

March 1, 2002

Admiral James D. Watkins, USN (Ret.), Chairman  
Atten: Terry Schaff  
U. S. Commission on Ocean Policy  
National Science Foundation  
1120 20th Street, NW  
Washington, DC 20036  
**TSchaff@nsf.gov**

Re: **Written Comments**  
**U. S. Commission on Ocean Policy - Second Regional Meeting (2/22/02)**  
**Florida and Caribbean**

Dear Chairman Admiral Watkins:

On February 13, 2002, I submitted a letter including preliminary personal comments (with selected attachments) regarding critical ocean-related issues. That letter was submitted electronically to Terry Schaff (TSchaff@nsf.gov), in accordance with the Federal Register Notice posted on the Commission on Ocean Policy website ([www.oceancommission.gov/notices/fr\\_public\\_mtg4.html](http://www.oceancommission.gov/notices/fr_public_mtg4.html)). On February 22, 2002, I arrived in St. Petersburg, Florida an hour before the 8:30 AM Public Meeting initiation time to sign the register so that I would be able to provide live public comments to the U. S. Commission on Ocean Policy at the Second Regional Meeting, which focused on Florida and the Caribbean. I intended to provide comments on my behalf, as well as behalf of Third Planet, a nonprofit organization promoting sustainable growth and development.

The purpose of this regional meeting was to obtain comments from invited panel speakers and the general public regarding critical issues and problems affecting the integrity of our oceans. Due to the numerous invited panel speakers that were scheduled to address the Commission, only one hour was available to accommodate everyone else who attended the meeting to provide live public comment. Live comments were taken from speakers in the order in which they registered to speak, with 5 minutes provided for each speaker. Despite my 7:30 AM sign-up time, I was near the end of those allowed to provide live comment within the hour. The allotted time was insufficient to provide the necessary comments on behalf of Third Planet, or supplemental comments on my behalf, which were intended to include responses to information presented by panel members, as well as queries of panelists by the Ocean Commissioners.

The Commissioners repeatedly apologized for the limited time available for live public comment, and encouraged attendees to submit comprehensive written comments following the Public Meeting. Additionally, after I presented brief live comments at the Public Meeting, I was approached by **Dr. Frank Muller-Karger (Ocean Commissioner from Florida)**, who **expressed his interest on behalf of the Commissioners in receiving more detailed information about the serious problems I addressed briefly during my live comments.** Therefore, **this letter is submitted as a summary of comments to the U. S. Commission on Ocean Policy** (in conjunction with the letter and attachments that I submitted electronically on February 13, 2002), **on behalf of Third Planet, and as my personal comments.**

FORMAL COMMENTS PRESENTED TO THE  
U. S. OCEAN COMMISSION  
FOR THE FLORIDA/CARIBBEAN REGION

**BACKGROUND:**

1. I am a **third generation Floridian** and have spent approximately 50 years engaged with the oceans of Florida and the Caribbean for recreational, research, and professional purposes. During this time, I have **observed and documented numerous forms of degradation of those oceans and coastal resources.**

2. I am a **hydroecologist**, received my doctoral degree from the University of Georgia, and my doctoral field of research was groundwater/surfacewater interactions and ecological impacts of anthropogenic groundwater alterations. I have authored or co-authored approximately **40 refereed (peer-reviewed) papers regarding various aspects of adverse impacts associated with anthropogenic groundwater alterations.** I also have served as a reviewer for manuscripts related to groundwater/surfacewater interactions that have been submitted to professional journals for publication. The majority of my publications involve sites in Florida.

3. My initial awareness of the Second Regional Meeting of the United States Commission on Ocean Policy for the Florida and Caribbean Region was the result of the impressive article/notice in the January 15, 2002 issue of Transactions American Geophysical Union (Eos) 83(3):22 by Ocean Commissioner Frank Muller-Karger. I obtained additional information from the Commission's website ([www.oceancommission.gov/noticefr\\_publicmtg4.html](http://www.oceancommission.gov/noticefr_publicmtg4.html)).

4. The referenced notices stated that the Commission is conducting a **detailed review of existing and planned U. S. ocean and coastal programs and activities**, and will be providing recommendations for a **coordinated and comprehensive national ocean policy** on issues including **stewardship of marine resources, pollution prevention, and enhancing/supporting marine science.** My comments relate to all of those issues.

5. During the Public Meeting held on February 22, 2002, 17 panelists addressed various specific concerns and problems that need to be resolved in order to maintain and sustain the integrity of our oceans and coastal resources. Each panelist was provided 10 minutes to address their concerns, after which, the Commissioners were allowed to ask questions and request additional information from the panelists. Live comments from all remaining attendees were restricted to a total of one hour, with 5 minutes available for each speaker selected to present comments during the hour period. **The Commissioners reiterated several times that written comments also would be given full consideration.**

6. The manner in which the Public Meeting was structured and conducted appeared to be fair and an expeditious use of the Commissioners' limited time. The presentations by the panelists and live comments by attendees were succinct and impressive, as were the questions and comments by the Commissioners. **Additional comments, supplemental information, and suggested solutions to problems repeatedly were requested by the Commissioners.**

7. **None of the panelists or other attendees who provided live comments at the Florida/Caribbean Regional Meeting addressed the specific and serious problems which are the focus of my comments (provided previously and addressed more fully in this letter). Likewise, none of the agencies currently overseeing U. S. ocean and coastal programs and activities are addressing the specific serious problems which are the focus of my comments.** Existing federal laws (e.g., the Clean Water Act, the Endangered Species Act, others) appear to provide sufficient avenues to resolve these serious

**problems.** Actions and in-actions of representatives from federal agencies such as the U. S. Army Corps of Engineers (COE), the U. S. Environmental Protection Agency (EPA), the U. S. Fish and Wildlife Service (FWS), and the National Oceanographic and Atmospheric Administration (NOAA), suggest clear violations of, a failure to enforce, or ignorance of the laws capable of resolving the referenced problems.

## I. WHAT IS WRONG? - PRIMARY FOCUS OF MY COMMENTS

### A. GROUNDWATER MINING:

1. The primary focus of my comments is the catastrophic damage and destruction being caused to our ocean and coastal resources by anthropogenic alterations of ground water. In Florida (and parts of the Caribbean) these alterations take the form of **groundwater mining and aquifer-injection of wastes, including minimally-treated sewage effluent.** The groundwater mining and aquifer-injection of wastes are of epic proportion - hundreds of millions of gallons daily - occurring at single locations, with effluent injections concentrated along Florida's fragile coastline.

2. **David Struhs**, Secretary of the Florida Department of Environmental Protection, was the first speaker to address the Commissioners during the Public Meeting. He spoke of the importance of reestablishing the historic "**sheet flow**" from the Everglades to Florida Bay. Secretary Struhs neglected to mention the essential, equivalent flow of fresh ground water that historically maintained the integrity not only of Florida Bay, but Biscayne Bay and related coastal waters. **This equivalent groundwater "sheet flow" to Florida's coastal areas is known as "submarine groundwater discharge".**

3. The **first Exhibit** in the packet of documents that I provided to the Commissioners following my oral comments during the Public Meeting was a copy of a **News Release by the U. S. Geological Survey (USGS) dated December 11, 2001, documenting saltwater intrusion of the aquifer system 15 miles inland in south Florida.** This saltwater intrusion is the direct result of years of unbridled groundwater mining for agricultural, industrial, and municipal use.

4. The **second Exhibit** in the packet of documents that I provided to the Commissioners following my oral comments during the Public Meeting was a copy of the **June 10, 2001 Palm Beach Post article by Chris Barker and Robert P. King titled, "Golf's water guzzlers - 13 courses in Palm Beach County overflowed their water limits last year by a total of more than 1 billion gallons - enough to supply West Palm Beach with water for 40 days."** This article calls the abuse the "billion-gallon mulligan", and was provided as only one example of the magnitude and severity of the problem.

5. An example of the unbridled groundwater mining activities that occur blatantly, in broad daylight as **routine agricultural activities in Florida - including immediately adjacent to and within the Everglades - can be seen in the water cannons in the South Florida Water Management District archives photograph posted on the web at: <http://www.orckl.com/dwi2/dwilinks2.htm>.**

6. **What do groundwater mining on the mainland and the documents referenced above have to do with the Ocean Commission's stated intention of developing a coordinated and comprehensive national ocean policy on issues including stewardship of marine resources, pollution prevention, and enhancing/supporting marine science?** The ocean and our marine resources are not bounded by a line that separates emergent land masses from the ocean. Likewise, surfacewater connections and inputs from these emergent land masses are not the sole influence these emergent land masses have on the ocean and our marine resources.

7. The Floridan aquifer system that is being mined underlies Florida's marine waters to the edge of the "shelf". The ocean historically received large contributions of pristine, fresh ground water (submarine groundwater discharge, as noted above) from this aquifer system. The **third Exhibit** in the packet of

documents that I provided to the Commissioners following my oral comments during the Public Meeting was a copy of my peer-reviewed paper published in the Interactive Hydrology Proceedings of the 3rd International Hydrology and Water Resources Symposium of the Institution of Engineers, Australia (November 20-23, 2000), **"Predicting nearshore environmental impacts from onshore anthropogenic perturbations of ground water in the southeastern Coastal Plain, USA"**. That paper provides a summary of the historic submarine groundwater discharge influencing marine and coastal waters associated with Florida, and as well as the Caribbean.

8. More detailed information regarding the ecological significance of historic submarine groundwater discharge, as well as impacts of present-day alterations of the quantity and quality of this discharge are presented in the **fourth Exhibit** in the packet of documents that I provided to the Commissioners following my oral comments during the Public Meeting. That Exhibit was a copy of my **peer-reviewed chapter in "Everglades, Florida Bay, and Coral Reefs of the Florida Keys: An Ecosystem Sourcebook"**.

9. I return to the opening comment by Secretary Struhs. The Exhibits referenced above should provide sufficient documentation to show that **critical "sheet flow" through and from the Everglades into the coastal waters of south Florida cannot occur until the groundwater mining is curtailed and the groundwater flow regime has been restored**. Congress recently appropriated approximately \$8 Billion in tax dollars for Everglades Restoration. This appropriation is being administered by the COE and promotes, as the primary component of this effort, the highly controversial and unscientifically-founded aquifer **"storage" and "recovery" (ASR) approach**. Not only will this approach fail to restore the Everglades, it will exacerbate existing problems to marine and coastal systems.

10. The initial set of Panelists addressed the problem of accommodating coastal growth. One of the Commissioners commented that he was shocked at the intensity of growth along Florida's west coast since his last visit to this area. The first Panelist of the coastal growth session, **Dr. Charles Groat of the USGS**, indicated that **monitoring, mapping and research were critical and that we need to even understand sustainability**. I concur with these statements. Presently there is no concerted federal effort or financial support for **monitoring, mapping and research regarding the impacts of groundwater mining on the marine and coastal resources of Florida and the Caribbean, including how that groundwater mining affects the sustainability of our marine and coastal resources**. For example, the sole focus of concerns regarding saltwater intrusion (as described in Exhibit 1) is how it will effect the entities responsible for the groundwater mining (e.g., the limitations it creates on mining greater volumes of ground water). **I re-iterate that no consideration is being given to the adverse impacts of this groundwater mining on the sustainability of our marine and coastal resources**.

11. During Secretary Struhs' opening remarks to the Commissioners, he stated that **coastal resources, such as oil and gas "should remain untouched" to protect our natural resources, like coral reefs**. Yet Florida's most precious coastal resource - **pristine, fresh groundwater - has been mined extensively during the past century, with no regard to the resulting impacts on marine and coastal resources**.

## **B. AQUIFER INJECTION:**

1. **Dr. Jeffrey Chanton of Florida State University's Department of Oceanography** was the final Panelist of the coastal growth session. He discussed stormwater and aerial deposition as sources of contamination of marine and coastal waters. He also indicated that **Florida currently was experiencing a large red tide**. During his excellent presentation he showed slides of actual **aquifer rock illustrating the large flow-paths ("holes") present in Florida's "karst" (swiss-cheese) aquifer system**. He spoke about the problems of shallow (60' deep) wells in the Keys that increasingly are being constructed for the injection of minimally-treated sewage effluent. He confirmed that the injected wastes **"bleed out" of these wells rapidly, into surrounding coastal waters, and that effluent contaminants such as nitrate are**

NOT attenuated by the limestone, and that agricultural activities were an additional large source of nitrate contamination of ground water in Florida. He spoke about the rapid transport of contaminants via submerged "sinkholes" along the coast. He stressed the need to know the "loading" of the coastal waters (not just from surfacewater sources, but also from groundwater sources). He also stressed the need to limit impervious surfaces, since impervious surfaces generate more contaminated stormwater runoff, which is a major source of contamination of marine and coastal waters. Dr. Chanton concluded by stating that we need a "different way" of doing things, and that we need to look at alternatives.

2. Dr. Chanton failed to address comparable problems of "induced discharge" of injected waste into coastal waters from deep-injection wells (probably because of time-constraints or because his research was confined to shallow injection wells). Exhibit 4 in the packet of documents that I provided to the Commissioners following my oral comments during the Public Meeting addresses the severe water quality contamination and ecological devastation that can occur in marine and coastal waters as a result of "induced discharge" of injected wastes.

3. The Miami-Dade facility, located in close proximity to the shores of Biscayne Bay, is permitted to inject more than 200 Million gallons per day of minimally-treated sewage effluent into Florida's highly fractured, swiss-cheese karst aquifer. This facility has been injecting more than 100 Million gallons per day since the 1970's. The lack of significant increase in pressure in those injection wells is sufficient evidence to conclude that the injected effluent rapidly migrates from the point and formation of injection. The fact that the non-saline effluent is less dense than the saline aquifer into which it is injected ensures that it will rise toward the surface, via the myriad vertical fractures and dissolution features known to occur in the Florida's carbonate aquifer system.

4. Is there evidence that the minimally-treated sewage effluent injected into deep wells at the Miami-Dade facility is resulting in "induced discharges" of deep-aquifer water in marine and coastal waters? YES. The paper published by Top and co-authors in the fall of 2001 (a copy of which was submitted to the Commissioners as Exhibit 5), analyzed helium isotope ratios in water samples from locations throughout Florida Bay and in the vicinity of the coral reef ecosystem of the Florida Keys National Marine Sanctuary. The findings of that study strongly support the conclusion that sewage injected at the Miami-Dade facility is resulting in induced discharge of deep aquifer water throughout Florida Bay and at locations associated with the coral reef ecosystem of the Florida Keys National Marine Sanctuary.

5. The research described in Exhibit 5 did not attempt to identify any contaminants, including excess nutrients, that might be associated with the discharging water, and that could be contributing to the large-scale degradation of Florida Bay and the coral reefs. The results of another research project also published near the end of 2001 (a copy of which was submitted to the Commissioners as Exhibit 6), used nitrogen isotopes to confirm a strong signature of sewage-based nutrients for the macro-algal "carpet" that is smothering deep reefs associated with the Palm Beach, Florida coast. The most logical source of these nitrogen-laden nutrients is "induced discharge" of injected sewage in Palm Beach, similar to that occurring at the Miami-Dade facility further south.

6. Are macro-algal blooms the only nutrient-related problem associated with induced-discharge of injected effluent? NO. Phytoplankton blooms also are stimulated and fed by induced discharge of injected nutrients. In addition to vertical fractures and dissolution features, one of the logical discharge points for the injected effluent is the margin of the submerged carbonate platform that also is the margin of Florida's regional aquifer system. Those locations also happen to coincide with locations of red tide blooms, such as the one that Dr. Chanton noted was occurring at the time of the Ocean Commission Public Meeting. Millions of federal tax dollars are being spent to

investigate the cause of "harmful algal blooms" such as red tide, yet **no research is being conducted to investigate the role of induced discharge of injected wastes (including sewage effluent) in generating these harmful algal blooms.**

**7. Is nitrogen the only contaminant of concern associated with injected effluent?**

**NO.** My peer-reviewed paper published in 2001, titled "Knowledge of groundwater responses - A critical factor in saving Florida's threatened and endangered species. Part I: Marine ecological disturbances" describes **numerous other hazardous contaminants associated with the injected effluent. That paper describes the potential impacts of those other contaminants to corals reefs, as well as to federally-listed species.** A copy of that paper was submitted to the Commissioners at the Public Meeting as **Exhibit 7**, and was forwarded electronically, previously as a pdf copy.

8. Secretary Struhs specifically-referenced the **Tortugas Marine Sanctuary (National Park - an extension of the Florida Keys National Marine Sanctuary)** in his address to the Commissioners. He noted that **many groups participated in the designation, "each giving up something".** Apparently what his "group" (DEP) gave up was the **protection of the Marine Sanctuary's water quality and coral reefs, since his agency recently issued permits for operation of the first deep-aquifer injection wells in the Florida Keys, located in Key West, the closest Key to the Tortugas Marine Sanctuary.** Those permits were issued despite extensive documentation regarding the anticipated adverse impacts of these injection wells on the "crown jewels" of the Florida reef ecosystem, in the form of **mainlining injected effluent to the Sanctuary via fractures and other preferential flowpaths in the aquifer system.** Secretary Struhs also expressed his concerns to the Commissioners regarding "fiber-optic cables". Although he emphasized the essential need to "protect the coral reefs", **his agency has issued permits for more than 1000 shallow wells for the injection of minimally-treated sewage effluent in the Florida Keys (and continues to issue such permits), in addition to the deep-injection wells recently permitted in Key West.**

9. Secretary Struhs' agency also is issuing permits for injection of stormwater - including **untreated stormwater - into shallow injection wells throughout the Florida Keys.** This action is occurring despite the "**clear evidence**" that **contaminants injected into these wells rapidly discharge into marine/coastal waters, as testified by Dr. Chanton (re-iterated below).** Either Secretary Struhs is unaware of his agency's actions (unlikely, due to the constant letters of protest to him from Keys citizens and me), or he and his agency are incapable of comprehending the magnitude of damage his agency is doing to Florida's marine and coastal waters. In either case, the end result is sufficient justification for the removal of the Florida Marine Research Institute from his agency's purview, as he lamented to the Commissioners.

10. Commissioners asked Dr. Chanton **how the Commission can deal with the control of contaminants.** Dr. Chanton responded, "**educate the people - the evidence is clearly there**". Dr. Chanton further responded with the example that **non-native (alien) plants require water and fertilizer, and Florida doesn't have available water.** The Commissioners indicated that they **need guidance regarding how to address these problems.** In the final section of my comments, **I will offer guidance to the Commissioners regarding how these problems can be addressed and resolved,** including providing an **electronic list of references with information about pervious (porous) surfaces.** These surfaces have been available commercially in Florida for more than 20 years and can **reduce stormwater runoff,** as well as **allowing more natural recharge of Florida's grossly-depleted aquifer system.**

11. Many of the members of the audience who were fortunate enough to be able to address the Commissioners with live comments re-iterated Dr. Chanton's plea to "educate the people", but it is **important that the educational documents be accurate, factual, and not misleading.** One of the **educational documents** that Dr. Chanton distributed at the Public Meeting was a "**Sea Grant**" brochure titled, "**Submarine Groundwater Discharge: An Unseen Yet Potentially Important Coastal**

**Phenomenon"** (Sgeb-54, emphasis added). The brochure was **funded** (in part) by NOAA. Although the brochure provides some excellent information, the **title clearly infers that the importance of submarine groundwater discharge is not known**. In fact, the **importance of submarine groundwater discharge to marine/coastal resources has been documented for Florida in peer-reviewed scientific publications since at least 1967** (Kohout and Kolipinski), **and since 1980 for similar karst systems in Australia** (Johannes). The full citations for those papers are provided in Exhibits 3 and 4 that I provided to the Commissioners during the Public Meeting.

12. The Sea Grant publication referenced above, that was funded by NOAA, also misleads the public in several other respects. The cover of the brochure clearly shows a photograph taken from a shallow mangrove area shooting toward what appears to be the shoreline of Miami, Florida. **The first figure the reader sees after opening the brochure, however, is a "schematic representation" of the water cycle, depicting a huge mountainous region that resembles the Pacific Northwest**. Such images **re-enforce the gross misconception held by most of Florida's residents and visitors, that Florida's ground water is generated from the mountainous regions of North Carolina**. In the words of Internationally-renowned Dave Barry, "I am not making this up!" I routinely hear such comments from otherwise intelligent people who attend my public education seminars and slide presentations on groundwater/surfacewater interactions throughout Florida. In fact, a representative for one of Florida's prominent non-profit organizations rushed up to me after my public comments to the Commissioners on February 22, 2002, indicating that he had been taught that Florida's water came from the mountains of North Carolina.

13. Figure 2 of the Sea Grant brochure referenced above, and **funded in part by NOAA**, depicts a "hydrogeologic cross-section of the interaction between coastal groundwater aquifers and surface waters." This illustration **infers to the reader that water from neither the deep, nor shallow "confined" aquifers discharge at any location other than the "coastal shelf zone"**. This inference is **contrary to scientific knowledge in publications that date back to the late 1960's for Florida**. Furthermore, extensive concerns were expressed in scientific publications as early as 1973 - at the initiation of aquifer injection of wastes in Florida - regarding the potential damage to marine and coastal resources from these injected wastes. Refer to Exhibits 4 and 7 (and to Jordan, 1954; Kaufman, 1973; and Manheim, 1967 cited in those publications) for more detailed discussion on this phenomenon, which is intensified by the injection of non-saline wastes (such as effluent). **The cross-section of the aquifer depicted by Patton and DeHan on page 3 in the first chapter of the Water Resources Atlas of Florida (1998 ISBN 0-96067078-2-3) would have been a much more accurate "schematic" to have used for Figures 1 and 2 of the Florida Sea Grant publication**. The Water Resources Atlas figure at least shows the numerous breaches in the so-called "confining" layer (which more accurately is referenced as the "semiconfining" and "leaky confining" zone), with vertical migration of water occurring throughout these breaches, regardless of where the breaches occur.

14. The second set of Panelists addressed "Management of Coasts and Oceans". Mr. James Murley, Director of FAU's Joint Center for Environmental and Urban Problems, was the second speaker of that Panel, and noted that "one size does not fit all". One of the Commissioners asked, **"Is there a pattern or policy that can apply to all?"** My response to that is, **YES, with respect to injections of wastes in coastal states. Injections similar to those in Florida are occurring in Hawaii, where coral reefs also are becoming over-grown with macro-algae like in Florida**. Although Hawaii does not have a karst aquifer system like Florida, it does have "lava tubes" that should be expected to function as the preferential flow paths in Florida (capable of waste transport to coral reefs). **It is my understanding that such practices also are occurring in Puerto Rico for the disposal of pharmaceutical wastes**.

15. The final speaker of this second panel was Ken Haddad, Director of the Florida Marine Research Institute. He asked the Commissioners whether the U. S. wants to deal with aquaculture. I urge the Commissioners to consider the fact that **aquaculture characteristically is nothing less than the water-based equivalent of industrial farming** (recall Dr. Chanton's comments about the enormous level of

contamination of coastal waters from industrial farming sources). As a personal note, **during one of my air flights from the east coast to the west coast of Australia I observed a huge algal bloom that appeared to stretch for miles along a totally undeveloped stretch of coastline, surrounded by otherwise crystal clear coastal water. There was no sign of human inhabitancy anywhere near the bloom.** After inquiring of knowledgeable locals on the same flight, I was informed that **the area of the algal bloom was the site of a tuna aquaculture project.**

16. The hour of Public Comment followed the lunch break. One of the early speakers was John Hussock, who expressed concerns about the "No Discharge Zone" being imposed on boaters in the Marine Sanctuary in the Florida Keys. He firmly stated that the boaters want clean water, but that the agencies are not using the "best scientific information available". **I concur. Inferring that a "No Discharge Zone" in the Keys Sanctuary can be a reality by banning discharges from boats - while 1000's of injection wells spew sewage effluent into the same coastal waters of the Keys - is a farce.**

17. In addition to emphasizing the need for public education regarding scientific aspects of our ocean resources, many of the public comment speakers emphasized **the need to enforce existing federal laws. I concur with those comments. In fact, the copies of 14 letters to various federal agencies, that I submitted previously** (via electronic mail, and via hard copies at the time of my live public comments), not only provide more detailed discussion of the problems described above, but address various existing federal laws that are being violated by the actions and in-actions of those federal agencies. **Please refer to those letters for more detailed information regarding how the actions and in-actions of various federal agencies are promoting the destruction of our ocean/coastal resources.**

18. Elizabeth Fleming, who presented public comments after I spoke, noted that **the Department of the Interior regulates "animals", and that "fish" are "animals". Despite this obvious fact, the Department of Commerce currently regulates marine fish.** I have alluded to related concerns in some of my comment letters to the various agencies, specifically with respect to NOAA's regulation of live coral reefs, one of the most sensitive and complex assortment of "animals" in the ocean/coastal waters of the U. S. **Obviously this is a problem that needs to be resolved.**

19. Dr. John Reynolds, Chairman of the Marine Mammal Commission, was the first speaker of the afternoon Panel on "Ecosystem Management". His presentation was both impressive and depressing. He indicated that approximately 80 manatees (a federally-listed species) are killed by boats in Florida each year, while an "incidental take" is considered to be 1. Dr. Reynolds **emphasized the slow breeding state of marine mammals and that reproductive status of marine animals is based on their health, and "we don't have a clue". This emphasizes my concerns regarding the impacts of both reduced pristine fresh submarine groundwater discharges to coastal waters that are habitat for these marine mammals, as well as the impacts from induced discharge of injected wastes into their habitat. He further indicated that the current laws do not require basic scientific knowledge regarding what constitutes a "healthy population", therefore unfounded assumptions must be made. Therefore, all decisions regarding these animals must be conservative. Dr. Reynolds summed up the situation for marine mammals, which mirrors the message I have tried to present throughout my written and live comments - we must shift from the current state of "crisis management" to a pro-active approach!**

20. David White, Regional Director of the Southeast Atlantic and Gulf of Mexico Regional Office of the Ocean Conservancy, was the next speaker in that Panel session (taken before Billy Causey, who was having technical difficulties). He indicated that **Marine Reserves were "closed to extractive activities".** If the Commissioners have been following my comments up to this point you will know **this is not a factual statement for Florida, where billions of gallons of fresh ground water is "extracted" from these Marine Reserves on a daily basis, via groundwater mining on the mainland.**

21. Mr. White's next statement was that National Protection Areas (NPAs) are "No Take" Reserves.

Unfortunately this is **another misconception with respect to Florida**. By definition, a "Take" includes activities that harm or harass organisms, or destroy their habitat. **Existing, pending, and proposed activities such as effluent injection into deep and shallow wells, groundwater mining, and "ASR" all can constitute significant "Takes" of numerous species, including sensitive corals, in Florida's "protected" marine and coastal waters.** Therefore, in response to his comment that we need more "No Take Reserves", with respect to Florida, there are none. **We need to stop "Taking" the ground water, and replacing it with wastes, such as sewage, that are hazardous to marine organisms.** His concluding remark was, **"we wanted the entire Tortugas Bank protected, but we only got half of that."** In reality, **with continued sewage injections at the Miami-Dade facility and initiation of sewage injections at the Key West facility, none of the Tortugas Bank is "protected".**

22. **Mr. Billy Causey**, Director of the Florida Keys National Marine Sanctuary, was the final speaker of the Ecosystem Management Panel. He discussed "zoning" as an approach to sanctuary management. Please refer to my comments in the paragraphs above regarding the **lack of scientific basis for the effectiveness of any of the Sanctuary's various "zones" from a "protection" standpoint.** These comments refer to "No Discharge" zones, as well as "No Take" and "Research Only" zones. **Groundwater mining and induced discharge of injected contaminants do not recognize such designated zones.**

23. Despite the repeated scientific documentation of such induced discharge from injected waste in the Keys, **Mr. Causey, on behalf of NOAA and the Florida Keys National Marine Sanctuary, supported the recent initiation of additional shallow injection wells in the Florida Keys, in proximity to coral reefs already dying and exhibiting signs of eutrophication from existing shallow injection wells.**

24. On January 9, 2001 (after returning from several months out of the country for research and conferences) **I submitted electronic comments to NOAA contact person, Susan Fruchter, regarding the significant inadequacies of the Final Environmental Impact Statement (EIS) conducted for the "Tortugas Ecological Reserve".** Please refer to the comments I provided to NOAA, and have forwarded electronically, under separate cover. **The critical new information that surfaced after the EIS was conducted, regarding induced discharge of injected effluent should have prompted NOAA to initiate a Supplemental EIS to determine the impacts of both injection wells and groundwater mining on the proposed Tortugas Ecological Reserve (and existing Sanctuary), but no action was taken. The Tortugas Ecological Reserve was created without any provisions in the Management Plan for impacts from aquifer injections or groundwater mining.**

25. During that same time period, **I also submitted a statement of similar concerns to the seven NOAA representatives listed below, asking why NOAA has not required a full EIS to ensure that the ecosystems in the Sanctuary are protected, before more injection wells are initiated.** An example of the identical inquiries forwarded to the seven NOAA representatives listed below has been forwarded electronically, under separate cover (message submitted to Barbara Moore, who forwarded it to Dan Basta). Although I received "display receipts" for all messages, **I received no actual responses from any NOAA representatives other than "forward notices" from Barbara Moore and Christine Maloy. I also forwarded my concerns to Commander Craig Mclean, NOAA's Washington director of the marine sanctuaries.**

Dan **Basta**, NOAA Acting Director of the National Marine Sanctuaries Program\*

Susan **Fruchter**, NOAA contact for Tortugas Marine Reserve EIS comments

Claire **Johnson**, NOAA Special Projects Office

Michael **Kelly**, NOAA Program Coordination Office

Tom **Lapointe**

Christine **Maloy**, NOAA Office of Oceanic and Atmospheric Research

Barbara **Moore**, NOAA National Undersea Research Program

Mike **Shelby**

SEecomments, requested response from NOAA's Legal Staff

\* Barbara Moore forwarded my message to Dan Basta

## II. HOW TO FIX IT! - GUIDANCE REGARDING HOW TO RESOLVE THE PROBLEMS

1. In summary, my comments and exhibits have attempted to describe the primary problems facing our marine and coastal resources that have not been addressed by the federal (or state) agencies or others providing public comments at the Florida/Caribbean Regional meeting in St. Petersburg, Florida. Those **problems are associated with three types of anthropogenic alterations of Florida's aquifer system** (implying all layers of high to low-permeability zones, which are interconnected throughout Florida). The three types of anthropogenic alterations are: **1) groundwater mining, 2) aquifer-injection of wastes** (including hundreds of millions of gallons of minimally-treated sewage effluent), and **3) so-called aquifer "storage" and "recovery" (ASR)**. I refer you again to my Exhibits of scientific literature and comment letters to various federal agencies for details regarding the adverse impacts of those activities to our marine and coastal resources.

2. **Are viable alternatives to groundwater mining available in Florida? YES.** Florida's extensive coastline is ideal for desalination of seawater - the least costly and least environmentally destructive source of water available to Florida. **How can desalinization of seawater be less costly than groundwater mining?** Florida has taken a "balloon mortgage" on groundwater resources - paying nothing for the actual water, and **refusing to include the costs of destruction of terrestrial ecosystems** (e.g., wetlands, streams, lakes, springs); **silvicultural (forest) stands** (destroyed by rampant wildfires, pathogens, and pests); **private and public property damage caused by sinkholes induced by groundwater mining**; as well as **marine and coastal ecosystems destroyed by diversion of pristine, fresh ground water, and the introduction of eutrophic, and otherwise contaminated ground water - all of which result from groundwater mining.** The "balloon mortgage" payment is now due for payment.

3. **How can this contaminated ground water be considered an uncalculated cost of groundwater mining?** By treating ground water as a "free" commodity, Florida has devalued it to the point where it is squandered. For example **approximately 50% of Florida's potable ground water destined for municipal use is piped into toilets, as a "carrier" for human excrement.** This devalued ground water, now laden with human excrement and other contaminants, then simply is "disposed" via ever-increasing aquifer injections. This gross devaluation of ground water also has precluded implementation of any perceptible, serious conservation efforts in Florida. For example, recall the website photograph of the **agricultural "water cannons" adjacent to the Everglades.** I observed **that type of irrigation as recently as last year, in the midst of Florida's so-called "drought", while billboards sponsored by the South Florida Water Management District urged passing motorists and pedestrians to "turn off the faucet while they brushed their teeth"!**

4. **Are there viable alternatives that could eliminate aquifer injections of sewage completely and reduce existing municipal water use by approximately half? YES.** One alternative is the **approach taken by the Vermont Law School** in their recently constructed, \$3.25 million, environmentally-friendly classroom facility (for more information on the facility see: <http://www.vermontlaw.edu/life/lifabooak.cfm>). One of the many impressive features of this multi-million dollar facility is its composting toilets, which use NO water. **I encourage you to check out the Vermont Law School's impressive non-use of water at - <http://www.vermontlaw.edu/life/medpr9.cfm>.** A second, more expensive, alternative is a "closed loop" system which **pipes highly-treated sewage effluent ("re-use" water) back to toilets so that the effluent water is not discharged.** The State of Florida presently has rules that govern such re-use of treated effluent, although there is little or no incentive to do so. In fact, the correspondence from me to NOAA representative Susan Fruchter (see forwarded electronic copy) includes concerns from Keys residents that Florida DEP is preventing re-use for

treatment facilities in their area.

**SOLUTIONS:** Use the carrot and stick approach. **Freeze all federal funding for programs and other federal support to Florida** (including federal funding for road construction projects) **and all other coastal states that have not: 1) ceased all new/increased withdrawals of and injections into their aquifer systems; 2) ceased all destruction of natural recharge areas for the aquifer system** (e.g., dredging and filling of recharge areas, and paving with impervious surfaces); **and 3) initiated aggressive, mandatory conservation measures, such as conversion to those alternatives described above.** Conversely, offer federal funding as incentives for large-scale conversion to water conservation approaches. These conversions should target the largest and least conservative users of water, and include approaches such as conversion to waterless systems for municipal and industrial systems, and microjets for agricultural use. Federal funding incentives also should be provided for conversion of impervious surfaces with porous surfaces when technically feasible (see paragraphs below regarding the large-scale destruction of Florida's recharge areas).

5. **Are there scientifically-viable alternatives to 'Florida's current, unscientifically-founded approach for replenishing the aquifer system? YES.** Use of pervious (porous) pavement generates less stormwater run-off, which allows for more recharge of Florida's aquifer system, as well as reducing the load of contaminated water entering marine and coastal waters. A list of Porous Pavement Literature is being forwarded, electronically with this letter, as an rtf file as background information.

6. During the Panel session on "Accommodating Coastal Growth, Commissioner Dr. Paul Sandifer indicated, "People believe these are National resources, but "growth" issues are decided at the local level. How do we address this?" The response to this query is that the Federal Clean Water Act and the National Environmental Policy Act (NEPA), include clear provisions that federal actions such as permits evaluated under Section 404 of the CWA, and all federally-funded projects must consider all of the direct, indirect, and cumulative impacts of proposed federal action. Currently this is NOT occurring in Florida (refer to my agency comment letters). This gross lack of compliance with these basic federal laws has resulted in irresponsible and unsustainable "growth", and the subsequent destruction of our precious marine and coastal resources. **The most blatant example of failure to adhere to these laws is the COE's administration of the Section 404 CWA Program.** This program originally was administered by the EPA, an agency with more suitable technical expertise for recognizing the myriad direct, indirect and cumulative impacts of proposed actions on ecosystems than an agency dominated by Engineers, the primary focus of which has been to erect monumental structures that destroy ecosystems.

**SOLUTION:** As indicated previously, freeze all federal funding for programs and other federal support to Florida (including federal funding for road construction projects) and all other coastal states that are destroying natural recharge areas for the aquifer system . Also, transfer the Section 404 CWA Program back to the EPA.

7. Similarly, the EPA has exhibited no evidence that it comprehends the nature of groundwater responses that are associated with the aquifer-injection program that it administers. This lack of comprehension includes the fact that the injected wastes are discharging into coastal and marine waters.

**SOLUTION:** Halt all new and increased aquifer injections of any fluids in any coastal states until detailed studies have been conducted to determine all of the adverse impacts of those injections to coastal and marine resources. Simultaneously, transfer oversight of all aquifer injection activities to the USGS, the agency with the expertise for oversight of that program.

8. Likewise, the COE lacks both the technical expertise and initiative for ecosystem "Restoration of the Everglades". Everglades restoration - including the groundwater components of the Everglades flow system - is critical in ensuring that all associated marine and coastal resources linked to the Everglades will not continue to be degraded.

**SOLUTION: Transfer the administration and implementation of the Everglades funding to the USGS.**

Thank you for the opportunity to provide comments regarding the important mission of the Commission.

Sincerely,

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**Exhibits submitted at the Public Meeting:**

1. 12/11/01 News Release by the USGS documenting saltwater intrusion 15 miles inland
2. 6/10/01 Palm Beach Post article by Barker and King titled, "Golf's water guzzlers"
3. 2000 peer-reviewed Bacchus paper in Interactive Hydrology Proceedings
4. 2002 peer-reviewed Bacchus book chapter in "Everglades, Florida Bay, and Coral Reefs of the Florida Keys: An Ecosystem Sourcebook"
5. 2001 peer-reviewed Top et al. paper "Helium and radon as tracers of groundwater input into Florida Bay"
6. 2001 peer-reviewed Lapointe and Barile Final Report "Discrimination of Nitrogen Sources to Harmful Macroalgal Blooms on Coral Reefs Off Southeast Florida"
7. 2001 peer-reviewed Bacchus paper "Knowledge of groundwater responses - A critical factor in saving Florida's threatened and endangered species. Part I: Marine ecological disturbances" (previously submitted electronically as a pdf file)

**Exhibit submitted electronically with this comment letter**

8. Porous Pavement Literature

**Exhibits submitted electronically following this comment letter**

9. 1/9/01 letter from Bacchus to NOAA (Fruchter) re: inadequacies of Tortugas Reserve EIS
10. 1/9/01 letter from Bacchus to NOAA (7 recipients) re: inadequacies of Tortugas Reserve EIS

**Exhibits previously submitted electronically, and submitted in hard copy at the Public Meeting:  
(Examples of Recent Comments Regarding Federal Agency Actions/In-actions)**

11. 2/11/02 letter from Florida Sierra Club re: COE in-actions
12. 1/16/02 letter from Bacchus to NPS re: Cumberland Island National Seashore
13. 1/2/02 letter from Bacchus to EPA re: aquifer-injection of sewage effluent
14. 12/21/01 letter from Bacchus to COE re: Everglades Ecosystem
15. 12/14/01 letter from Bacchus to Daschle/COE re: Lennar Homes, Inc., FL - Apartment Complex
16. 11/23/01 letter from Bacchus to NPS re: Cumberland Island National Seashore
17. 10/31/01 letter from Bacchus to NPS re: Cumberland Island National Seashore
18. 9/28/01 letter from Bacchus to COE re: Nationwide Permits/Regional Conditions
19. 9/26/01 letter from Bacchus to COE re: Nationwide Permits
20. 8/9/01 letter from Bacchus to COE re: Hardee Co., FL - Rock Mining
21. 7/5/01 letter from Bacchus to EPA re: aquifer injection of wastes
22. 5/21/01 letter from Bacchus to COE re: Broward Co., FL - Glassman Development Corp.

23. 4/18/01 letter from Bacchus to COE re: Dade Co., FL – Rock Mining/“Reservoirs”
24. 8/16/00 letter from Bacchus to EPA re: aquifer injection of wastes

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