# BISCAYNE BAY MFLs
## Summary
## Meeting of the Technical Discussion Group
## September 11, 2002
## SFWMD Miami Field Station

Attendees: Joe Serafy(NOAA), Patrick Pitts(FWS), Susan Teel(EPA), Sarah Bellmund(BNP), Susan Markely(MD-DERM), Rick Alleman(SFWMD), Joe Vanarman(SFWMD), Trisha Stone(SFWMD), Murray Miller(SFWMD). In addition, Peter Ortner(NOAA) attended.

Purpose and Composition of Discussion Group: R. Alleman provided a general description of MFLs, and the purpose of the discussion group. It is composed of knowledgeable governmental stakeholders with direct knowledge of the ecological systems of Biscayne Bay. The group will provide input to the District for the development of technical criteria for minimum flows and levels. An MFL requires a compelling scientific argument for managing freshwater to achieve a desired salinity target, particularly under low flow conditions. The purpose of the group is to help identify a biological indicator, species, or Valued Ecosystem Component that responds to changes in salinity and can be used to establish a salinity target at a specific time or location in the Bay. Tools, such as WES's hydrodynamic model (TABS-MDS), can then be used to examine the relationship of freshwater to the salinity target. R. Alleman pointed out that there has been an ongoing discussion in CERP, based primarily on intuitive arguments, linking Bay conditions to freshwater flows; however, the MFL process is an opportunity to undertake a rigorous investigation of existing data.

MFL Development Schedule: The MFL process was described generally to include public workshops, peer review, and administrative rulemaking. The SFWMD has made an initial commitment to complete this by 2004, although this may be justifiably extended. The process, however, does not include further data collection or research.

Concepts of MFLs, Reservations, and Restoration: SFWMD's draft white paper "*Reservations of Water for the Environment and Assurances for Existing Legal Sources Consistent with Federal and State Law*" was distributed. The concept of "significant harm" has been defined as a resource's recovery in a time span of more than one year. MFLs for riverine systems have heretofore included flow, duration, and return frequency components. Restoration goals are necessary and valuable context for the MFL, and this is the context within which to address the impacts of high flows on the Bay. On the question regarding protection of existing resources (through redistribution of existing freshwater) versus restoration to historical levels, an analogy to the Everglades MFL discussed. In this case, the historical record was examined for thresholds and these were considered integral restoration goals.

In response to perceived need to prioritize limited resources, a project area for an "interim Southern Biscayne Bay MFL" was presented. This area encompasses the Biscayne National Park, a primary client, and would also include the coastal basins immediately north of the S-123, south to Barnes Sound. Inclusion of the Snapper Creek and Coral Gables Waterway basins was discussed based on their potential for contributing freshwater to productive areas of Biscayne Bay. Additional commitments to address precursory monitoring and research in the north bay, as well as Miami River, were also discussed.

The group was advised that the Southern Biscayne Aquifer MFL will be developed concurrently and individuals asked that this be discussed at the next meeting. Of particular interest is the treatment of geographic scope and how boundary conditions coincide in the two MFL efforts. It was agreed to ask Jeff Giddings to speak to the group at the next meeting.

Summary of Current SFWMD Work Efforts: R. Alleman summarized briefly the current efforts on data collection (flow/salinity) and modeling capability at the SFWMD. BNP has no resources to contribute at this time.

Current Approach for MFL Development: A working hypothesis exists based on recent analysis. Although anecdotal evidence exists, very little data or published research exists by which to link "significant harm" to salinity in the Bay; secondly, very little freshwater is currently, or projected to be, available by which to significantly change salinity regimes in the study area. Small-scale opportunities may exist, particularly in the mesohaline region along the mangrove fringe of the western bay, which can be preserved or enhanced if existing freshwater can be effectively redistributed. The group was directed to a map that approximated an area of the bay adjacent the drainage basins from C-100 (Cutler Drain) south to C-111 (Aerojet). **The general idea of prioritizing segments of the bay were discussed, and was supported by the group.** It would result in modifying the District's annual priority list to FDEP, since the current list does not make distinctions between portions of Biscayne Bay. Sarah Bellmund said she favored including Snapper Creek (C-2) and Coral Gables Waterway (C-3). Rick explained that it could complicate the process, because these canals are tied into the C-4 and C-6 basins. The group discussed the impact of flows from these canals on the nearby pink shrimp beds. The matter was left unresolved for now, but impacts to salinity and pink shrimp productivity will be investigated by the District. It was also noted that RECOVER will likely include flow-based performance measures for these canals. **It was agreed, however, that MFLs should be developed eventually for all segments of Biscayne Bay, and the group will assist the SFWMD on segment delineation, prioritization, and scheduling.**

Valued Ecosystem Components/Indicator species: The *report "Status and Distribution of the American Crocodile*" (Mazzotti and Cherkiss 1998) was

distributed. Discussion focussed on this report's recommendations on dry-season management of freshwater, as an example of the current approach. Use of pink shrimp was discussed, along with research status and limitations (catch data not available in target areas). The issue of salinity variation (natural range vs. extreme highs vs. rapid changes) was discussed. Areas of hypersalinity exist in the Bay and hypersalinity appears to negatively affect all organisms across the spectrum. Interest in a generic measure of productivity was expressed. Some species are more tolerant of extremes, e.g. blue crab, but a salinity tolerant species was determined to not be a good indicator. Suggestions for good indicator species focused on those that are able to divert energy from osmo-regulation to life-cycle functions, e.g., reproduction, in the 15-20 ppt. range. Species mentioned for evaluation included: grey snapper, redfish, sea trout, gold-spotted killifish, and gambusia. A general concern was raised to avoid species moving from less saline conditions in drought conditions, since this indicates another problem. Oysters and crocs remained potential candidates, also. J. Vanarman noted that oligohaline species were identified in the St. Lucie River MFL process, and their habitat locations under drought conditions mapped. Members requested the website where this document could be found.

J. Serafy noted that the "Black Ledge" area of the Bay (Black Point to Cutler) had the highest densities of pink shrimp and sport fish. Questions focused on the potential reasons: less influence of pulsed discharges due to location opposite the Safety Valve, bottom types, or availability of grass shrimp. Joe explained that salinity variability in the nearshore area between Black Point an Turkey Point may explain the absence of pink shrimp. Sentiment favored looking at the Wang (John Wang, et al., RSMAS) model, and S. Bellmund noted that a comparison of data inputs to the Wang model and Hydrodynamic Model is underway. J. Serafy suggested that the best approach was to maintain an appropriate habitat in the intertidal/nearshore area by maintaining lower salinity, rather than attempt to use individual species as indicators. Many protected and commercially and recreationally important estuarine species could be linked to the habitat. Overall, productivity of the estuarine community would increase by maintaining a preferred salinity range. R. Alleman summarized the concept: **When water becomes scarce, preferentially route it into a few strategic locations along the coast to preserve estuarine conditions.** In this way, these areas act as refuge for the targeted community. Oysters may still be useful as an indicator for this approach within those strategic areas.

Next Meeting: The group agreed to meet in November.

Action Items from the meeting:

- Summarize major points from the September 11th meeting and email to group.

- Ask Jeff Giddings, SFWMD project manager for southern biscayne aquifer MFL development, to give a presentation to the group at the next meeting.

- Propose criteria for delineating, and map (if possible) segments for sequencial development of MFLs for the entire Bay.
- Check with Jiangang Luo, RSMAS, regarding his verified flow database to see if the data can be used by SFWMD.
- Email URL of the St. Lucie MFL document to the group.
- Establish a date for the next meeting.