WRITTEN TESTIMONY OF:

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BEFORE THE U.S. SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION
HEARING: "Threats Facing Florida's Tourism Driven Economy"

August 10, 2017

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, by full or part time residents, or 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 fresh water springs that attract divers worldwide, to numerous iconic mammals and reptiles (alligators, manatees, sea turtles, panthers, Key deer, etc.), unique birds (e.g., 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% of Floridian's live and work – have 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).

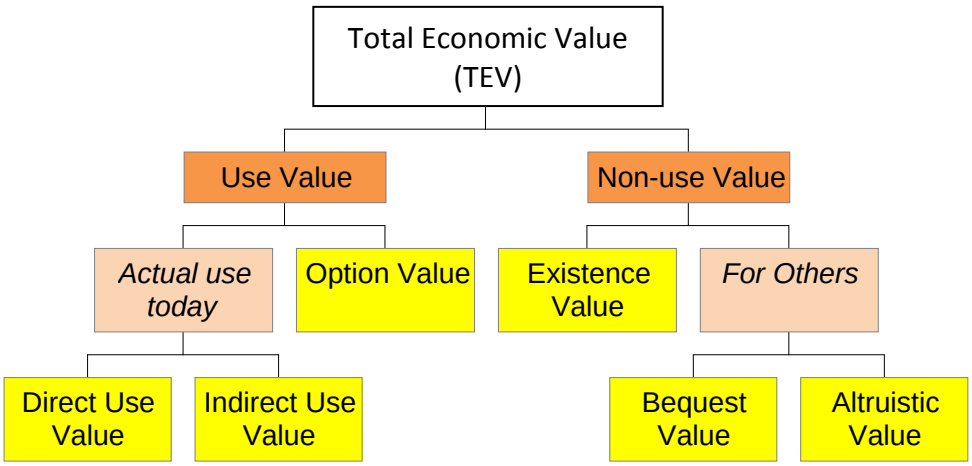

Figure 1. Total Economic Value (TEV) of a natural resource to an individual and society can be measured as the sum of up to six distinct values (in yellow).

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

[1] Further 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.).

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 of the opposite. 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 economic analyses (be it of costs and benefits, risks, and/or impacts), decision makers are poised to make informed decisions within the context of limited resources for investment.

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% – 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 (existence) 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 domestic visitors from other states (via IMPLAN software).[2] In particular, visitor spending fell

[2] Impact 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).

$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.

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 issue is to first consider – or not – is 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 return on investment.

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.

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

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.

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 investments by the Florida Aquarium and the new UF/IFAS Nature Coast Biological Station, which houses UF faculty conducting research pertaining to 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 optimize regulations, engineering research to improve design and economic research to improve efficiency and evaluate the return on investment (ROI) 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 groves, panthers and black bear), and human health (think 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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