendous dividends to our state.

OK. Let's get to our witnesses. Dr. Sherry Larkin is a Professor of Resource Economics and Associate Dean for Research at the University of Florida. She's also Associate Director of the Florida Agricultural Experiment Station. Ms. Robin Sollie is President and CEO of the Tampa Bay Beaches Chamber of Commerce, working out of their St. Pete Beach headquarters, representing the business and tourism interests of several Bay communities.

Ms. Maryann Ferenc serves on the Board of Directors for the U.S. Travel Association and Brand USA. Dr. Mitchell Roffer is the President of Roffer's Ocean Fishing Forecast Service based in Melbourne and Miami, and he has provided targeted, science-based fishery forecasts for 30 years.

So welcome to all of you. Take about 5 minutes apiece. Let's start with you, Dr. Larkin, and we'll work right down the panel.

**STATEMENT OF SHERRY L. LARKIN, PH.D., PROFESSOR,
FOOD AND RESOURCE ECONOMICS DEPARTMENT,
ASSOCIATE DEAN FOR RESEARCH AND ASSOCIATE DIRECTOR,
FLORIDA AGRICULTURAL EXPERIMENT STATION,
INSTITUTE OF FOOD AND AGRICULTURAL SCIENCES,
UNIVERSITY OF FLORIDA (UF/IFAS)**

Dr. LARKIN. Good afternoon, Senator Nelson and distinguished panel members. My name is Sherry Larkin. I'm a natural resource economist at the University of Florida.

My research examines how our common property resources can be better managed by considering the biological, ecological, and economic dynamics that affect sustainability and generate benefits to society. A component of my research involves estimating the economic value of so-called nonmarket goods, which are environmental services, like clean air and water and healthy fish and wildlife populations, in order to include such information in decision modeling.

While most of my research has focused on fisheries, I have examined environmental stressors like red tides and oil spills in my 20-year career here in Florida. I first came to Florida in 1997. I envisioned Miami and the Everglades and hoped to visit all of the famous beaches. But what I learned in my first few weeks has set the tone for my career and enticed me to stay, and that is that Florida's economy, and especially tourism, is based on our natural resources, especially from things like our spring water that flows to our coasts to the diverse flora and fauna that we share our coastal habitats with.

In the most developed and undeveloped communities statewide, protecting and enhancing our natural resources and conserving them for future generations is in our economic self-interest, whether they be used directly or indirectly, by full or part-time residents,

or by visitors from other states and nations that may one day be our neighbors. In what follows, I outline Florida's strengths, opportunities, and aspirations for ensuring a strong and vibrant nature-based tourism economy.

Strengths. I believe Florida has three basic strengths in that regard. First, we're already a strong brand recognition as a tropical vacation destination and supporting built infrastructure. Second, Florida has a rich and diverse environment. Third, visitors seek out nature-based experiences while in Florida, either indirectly at our famous theme parks that highlight them or directly through visits to state parks. Recent corporate investments by Disney to expand into coastal resorts and even redesign and rename their downtown to highlight our local freshwater springs signals that corporate America recognizes the potential for additional nature-based tourism.

Opportunities. The neo-classical economic framework identifies six distinct economic values associated with human use of the environment that can be measured. I included a graphic on page 3 [see page 11 for reference to graphic]—I'm not sure if all of you have that—but they are basically of two types. There are so-called non-use—or use values, first, I'll talk about—because they're generated from people that literally use the resource directly, such as from fishing or indirectly from activities like birdwatching.

And then there are the non-use values, where an individual values the protection of a resource, not for their own personal use, but rather to ensure that it continues to exist. Think of polar bears that perhaps nobody will ever even see in person.

This total economic value framework allows economists to make a "deep dive" into the investigation of what constitutes and contributes to economic value, which also helps identify opportunities for investment to increase that value. I have used this framework for the Florida legislature's Office of Economic and Demographic Research to value, you know, making the public whole following the *Deepwater Horizon* oil spill as required by the Oil Pollution Act.

The analysis generated a conservative estimate of \$643 million for lost direct-use value and \$854 million for lost existence value. That is \$1.5 billion for just two of the six types of economic losses, and those are to Florida residents alone. These figures actually also exclude job losses and lost tax revenues from reduced visitor spending.

Aspirations. In closing, Florida's economy fundamentally depends on our tourism, which, in turn, is dependent on our natural resources. But the industry does face numerous threats, some natural and others manmade, all of which can be prioritized in part with economic analysis of, for example, the following four types of projects.

One, built and natural infrastructure to expand recreational opportunities and support rural development. Two, technological innovations, such as marine aquaculture, to jump start a blue revolution for job growth. Three, improve terrestrial and freshwater environmental systems that generate spillover and downstream economic benefits for nature-based tourism. And, four, prevent, mitigate, or control invasive species to protect our old Florida brand, ecotourism, and commercial sectors of our economy.

Thank you for the opportunity to testify. I would be happy to answer any questions.

[The prepared statement of Dr. Larkin follows:]

PREPARED STATEMENT OF SHERRY L. LARKIN, PH.D., PROFESSOR, FOOD AND RESOURCE ECONOMICS DEPARTMENT, ASSOCIATE DEAN FOR RESEARCH AND ASSOCIATE DIRECTOR, FLORIDA AGRICULTURAL EXPERIMENT STATION, INSTITUTE OF FOOD AND AGRICULTURAL SCIENCES, UNIVERSITY OF FLORIDA (UF/IFAS)

Good afternoon Chairman Thune, Ranking Member Nelson, and members of the Committee. Thank you for giving me the opportunity to provide testimony regarding the threats to Florida's tourism industry, especially those that are directly and indirectly linked to natural resources of our estuaries and wetlands, surrounding gulf and ocean, and our coastline.

My name is Sherry Larkin and I am a natural resource economist at the University of Florida. My research examines how our common property natural resources can be better managed by considering the biological, ecological and economic dynamics that affect the regeneration and sustainability of environmental assets (primarily fish stocks) that generate economic benefits to society. A component of my research involves estimating the economic value of so called "non-market goods"—environmental goods and services, such as clean air and water, and healthy fish and wildlife populations, are not traded in markets—in order to include such information in decision modelling. This type of analysis is necessary when considering environmental issues that affect human systems, and public programs that have the potential to generate non-market benefits (such as recreational experiences) or to mitigate, control or prevent negative economic consequences. In addition to my academic achievements as a professor, including that I am the current President of the North American Association of Fisheries Economists, I have served on the Science and Statistical Committee of both the South Atlantic and Gulf of Mexico Fishery Management Councils. While most of my research has focused on fisheries, I have examined environmental stressors like red tides and oil spills in my 20-year career in Florida.

For this hearing, I was asked to discuss challenges to the tourism economy in the State of Florida, and provide suggestions for how these challenges could be addressed to protect existing tourism opportunities. My comments will primarily represent the research with which I have been involved, but my opinions will be reflective of my collaborators and colleagues within UF/IFAS that are conducting research under the auspices of the Florida Agricultural Experiment Station and the Florida Sea Grant College Program.

I came to Florida on a one year post-doc in 1997, never having been east of Indianapolis. I envisioned Miami and the everglades, and hoped to visit Key West to enjoy those famous pink shrimp, but what I learned in my first few weeks has set the tone for my career—Florida's tourism is based on our natural resources, from our spring water that flows to our coasts, to our diverse flora and fauna that we share our coastal habitats with, and in the most developed and undeveloped communities from Key West to Pensacola. Protecting and enhancing our natural resources and conserving them for future generations is in our economic self-interest whether they be used directly or indirectly for full and part time residents, and visitors from other states and nations that might one day be our neighbors.

As a natural resource economist, and with respect to our environment and natural resources that have and generate economic value, we aim to provide information to help make strategic investments; yes, all projects provide value, but what about costs, lost opportunities and relative values? In the face of limited resources, I am here to argue for the use of economic analysis in decision-making both from my disciplinary expertise and my own research, but also as a representative of all UF/IFAS researchers that I serve in my role as an associate dean for research and associate director of the Florida Agricultural Experiment Station.

In what follows, I outline—from an economic perspective—Florida's strengths, opportunities, and aspirations for ensuring a strong and vibrant tourism economy.

Strengths . . . of Florida's tourism economy

Florida has a rich and diverse high-quality environment—from freshwater springs that attract divers worldwide, to numerous iconic mammals and reptiles (alligators, manatees, sea turtles, panthers, Key deer, etc.), unique birds (roseate spoonbills), 825 miles of coastline with diverse beach characteristics and palm, pine and oak trees that highlight our tropical to upland habitats that reinforce our "old Florida" brand. A brand that has been fostered by past public investments and that I sought

to model in a theoretical contribution to the literature. A brand that arguably supports a robust tourism industry.

Florida's "brand" is comprised of 9 features that attract visitors. Beaches are the most important feature, but only account for 26% of Florida's attractiveness to visitors. More importantly, specific ocean legacy industries (ports/ocean transportation, the marine fisheries, and ocean recreation by tourists), excluding the hospitality industry, directly employ over 228,000 Floridians (Florida EDR, revenue estimating conference, 2015).

While beaches may be the first destination for the majority of visitors, data shows that visitors seek to enjoy our natural resources and that enjoyment translates into economic value and return to the state. (see box). Clearly, our natural resources are the key to our tourism, and coastal tourism in particular—where 80 percent of Floridian's live and work—has been an economic engine for the state. Recent corporate investments by Disney to expand into coastal resorts and even redesign and rename their "downtown" to highlight our local freshwater springs indicate the potential growth of our natural resourced-based tourism.

Opportunities . . . of identifying and increasing the economic value associated with nature-based tourism

From a neo-classical economic perspective, anything that gives an individual satisfaction or "utility" to the point that they are willing to forgo scarce resources to obtain it has an "economic value." Whether the scarce resource is time, money, or some other object of trade, the value of the trade is a conservative estimate of the value of the non-monetized natural resource because the trade would only happen if the individual derived at least the same or greater level of satisfaction.

In total, there are six distinct economic values associated with human use of the environment that can be measured (Figure 1) and they are of two types: so-called "use values" because they are generated from people literally using the resource today (either directly such as from catching and eating fish or indirectly from ecosystem services or recreational boating, beach going, or wildlife viewing),¹ or from the value of holding the resource with an option of using it in the future (such as set aside areas of biodiversity for future recreation or medical products) and "non-use values" where an individual values the protection of a resource—not for their own personal use—but rather to either ensure it exists (think polar bears and koalas that maybe no one will ever see), or for the benefit of others either today or in future generations (that is, altruistic and bequest values, respectively).

¹Further distinction can be made within these categories, and different names are used to convey the nature of each value. Such categories include those that focus on the "services" provided including provisioning (direct use value), cultural (indirect use value, recreation in particular), regulating and supporting (indirect use value, ecosystem services like habitat, water filtration, wetlands, and nutrient cycling etc.).

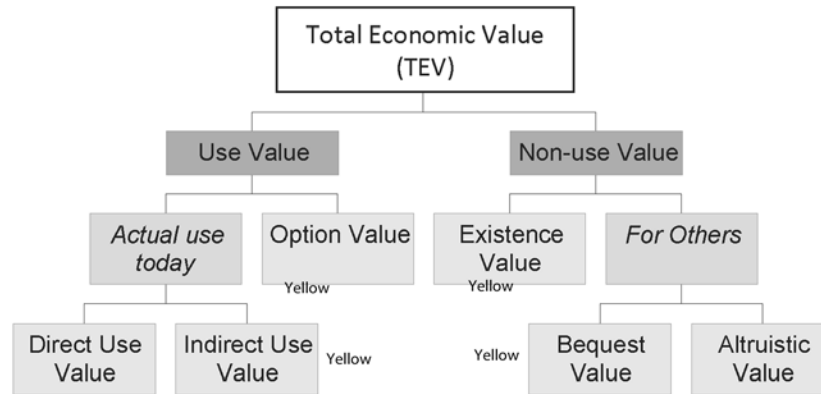


Figure 1. Total Economic Value (TEV) of a natural resource to an individual and society can be measured as the sum of up to six distinct values (in yellow).

This total economic value (TEV) framework allows economists to make a “deep dive” into the investigation of what constitutes and contributes to economic value. And while some of these values are relatively straight forward to estimate—such as the value of seafood or cost to travel to the coast for recreational boating, others are more salient and require advanced methodologies and strict protocols for data collection in order to begin the judicial process of damage assessment under conditions established following the 1989 Exxon Valdez oil spill (Bishop *et al.*, 2017. “Putting a value on injuries to natural assets: The BP oil spill” *Science* 356(6335): 253–254).

The TEV framework has been used to estimate the value of opening up new natural areas to recreation, investing in infrastructure that can allow for greater use, or protecting existing coastal areas; alternatively, it can be used to value losses or potential losses in the same. By integrating scientific information on changes in either the biophysical or human infrastructure—whatever the cause (rising seas, rising temperatures, storm events, or algal blooms)—with the economic (be it either costs and benefits, risk assessments, and impact analysis), decision makers are poised to make informed decisions with the highest return on investments (ROIs).

While the TEV framework estimates the value to individuals that can be extrapolated to society as a whole, economists have also utilized impact analyses that estimate the ripple effects of a change in economic activity at the county, regional, or state level—that is, by estimating a change in the spending in an economy and associated secondary effects (indirect and induced from multipliers) of the change in spending. This is an important tool as it highlights the linkage between the economic value of the environment and natural resources and the job creation and community benefits derived. This was highlighted in a recent Florida Sea Grant Report entitled “Living on the edge: The balance between economy and environment” that claimed

Most of Florida’s 20 million residents live in coastal counties, and over 80 million tourists visit the coast each year. This concentration-of people, activities and economies contributes more than 80 percent—almost \$562 billion—to the state’s economy annually.

I would argue that the premise is false, that is, there isn’t a balance; the environment and economy are inextricably linked and what benefits one, benefits the other and vice versa.

I have used the TEV framework on behalf of the Florida Legislature’s Office of Economic and Demographic Research to value making the public “whole” following the Deepwater Horizon oil spill—as required by the Oil Pollution Act. The analysis generated a *conservative* and risk-adjusted estimate of \$854 million for lost passive use value and \$643 million for lost direct use value from forgone recreational trips in the aftermath; or nearly \$1.5 billion of lost TEV associated with just two of the six economic values that Floridians could have for a restored Gulf environment in the short run. This means the analyses would support investing up to \$1.5 billion in preventing similar damages to the Gulf of Mexico’s natural resources. In addition, the study also estimated the losses to the state of Florida from forgone trips by do-

mestic visitors (via IMPLAN software).² In particular, visitor spending fell \$1.3 billion due to cancelled trips over a 28-month period. The associated regional economic impacts equaled a reduction of \$2.03 billion in output (industry revenues), and employment loss of over 20,000 job-years, and \$1.37 billion in decreased value-added. In addition, the corresponding loss in sales tax revenue totaled \$77.8 million dollars. For comparison, the state was awarded \$2 billion on behalf of its trustees to compensate for economic losses following the spill, primarily due to tourism effects.

In addition, I have participated in studies that have generated economic information for resources in Florida (see box for examples). Economic analyses provide a rigorous framework upon which to evaluate investment in environmental and natural resource assets that in Florida are surely to be used and enjoyed by tourists. Such a framework is critical when investment dollars are scarce and scientific information is costly. And given an increasing demand from population growth, choices will be imminent.

Studies by S. Larkin estimating the economic value or impact of:

- dredging deeper to facilitate recreational boating and establishing no wake zones to protect wildlife in Lee County;
- investing in artificial reefs in six Southeast Florida counties to augment recreational fishing;
- the prevention, mitigation and control measures for harmful algae blooms (e.g., fertilizer taxes, beach information systems, biological and chemical control);
- tradeoffs of overfishing versus reef fish diversity, and how fisheries management could partially mitigate impacts of invasive lionfish on marine food webs in the West FL shelf;
- managing or removing invasive plants from state parks;
- the ecosystem services provided by the hard clam industry near Cedar Key; and
- the potential demand for new outdoor recreational opportunities along the St. John's River.

See References for source documents.

No discussion of environmental and natural resources would be complete without mention of climate change and associated concerns over sea level rise and extreme weather events. One way to frame the issues is to first consider—or not consider at all—whether the cause matters. If we, as a society, have strategies that mitigate, control and possibly prevent associated environmental and economic damage with a high degree of certainty and at costs that are less than the value of rebuilding existing infrastructure, what then? Economic analyses can compare the future costs with the benefits of proposed strategies to assess the ROI.

²Impact Analysis for Planning (IMPLAN) software uses national and regional economic data to measure the “ripple effect” on a regional economy that is caused by a change in spending by non-residents. The total economic impact from a change in spending by non-residents of the study region (direct effect) includes the secondary effects of economic activity lost from reduced purchases of intermediate products through the industry supply chain (indirect effects) and activity lost from reduced employee household and government spending (induced effects). Economic multipliers are used to capture the distinct secondary effects on the regional economy by accounting for the “leakage,” or the degree to which demand for goods and services in the region is met by businesses that import from other regions.

Aspirations . . . for moving forward

My personal and professional hopes are that society makes investment decisions based on sound science, including sufficient knowledge of the biophysical world and interdependent social sciences that collectively shape societal outcomes. I also hope that the inherent interconnectedness of the natural and physical world become better understood by all so that strategic investments, while seemingly narrow in their objective, can eventually lead to significant socioeconomic benefits. I offer two examples before ending with a list of suggestions to help mitigate future threats to Florida's tourism driven economy.

The first example involves the political decision to close a fishery over concerns of stock collapse. The town of Cedar Key was essentially removed of its lifeblood after a public vote to ban net gear for the capture of mullet in the mid-1990s. The public investment that ensued to retrain fishermen to farm hard clams was significant. Fast forward 20 years and Cedar Key is the leader in the production of hard clams, which has supported a relatively high-valued locally caught fresh source of seafood with spill over externalities to the supporting rural community. Fishing jobs have increased, a working waterfront is maintained, tourism is burgeoning, and public and private investments are increasing. This public investment 20 years ago has resulted in recent substantial investments by the Florida Aquarium and the new UF/IFAS Nature Coast Biological Station, which houses new UF faculty conducting research along the Big Bend Region. The seemingly private benefits of reinvesting in fishermen has provided public benefits in the form of rural development and expanded tourism opportunities that are independent of out-of-state brand name hotels.

The second example highlights the potential for further development of aquaculture in Florida. UF/IFAS has researchers, including nearby at Apollo Beach and in Ruskin, that are seeking to (1) farm corals for restoration of the Florida Bay and the Keys in order to improve water quality, habitats for other species, and support increased snorkeling, diving and fishing; (2) rear live bait fish that have high economic value and the potential to reduce pressure on the harvest of wild forage fish from the ecosystem, a move that would leave forage fish to support an increase in valuable reef fish species; and (3) augment populations of popular recreational marine species such as snook, red drum and scallops. Today, the recreational scallop fisheries along the northern Gulf coast of Florida provide substantial economic activity to several rural coastal communities.

In closing, Florida's economy is fundamentally dependent on our tourism, which is in turn dependent on our natural resources. But the industry faces numerous threats, some natural and others man made; all of which can be addressed in part with investment. Florida's brand name will continue to grow with continued investments that evaluate the benefits and costs of each choice, which may require scientific information. Below are types of investments—some obvious, some not so obvious—that show the breadth of activities to achieve this objective:

1. *Investment in built and natural infrastructure.* Improve or create new on-site recreational facilities such as parking lots, boat ramps, and boardwalks. Improve off shore and underwater ecosystems that protect the built environment in coastal areas (e.g., oyster reefs), and that serve as habitat for species that can supply additional recreational opportunities (diving, fishing, and/or snorkeling). These investments *will directly strengthen local economies by improving access and visitation opportunities, and expand Florida's portfolio while providing rural development.*
2. *Facilitation and support of technological innovations such as aquaculture.* Biological research to close the life cycle of high-valued species, legal research to reduce regulatory burden, engineering studies to improve design and economic studies to improve efficiency and evaluate the ROIs can all help to augment wild populations for recreational harvest (e.g., fish species) and increase the supply of fresh fish to tourists to boost the local experience, and further build the Old Florida brand. These investments *would serve to initiate a "blue revolution" in the U.S. and the new industries would be associated with job growth.*
3. *Continued protection of wildlife.* Collaborate with and augment efforts by conservation organizations to ensure habitat areas are sufficient for iconic species like sea turtles, manatees and goliath grouper that have tremendous popularity among tourists. Bird watching is one of the fastest growing hobbies as enjoyment is not limited by physical ability, and birders are willing to travel to see unique species like sandhill cranes, whooping cranes, and bald eagles. Public investment to support private lands that sustain valuable species for the benefit of all are well justified. Such investments could include the additional expense of beach renourishment projects that are suitable for sea turtle nesting

(i.e., proper sand, slope and compaction) and conservation easements for agricultural lands that ensure continuous acreage to support larger mammals; this is because investments in terrestrial and freshwater environmental systems generate spillover and downstream economic benefits that support nature-based tourism.

4. *Invest in efforts to prevent, mitigate or control the spread of invasive species* that can introduce pests and diseases that threaten the survival of iconic plants and animals (think large palms, citrus, and endangered panthers and black bear, some of which are currently threatened), and human health (e.g., mosquitos). Florida is ground zero for the unintended and undetected introduction of new species that do not have local predators to keep populations in check. The risk is exacerbated by the ongoing expansion of port capacity and international trade. UF/IFAS research has shown that early investments in detection (biological risk assessments) are substantially more cost effective than controlling the spread of established species (pythons and melaleuca come to mind); consider investments in risk assessments for example *to preserve the aesthetics of our tropical environment and sustain the economic benefits derived from ecotourism that are critical to nature-based tourism and commercial sectors of our economy.*

Thank you for the opportunity to testify today. I would be happy to answer any questions that you might have.

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Senator NELSON. Thanks, Dr. Larkin.

Ms. Sollie?

STATEMENT OF ROBIN A. SOLLIE, IOM, FCCP—PRESIDENT/ CEO, TAMPA BAY BEACHES CHAMBER OF COMMERCE

Ms. SOLLIE. Thank you, and—

Senator NELSON. By the way, while you all are working on that, let me call your attention to the poster over here. [Poster is on display.] That, of course, is the peninsula of Florida. All of that yellow in the Gulf is the area that is off limits in law to drilling, and, as you see, in a position from Clearwater Beach to the edge of the line on the west, which is called the Military Mission Line. That's 235

miles away. When you get down as far as Naples, it's something like 260 miles. Up in the panhandle off of the beach there, it's 125 miles off of Panama City Beach, and that is one of the national assets.

We are now—look down there where the Keys are. So when the U.S. Navy Atlantic Fleet had to shut down its training in Puerto Rico in the island of Vieques, all of that training comes here now. So they'll send the squadrons of F-18s in the Navy down to Key West Naval Air Station, which is on Boca Chica Key, and when they lift off, you can see from that map, in 2 minutes, they are in restricted airspace. So they don't have to spend a lot of fuel and time to get to their training area.

Then you can see from the bottom all the way north to the panhandle where the big Eglin Air Force Base is. That's a distance of 350 miles. They can test weapons. For example, they could shoot a cruise missile in its testing operation from the south, and it'll go 350 miles in testing it, and then if they wanted to land it in the sea, they could. If they wanted, they could land it on land, and its impact could be on the huge Eglin Air Force Base.

So, visually, that's a good pictorial for you to see how big that training range is.

OK. Ms. Sollie?

Ms. SOLLIE. Thank you very much. Thank you for having me this afternoon. I'm extremely honored to be here and honored to be representing the coastal communities of Pinellas County and the business community as well.

My first slide in my presentation—thank you, panelists. You've taken care of everything up there in your opening remarks.

I would like to emphasize, as we discuss tourism and we say tourism industry, that everyone here in the audience and our elected officials remember that it's truly economic impact. It is an economic driver. In many times and instances, it is left out of economic development because we think about diversification of jobs in the markets that we have within the county, and tourism needs to always be in the conversation when we talk about economic development and the economy.

The numbers are there. Twenty-three percent of the sales tax generated is generated by our tourists that come to the destination. We have businesses that are built in these communities because they thrive and are alive because of the tourists that come here. When I have my closing, I can definitely depict what had happened in 2010, especially in the beaches and the coastal communities in Pinellas County as a result of 2010.

So you asked me to present to you what we see as threats to our tourism economy. I did that in conjunction with polling a lot of our businesses in the coastal communities, and we came up with some high-impact threats, mid-level impact threats, and low-level impact threats.

Obviously, oil drilling off of Florida's coast—we can talk about it over and over, and it's an unfortunate situation. What happened in 2010—we're still, you know, trying to understand and ascertain—thank you, Dr. Sanberg—to understand the impact on the health of the Gulf of Mexico, let alone what happened when tourists stopped coming here as a result of that tragic explosion that was

nowhere near Florida. So we say and we ask, to mitigate this threat, to continue the moratorium on the exploration and oil drilling off Florida's coast.

Our second high-level impact threat is storm surge and hurricanes. Obviously, we can't control when a storm comes to our coastline or when a hurricane does. But what we can do is we can control the health of the natural resource of our shoreline. When a storm comes or a hurricane comes, there's severe amounts of beach erosion. Debby came to our coastline and tore up our beaches, from Redington Shores, Sand Key, all the way down to Pass-A-Grille. A few years later, in 2016, Hurricane Hermine came by—again, eroded our shoreline. One was a tropical storm. One was a hurricane. They both have the same impact of beach erosion to the beaches.

If we don't have a healthy beach, our tourists and our residents don't have a beach to go to. Our businesses around those beaches end up suffering. So we do ask, to mitigate that threat, that we continue—and thank you, Senator Nelson—continue funding nourishment, increase funding nourishment along with the contributions that we do on a state and local level when it comes to beach nourishment.

Then third, we classified this as mid-level only because if funds are diverted from Brand USA and, unfortunately, here in the state of Florida, Visit Florida, it has a slow, residual, painful effect on tourism. It's not a high immediate effect, like a storm or an oil spill. But to divert funds from a marketing agency that we need vitally to make sure that we are a competitive industry globally, especially when we have emerging markets, like Dubai and Cuba—we have cruise ships that are going to Cuba, taking thousands and thousands of passengers there. So we want to encourage, to mitigate this threat, that you fight for us on our behalf up there to continue to fund Brand USA and continue to use those funds for the intended purpose, to market us globally so we can stay competitive.

Transportation—big one. We're number four in the nation when it comes to transportation, due to our infrastructure and our roads. That sounds great, but when we lift up the hood and we look at our destinations, Pinellas County, Orlando, connectivity, transportation is more than a road. It's easements to create the future of transit. We need transit. We need mobility.

We have travelers who come to this destination. The demographic is changing. Foreign travelers—their expectations are much higher when it comes to public transportation. Millennials—we have to think for the future. We need to have the ability to make sure that our tourists can be mobilized in a variety of facets, and that even includes the Federal funding in any capacity for our airports and the fees involved there so we can continue to be that competitive market.

So the threat there, to mitigate that, is please continue to explore funding and, whenever possible, expanded funding, and I'd say be advantageous. Let's be cutting edge in some cases. We're way down at the bottom here in Pinellas County when it comes to transit.

Another threat—Zika. Zika, and you could say, slash, red tide or any other type of maybe algae bloom or anything that may happen in the ocean or within our environment. We say it's low, because the impacts, again, aren't an immediate ramification of loss of rev-

enue and jobs and tourists automatically fleeing from us. However, they do impact us.

It's very hard to track. It's very hard to understand. But we do ask, to mitigate those threats, that you continue to fund research and development to eradicate whatever that is, or to find cures, or be able to at least minimize the ramifications of any of these blooms, Zika, whatever would impact national media hype, as I like to call it, to make it look like we're not a place that you should visit as a result of this.

And then, finally, we talk about sea level rise. That is a low and is a long-term effect. I know there was an article in the *Times* today about sea level rise, and it's escalating. But we don't see immediate results today, right, of sea level rise. It's one of those things—we say, “Oh, our grandkids or our grandkids' grandkids are going to see that.” We need to address it now.

We are working in environments in Pinellas County with many municipalities that have specific land use plans, and at a county level, we need to address the land use plans for redevelopment or new development that has sea level rise in the vision so that we can plan for the future, so that our coastal communities are protected long-term, and those tourists will continue to enjoy our destination, and our residents can continue to thrive in our destination as well.

You know, I talk about the recipe. What is the recipe? Because we never know how this is going to pan out. We can't always plan for the impact of what any of these may present to us. If you think about 2010, we had three things that occurred. We had an oil spill, we had a cold snap—we can't control that—and we had a recession. Maybe we could have controlled that in some capacities in hindsight, but, pretty much, we couldn't.

We lost thousands of jobs. We had businesses closing. Bed tax collections were down. We had to cut marketing funding during that time. Our sales tax collections go down as a result of that as well.

So we, as leaders, need to continue to plan for the future, plan as if, because when it comes, we don't know in what variety it will come. It will, unfortunately, and we will need to be prepared, fully funded, and fully healthy and nourished, and we appreciate it.

I accept any questions, and thank you for the opportunity to present.

[The prepared statement of Ms. Sollie follows:]

PREPARED STATEMENT OF ROBIN A. SOLLIE, IOM, FCCP—PRESIDENT/CEO,
TAMPA BAY BEACHES CHAMBER OF COMMERCE

Thank you for giving me the opportunity to testify today regarding “Threats to Florida's Tourism Economy”. On behalf of the businesses in our communities we appreciate all you do each day for our country, the state of Florida and our local communities.

Introduction

As the CEO of the Tampa Bay Beaches Chamber of Commerce (TBBCoC), I have the privilege to represent over 730 businesses with the majority directly tourism related (accommodations, restaurants, and attractions). The TBBCoC geographical reach is the entire coast line of Pinellas County, which are 12 municipalities and 1 un-incorporated community. The culmination of these communities is an estimated 8,872 businesses and over 156,000 residents (*Stats from Pinellas County Economic Development <http://www.pced.org/?page=DemoBusiness>).

Important facts regarding the Tourism industry and its economic impact:

- 112 million Visitors to the State of Florida in 2016
- Over 1.4 million Tourism related Jobs in the State of Florida in 2016
- Approximately \$110 billion Economic Impact to the State of Florida in 2016
- 23 percent of Sales Tax in Florida is generated by visitors
- Pinellas County alone has over 100,000 jobs, nearly 6 million visitors in 2016, \$10 billion economic impact in 2016
- Diversification in Tourism: sports, film, leisure, and meetings all make up the industry

(*Stats from www.visitflorida.org & www.pinellascvb.org)

The numbers are very powerful for the entire state and Pinellas continues to lead as a destination. As an industry we continue to keep our pulse on what elements could damage, interfere or even disrupt this vital economic driver. Managing threats is a strategic process with a precise recipe (planning & funding). Mitigating the long term effects could be managed if proper planning occurs. The elements the industry has found to be threats are:

- Oil Drilling off Florida's Coast (High)
- Storm Surge/Hurricanes (High)
- Continued Funding of Brand USA & Visit Florida (High)
- Transportation (Mid/Long Term)
- Zika (Low)
- Sea Level Rise (Low/Long Term)

The degree at which any of these threats effect Florida's economy is a moving target which in some cases could be timing, media, and if there are multiple threats simultaneously. It's obvious some threats cannot be controlled, but how we react, fund or plan can be within our control.

Oil Drilling (High Level)

One of the highest threats we have to Florida's tourism economy is the idea that lifting the ban on oil drilling off the coast of Florida is a viable and lucrative option. There is no amount of money/proceeds from oil exploration and drilling that can outweigh the risk that is has on the entire coast of Florida. In 2010, this was experienced firsthand through the *Deepwater Horizon* explosion.

As a result of this explosion, only small amounts of oil came to Florida's coast in the Panhandle. Not one drop washed to Pinellas County's coast; yet the magnitudes of losses are still being calculated. As of this date, businesses and municipalities are still working on their claims process to compensate for lost revenues.

The environmental consequences have been studied by a variety of agencies one of which is here in Pinellas county; USF's College of Marine Science, the lead institution for the Center for Integrated Modeling and Analysis (C-IMAGE), an international research consortium which was created to study the effects of the 2010 *Deepwater Horizon* oil spill, their research is outlined here: <http://news.usf.edu/article/templates/?a=7309&z=220> and mentions as one of 4 finding that prolonged oil toxicity in fish continues. Many of these agencies continue to monitor the ramifications of this spill on the marine life and Gulf of Mexico's overall health and indicate that it may be years before we truly fully understand the depth of this impact.

During this tragedy and many months afterwards, the Tourism industry had to fight the perception that there was oil on our beaches, and that our beaches were closed, while re-structuring tourism marketing expenditures to crisis messaging.

One of the largest resorts on the West Coast of Florida, Tradewinds Island Resorts had the following impact on their business (during the 2010 spill):

- Call volume from potential visitors went down by as much as 25 percent
- Since the oil spill (April 21st through June 2010), two resorts were down by over approximately \$1.7 million dollars in revenue. If you assume the hotels that represent the rest of the 35,000 rooms experienced similar revenue losses per room, that is over \$70 million dollars in revenues lost in just Pinellas County
- Keep in mind these losses don't consider restaurants, suppliers, attractions or other secondary businesses which rely on visitors staying in hotels

(*Taken from *Keith Overton written testimony July 12 to the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling*)

It is simple; the *Deepwater Horizon* explosion was off the Louisiana Coast and still had major threats and consequences to the entire Florida Tourism Industry.

ACTION TO MITIGATE THIS THREAT: Continue the extensions of the moratorium on drilling off Florida's coast.

Storm/Hurricane Surge and Beach Erosion (High Level)

The threat of storm/hurricane surge results in beach erosion; this holds true for the entire coast of Florida. In Pinellas County we are very proactive in what measure we need to take regarding beach nourishment. Beach nourishment is vital to the health of the beaches for our visitors and residents to enjoy as well as our wildlife (birds and turtles).

The #1 reason travelers come to the state of Florida is to visit the coastal communities and enjoy the award winning beaches.

A stat sourced from visitflorida.org/resources/research "The most popular activities for domestic visitors in 2015 were beach or waterfront activities (41 percent)"

In June 2012, Tropical Storm Debby and in 2016, Hurricane Hermine came for a visit. Both of these visitors left their baggage behind. That baggage was the damage to the beach—large amounts of erosion along Pinellas County.

Andy Squires, Section Manager for Coastal Resources in Pinellas County provided specific data regarding Tropical Storm Debby and Hurricane Hermine.

Hurricane Hermine Impact to Pinellas Beaches

(Reference PDF, page 28, Table 1 for summary of sand losses)

Table 1. Volume Changes Measured along the entire Sand Key, Treasure Island, and Long Key

			Volume changes				MHHW line change
			Dune	dry beach	overall loss	overall gain	
<u>Sand Key Barrier Island:</u>			Cu. yds	Cu. yds	Cu. yds	Cu. yds	ft
North End Sand Key:	R55-R56:	Not nourished	-2100	-2300	-15800	2100	-19.3
North Sand Key:	R56-R66:	Nourished in 2012	-4900	-11000	-83700	69600	-17.2
Belleair Shore:	R66-R71:	Not nourished	-8600	-8000	-57900	34800	-9.2
Indian Rocks Beach:	R71-R82:	Nourished in 2012	-18300	-21300	-117100	91900	-5.0
Headland:	R82-R89:	Nourished in 2012	-10600	-30900	-66900	30000	-29.2
Indian Shores	R89-R100:	Nourished in 2012	-7100	-30500	-66300	21000	-35.3
North Redington Beach:	R100-R107:	Nourished in 2012	-3000	-16700	-23400	14000	-32.0
Redington Beach:	R107-R116:	Not nourished	-2800	-12300	-34700	12700	-29.3
Madeira Beach:	R116-R124:	Not nourished	-800	-11800	-15500	13300	-18.4
Total Sand Key			-58500	-144600	-481200	289500	
<u>Treasure Island Barrier Island:</u>							
Sunshine Beach:	R126C-R128:	Nourished in 2014	300	-3600	-3100	3100	-15.6
Middle Treasure Island:	R128-R136:	Not nourished	2000	-13400	-41000	36200	-23.9
Sunset Beach:	R136-R143:	Nourished in 2014	-3100	-10500	-24900	29200	-11.0
Total Treasure Island:			-800	-27400	-69000	68500	
<u>Long Key Barrier Island:</u>							
Upham Beach:	LK1-LK6:	Nourished in 2014	1800	-2600	-5900	12300	-6.4
Middle Long Key:	LK6-R160:	Not nourished	9100	-32200	-52500	42100	-15.2
Pass-A-Grille Beach:	R160-R165:	Nourished in 2014	-3600	-14900	-21800	15800	-23.1
Total Sand Key			7300	-49700	-80200	70500	

- Impacted Pinellas beaches for 2 days between Sept 1–3, 2016
- Sand Key sand loss from erosion totaled about 481,200 cubic yards
- For reference, a typical volume of sand placed each 6 year nourishment cycle is typically about 1.3 mm cubic yards. The 2 day storm eroded over 1/3 the volume of sand that is typically eroded over a 6 year duration
- Loss of dry beach width ranged from 5 feet along Indian Rocks Beach to 35 feet along Indian Shores
- Treasure Island sand loss from erosion totaled 69,000 cubic yards and loss of dry beach width ranged from 11 feet at Sunset Beach (part of Treasure Island) to 24 feet at middle of Treasure Island

- For Long Key (St. Pete Beach) sand loss (note Table 1 has a typo) from erosion totaled about 80,200 cubic yards; Loss of dry beach width ranged from 6 feet to 23 feet

Tropical Storm Debby Impacts to Pinellas Beaches

(Reference PDF, page 20, Table 1 for summary of sand losses)

Table 1. Volume Changes Measured along the Long Key, Treasure Island, and Long Key

			Volume changes				MHT line change
			Dune	dry beach	overall loss	overall gain	
			Cu. yds	Cu. yds	Cu. yds	Cu. yds	ft
<u>Long Key Barrier Island:</u>							
Pass-A-Grille Beach:	R160-R165:	nourished in 2004	1500	-22100	-36500	22900	-25.6
Middle Long Key:	LK6-R160:	not nourished	6400	-31500	-64000	82600	-15.1
Upham Beach:	LK1B-LK6:	nourished in 2010, T-groins	270	-5100	-12900	20400	-10.8
Total Long Key			8170	-58700	-113400	125900	
<u>Treasure Island Barrier Island:</u>							
Sunset Beach:	R137-R143:	nourished in 2010	-7700	-12000	-43400	22600	-21.3
Middle Treasure Island:	R128-R137:	not nourished	11000	-13000	-50100	63600	-10.2
Sunshine Beach:	R127-R128:	nourished in 2010		-2100			
Total Treasure Island			3300	-27100	-93500	86200	
<u>Sand Key Barrier Island:</u>							
Madeira Beach:	R116-R124:	not nourished in 2006	700	-22500	-29600	35000	-18.4
Redington Beach:	R107-R116:	not nourished in 2006	-4300	-19200	-38600	48800	-18.4
North Redington Beach:	R100-R107:	nourished in 2006	-500	-21800	-59400	41000	-33.8
Indian Shores:	R89-R100:	nourished in 2006	-6300	-32200	-98400	100000	-34.4
Headland:	R82-R89:	nourished in 2006	-5500	-15800	-58400	61400	-28.2
Indian Rocks Beach:	R71-R82:	nourished in 2006	-12100	-15300	-86900	100800	-10.2
Belleair Shore:	R66-R71:	not nourished in 2006	-2800	6800	-29900	38600	10.5
North Sand Key:	R55 – R66:	nourished in 2006 and now	-5600	2500	-22800	20000	
Total Sand Key			-36400	-117500	-424000	445600	

- Impacted Pinellas beaches for 3 days from June 24–26, 2012
- Sand Key sand loss totaled about 424,000 cubic yards and dry beach width loss ranged from 10 feet to 34 feet
- Treasure Island total sand loss was 93,500 cubic yards and dry beach width loss ranged from 10 to 21 feet
- Long Key (St. Pete Beach) total sand loss was 113,400 cubic yards and dry beach loss ranged from 11 to 26 feet

In summary the overall impacts to erosion from each storm were similar. This demonstrates that a tropical storm can have extreme impacts and risk to our beach environments.

ACTION TO MITIGATE THIS THREAT: Continue and increase funding for beach nourishment projects throughout the state of Florida; along with funds at the local level.

Transportation (Mid-Level)

Florida is #4* in the Nation when it comes to transportation and we must continue to stay competitive. However, many of our popular destinations fall well below average as it relates to transportation options (transit/mobility). With the increase in traffic from foreign travelers and a rise of the millennial traveler, both demographics desire and expect access to better mobility options.

Transportation options are vital to stay competitive.

(Source: <http://www.flchamber.com/did-you-know-florida-road-conditions-rank-best-in-the-country/>)

ACTION TO MITIGATE THIS THREAT: Encourage funding for progressive transportation projects to ensure we can stay competitive in the ever changing travel market.

Funding Brand USA & Visit Florida Emerging Competitive Markets (Mid-Level)

With emerging competitive markets (Cuba and Dubai for example) vying for our tourists it is imperative that agencies like Brand USA (and Visit Florida) are ade-

quately funded and funded for extensive periods of time. This will ensure the marketing is earmarked to continue to attract global travelers to our award winning destinations.

ACTION TO MITIGATE THIS THREAT: Continue funding this agency to remain competitive to emerging markets like Cuba and Dubai.

Sea Level Rise (*Low level*)

We do not see any immediate consequences in the business communities; however, if our state and local agencies do not start to draft land use plans accordingly for the long term effects of this, we will experience impacts. Sea level rise will continue to become a pressing issue in the years to come. It is vital to plan for the future and set the legacy we leave behind.

Pinellas County executed a study titled: "Awareness and Implications of Sea Level Rise". It is clear that if coastal communities begin to plan for sea level rise, there are options to protect the majority of the acreage that will eventually be impacted.

(See Table 29, from Awareness and Implications of Sea Level Rise—Document is also attached).

TABLE 28
Estimated Sea Level Rise for the Tampa Bay Region

Sea Level Projections by Year						
Probability	2025	2050	2075	2100	2150	2200
(%)	cm	cm	cm	cm	cm	cm
90	7	13	20	26	40	53
80	9	17	26	35	53	71
70	11	20	30	41	63	85
60	12	22	34	45	72	99
50	13	24	37	50	80	112
40	14	27	41	55	90	126
30	16	29	44	61	102	146
20	17	32	49	69	117	173
10	20	37	57	80	143	222
5	22	41	63	91	171	279
2.5	25	45	70	103	204	344
1	27	49	77	117	247	450
Mean	13	25	38	52	88	129

Source: Tampa Bay Regional Planning Council, "Sea Level Rise in the Tampa Bay Region", 2006.

ACTION TO MITIGATE THREAT: Start the planning now in conjunction with coastal communities; collaborate to have a unified approach.

Zika Virus (*low level*)

Though a low level threat at this time, depending on press, containment, number of cases it is still a threat to certain parts of the tourism market. Some resorts reported minor cancellations when they could track, but many times it is difficult to track.

ACTION TO MITIGATE THREAT: Fund research and development of eradicating this disease or a cure to how harmful it is.

Conclusion

We recognize many of the threats that Florida's Tourism economy faces are uncontrollable circumstances. It is the deliberate pre planning and funding we invest now that will mitigate and help soften the immediate and long term effects on Florida's overall tourism economy.

Additionally, we do not know the exact ingredient for successful mitigation. However, we do know that in 2010 we had a recipe for a major hit on this industry which was an oil spill, a severe cold snap and the recession. The three combined resulted in a considerable dip in bed tax collections, sales tax, 1000s of job losses and business closures. We need to be pro-active and innovative as we protect this industry.

As a voice for over 730 business members and 14 communities we urge this committee to acknowledge all aspects of tourism and consider your ability to invest in the future of this indispensable economy.

Senator NELSON. Thanks, Ms. Sollie.
Ms. Ferenc?

**STATEMENT OF MARYANN FERENC, CHIEF EXECUTIVE
OFFICER, MISE EN PLACE, INC.; AND MEMBER,
BOARD OF DIRECTORS, U.S. TRAVEL ASSOCIATION**

Ms. FERENC. Senator Nelson and members of the Florida congressional delegation, I am honored to testify before you today as CEO and Proprietor of *Mise en Place*, the restaurant, and *Mise en Place Hospitality Group*, the business, which was born recently of that foundation. I am also here as a Board Member of the U.S. Travel Association, representing all sectors of the national travel and tourism industry. On behalf of 876 Floridians and 15.3 million Americans whose livelihoods depend on a vibrant travel sector, thank you for holding this field hearing. It couldn't be more important to us.

Tourism is Florida's largest industry and an integral component of the new economy. Tourism provides employment to individuals from all walks of life and all levels of education. Beyond that, tourism provides community, a sense of place, and creates destinations that other industry sectors, such as technology, desire to call home. Tourism has recovered faster than any other industry from the economic recession. My testimony will briefly address the progress we've made on each of the five policy priorities and how the Congress can help.

Brand USA. I remember attending World Travel Market in London for the first time and being shocked by the underwhelming presence of the United States at the show. Then the public-private partnership Brand USA was formed with the bipartisan support of this committee and Congress as a whole. Brand USA has an important mission to attract millions of new international visitors by marketing the entirety of the United States and communicating ever-changing entry and visa policies, all at no expense to American taxpayers.

As a member of the Board of Directors, I can report that Brand USA's activities are supported by private sector contributions matched by a \$10 fee on visitors from the Visa Waiver Program nations. According to Oxford Economics, Brand USA has generated nearly \$3.9 billion in Federal, state, and local taxes. This has supported 50,900 incremental jobs annually and overall yielded an astonishing 27-to-1 return on investment.

Nonetheless, the President proposed defunding Brand USA in 2018 by redirecting its resources to the Department of Homeland Security. We have been gratified by the bipartisan congressional response, including from Senator Nelson and Senator Thune of this committee. Last month, the House Appropriations Committee rejected the White House recommendation, and we seek your support as the legislative process continues.

Survey of International Air Travelers, or SIAT. SIAT, conducted on a monthly basis continuously since 1983, provides information on passenger trip planning, travel patterns, demographics, and spending. This travel data from inbound foreign visitors is critical to the promotion strategies of destinations in Florida and across the nation.

The administration's 2018 budget proposed disrupting SIAT's funding, but the Senate Appropriations Committee last month included report language explicitly rejecting the administration's proposal and even encouraged an increase in the sample. The pending House version of the Commerce funding bill is silent on SIAT, so we still have work to do, and we would appreciate your support.

The Passenger Facility Charge, or PFC. PFC is an indispensable tool for local communities to make their own decisions about how to finance airport modernization. Adjusting the PFC ceiling would allow each airport authority to tailor its own PFC rate in order to maximize efficiency, reduce project costs, and ensure fiscal responsibility.

At Tampa International Airport, the PFC was used to expand Airside F, enabling new service from four international airlines. One daily nonstop flight from Europe creates \$156 million annual impact for this region and creates 1,200 jobs. The *Mise en Place* companies are a good example of those jobs. We joined forces with other companies to create TPA Hospitalities and will soon own and operate eight food service establishments at the Tampa International Airport.

Last month, the Senate Appropriations Committee approved an increase in the PFC cap from \$4.50 to \$8.50 for originating passengers. This would be the first increase in 17 years and protects rural passengers from having to pay a higher PFC twice on connecting flights. As we pursue this priority further, we would be very grateful for your help.

Open Skies. Open Skies agreements have yielded hundreds of thousands of American travel and manufacturing jobs, billions of dollars in U.S. economic growth, lower fares for travelers, and more flights to airports beyond the major gateways. Regrettably, the large legacy airlines have sought to disrupt Open Skies agreements with Gulf carriers. U.S. Travel is part of a diverse coalition of airlines, travel businesses, destination, and cargo companies opposed to this attack on our Open Skies treaties. We welcome your assistance as we continue to press this issue with the administration and in the Congress.

Balancing security and travel facilitation. In recent months, the administration has proposed or implemented a battery of new policies intended to protect national security, and the travel industry certainly appreciates the need to adapt to evolving terror threats. But there is more to the equation. In the echo chamber of the foreign press, the stricter views and entry policies announced in recent months could serve to discourage potential visitors. For instance, we were alarmed when the Trump administration recently reversed the State Department's goal to meet a three-week Visa interview goal for Visa applicants. The U.S. Travel Association, joined by 20 national travel and business leaders, has asked President Trump to reconsider.

We detailed the economic fallout from visa processing delays and asked the White House to reiterate our nation's commitment to an efficient, world class visa process. We urge your continued diligence as such security policies are brought forward.

We are open for business. It's our role to create the jobs. But there are government policies that can help rather than hurt. As

outlined above, we need to continue to support the SIAT, adjust the PFC cap, support Brand USA, and defend Open Skies. Taken together, these policies can go a long way toward conveying a clear global message to international travelers that America is open for business and open to the millions of travelers that wish us well.

Thank you again for this opportunity to participate in today's hearing, and thank you so much for your support to date on travel and tourism. It is appreciated by all of us.

Thank you.

[The prepared statement of Ms. Ferenc follows:]

PREPARED STATEMENT OF MARYANN FERENC, CHIEF EXECUTIVE OFFICER, MISE EN PLACE, INC.; AND MEMBER, BOARD OF DIRECTORS, U.S. TRAVEL ASSOCIATION

Senator Nelson and members of the Florida congressional delegation:

I am honored to testify before you today as the CEO and owner of *Mise en Place*, a premier Tampa restaurant and event company since 1986, and the hospitality business which it created—the *Mise en Place Hospitality Group*. I am also here as a board member of the U.S. Travel Association, the trade association representing all sectors of the national travel and tourism industry. On behalf of the 876,000 Floridians and 15.3 million Americans whose livelihoods depend on a vibrant travel sector, thank you for holding this field hearing. It couldn't be more important to us.

The mission of U.S. Travel is to increase travel to and within the United States—which together yields \$2.3 trillion in economic output annually, supporting one in nine American jobs. Last year, America attracted 75.6 million international visitors, making travel the Nation's top service export.

Tourism is Florida's largest and, I would submit, most impactful, industry and an integral component of the new economy. Tourism provides employment to individuals from all walks of life and levels of education as well as a unique opportunity for on-the-job training that results in substantial possibilities for advancement. Beyond that, tourism provides community, a sense of place and destinations that other industry sectors, such as technology, desire to call home. In 2016, we welcomed 112.8 million visitors, who spent \$108.8 billion and supported 1.4 million Florida great jobs and highlighted countless great places to work and live as well as to visit.

We are a resilient, self-reliant industry—and have recovered faster than any other industry from the economic recession. We thrive when we serve the public well by providing safe, efficient, productive and enjoyable travel experiences.

In this context, we today respectfully urge your support for:

- full funding of Brand USA;
- retaining the Survey of International Air Travelers;
- lifting the cap on the Passenger Facility Charge user fee;
- protecting U.S. Open Skies agreements; and
- balancing needed visa and travel security protocols with a clear welcome message for international visitors to the United States.

My testimony will briefly address the progress we've made on each of these priorities and steps the Congress can take to enhance travel's contributions to our economy.

Brand USA

By attracting international visitors, Brand USA enhances economic growth, spurs job creation and advances public diplomacy—all at no expense to American taxpayers. As a member of its board of directors, I can report that Brand USA's activities are supported by private sector contributions, matched by a \$10 fee on visitors from Visa Waiver Program nations.

Brand USA was created by statute in 2010 to help address the post-9/11 decade of declining U.S. share in the booming global travel market, costing the U.S. economy nearly a half-million travel-related jobs. Prior to 2010, the United States was one of the few developed countries in the world without a national destination marketing organization. I remember attending World Travel Market in London for the first time and being shocked by the underwhelming presence of the United States at the show. It was a graphic manifestation of the impact of travel which the U.S. was ignoring. The Travel Promotion Act, enacted and reauthorized in 2014, and sup-

ported by large congressional majorities, sought to restore our leading position in the highly competitive worldwide travel marketplace.

Overseas business and leisure travelers are critical to local economies across our Nation. To help attract these visitors, Brand USA has forged working relationships with hundreds of communities—large and small, urban and rural—and leveraged their varied promotional efforts into a coherent, cost-effective and productive national marketing campaign.

According to Oxford Economics, over the last four years, Brand USA has attracted 4.3 million incremental visitors; \$13.6 billion in related spending; and \$29.5 billion in total economic impact, including nearly \$3.9 billion in federal, state and local taxes. This has supported 50,900 incremental jobs annually and overall yielded an astonishing 27-to-1 return on investment.

In addition to marketing the U.S. as a destination, Brand USA is charged with communicating our evolving visa and entry policies, by addressing confusion about our security protocols that can discourage potential visitors from choosing U.S. destinations. Brand USA helps ensure that such visitors get accurate explanations of our changing rules—and ultimately return home to spread the word about America's attractions and hospitality, generating goodwill for years to come.

In short, Brand USA is an extraordinarily successful public-private partnership—and not only for gateway cities. During my terms on the United States Travel and Tourism Advisory Board, under the auspices of the Department of Commerce, I witnessed the power and impact of thoughtfully-created, high-quality public-private partnerships as we deployed a whole-of-government approach. I was inspired by the organization and its efforts to represent all of our industry. I found it to be both inspiring and personally rewarding to support the close and successful partnership of extraordinarily talented civil servants and truly remarkable travel and tourism professionals. Brand USA is another fine example of this and its work has been particularly beneficial for small destinations with limited marketing resources that can leverage Brand USA's coordinated outreach overseas to market their brands in the global marketplace.

Nonetheless, the President's Fiscal Year 2018 budget proposes to de-fund Brand USA by redirecting its resources to the Department of Homeland Security. We have been gratified by the bipartisan congressional support for Brand USA, including from Senator Nelson and Senator Thune of this Committee. Furthermore, last month—the House Appropriations Committee rejected the White House recommendation

We appreciate the House Appropriations Committee's acknowledgement of the uniformly positive impact of Brand USA's work—and seek your support as the process continues in the Senate. With misperceptions of the size, quality, and vitality of America's welcome mat now in the foreign press, Brand USA's efforts and proven results have never been more important to our communities.

Survey of International Air Travelers (SIAT)

The Survey of International Air Travelers (SIAT), conducted on a monthly basis continuously since January 1983, provides information on passenger trip planning, travel patterns, demographics and spending. This travel data from inbound foreign visitors is critical to the promotion strategies of destinations in Florida and across the Nation.

The Administration's FY 2018 budget proposed disrupting SIAT's funding—but the Senate Appropriations Committee last month included report language explicitly rejecting the Administration proposal and even encouraging an increase in the sample size—important because the Commerce Department is also considering reducing the survey size and raising its fees.

The pending House version of the Commerce funding bill is silent on SIAT, so we still have work to do—and we would appreciate your support.

Passenger Facility Charge

A key barrier to the travel industry's growth and future competitiveness is the poor condition and performance of our Nation's airports. As a result of misguided Federal policies, too many of our Nation's airports are outdated and unable to handle passenger demand.

These problems are forecast to worsen and will soon be unsustainable. Within the next four years, the top 30 U.S. airports will experience passenger volumes, congestion and delays equal to the day before Thanksgiving at least once per week. The Federal Aviation Administration predicts that travel demand will exceed capacity at many of the Nation's largest airports within the next 15 years, unless airports achieve sustainable levels of capital investment.

The Passenger Facility Charge (PFC) user fee is an indispensable tool for local communities to make their own decisions about whether and how to finance airport modernization. Adjusting the PFC ceiling would finally allow each airport authority to tailor its own PFC rate on a project-by-project basis in order to maximize efficiency, reduce project costs and ensure fiscal responsibility. This would also allow large hub airports to rely almost entirely on local user-fee funding, and enable Congress to redirect Airport Improvement Program (AIP) grants for large hubs to smaller airports that require more Federal assistance. At Tampa International Airport, the PFC was used to expand Airside F, enabling new service from Copa Airways, Edelweiss Air, Lufthansa Airlines and, in three weeks, Icelandair. This is in addition to British Airways expanding their service at Tampa International Airport and Southwest Airlines adding commercial service to Havana, Cuba. One daily non-stop flight from Europe creates a \$156 million annual impact for this region and creates 1,200 jobs. These jobs are essential to the economic health of our State. The Mise en Place Companies are a good example of the PFC being used in a way that spurs growth and jobs. We joined forces with other local companies and a national concession powerhouse to create TPA Hospitality Partners, LLC, to invest millions of dollars in retail build-out at the airport, and to own and operate eight food service establishments.

I'm pleased to report that last month, in the FY 2018 transportation-funding bill, the Senate Appropriations Committee included an increase in the PFC cap, from \$4.50 to \$8.50 for originating passengers. By adjusting the Federal limitation on the cap, the Committee language would unlock desperately needed airport infrastructure investments that will improve the passenger experience, facilitate growth in domestic and international air travel, and make America's economy more globally competitive. This would be the first increase in 17 years and would protect rural passengers from having to pay a higher PFC twice on connecting flights.

The Senate committee language was supported across the political spectrum, from the Heritage Foundation to the U.S. Conference of Mayors. But the path ahead is uncertain. There is no such provision in the Senate FAA reauthorization bill; and as you well know, the overall appropriations process faces parliamentary turbulence. Still, this is significant progress on which to build—and we're grateful for the Senate's leadership.

Open Skies

In recent decades, a cornerstone of American aviation policy has been the 100+ Open Skies agreements that the U.S. has negotiated with countries around the world. By reducing government interference in air travel, Open Skies agreements have yielded hundreds of thousands of American travel and manufacturing jobs, billions of dollars in U.S. economic growth, lower airfares for travelers, more flights to airports beyond major gateways and new opportunities for U.S. airlines willing to take advantage of them.

Regrettably, the large legacy airlines have sought to disrupt existing Open Skies agreements with the Gulf carriers. U.S. Travel has participated in a diverse coalition of airlines, travel businesses, destinations, cargo companies and others opposed to this attack on our Open Skies treaties.

On the merits of the Open Skies debate, we feel strongly that:

- *Open Skies is critical to fixing America's trade deficit.* These agreements grow international inbound visitation. Every dollar spent by an overseas visitor to the U.S. counts as an export and closes our trade deficit. In 2016, U.S. travel exports contributed \$246 billion to our balance of payments.
- *Open Skies creates jobs and has great economic impact across Florida.* In 2016, Gulf carrier flights brought 143,000 additional visitors to Fort Lauderdale, Miami and Orlando. These additional visitors spent \$451 million at Florida businesses in these markets, which supported more than 6,000 jobs and \$291 million in income to Floridians.
- *Open Skies agreements boost made-in-America manufacturing.* Because of Open Skies, the Gulf carriers have committed to purchasing American products and strengthening our manufacturing base. The three Gulf airlines have over 300 Boeing planes on order or currently in use, including 777s and new Dreamliners. These orders support thousands of American manufacturing jobs across the Boeing supply chain.

In recognition of the broad economic benefits of U.S. Open Skies agreements, the Senate Appropriations Committee recently included positive report language on Open Skies in the 2018 transportation-funding bill. The Committee directed the Transportation Department to consider whether any further action is necessary in response to allegations by the large legacy U.S. carriers regarding unfair subsidies—

and further encouraged DOT to protect the interests of travelers, the travel industry and the broader economy if any further action is taken.

Open Skies agreements have led to hundreds of thousands of new American travel and manufacturing jobs, billions in U.S. economic growth, lower airfare for travelers, more flights to more airports, and new opportunities for U.S. airlines. Overall, they create a widespread effect for not only the large companies, as is often thought, but also a trickle down effect that actually benefits to small companies, communities and individuals. The Committee's report dismisses the U.S. legacy carriers' parochial arguments to roll back those agreements—and we will continue to press this issue with the Administration and in the Congress.

Balancing Security and Travel Facilitation

In recent months, the Administration has proposed or implemented a battery of new policies intended at protecting national security—from the President's executive order on immigration and travel to stricter vetting of visa applications. The travel industry certainly appreciates the need to adapt to evolving terror threats because, without confidence in public safety, no one will choose to travel here.

But there is more to the equation, for the United States—and especially for Florida, one of the Nation's prime destinations for inbound international visitors. America needs to convey a clear global message that, while we aggressively confront all threats, we still welcome overseas visitors coming here to relax on our beaches or close deals in our boardrooms.

As specific security proposals have been rolled out over the last few months, travel professionals across the country have sought to help Federal officials explain and implement them. At the same time, we have drawn on our expertise to analyze and detail for policymakers how these changes impact the real-life travel experience—with particular concern about unnecessarily exacerbating delay, confusion and inefficiency for travelers.

The international travel marketplace is highly competitive. While the United States—and states like Florida in particular—are highly attractive destinations, foreign travelers have countless other choices. And it is clear that one factor in consumer decisions about where to travel is the perception of a potential destination's hospitality.

America is renowned as a welcoming nation. From our iconic cities to the Nation's heartland, visitors know ordinary Americans will greet them with open arms—but only if they can get here. In the echo chamber of the foreign press, the series of stricter visa and entry policies announced in recent months could serve to discourage potential visitors.

In the years after the September 11 attacks, labeled by our industry as the "Lost Decade," travel to the United States plummeted. We battled back to regain our historic share of the marketplace, but it took ten years—and was then possible only because of sustained White House commitment to a National Travel and Tourism Strategy. This inter-agency strategy, announced in 2012 in Orlando, not only set ambitious goals for volumes of international visitors, but also made sensible, low-cost management reforms that yielded remarkable success.

For instance, delays in the visa process had gotten so serious that applicants in key visiting nations—such as China, India and Brazil—had to wait over three months for a visa interview. After a presidential order requiring most visa interviews within three weeks, the delays were reduced to a few days, removing a disincentive to travel here and reducing misperceptions about U.S. policy. That was outstanding work that could be used as a model. I recall once more my time on the Travel and Tourism Advisory Board. The work on this subject, by dedicated individuals from the private and public sector, was long and arduous with results that were broad and deep. Great progress was made and overwhelmingly positive effects were realized—more travel, more jobs, more prosperity and, we believe, more security through greater understanding of one another as people and communities.

For this reason, we were alarmed when the Trump Administration recently reversed the State Department's goal to meet a three-week visa interview goal for most visa applicants. After engaging the Administration to review its rationale, U.S. Travel—joined by 20 national travel and business leaders—wrote to President Trump to ask him to reconsider. Our letter detailed the significant economic impact of visa processing delays, then asked the White House to reiterate our Nation's commitment to an efficient, world-class visa process—and to back that statement up with full staffing of consular personnel to meet the growing demand from overseas visa applicants.

The good news is: so far this year, visitors are still choosing travel to the United States. The data is still very preliminary since international travel is typically planned long in advance, but our fingers remain crossed. And this is where Brand

USA comes in: never has its statutory mission of explaining our security protocols overseas been more essential.

Open For Business

In Florida and across the nation, the travel community is being challenged on a daily basis but we remain upbeat and optimistic. The United States remains the top global destination. We're working each day to grow our share of the competitive and lucrative international market—while also serving the needs of our domestic travelers.

It's our role to create the jobs—but there are government policies that can help, rather than hurt. As outlined, above, we need to adjust the PFC cap, support Brand USA, and defend Open Skies. By accelerating airport modernization, promoting the United States as a global destination, and preserving successful international air route governance, we can go a long way to conveying a clear global message—to both leisure and business travelers—that America is open for business.

Thank you again for the opportunity to participate in today's hearing.

Senator NELSON. Thank you, Ms. Ferenc.
Dr. Roffer.

**STATEMENT OF MITCHELL A. ROFFER, PRESIDENT,
ROFFER'S OCEAN FISHING FORECASTING SERVICE INC.; AND
ADJUNCT FACULTY, FLORIDA INSTITUTE OF TECHNOLOGY,
DEPARTMENT OF OCEAN ENGINEERING AND SCIENCES**

Dr. ROFFER. Thank you. I'd like to thank you, Senator Nelson, for inviting me, and the panel for hearing me. I wish the screen had been put on the side.

While I have done 10 years worth of research, the NASA funded research involved the Gulf of Mexico and various fisheries here and around the United States. Today, I'm going to be talking more about the fishing industry.

So when we wake up in the morning, Floridians and tourists, we all have the assumption of clean water and clean air, and up to now, we've had it. So the assumption of clean air and water goes to an abundant source of resources that includes fish and undersea fisheries and biodiversity. Healthy ecosystems is, in fact, the economic engine in the state.

Recreational boating in Florida has put together approximately \$10 billion in value. Eighty-three thousand to 115,000 jobs have gone to strictly recreational boating in the state of Florida. The Tarpon Bonefish Foundation estimated the actual impact of the state's saltwater fishing as \$7.6 billion. So the fishing industry is quite a big deal in the state of Florida.

As we know, we have a decline in water quality, as we've seen recently around the state. It's a decline in revenue, as we've heard from other panelists and yourself, Senator Nelson, as well as a loss of reputation which we've also heard. The biggest threats that I've seen is now what's under our control—is water quality and habitat degradation and loss.

Secondary threats, but big threats as well, not under our control, unfortunately, is climate change, and these things involve changes in fish migrations. The water gets too hot, the fish don't visit Florida anymore, and we don't have fish in our areas for fishermen to go, or the catchability changes. Climate change involves sea level rise, changes in pH, as well as changes in oxygen levels.

So the threats in our state come from inside the state and outside the state. We didn't have to go too far—and you've already discussed it—if you turn around just briefly, you'll look at a reminder

of the *Deepwater Horizon* spill, what it did. We talked about the beautiful beaches in Panama Beach were turned into, unfortunately, an oil color. And we also should not forget the *Deepwater Horizon* and the amount of oil that spilled that destroyed animals and potentially our beaches throughout the entire state.

We look at the polluted water, not just the oil that was recoverable. The water—we tracked the water that actually touched the oil at some point and tracked it using satellite data around the state. We noticed that it came off the West Florida shelf and down into the Keys, and then we lost continuity with it, and we really couldn't tell. So had we not had the loop current pulling this oil away and the wind not cooperating, we would have had a lot of oil on the west coast of Florida as well as the Florida Keys.

So in terms of Gulf Stream connectivity, we have a great deal of threat in terms of industrial threat or even terrorist threat, one from the Gulf of Mexico using a loop current in the Gulf Stream system. The other is from Mexico and Cuba. Put something in the Gulf Stream, and it will go into the Florida Keys and the east coast of Florida. Also, we have threats from out-of-state that work down the east coast of Florida from the north. These are all critical issues in terms of water quality.

So in-state water quality threats—we've changed our patterns of water flow throughout the state. The water used to run straight down the Everglades. It was a great thing. Unfortunately, at the time, people thought it was best to put in canals and divert the water to the coast. Unfortunately, people have been dragging our feet to get that water flow back to the Everglades where now Florida Bay is starving from lack of freshwater. So other water projects in the state have changed the flow alternations which, in fact, changes the ecosystem in the state.

One of the other threats to the state of Florida is the lack of user remediation. Users are not required in the state of Florida to clean their water after using it, whether it's you or I, or industry. They use the water and they put it right back into the canals, the rivers, and the bays, and then the rest of us have to suffer. Algae blooms—polluted water is dumped right back in. I mean, Lake Okeechobee is a classic example of agricultural dumping into the lake, and that water now has been spread to both sides of the state, causing a great deal of problems.

Another threat is no environmental bond is taken for remediation insurance for people who use the water and have coastal businesses. An example—people simply, when they have an environmental problem, like they had at Piney Point several years ago in Manatee County—"Well, we'll go out of business. We won't worry about the problem. We'll walk away from it and let—that's the state's problem." That became a big problem. Added phosphate to the water, and now people are even talking about putting that water in subsurface and doing some internal drilling to put that nutrient rich water away.

Algae blooms is a major, major threat. We have too much nitrogen and phosphorus in our ecosystem. It comes from a whole host of varieties of sources. We've changed from really great sea grasses, which support a lot of our ecology, to a real big mess. This is an example, the picture here, showing what happened just last year

from the water spill coming down from Lake Okeechobee—fish kills, animals were killed, and look at the human advisory. This goes in the news all around the world, and people—“Why should we come to Florida anymore?”—because you can’t even touch the water. So this is a big problem. Boatwork people have lost money. Hell’s Bay Boatworks lost \$1.5 million—a very popular skiff making company in central Florida, Titusville.

Red tide comes from too much nitrogen and phosphorus, which we can control. It is a major problem. Sarasota, Pinellas County—you recognize this picture. This is from your beaches here just a few years ago. Smelly fish on the beaches. The beaches—they’re not going to go there—plus the toxic in the air, the burning of the eyes and the lungs of the tourists.

Another threat we have in the state of Florida is the lack of an integrated coastal ocean observing system. We have no way to monitor the health of our ecosystem as it is right now, none whatsoever. There are some minor studies done by the state. We really need an integrated ocean observing system in the state. This is like having a doctor checking the health, the diagnosis of the ocean. It protects the economic engine. It just doesn’t tell people about where there’s blooms. It’s very important. Nationally, there’s a bill, Bill 1425, that’s up, and we would like all your support for that.

Climate change—as I go into my final slides on this. It’s more than just warming. It’s oxygen loss. It’s pH. When you have pH declining, heavy metals increase the toxicity. One of the panelists mentioned that, well, sea level rise is not a big deal. Ask the people in South Beach if sea level rise is not a problem. This has become a daily occurrence now in South Beach—closing beaches. That’s a big problem. When your beaches close due to sea level rise and municipal waste going in because the sewers are backing up, that’s a problem.

Habitat loss—well known. Our coral reefs are dying from overheating from global warming as well as vessel groundings. Look at the beautiful coral on the left in 1980, and in 2011, and even worse now. This is our economic engine, and we’re letting it crash in front of us. Habitat loss from development has taken away so many mangroves, which filter the water, which help keep our economy going strong.

The threat from highly migratory species. If that’s not managed properly, then the fish will lose—will decline in abundance and won’t come into our waters. A lot of the fish that I’m talking about are internationally managed, but some in the state. I won’t get into the red snapper issue whatsoever. There’s other issues with regard to fisheries management, namely, the antiquated management assessments that they have—single models. But that’s in my written testimony. I won’t go into that now.

Port development and industrialization. Yes, we need better transportation in the state, but we do not need to become like New York or Newark, New Jersey. The picture up at the top is from Cape Canaveral as it presently looks. The picture below is from Newark. Which one would you rather have? I certainly wouldn’t want our ports and bays to look something like this.

Additional threats are in my presentation as well as my testimony. We have outdated municipal water treatment facilities. Sew-

age is dumping right into the water and elsewhere—not good for tourists when they see pictures of floating poop in our water.

Loss of groundwater. Municipalities gain too much water without proper management plants. Intake from power plants for cooling. We haven’t talked about nuclear meltdown. That used to be a thing of science fiction in the movies, but Japan showed us otherwise a couple of years ago. Importation of exotic species, and, of course, loss of access to the water and the need to dredge waterways is very important to have our access to the water.

So I’ve taken a little bit too much time, but I thank you. The picture behind you shows how some people enjoy the water, and let the questions begin.

[The prepared statement of Dr. Roffer follows:]

PREPARED STATEMENT OF MITCHELL A. ROFFER, PRESIDENT, ROFFER’S OCEAN FISHING FORECASTING SERVICE INC.; AND ADJUNCT FACULTY, FLORIDA INSTITUTE OF TECHNOLOGY, DEPARTMENT OF OCEAN ENGINEERING AND SCIENCES

Introduction

I am Mitchell A. Roffer, President of Roffer’s Ocean Fishing Forecasting Service Inc., and Adjunct Faculty at the Florida Institute of Technology, Department of Ocean Engineering and Sciences. I received my Doctorate from the University of Miami’s Rosenstiel School of Marine and Atmospheric Science in Biological Oceanography. ROFFS™ provides a variety of consulting services to the recreational and commercial fishing industries, as well as, to the oil and gas industry, ocean towing industry, environmental consulting organizations, as well as, to academic and government organizations. I am actively involved in ocean research with a variety of collaborators from academia, the government sector and non-governmental organizations. I was a member of NASA’s Ecological and Biodiversity Science team for 11 years. Thus, I am in constant contact with a broad range of people who conduct business in Florida, as well as, fish in Florida in addition to those visitors who travel to Florida to fish and use the water.

When people visit Florida as tourists and when Floridians get up each morning they assume that the air and water will be clean and that the waters will provide an abundance of marine life whether it be fish, marine mammals like dolphins and manatees, turtles, or birds. Over the years Florida has had sufficient clean air, clean water and healthy marine life to support good fisheries and fantastic tourism. The National Marine Manufacturers Association estimated that the total annual economic impact of recreational boating in Florida is \$10.35 Billion. Recreational boating provides for approximately 83K jobs in 5.5K businesses. See (http://www.nmma.org/assets/cabinets/Cabinet508/Florida_Boating_Economics%20State.pdf). The State of Florida (<http://www.myfwc.com/about/overview/economics/>) cites very similar numbers.

Governor Scott’s Report (<http://www.flgov.com/2016/06/10/gov-scott-florida-continues-to-lead-the-nation-in-saltwater-fishing-jobs-and-revenue/>) indicates that with 2014 data from NOAA, indicates that Florida is number one in the Nation in jobs supported by the recreational saltwater fishing industry at 114,898 jobs. The report states “Our state’s world class boating and fishing also helped attract a record 105 million tourists in 2015.” According to the report, Florida’s commercial seafood industry was third in the Nation in 2014 in numbers of jobs supported with 92,858 jobs. Florida is also second in the Nation when it comes to highest sales, income and value-added impacts from the commercial fishing industry with 18.3 billion in sales impacts. The 2014 data are the latest economic data available.

The Bonefish & Tarpon Trust estimated that statewide, saltwater fishing has an annual economic impact of \$7.6 billion. When considered by region, some of the annual economic impact numbers are: \$1 billion for the Florida Everglades; \$765 million for the Florida Keys; \$110 million for the tarpon fishery in Charlotte Harbor; and \$59 million for the Treasure Coast tarpon fishery.

These are the economic yields are only possible if Florida continues to have clean air, clean water and healthy ecosystems, our true economic engine. Unfortunately, during the last few decades we have witnessed declines in the water quality and habitat which are impacting the fisheries and associated economies. For example a recent *Miami Times* article cites that that Hells Bay Boatworks of Titusville, FL which manufactures fishing skiffs, lost \$1.5M in boat sales in Florida in association

with declining water quality and fish abundance. The article reports loss of sales for other boat manufacturers as well—all due to Florida's water quality and habitat issues.

Threats to Florida's Coastal Ocean Economy

Threats Coming from External Sources

Threats to our coastal ocean economy come from sources external and inside (domestic) the State of Florida. Threats from outside the state include pollution from oil and gas development as evidenced by the BP Deepwater Horizon where oil from another state was transported by the currents and winds to the Florida panhandle and along the west Florida coast. If we were not so lucky to have a very large Loop Current eddy form and pull the oil westward, the oil would have reached the Florida Keys and southeast Florida. (images of oil and currents).

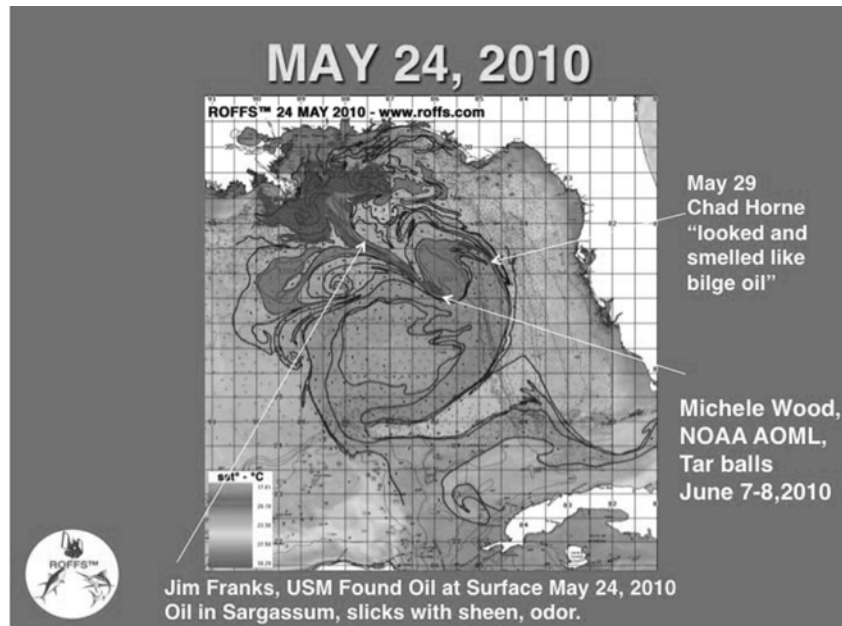


Figure 1. ROFFS™ Oil Oceanographic Analysis from May 24, 2010 with evidence that what ROFFS™ was mapping was oil from the British Petroleum *Deepwater Horizon* oil spill



Figure 2. A reminder of what the *Deepwater Horizon* oil spill looked like at ground level.

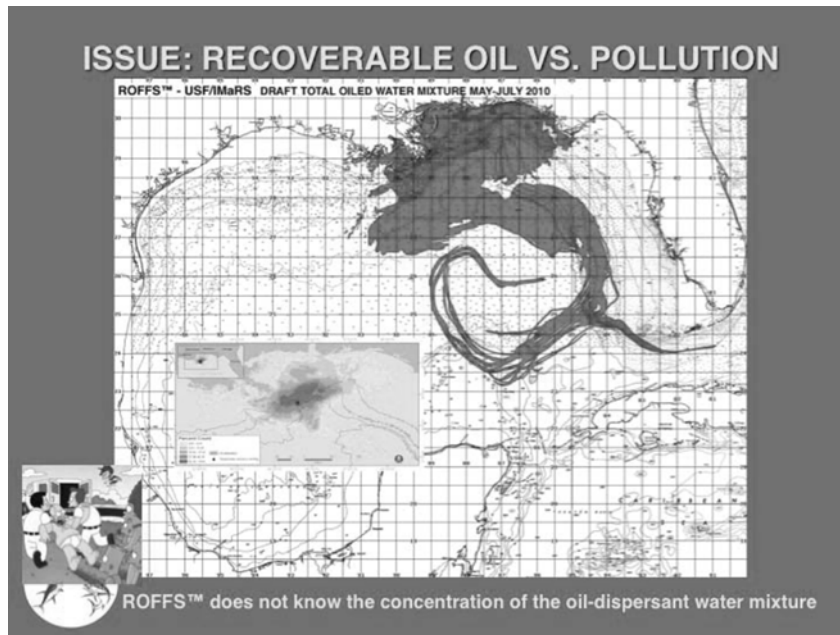


Figure 3. Map of the water (red) that came in contact with the BP Deepwater Horizon oil. Note that ROFFS™ was able to reliably follow the polluted water into the Florida Keys.

Oil and chemical pollution along with other hazardous materials could easily come to Florida from Mexico via the Yucatan Current and Cuba via the Florida Current both part of the Gulf Stream. It could also come from other south Atlantic states (*e.g.*, North Carolina, South Carolina and Georgia) as the currents all provide pathways to Florida as shown in Figure 4.

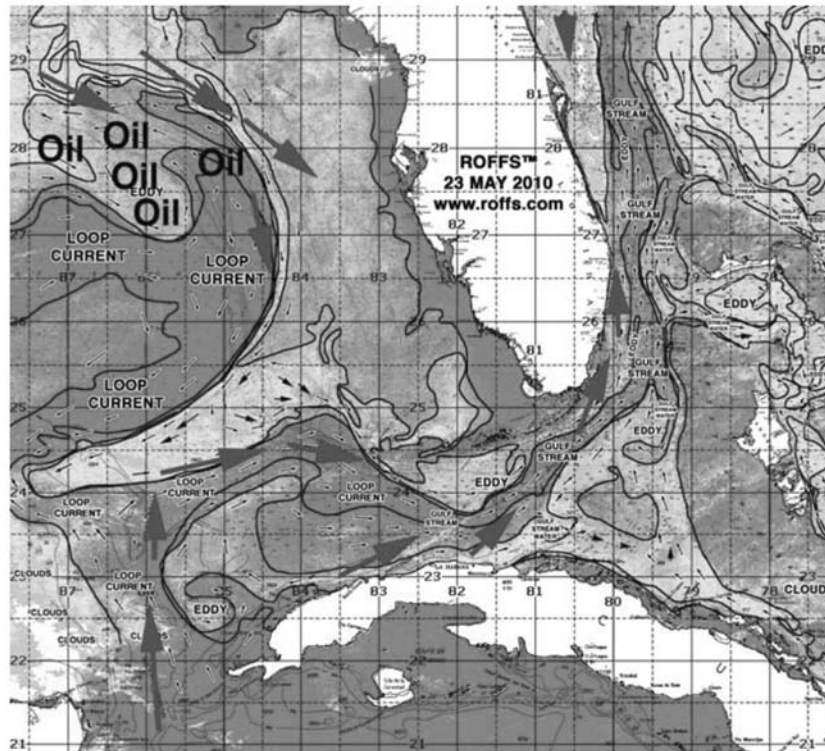


Figure 4. Modified from a ROFFS™ Oil Oceanographic Analysis shows blue arrows as the major ocean current paths of oil and other pollutants to enter Florida waters.

Domestic Florida Threats

Perhaps the biggest threat to Florida's fisheries and nature-based economy come from within. Altered freshwater flows to our estuaries are causing significant damage to coastal ecosystems, with predictably negative impacts on fisheries and tourism. The 2016 algae bloom in the St. Lucie Estuary was bad enough it made national news, as did the large fish kills in the Indian River Lagoon and Florida Bay. As bad as these events were, they are reflections of a much larger issue—a long-term and worsening strategy of water and habitat management. Clean water and healthy habitats are the factory that produces the fisheries and nature-based tourism for which Florida is famous. Unless the strategy is changed to protect and restore water quality and habitats rather than exploit them, the state's fisheries and nature-based tourism will continue to decline, as will their economic impact.

A major issue is the poor water management within the State. Industrial and other users of our precious water resources are not required to completely remediate their water after they use it. So fantastic amounts of nutrients, pesticides, hormones from cattle, citrus and other agriculture get dumped into the canals and rivers that either run to coasts via the canal system or enter our lakes. These result in algae blooms that kill our ecosystems. For example, Lake Okeechobee receives nutrient and pesticide polluted water and then algae blooms form. Some like cyanobacteria are harmful to humans.

The polluted Lake Okeechobee water is diverted from its natural flow to the Everglades to the east coast and west coast via Port St. Lucie and via the Caloosahatchee River estuary. In the last few years we have experienced massive fish kills from the toxic water from both the toxins in the water, from the massive abnormal amounts of freshwater in which the fish, marine mammals, and invertebrates can not survive in. The algae shades the sea grass resulting in its demise.

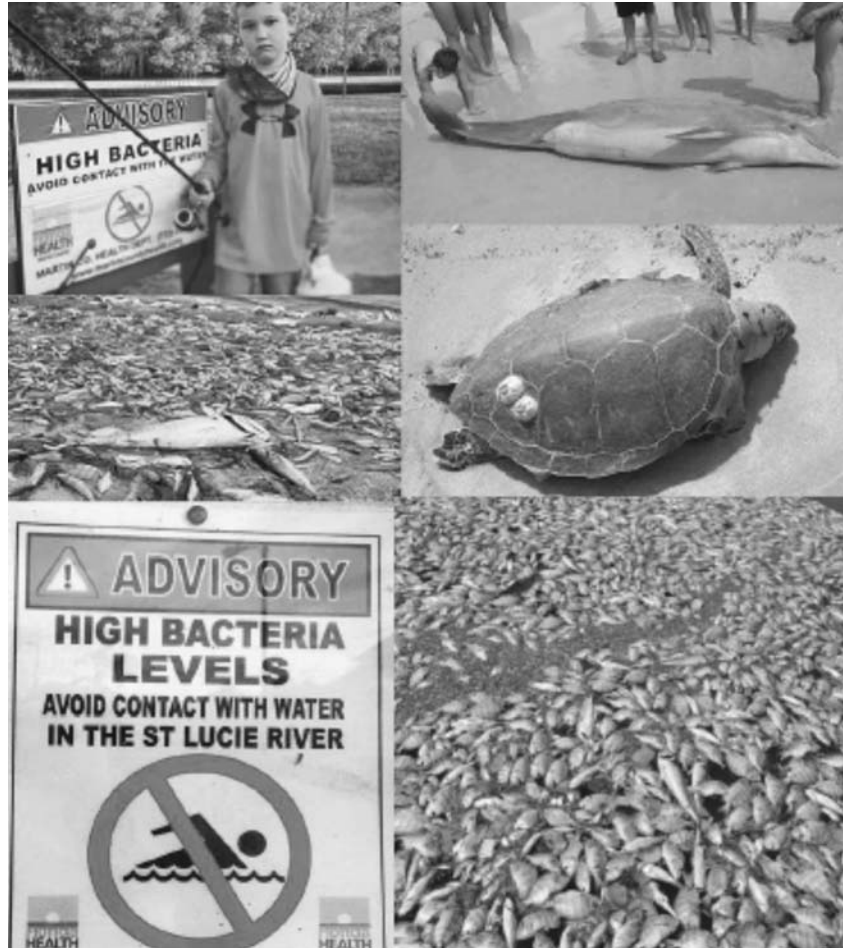


Figure 5. A montage of dead animals from polluted water around Port St. Lucie in 2016. The Department of Health posted warnings to avoid contact with the water.

When either the fish die or the algae dies, the decomposition uses most of not all of the available oxygen producing anoxic conditions which kill the remaining organisms. This is happening all over the state in different degrees. In my backyard, the Indian River Lagoon system lost between 60 percent and 80 percent of its sea grass from algae blooms blocking the light from the bottom vegetation. Also when the plants die the increased turbidity from the sediments along with the algae bloom prevent new vegetation from growing back.

The algae bloom threat to the Florida fishing economy also comes in the form of red tide and other hazardous algae blooms (HABS) that not only kill fish, but also produce airborne irritation that causes serious respiratory problems along with coughing, sneezing, and burning eyes to coastal visitors. Loss of beach traffic and fishing causes significant economic loss. The HABS threat is directly related to the increase in nutrients entering the water from numerous sources including agriculture, urban runoff, leaking septic tanks, residential use of fertilizer, and grass

clippings entering the water, etc. Another threat is the lack of economic data on the losses from such events. Florida State and local tourist departments do not like to talk about red tide and algae blooms. They would rather show photos of beautiful beaches and amusement parks.

What happens to the Florida economy when algae bloom occur? Fish leave the area and/or die and people stop fishing and buying equipment, bait, and boats. In the past 18 months it has been estimated that Hell's Bay Boatworks, a major Florida boat manufacturer has lost \$1.5 million in revenue recently due to the loss of sales. They minimized their losses recently by shipping their boats out of state for sale which historically they never did. Other Florida-based boat manufacturers have lost 80 percent of their revenue. (see Miami Times article by Isabella Gomes August 04, 2017. <http://www.miaminewtimes.com/news/florida-boat-industry-underwater-from-water-crisis-9502729>)

While our coastal areas are getting too much freshwater from the center of the State, the southern Everglades and especially Florida Bay is suffering from lack of freshwater. The National Academy of Sciences has considered this as well as all the so-called water managers. A short review can be found in the Miami Herald (<http://www.miamiherald.com/news/local/environment/article126205254.html>). Apparently Florida Bay needs approximately 30 Billion more gallons of freshwater per year. See the free National Academy of Sciences "Progress Toward Restoring the Everglades: The Sixth Biennial Review—2016" (<https://www.nap.edu/catalog/23672/progress-toward-restoring-the-everglades-the-sixth-biennial-review-2016>).

Another threat is the loss of groundwater and the pollution of groundwater. In my opinion we are selling too much of our groundwater and managing our surface freshwater poorly. In some cases like the St. Johns River Management District, they are allowing municipalities to extract more freshwater from the St. Johns River than a safe water budget requires. Downstream the ecosystems suffer from lack of water.

To fix these problems one must stop the pollution, fix the plumbing and restore the ecosystems. This takes expertise, comprehensive study and monitoring and of course time and money. Brevard County has taken steps to repair and restore the Indian River Lagoon through a special sales tax the residents voted for. Only time will tell if we waited too long to act.

Another domestic Florida threat to the coastal ocean economy is from industrial waste pollution being dumped into our Florida waters. This threat includes phosphate mining discards and storage water from the industrial processing. I remind you of the Piney Point, Florida polluted waste water "containment" ponds breaking and entering the Tampa Bay in 2003. A "solution" permitted by the Florida Department of Environmental Protection was to allow partially treated highly polluted water to enter the coastal waters of Manatee County. Now there is serious discussion about injecting this polluted water underground. We learned from the BP Deepwater Horizon that polluters often want to remove the surface pollution to keep the public and media from seeing it. A related threat is that businesses are not required to post a meaningful, non-refundable environmental remediation bonds. Thus, many polluters "go out of business" and walk away.

One domestic threat to our Florida economy is the lack of a fully funded, comprehensive coastal ocean monitoring system. This would allow objective, non-politically motivated scientists a continuously funded system to gather the necessary data to understand the changes in the health of the ecosystems. Automated and non-automated warning systems based on complete sampling regimes can be devised. Presently the State only samples a relatively few areas on a limited schedule. Based on my experience and opinion, it appears they do not sample extensively or comprehensively so that they do not find problems or the sources of the problems. A coastal ocean observing system would protect the economic engine of Florida by monitoring the health of the ecosystem and provide information that would be used to create management strategies to fix the problems before they become too severe. The idea is to identify the results of the good management practices and non-effective practices. Having a coastal ocean observing system is like having a full time medical doctor watching your health. Observations and diagnoses must be made to properly treat the patient. In our case the patient is the Florida ecosystem and Florida tourist economy. Such a system would also likely save lives from the resulting real-time current data and improved search and rescue models.

Another domestic threat to our economic engine is the loss of fish nursery habitats and the degradation of all fish related habitats. This is important as the amount of habitat greatly influences the total abundance of a fish species. It is well known that habitat quality and connectivity will influence fish health, survival, and abundance. Cutting the natural flow of water and destroying nursery and essential habitat will destroy the fisheries that are an economic engine in Florida. According

to Dr. Aaron Adams of the Tarpon Bonefish Trust who studies such issues, there has been a loss of approximately 50 percent mangrove habitat in Florida. At least 9.3 million acres of wetlands, more than two million acres of seagrass and up to 80 percent loss of naturally occurring oyster beds. This has caused a decline in the abundance of many fish that are fished recreationally and commercially. Given that the Florida Fish and Wildlife Conservation Commission does a good job managing fisheries, it is clear that the declining fisheries are due to habitat loss and degradation. We can not afford to lose any more habitat and the negatively affect habitat should be remediated. These habitat losses stem a variety of causes particularly coastal development, water pollution, poor management of the freshwater flow in the State.

The loss of coral habitat is a particular threat to Florida's fisheries and tourist economy. Coral habitats are nursery areas for many fish that are important components of the Florida fishing economy such as snappers and groupers. They are also the habitat for important adult fisheries. Coral reefs have been destroyed by improper anchoring and by direct damage by boat groundings.

A much larger threat to the coral ecosystem is coral bleaching from overheating of the waters and also due to the decline in pH of our oceans. Not only do corals die from overheating, they are also more susceptible to diseases. See Eakin *et al.*, 2010 (<https://doi.org/10.1371/journal.pone.0013969>) for more details)



Figure 6. Photo of the same area of Florida corals taken in 1980 and 2011. Photo credit Mote Marine Laboratory

Another Florida domestic threat to our fisheries tourist economy is the dumping of treated and untreated wastewater into our canals, rivers, estuaries and oceans. The threat is that many water and municipal managers think that the solution to pollution is dilution. This is a dangerous threat to the Florida economy. Firstly the polluted water should be totally remediated by its users before being returned to our rivers, bays and oceans. Just last week the Miami Metro-Dade County sewage outfall pipe was found to be leaking polluted water in the coastal waters. See <http://www.miamiherald.com/news/local/environment/article164655777.html>

Part of this wastewater threat is that water treatment plants in the State have not increased their operational capacity or modernized their treatment technology. Far too many pharmaceuticals, pesticides, pesticide by-products and nutrients enter our waters from our permitted municipal water treatment plants. These are negatively affecting our fisheries ecosystems from the rivers and bays to the ocean ecosystem including hard and soft reef ecosystems.

Improved wastewater treatment is especially urgent given that many Florida homes must be converted from septic tanks to municipal sewerage systems. Numerous studies have demonstrated that many regions of Florida are not appropriate for septic systems, and in many locations the density of homes is too high for septic systems to be effective. These septic systems leak excessive nutrients into Florida's coastal waterways, adding to the problems associated with surface runoff.

Inadequate or improper fisheries management is a threat to the State fisheries tourism. Since Florida fisheries operate in State and Federal waters the fisheries are managed by the State and by the South Atlantic Fishery Management Council and the Gulf of Mexico Fishery Management Council. The threat is the lack of modernization of their stock assessment methods from data collection to single species models that do not incorporate environmental data—covariants into their assessment. Estimates of abundance are often biased and often do not reflect what the fishermen are experiencing in the water or what modern estimates of abundance

would show. Over managing the fisheries results in opportunity losses, but under-management or mismanagement results in overfished stocks. A multi-species, habitat oriented and environmentally sensitive system of stock assessment and management needs to be established.

Another threat to Florida fisheries is the poor management and over-fishing of fish stocks outside Florida that migrate to Florida. When populations that migrate to Florida decline in abundance, then it affects the Florida fisheries. Tuna, swordfish, sailfish along with blue and white marlin are examples of this. See Restrepo *et al.*, 2003 (<https://doi.org/10.1071/MF02057>) and http://www.takemarlinoftthemenue.org/global_status_of_billfish. Recent efforts to ban commercial swordfish longline fishing in Florida waters has been effective for Florida's recreational swordfish fisheries. The threat is to open this fishery to commercial longlining again. The bycatch of many other valuable species occurs during longlining operations.



Figure 7. Example of recreationally caught swordfish in Florida (left). Photo credit Richard Gibson and Marlin Magazine.

Another threat to the Florida fisheries economy is the mortality of fish caught, removed from the water to take photos that damage the fish, and returned to the water. This threat comes in the form of lack of enforcement of existing laws on removing highly migratory species from the water, and also due to the lack of educational programs to educate fishers of this issue.

Port development is yet another threat to the Florida economy. The tourist economy benefits from cruise ships bringing visitors to Florida. However, the further development for cargo and ships that transport chemicals including petroleum is a threat as they add additional pollution to the port areas and the surrounding land areas through increased truck traffic as associated pollution. My personal view is that Florida ports should not become like the Port of Newark, NJ. Port expansion usually results in the loss of essential fish and bird habitats.

Another threat to the Florida fisheries economy is leakage of nuclear waste and overheated water from nuclear power plants. A further threat is the loss of fish larvae and juvenile fish that are killed when the power plants pump water to cool their power production.

Additional threats come from fish and other wildlife being imported illegally or disposed of illegally. One only has to look as far as the Burmese python in south Florida and central Florida. The lionfish is another example of alien species changing our ecosystem. See <http://myfwc.com/wildlifehabitats/nonnatives/> for a list.

A final threat to the Florida fisheries economy is climate change. The change in the absolute abundance along with the changing of the migratory patterns in time and space is a major issue. For example warmer winters have resulted in the late or reduced arrival of the migratory sailfish into south Florida waters. Without reliably good fishing many tourists who have traveled to Florida are not traveling to other locations (*e.g.*, Costa Rica, Guatemala, and Dominican Republic) to fish. Tem-

perature increases are causing significant coral reef mortality and disease. Sea level rise and increase flooding in some Florida locations like Miami have a negative impact on marina operations including boat dockage and storage.

Most Important Threat

To list which single overall threat is the biggest is a difficult task. In the present and near term, water quality along with the degradation and destruction of habitat is the biggest threat. In the future, water availability and quality along with climate change are likely to be the biggest issues.

I would like to acknowledge help in the writing/editing of this testimony including photo sources: Aaron Adams (Bonefish Tarpon Trust), Mark Eakin (NOAA), George Maul (Florida Institute of Technology) and Kellie Ralston (American Sportfishing Association).

Senator NELSON. All right. Thank you, Dr. Roffer.

I want to welcome all the folks from so many different counties that have come today. Would all the elected officials who are in the audience—would you stand and be recognized, please?

[Applause.]

Senator NELSON. Thank you very much.

Would all the members of the Chambers of Commerce in the entire Tampa Bay region—would you stand and be recognized?

[Applause.]

Senator NELSON. Very good.

And we have a number of environmental advocacy groups that are here. Would you stand and be recognized?

[Applause.]

Senator NELSON. Well, as you can see, there's broad interest.

Now, in a Senate hearing, what is typical is the Chairman will start the questions first, and then the Ranking Member will ask. Since I'm running the show, I'm going to break the normal, and because of our two congressional colleagues—I want you all to have the first chances.

So, Madam Congresswoman?

Ms. CASTOR. Well, good afternoon, everyone. Thank you, Senator Nelson, for calling us all together. You simply cannot understate the importance of having a leader like Senator Nelson from the state of Florida as the leader in the Congress when it comes to these issues on the Commerce Committee, Science—

[Applause.]

Ms. CASTOR. So thank you very much. And you are right. Travel and tourism are the lifeblood of Florida's economy, and we've all got to work together to do everything we can to protect it and to ensure that it thrives.

Robin, you'll remember this. It is etched in my memory, more than most things in my career, my professional career—was in the days after the BP Deepwater Horizon disaster, when we convened a working group of small business owners there at the TradeWinds on the beach, and we had one business owner who was weathering the recession. But, boy, the BP Deepwater Horizon came in and it was a very difficult one to punch. She cried. She brought me to tears. She was facing significant layoffs and maybe an end to her business, and she was not alone.

In the days—remember that the oil spewed out for five months, 5 months, and that was what the rest of the world saw. No oil on the beaches in the whole Tampa Bay area, and yet the tourists

didn't come. So we've learned lessons, haven't we? We've got to do everything to ensure that that never happens again.

And God bless the folks here at the University of South Florida and the College of Marine Sciences, and, Dr. Sanberg, I know you're very proud of them, and Dean Dixon, Dean Hogarth. Boy, we had Dr. Weisberg explaining the loop current to everyone, and Dr. Hollander that was fighting for the oil sample that we had to kind of—we had to shame BP into providing—fighting for the research dollars to come. So thank you. The Weatherbird research vessel was out sampling the oil before anyone else was. So this was ground zero for protection of our economy and our environment.

Senator, you were kind of modest, because you didn't mention the role that you played in passing the RESTORE Act in the years after the BP Deepwater Horizon disaster. You all remember the RESTORE Act was the law that we passed to ensure that 80 percent of all of the fines and penalties that BP and the other polluters had to pay came back to the Gulf Coast.

Now, the importance of the RESTORE Act is more plain than ever, because we're facing very significant cuts from the Trump administration when it comes to science, research, whether we're talking about NOAA or EPA or the other science-based agencies. But those RESTORE Act funds will continue to flow for years to come, and they will be very important in addressing algae blooms and the change of climate. But I wanted to thank you for that, because I don't think that should go unmentioned today.

But we learned our lessons, and I think, as we set priorities for leaving here, we do have to prioritize the offshore oil drilling, and it's very heartening to hear there is a bipartisan effort to extend the moratorium from 2022 for another 5 years. I have filed the Coastal Protection Act for a number of years now that would make the moratorium permanent.

[Applause.]

Ms. CASTOR. And we have bipartisan support. But what we need is a unified Florida delegation. It's only through bipartisan unity that we are going to get that accomplished. So I'm going to highlight that to you all.

The other huge challenge that we're facing, of course, is the change in climate, and this is going to be very costly to our businesses and everyone that lives in Florida and everywhere else. But think about what we're facing here in Florida when it comes to cost—higher AC bills, beach re-nourishment that our local government officials fight for, higher flood insurance rates, property insurance rates, property taxes, because our local governments are going to have to be more resilient in improving water and waste water infrastructure. So if we do not act now to get ahead of this, we are going to be facing a very difficult future.

So in addition to clean air and clean beaches, it's time to fight for clean energy in Florida. And, Mayor Kriseman, I want to thank you—

[Applause.]

Ms. CASTOR.—because here in the Sunshine City, you've been the most outspoken advocate—and I see Councilman Rice and Councilman Nurse and Commissioner Welch. This is the place where it can happen. Did you all know that Florida is one of the worst

states in the country in producing energy through renewables—one of the worst, the Sunshine State. New Jersey, Georgia, North Carolina produce more energy through solar power than the Sunshine State. I think we can do a lot better, and we can have our community thrive. We can grow, we can build jobs in this clean energy sector, and it will improve our tourism based economy.

I'd like to offer into the record, Senator, the editorial from the *Tampa Bay Times* just today. They're coming fast and furious after the National Report of Scientists on Climate, the University of Florida Report that was out today.

So I'll offer this for the record, "Climate Threats to Florida Mount."

[The information referred to follows:]

Tampa Bay Times—Thursday, August 10, 2017—Opinion—Times editorials

CLIMATE THREATS TO FLA. MOUNT

The latest Federal report on the Earth's warming climate doesn't mince words about the disturbing trends, man's contributions or the dangers that millions across the globe already face, especially in low-lying coastal areas in Florida and elsewhere. It is yet another call to action for federal, state and local officials—and they all have a role to play in curbing emissions of heat-trapping gases, shoring up infrastructure, improving flood control and finding more efficient ways for societies to grow and manage their populations.

Drafted by scientists at 13 Federal agencies, the report cited the warming trend as "global, long term and unambiguous." Global temperatures have increased by about 1.6 degrees over the past 150 years, the study found, and thousands of studies have created "many lines of evidence" to conclude that human activity is primarily behind the changing climate. The authors found it "extremely likely" that most of the warming since 1951 was caused by humans, and that even if emissions were to cease, existing levels of greenhouse gases in the atmosphere would cause temperatures to increase at least a half-degree Fahrenheit over this century.

The report, by 30 lead authors representing agencies such as NASA, Federal laboratories, the private sector and universities, is part of the National Climate Assessment. That is a congressionally mandated analysis that seeks to build on the existing science and provide a snapshot of the current state of climate change. It found an increase in the frequency and intensity of extreme weather, and warming in the Arctic at twice the rate of the global average—a phenomenon that could impact sea levels, the weather and other patterns in the lower 48 states. One-third of the sea level rise since 1880 has occurred since 1990, and coastal communities from the Gulf of Mexico to the Atlantic are at increasing risk of routine flooding, saltwater intrusion into the drinking water supply and the collapse of roads, utilities and other vital infrastructure. That puts Florida's east and west coastlines at risk, yet Gov. Rick Scott's administration has been less aggressive than local governments in South Florida and Tampa Bay in addressing the challenges.

The findings contradict the talking points of the Trump administration, which has openly questioned the science behind climate change and the degree that humans contribute to it, and which has moved to reverse the clean-air initiatives of the Obama White House. The unpublished analysis was made available to the *New York Times* days before Sunday's deadline for the 13 Federal agencies to approve the report. Making the report public at least forces the Trump administration to explain why it does or does not stand behind the science.

This national assessment lays a foundation for securing Federal funding and regulatory direction on climate policy, and it offers state and local governments the technical assistance they need to incorporate the impact of climate change into their planning for infrastructure, land use and other long-term issues. States and cities, though, cannot cede all responsibility to the Federal Government. Studies show Florida, for example, has invested trillions of dollars in infrastructure with virtually no consideration given to rising sea levels. Rising seas could swell Tampa Bay up to 19 inches over the next quarter-century, putting tens of thousands of residents at risk. The Federal study is another wake-up call about a threat that is real, here and more pressing by the day.

Ms. CASTOR. This is the challenge of our time. We do not want to be left with our children and grandchildren asking us, "What did you do? What did you do? Did you address this? Did you fight for our way of life?" We're so fortunate to live here.

So maybe I'll ask my question. Robin, you remember that day when we would bring businesses together. What would it mean to them now to know that they would have a little more breathing room if we were able to extend the moratorium on oil drilling off the coast of Florida or make it permanent?

Ms. SOLLIE. It would mean the world to them, professionally, and I think, personally, because they not only work on the beaches but they live on the beaches. We talk about this, as you know, and have been for many, many years, and thank you for your support on the issue. They're fearful. They don't want to see that happen again. So extending the moratorium or getting it to be permanent is amazing, and we, as an organization in coastal communities, will do everything we can to support your role in helping make that happen.

Senator NELSON. The editorial will be introduced into the record. Congressman?

Mr. CRIST. Thank you very much, Senator. I want to add to what Representative Castor had to say in thanking you. Thank you, Senator Nelson, for your great leadership in this arena. You understand, as a Floridian, how important all these things are to all these people in this room and beyond, how it affects tourism, how it affects their businesses, whether they be restaurants or hotels or resorts on the beach, or people who are fishing, charter people. It has an enormous impact on everything that we do.

You know, I tell people all the time I have the honor of representing the most beautiful district in America. So does Kathy.

[Laughter.]

Mr. CRIST. And, of course, the Senator has the opportunity to represent the most beautiful state in America. All of you here understand that and the importance of what we're talking about and these issues, how sea level rise affects us in a very direct way, Commissioner, and what it does when it comes to flood insurance, the things that Representative Castor addressed as well.

So I'll pose the following question to anybody who would like to respond to it. With nearly unanimous scientific consensus that man-made climate change is, in fact, real, how can we proactively protect our businesses that rely on tourist dollars from the impacts of more severe weather-related events, such as hurricanes and flooding?

Ms. FERENC. I would say—thank you very much for the question, and, again, thank you for the opportunity to answer. I would say that it's the reason why organizations across the county, locally, and at the state level, and then at the national level, are so important to us, because getting the word out to our state and beyond and internationally now when a disaster occurs is what is the difference between it being a moment and it being a long, long problem for the economy of the state.

So we really can make a difference, and we saw that. I think we've gotten much better at it since the oil spill, and we've improved, both at the local and state levels, and at the national level,

in terms of getting a message out immediately. But I think it's the reason why we need to continue to do such things like fund Visit Florida and fund Brand USA so that we can be—so we are prepared at those levels. If we have the funding, we can get that word out and really minimize the damage that a hurricane can do in terms of the economic impact to the state.

Dr. ROFFER. I think education is part of the issue here, too. We have to educate the public with what the real threats are versus the non-real threats and how to prepare for a storm and how to build properly. I lived in Miami through Andrew, and, fortunately, I survived without too much damage to the house. But the building codes changed as a result of Andrew, and it was just a really—truly was a minimum increase, and there should be more increases in the building code as these storms, in theory, are supposed to be getting stronger each time due to the warming of the ocean. So educating the builders, educating the public, and then getting the word out to everyone what the real threats are and how to prepare for them properly.

Ms. SOLLIE. The way I heard your question and how it affects businesses and how we can make it easier for them to mitigate and deal with it as it's naturally occurring for us day in and day out, or it's an immediate occurrence, right, with a hurricane. I think, nationally, we need to make accessibility to the small businesses more achievable.

In a lot of instances, whether it's renewable energy, using solar panels, protecting their building against sea level rise or floods or whatever it is, the entry, the cost for a small business owner, which is the lifeblood of our nation, right, is too extreme for them to invest in that, to mitigate something that they can't see immediately, but they know it'll help them later when this happens. But they've got to pay their electric bill, right? They've got to pay their lease.

So I think that there needs to be some, again, planning, some foresight to develop programs that could help us fund small and medium sized businesses to help mitigate whatever that circumstance is in the whole breadth of these threats.

Dr. LARKIN. So thinking proactively makes me think back to my first point, which was investing in natural and built infrastructure, so certainly things like oyster reefs, offshore oyster reefs, and planting sea grasses that can protect coastal shores. But when we think about things, I guess, to follow up on Robin's point, we think about projects and private companies investing and perhaps spending more to develop in a way that protects from sea level rise. A portion of that spending is for a public good, not just a private good. So, certainly, they benefit, absolutely, but there is a public good component that all of us benefit from, that does justify public investment in that resource through a variety of programs.

Senator NELSON. Let me see if I can nail down a couple of more points for the record. What I've found is that the sea level rise that is occurring—and this is not forecast. This is not projections. This is measurements that, over the course of the last 40 years, have shown that the seas in southeast Florida have risen five to eight inches. In fact, the people of southeast Florida are getting sensitized to this, because they're seeing it on the 6 o'clock news.

They're seeing the water sloshing over the curbs in Miami Beach, same thing in the Las Olas section of Fort Lauderdale. But what I've found in other parts of Florida—it's out of sight, out of mind.

What do you think is going to change in order for this to sink in? What, in fact, has happened? Anybody?

Ms. Ferenc?

Ms. FERENC. I would say from that question and from many of the comments that you have made today that an education process and a campaign, perhaps within our own industry, of understanding more critically how our environment is tied to the health of our businesses and allowing us an opportunity to take more responsibility in the paths that we carve out for ourselves and how we're going to conduct ourselves in the future and what's going to be important to us might be a worthwhile effort.

Senator NELSON. Yes, ma'am. Dr. Larkin?

Dr. LARKIN. So one of my points was improve terrestrial and freshwater environmental systems. One of the things that happens in conjunction with sea level rise are changing weather patterns. So I think when we do research that tries to integrate sort of the biophysical with the economic and all the other components is helping people—going back to the education point—realize how integrated it is, and it may be investments in things to address those changing weather patterns that might go a step further.

Senator NELSON. Dr. Roffer, you certainly indicated this in a number of your slides as you were talking about fish and all the other things. The effects of climate change are real. Are the commercial and recreational fishermen and the charter boat captains—are they beginning to see any differences out there on the sea?

Dr. ROFFER. Quite a bit. You know, when—for example, the south Florida sailfish fishing has been very poor—southeast Florida sailfish fishing for the last couple of years has been very poor, because we've had warm winters, and the sailfish haven't migrated from the Carolinas down into Florida all the way to the Keys. So, for example, Charleston had one of the best sailfish fisheries they've ever had because the sailfish were up there. So fishermen are clearly seeing the change in migration of the fish, and sailfish is one of them.

Cobia is another one that's not—that doesn't stay in the state as long as it had once before. It migrates with the warm water. As the seasons warm up, they're migrating further north and out of our area. So a lot of money goes into cobia fishing and sailfish fishing. People have noticed changes in the upwelling pattern of the Gulf Stream off of the east coast of Florida. We're not sure if it's real or not. The fishermen are telling us about it. So a change in upwelling will affect the availability and the catchability of these fish.

So to answer your question, yes, fishermen are starting to see it, and those that are seeing it are starting to understand it and realizing this is real.

Senator NELSON. Are they speaking out?

Dr. ROFFER. No, they're not speaking out. A lot of the problem becomes—with commercial fishermen and fishermen and, particularly, charter boat captains—in saying that their catch is decreasing is admitting to their potential clients that they're not catching

fish anymore. So you're not going to get people in the Keys saying, "Well, don't come down to the Keys anymore because the sailfish are in Charleston." So they're not saying it.

They can't advertise—the fishermen saying that it's hurting us. Privately, they'll tell you. But, publicly, it's very hard to get their testimony because they're basically giving negative advertising for their business. The researchers can, in fact, tell this. The recreational fishermen can report it, and people like myself.

Senator NELSON. And that's part of the problem. We're not willing to have an open discussion about this issue of what's happening to the Earth. For example, I was shocked, visiting some of the agencies under the jurisdiction of the Commerce Committee, highly technical agencies, NIST, NOAA, NASA, et cetera, and what I had found with regard to one of those agencies right at the turn of the new administration was that the word has gone out that they were not to use the two words, "climate change."

It has been reported here in the state of Florida that a similar edict—had gone out to all state employees—don't use "climate change." Now, if you can't even have a discussion about it, or alternatively, we see scientists—and I have seen this in Washington as well—attempt to be muzzled as to the free expression of what their scientific conclusions are on whatever the issue is, then I think we'd better get concerned and we'd better get vocal about this.

Dr. ROFFER. I agree. I'm constantly on social media, and I'm involved in a newsletter that goes out to quite a few people in the country, talking about such issues. Unfortunately, with the climate in D.C., the political climate, the words, "climate change," has to be basically taken out of proposals. You have to use the words, environmental variability or environmental change. It means the same thing, but it's not that blow-up word when someone searching says, "Oh, throw that out."

I have to give NASA a lot of credit. NASA has stayed within the climate change realm. I know I've been funded under a climate change with NASA, looking at bluefin tuna and highly migratory species, and they feel they're doing what's right for the country, and until they're forced to change, one way or the other, they're going to continue using the words, climate change. But, unfortunately, other agencies are forced not to use it, which I think is un-American.

Senator NELSON. Let me ask—yes, ma'am. Ms. Sollie?

Ms. SOLLIE. As leaders, we're involved in the conversation in-depth, and so we hear sea level rise or climate change. We know where our thoughts are going, and we want to plan for our future or protect our businesses or the constituents we serve. I think we need to come up with a methodology and education, even as an industry, to speak in more layman terms so that the general public understands what we're saying, and not in a threatening way, just to get it in their mindset.

We're humans. We live on instant gratification, right? And so, again, this is something that's gradually affecting our lives. But until they can see an experience, understand it, I don't think we, behind these doors today, can get the momentum that we really need to be powerful.

And I do want to add for the record that we're fortunate in Pinellas County. We are ahead of the curve. In 2006, Tampa Bay Regional Planning Council did a study on sea level rise, and I have it here with me. It depicts the acreage within the county that's actually protectable. So out of 109,000 acres, 78,770 are in a protection—almost certain protective zone. So maybe we can plan as municipalities or counties to take steps so that we can demonstrate this to other regions on how we can start to address the issue.

Senator NELSON. Yes, ma'am?

Dr. LARKIN. One of the mechanisms available to university researchers is to work with Florida Sea Grant College Program. It's a program that's housed at UF, but it represents all universities here in Florida. Through that program, there are local agents that help communicate the science to the public.

I think what's really effective about that is that they all have advisory boards on different issues, so the members of those advisory boards are folks that—probably some of these folks in the room here today that really have a direct contact to folks on the shore, and we see them as an extremely valuable resource. I know that their funding was, you know, one of those ones that was highlighted to be cut, and I think some of it was allowed to be saved, which let us do a big sigh of relief. But they've been so effective. It's kind of like the example that you have been talking about. It's hard to imagine it was on the chopping block just because of how successful it has been, and it is a real valuable tool.

Senator NELSON. That Sea Grant Program is within NOAA, and that is within the jurisdiction of the Commerce Committee, and one of those successes that you're talking about is what happened at Cedar Key. The fishermen have successfully transitioned to a clam aquaculture. Now, it has a \$39 million value to the state of Florida.

So, Dr. Larkin, further expand. How would cutting that investment, which is the proposal in the President's proposed budget, affect these natural resources impact jobs?

Dr. LARKIN. Right. I mean, you talked about the Cedar Key example, and that's just a really good one, because that is an example of where a fishery had used a particular gear—net gear—to harvest mullet, and because of a political vote by the public was immediately shut down. So it was devastating to a little community that probably most people had never heard of.

But the training that ensued, the ideas for how we are going to address this issue with this community, started with public investment, and those Sea Grants agents were ground zero. They were in a very difficult position, I mean, retraining a whole community of folks that have spent their lives, generation after generation, fishing one way for one thing.

So now you fast forward, and not only—you mentioned the commercial value of what's harvested. That industry, that type of investment, is almost like investing in a museum. It is an attraction. People now come because those businesses operate like little public aquariums. People can walk in, and they'll show them the process. They come and they now visit, and other private investment has ensued. There's a little artist colony there now. So it has seeded private investment and allowed that community to flourish, and there are other examples like that as well.

Senator NELSON. As the Earth heats up—and I'm assuming that most everybody here understands the scientific reasons behind this, although there are people that deny that this is, in fact, happening. It's simply as the sun's rays come in and hit the Earth, part of the heat is absorbed, but a lot of that heat is reflected off the surface of the Earth and radiates back out into space. When you put certain gases, like carbon dioxide or methane into the air, and it goes into the upper atmosphere, it creates what is known as the greenhouse effect, like a greenhouse glass ceiling, and it traps the heat.

Of course, as the Earth heats up, look what covers two-thirds of the Earth—oceans, and the oceans absorb 90 percent of the heat. And when water is heated, what happens to it? It expands, and, thus, we are seeing the phenomenon that has been chronicled here by our panelists.

One of you mentioned, I think, wells. Lo and behold, that's happened right here in a south Florida city. It's well field had to be moved further west because of the sea level rise and, therefore, the salt water intrusion into the well field. So it's happening, and it's going to cause great infrastructure investment.

I want to ask the two mayors. Are city mayors starting to think about the investments that you're going to have to make because of the changes in the climate?

Mr. CRETEKOS. Senator, the City of Clearwater was the first in the state and in the Southeast to have a natural gas refueling station, and we've started doing our vehicles—natural gas vehicles. We've partnered with Duke Energy to be the first city in Pinellas County to finish LED lights on all of our street lights, and we have a green print program that we adopted about 5 years ago to put us on the path of sustainability.

Senator NELSON. Mr. Mayor?

Mr. KRISEMAN. Yes, we're—and I thank the council members that are here who have been also pushing these issues. We're embarking on an integrated sustainability action plan for the City of St. Petersburg. We're looking at doing a long-term plan that really takes into account both the impacts of climate change and sea level rise, in particular, on our city, because we've seen the maps and we know the risk that our city is at, and we know that we are going to have to make significant changes to how we conduct our government, but how we conduct our city.

Our zoning changes are going to have to be implemented. How we build out is going to have to change. So we are looking at doing all those things in addition to a commitment to become 100 percent renewables in the city.

[Applause.]

Senator NELSON. Commissioner, is this discussion in front of the county?

Ms. LONG. Yes, Senator, and I thank you very much for that question, because I want to share with everyone a real living example of how elections matter. This County Commission now uses the words, climate change, sea level rise, and sustainability, and when I first came on the County Commission 5 years ago, I was stunned to learn that our county staff were not allowed to use those words in discussions with the commissioner.

On top of that, we are planning—our county is—a sustainability and sea level rise, climate change conference in partnership with the Tampa Bay Regional Planning Council a few months from now. So I hope you'll stay tuned to that.

On top of that, I am so proud that all of our facilities within county government have moved to things like LED lighting. We invested a lot of money into a cooling system in downtown Clearwater and worked with partnerships all over the City of Clearwater—the mayor is aware of this—and have saved over a million dollars a year in energy by using this cooling system.

So the long answer to your question is yes. It is high on our list. We have many bridges in our county that need to be replaced, and one of the big deep dive discussions is how high do we have to build the new bridges in order to ensure that in the future our citizens will not be at risk again.

One more thing, if I may be so bold, is to say elections matter. The issues we're talking about today are handled best by good, sound, public policy, and when we put people in office that don't believe in science, well, that's a problem, and we only have one Earth. Our oceans and our natural resources, our most important treasures—shame on us. What will our grandchildren say when they look back and go, "What were you thinking?"

[Applause.]

Senator NELSON. Dr. Sanberg, you're the head of research. USF has been particularly positioned as one of the leaders of the Florida Institute of Oceanography led by the Dean that I think you introduced as the Dean—stand up, Dean.

[Applause.]

Senator NELSON. Thank you.

The Florida Institute of Oceanography ends up being the recipient of some of the funds that we carved out in the RESTORE Act, specifically for researching the health of the Gulf in the future. Now, there's a lot of oil out there, and a lot of it is still lurking around the bottom of the Gulf.

Do you want to comment on any of your future plans in the Gulf research?

Dr. SANBERG. Sure. Of course, you have the experts right over there, so a comment, in general. I think that there are a few things. One is that the Florida Institute of Oceanography is a statewide institute, and it's housed here at USF and in St. Pete, a great place to be housed. But it's a collaboration between most marine groups around the state, and so when money comes in, it gets diffused, based on research projects around the state to look at all sorts of activities on all the coasts.

The other thing that's a real advantage is that we had a new ship that was recently built, the *Hogarth*, and it is a superb world class ship to continue to do research out in the Gulf, especially to look at these problems and issues related to the oil that's out there, the current health of the Gulf, the fisheries, just a number of things.

And the other thing is that students—one thing is we are a research university, but we have great students, and we have students that want to be out and work with these great professors that we have in marine sciences and all the other areas. So these

activities are extremely educational. They're also STEM-related activities, which really helps a great deal in the education of future Floridians and to move into this field.

The other thing I was just going to say, when I'm listening to all the witnesses here, speakers, is there are a number of things that you've brought up, and education, I think, is a key one, especially in tourism. We offer a master's in global sustainability with a concentration in tourism at USF. It's a very important program for us. And I guess the question, if I was going to ask one, is are there other educational programs for the Floridians of tomorrow that they could really train in and they could be helpful to all the industries that are being affected?

Senator NELSON. Anybody want to comment on that? Is Dean Hogarth here? I would certainly want to recognize him, because he certainly worked with us on the oil spill. Let me ask you another question. One of you mentioned invasive species. So we know the problem with lionfish, the Burmese python. You could say the Burmese python is related to weather, because the only thing that we found, how you can get at this population, is a cold snap that is sustained over time. Otherwise, it's very difficult to find them, and the Park Service is thinking there might be 150,000 of them in the Everglades.

Zika—infectious diseases, another byproduct. It's primarily in warm areas. Did any one of you who mentioned that want to expand on this?

Yes, ma'am. Dr. Larkin?

Dr. LARKIN. If you'll allow me a moment, I do want to mention one thing. We talked about built environment solutions for dealing with global warming. There is a role for natural systems, too. So we all know that trees sequester carbon, and we have researchers that are working on creating new forages for cattle that will help reduce methane. So there's a variety of solutions.

With respect to—and tourism. We have a Department of Tourism that also offers programs that, hopefully, will help in that scientific regard. The invasive species one is a good one. We have little beetles that are attacking our trees and our avocados.

The pythons—so, actually, we have some researchers who just compared the effect of the cold snap between the American crocodile and the python, and, actually, what it found was while it knocked both populations down, it only had a long-term effect on the potential northern migration of the crocodile, not the python. So we are still concerned about it moving north.

Senator NELSON. You know, we used to think that the python—by the way, have you seen the pictures? You know, they caught one that was 18 and a half feet long. You pick up one of these things, and it's 200 pounds, and it's solid muscle. We thought maybe they wouldn't go any further north than the humid marshy environment of the Everglades, but if there is increasing warming temperatures, you're right, Dr. Larkin. That snake is going to move north.

Dr. LARKIN. Right, and, you know, we know they're responsible for a loss of 95 percent of the rabbits and other small mammals in the Everglades.

Ms. SOLLIE. And it wouldn't be good for the tourism industry either if they travel north.

Senator NELSON. No.

Dr. LARKIN. Right. So, I mean, there's—you know, then you start affecting food web that's involved, and then you start affecting other of our iconic species.

Senator NELSON. All right. Either one of our members of Congress have any further questions?

[No verbal response.]

Senator NELSON. Charlie?

Mr. CRIST. I'm good. Thank you.

Ms. FERENC. Senator, may I make another comment about a solution?

Senator NELSON. Please.

Ms. FERENC. We talked about threats, and then there has been some talk of solutions, and there's been some success stories, and many of them seem to revolve around this notion of public-private partnership. I have had the honor to sit on the Travel and Tourism Advisory Board, and I know that there is also the Transportation Advisory Board. This is all at the Federal level. I believe Joe Lopano is in the audience from the Tampa Bay International Airport. I believe he sits on that advisory board at this time. And, of course, Brand USA is a public-private partnership.

I've seen such amazing work done when the public sector and the private sector come together in that intense and sustained fashion, and that some of the problems that we're talking about today, you know, we saw these issues come before the Travel and Tourism Advisory Board, and the progress that we hope not to give up on now that was made during that time, during long, arduous battles between the private and the public sector, and coming to good solutions for both sides, for security and for increased travel, and many other issues that were brought up in that way. Transportation is one that was brought up in the last round and, of course, I'm sure is being discussed now in that particular partnership.

But I think that these might be other issues that might be brought before the Travel and Tourism Advisory Board itself. Is climate change something that can be worked on there? Just the value of the public-private partnerships at the Federal level and at the State level, I think, is just truly amazing, and I offer that as a part of the solutions, to not forget how valuable they are.

Dr. ROFFER. As a closing comment, I would like to remind everyone on the panel and out in the audience that the true economic engine in Florida is a healthy ecosystem, which comes from clean air and clean water. That's the building block right there, and the solution to pollution is absolutely not dilution.

[Applause.]

Senator NELSON. Dr. Roffer, you had spoken—picking up on that theme there about stopping the pollution with regard to the Everglades—about fixing the plumbing and restoring the ecosystems. We have been working for a long time on Everglades restoration to stop or reverse what man had done over three-quarters of a century, which was to completely reverse the natural plumbing of the Everglades, which sent the water southwest of Orlando as it moved slowly through the Kissimmee chain of the lakes, as it went into a marshy Lake Okeechobee after having come down a winding, me-

andering stream called the Kissimmee River, and then slowly went through the marshes south into the River of Grass, the Everglades.

All of that was changed in three-quarters of a century. The Kissimmee River became a straight ditch, et cetera. You know the situation. Turning on the plumbing and reversing that requires sustained commitment from the Federal and the state government. Now, unbelievably, last month, the South Florida Water Management District threatened to pull out of the independent scientific assessment of restoration progress that's done every 2 years pursuant to Federal law.

I think some counties are addressing the problem head-on, but it stops and starts with the effort to restore the Everglades, and it's going to affect Floridians mightily. What have you seen, Dr. Roffer, over the years on the ground—you're out there with the fishermen—the need for restoration of the Everglades?

Dr. ROFFER. I see fish dying, an increased number of fish kills, and I see water quality degrading very quickly, and our fishing industry is hurting, even though the charter boat captains won't admit that their catches are going down. I've talked to many people, and finally you get Hell's Bay Boats admitting publicly that they lost one-point-something million dollars because they couldn't sell boats in the central part of Florida.

People are getting very frustrated. They believe that the fox is guarding the hen house, that some people in the sugar industry and agriculture are affecting these people in management and making them change their minds and opinions. And pulling out of a science-based committee to make the water flow is corruption, if you ask me. It may not be an actual dollar corruption, but certainly it's a mental corruption, and there might be money involved, but I'm not pointing fingers at this point.

But, clearly, we need to get that flow to go back down as fast as we possibly can. Every day you read about somebody—"Well, there's a reason we can't"—you can do it if you want to put your effort into it and going there.

So people are starting to get—the public is starting to get more educated on the issue and starting to raise their signs and their posters. You see it. People who get elected and changes—if you get people—representatives—and not the ones here—I know in central Florida—that wouldn't care anything about environmental and water quality who all of a sudden started putting environment and water quality on their web pages and started to come to meetings.

So if the grass roots people are out there, I honestly believe that the people, the grass root vote, will out-do the political money coming from those spots. The public has to raise their pitchforks, so to speak.

[Applause.]

Senator NELSON. We have had tremendous interest, and there were a number of people who requested to testify here at this hearing, and, obviously, we had to keep it within certain limits, thus, the four witnesses that we have. But I want to invite you for your testimony, if you will submit it, it will become a part of the written record. And I declare that the record will remain open for two weeks for additional members of the Senate Commerce Committee to submit additional memorandums and/or questions.

So thank you all for coming today. This has been terrific. With that, the meeting is adjourned.

Thank you.

[Whereupon, at 2:56 p.m., the hearing was adjourned.]

A P P E N D I X



TOWN OF LONGBOAT KEY

Incorporated November 14, 1955

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August 7, 2017

U.S. Senator Bill Nelson
United States Senate
716 Senate Hart Office Building
Washington, DC 20510

Dear Senator Nelson:

Thank you for inviting Longboat Key's participation in the special Field Hearing of the Senate Commerce Committee.

Florida's economy has many things going for it: agriculture, the health care industry, and a growing attractiveness for IT and R&D companies, attracted by the lifestyle opportunities offered in the state. However, there is no more important or vital component of the economy than tourism. Sales taxes, bed taxes, construction, service jobs, and professional service jobs all are dependent upon tourism to supply the foundation on which the entire economy runs.

The tourism/infrastructure concerns common to coastal Florida—and particularly for barrier islands such as Longboat Key—require leadership at the Federal and State level to provide a focused understanding of challenges we face, and a commitment to invest in intelligent planning and action. Today, without an overall acceptance by the State and Federal government in participation, we have localities competing for the same limited resources, putting us continually at close to square one.

What are some of the challenges we face? On an immediate basis, we are the victims of our own success. Florida, its businesses and its communities, spend hundreds of millions of dollars promoting to and attracting tourists. Hotel rooms are being added. But our investment in the infrastructure that greets them—again, especially in the coastal areas—has not kept up.

Senator Bill Nelson
August 7, 2017
Page Two

Roads, bridges, and transportation networks are years behind the numbers of visitors and residents. The result is that at the very time we want to put our best foot forward to service our guests, they sit in traffic. They look for alternative routes, and in the case of the barrier islands, there are none.

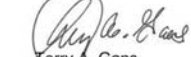
Visitors who sit and sit and sit become visitors who do not return. And, when one part of the transportation system falters it can produce a domino effect throughout a region so that movement is impaired to downtowns, suburbs, and beaches. Again, this impacts visitors and residents. The irony is that investing in improvements provides increased revenue. Allowing a deteriorating status quo would lead to revenue shortfalls and/or increased taxes and less desirability as a state to visit or in which to live. Such a spiral is preventable. As stated previously, solutions require recognition, commitment, and leadership.

Another serious concern for tourism and for residents is an issue that has unfortunately been allowed to be clouded by political arguments. As a barrier island, we can tell you unequivocally that we are witnessing rising waters. As for the "who done it", that really does not matter. We have to deal with the reality. Tourists come to coastal Florida for beaches. If beaches shrink, fewer tourists. If sea levels rise over decades, current road heights will be insufficient, as will the wastewater systems. Ultimately, this would make coastal communities less desirable as tourism destinations.

The same coordinated and dedicated commitment to detailing challenges and investment in solutions is called for from the Federal and State government to address sea level concerns. Localities cannot effectively go it alone.

We appreciate having the opportunity to share our thoughts on these vital issues. We would welcome to opportunity to work with you to achieve meaningful progress

Sincerely,


Terry A. Gans
Mayor, Town of Longboat Key



Parks & Natural Resources Dept
5502 33rd Avenue Drive West
Bradenton, FL 34209
Phone: (941) 742-5923
www.myanatee.org

August 24, 2017

Ms. Shahra Anderson
Regional Director
US Senator Bill Nelson

Dear Ms. Anderson,

Attached please find the submission from Manatee County Parks and Natural Resources for the U.S. Senate Commerce Field Committee Hearing of August 10, 2017. We are happy to answer any questions.

Thank you so much for providing this special opportunity.

Sincerely,

Nan Summers
Grants Coordinator
Parks & Natural Resources Department
Phone: 941.742.5923 – ext. 6052
Fax: 941.742.5972

U.S. Senate Commerce Committee Field Hearing

Threats Facing Florida's Tourism Driven Economy

August 10, 2017

Ensuring a High Quality Environment



"Manatee County Florida has achieved radial connectivity around an axis of community health and wellbeing for its many tourism components. Nonetheless, each component faces unique challenges to maintain these bonds, which can be met with federal resources identified in this Hearing statement." — Charlie Hunsicker, Manatee County Parks and Natural Resources Director

Air Quality

The area's good Air Quality attracts national and international athletic competitions to our region, contributing to the area's vibrant tourist economy. Manatee County partnered with the Florida Department of Health, World Rowing Championship sponsors and others to seek Federal support for air quality outreach. Our proposal leveraged public interest in large athletic events, reinforcing the importance of Air Quality to fitness and health. Along with 98% of the applicants to the Federal grant program, the proposal was not funded. Prime opportunities to deliver the message that Air Quality is important to visitors, residents and businesses will be missed absent support.



Community air quality outreach

Water Quality

Clean beaches and abundant fish and wildlife are important to high-quality visitor experiences. Healthy marine and coastal resources bolster natural processes that maintain water quality, support natural food-webs and protect coastal resources.

A successful local pilot (GCORR) collects recycled oyster and clam shells from the project's introductory restaurant group's waste streams normally destined for landfills, returning them as shell clutch proven to rebuild oyster reefs in Manatee County coastal preserves. To date GCORR has collected, recycled and diverted 26,000 pounds of oyster and clam shells from landfills and eliminated the expenses associated with the purchase of mined shell, historically used for restoration purposes.



Oyster recycling restaurant pick-up

GCORR efforts have garnered the support of the local shellfish industry. Benefits realized by the local shellfish industry from a healthy coastal environment may include increased resilience to the effects of Florida Red Tide. Support is sought to expand the GCORR program to engage in an efficient and dependable collection program serving all the willing restaurants.

Land Quality

Manatee County has nearly 30,000 acres managed for conservation and passive recreation. Earlier successes in the county's history of land preservation centered on watershed protection. This led to the creation of the county's largest preserve, Duette Preserve, which provides landscape level protection of not only the county's drinking water supply but many rare species including: the gopher tortoise, the eastern indigo snake and the Florida scrub-jay.



*Observation Tower Robinson Preserve
Photo by Rob Hamilton*

A recent era of coastal land acquisition including Robinson, Ungarelli, Neal, and Perico Preserves has helped to protect significant swaths of

the remaining coastal wetlands in the county. Projects under way now to protect and restore these sites are drawing community and national attention. Key characteristics of these projects include leveraging of private, state, and federal funding support, use of state-of-the-art techniques and best available and strong community engagement through programming and volunteerism. With over 300,000 visitors a year these coastal preserves have a large group of public stakeholders. Continue to support landscape level conservation efforts to connect the dots and create corridors using a variety of methods including conservation easements that help to keep lands in private hands and under legacy family management while still providing regional environmental benefits.

Workforce Quality

As a member of the first UN World Tourism International Network for Sustainable Tourism Observatories in North America, Manatee County joins the Blue Community Consortium's special emphasis on coastal habitat and marine environment enhancement, protection and restoration. Manatee County Parks and Natural Resources recognizes its role in cultivating the work force, beginning with its Environmental Educational programming for all ages to inspire curiosity, build habits of life-long learning and instill an environmental ethic.



Inspiring future environmental stewards

Each year, over 400 programs are provided free of cost to the residents of and visitors to the County, resulting in more than 5,000 individuals receiving an opportunity to connect with nature. Many of the programs include a community based service learning element, allowing participants to become volunteers and learn valuable restoration skills and techniques while working to improve Manatee County's wild spaces. While children find themselves inspired to pursue a future career, adults enjoy educational programming that provides direct training in the field as the Department offers a variety of peer based certifications and trainings.

Continuing with our established connections with local institutions of higher learning, we are insisting that the well-educated, well-trained, and well-rounded interdisciplinary work force needed can and will be home grown. Expanding access to opportunity is at the core of our efforts including the Natural Resources workforce development program which seeks to build environmental management competency; The Gulf Shellfish Institute which works to bring new aquaculture technologies to the Tampa Bay area and the small business opportunities that go with it. Additional funding is needed to support building the pipeline to train future conservation professionals.



Training and development of conservation professionals

Economic Quality

From the fines and forfeitures of the Deepwater Horizon oil rig explosion made available to Manatee County, a community-endorsed process selected diverse projects to strengthen our natural resources, improve the quality of our rivers and bays, and enhance appreciation of our coastal fishing economy. Manatee County selected projects from the following eligible funding categories:

- Restoration and protection of the natural resources, ecosystems, fisheries, marine and wildlife habitats, beaches and coastal wetlands of the Gulf Region in Manatee County's Robinson Preserve
- Workforce development and job creation for Manatee County natural preserves
- Coastal flood protection and related infrastructure in coastal Manatee County urban areas
- Promotion of tourism in the Gulf Coast Region, including promotion of recreational fishing through the Florida Maritime Museum Facility Enhancement
- Promotion of the consumption of seafood harvested from the Gulf Coast Region through support of research by the Gulf Shellfish Institute



RESTORE Act public engagement

Although the projects have different leaders, organizations, partners, objectives and measurable outcomes, all are working as one integrated team. The extensive level of coordination, including a dedicated collaboration website, regular in-person meetings and ongoing team updates, leverages professional expertise and funding sources to achieve the greatest possible impact for Manatee County's RESTORE projects. For public communication, a specially created RESTORE Internet portal was launched to help publicize these plans. A social media campaign was created which reached an audience exceeding 83,000. Expedite funding from the RESTORE Act and streamline the program application and review process.

Health Quality

As the collected oyster shells move from table to tide, Department staff craft unique opportunities for individuals to volunteer to build habitat. The Department has established a fast-paced "Ecofitness" series that marries oyster bag creation with exercise to promote health and fitness in the outdoors, as well as to develop a deeper respect for and relationship with the natural world. Staff work to move volunteering beyond simply completing a task into the realm of an extraordinary experiences that provide an immense and immediate sense of accomplishment.

In addition to the combination fitness/volunteerism events, the Department has begun a number of initiatives to encourage physical activity in people outside the traditional walls of a recreation or fitness center. A larger and more diverse group of people can be reached and therefore positively affected through creative outdoor opportunities for exercise. The research exists to show the benefits of exercising in the outdoors, and the Department needs additional funding to accomplish this mission. By building outdoor fitness trails and stations, and expanding on the already existing free endurance, yoga, and boot camp activities we



Eco-workout combines fitness and oyster restoration

provide, we can make a larger impact on the community. Hundreds of people participate in the current programs, and we seek to increase this participation through additional programs, and ones that do not require staffing or supervision. In Florida, the abundance of sunshine and warm weather allows for the unique option of taking fitness outside.

Community Quality

Following Sarasota Parks and Recreation's conversion of former borrow pits into an aquatic nature park with a rowing facility, this region was selected to host the first US-based World Rowing Championship in 23 years. In September 2017, 71 international teams with 1700 elite athletes, 2000 volunteers and 40,000 spectators will convene over 9 days to produce an event generating \$25M in economic impact. The collaboration across many sectors and two counties has formed long term relationships extending far beyond the event. Community programming involved 6000 school children. In addition, outreach events have inspired healthy lifestyles for all ages. Continue to leverage current interest by supporting funding for legacy programming.

Respectfully submitted by:

Robert Baugh, COO, Chiles Group
 Greg Blanchard, Environmental Program Manager
 Mallory Carteaux, Fitness Supervisor
 Mike Elswick, Natural Resources Division Manager
 Charlie Hunsicker, Director Parks and Natural Resources
 Damon Moore, Environmental Program Manager
 Melissa Nell, Programming/Education/Volunteer Division Manager
 Aedan Stockdale, Education Program Manager
 Erin Struzzieri, Environmental Specialist
 Nan Summers, Grants Coordinator



Community volunteers provide legacy leadership to World Rowing Championships



Neighborhood children help design their new nutrition and fitness themed playground

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