An Inventory of Hydrodynamic, Water-Quality, and Ecosystem Models of Florida Coastal and Ocean Waters

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Notes:

1) This listing is the result of information originally solicited via e-mail in July 2006, collected from websites, and received as part of the review of initial drafts. It is intended as a resource for water resource managers and will be updated as new information is received. The newest version will be posted at www.dep.state.fl.us/coastal
2) ***CAUTION: This inventory makes no attempt to evaluate listed models for their capabilities or suitability for any particular use.*** Any contact information found for modelers is included at the end of the document to help readers obtain more information.
3) The models are listed alphabetically by last name of primary modeler/contact. Additionally, to maximize utility there are indexes after the Table of Contents listing models by alphabetical location and proceeding around the state from west to east.
4) Please send additions/corrections to: Steve Wolfe, Steven.Wolfe@dep.state.fl.us

Table of Contents

Models Listed by Location

Models Listed Generally From West to East

Model ID #

List of models

1) 1. Bottcher, Del (Soil and Water Engineering Technology, Inc.)

2. *Water Body*: Myakka River

3. *Model Name:* Watershed Assessment Model (WAM)
4. *Model Type:* Watershed Runoff and Pollutant Loading Model
5. *Model Domain:*
   - *a) Inshore distance : NA*
   - *b) Offshore distance : NA*
   - *c) Alongshore distance: NA*
6. *Year of Model Development/Application:* 2001
7. *Model Grid:*
   - *a) Grid type:* Fixed
   - *b) Grid resolution (min, avg, max):* 100m x 100m
8. *Purpose of Model:* Used to calculate runoff and nutrient loads from the basin for EPA's Myakka River TMDLs.
9. *Simulation Period:* 1985-2000
10. *Validation with Data:* ??
11. *Used for Forecasting:* No
12. *Comments:* Constructed under contract to EPA. Kevin Petrus is FDEP contact.

2) 1. Chen, XinJian (SWFWMD)

2. *Water Body:* Lower Alafia River estuary (a major tributary to Tampa Bay)

3. *Model Name:* Lower Alafia River #1
4. *Model Type:* LAMFE
5. *Model Domain:*
   - *a) Inshore distance:* About 16 miles, from the mouth up to the USGS Lithia flow station
   - *b) Offshore distance:* ??
   - *c) Alongshore distance:* ??
6. *Year of Model Development/Application:* 2001 - 2006
7. *Model Grid:*
   - *a) Grid type:* Hybrid, boundary-fitted
   - *b) Grid resolution (min, avg, max):* 100 - 400 m horizontal, 0.3 - 1.6m vertical
8. *Purpose of Model:* Minimum Flows and Levels
9. *Simulation Period:* 4.6 years
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* No

3) 1. Chen, XinJian (SWFWMD)

2. *Water Body:* Lower Alafia River estuary (a major tributary to Tampa Bay)

3. *Model Name:* Lower Alafia River #2
4. *Model Type:* LESS3D
5. *Model Domain:*
   - *a) Inshore distance:* Most downstream 4.5km
   - *b) Offshore distance: ??*
   - *c) Alongshore distance: ??*
6. *Year of Model Development/Application:* 1999 - 2003
7. *Model Grid:*

a) Grid type: Hybrid (structured-unstructured), boundary-fitted (dynamically tracking shoreline)
b) Grid resolution (min, avg, max): 100 - 400 m horizontal, 0.3 - 1.6m vertical

8. *Purpose of Model:* Minimum Flows and Levels
9. *Simulation Period:* 10.5 months
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* No

4) 1. Chen, XinJian (SWFWMD)

2. *Water Body:* Manatee and Braden Rivers (Manatee River is a major tributary to Tampa Bay)

3. *Model Name: Dynamically Coupled LESS3D - LAMFE*
4. *Model Type: ??*
5. *Model Domain:*
   a) Inshore distance: From the Manatee River mouth to Lake Manatee and to Bill Evers Reservoir.
   b) Offshore distance: ??
   c) Alongshore distance: ??
6. *Year of Model Development/Application: Underway*
7. *Model Grid:*
   a) Grid type: Hybrid (structured-unstructured), boundary-fitted (dynamically tracking shoreline)
   b) Grid resolution (min, avg, max): 100 - 500 m horizontal, 0.3 - 1.0m vertical
8. *Purpose of Model: Minimum Flows and Levels*
9. *Simulation Period: About 1.5 years*
10. *Validation with Data?: Underway*
11. *Used for Forecasting?: No*

5) 1. Chen, XinJian (SWFWMD)

2. *Water Body*: Lower Peace River - Lower Myakka River - Upper Charlotte Harbor

3. *Model Name: Lower Peace #1*
4. *Model Type: Dynamically Coupled LESS3D - LAMFE*
5. *Model Domain:*
   a) Inshore distance: From SWFWMD - SFWMD boundary up to the USGS Arcadia station into the Peace River and almost to Myakka Lake into the Myakka River. Shell Creek and Myakkahatchee are also included in the domain.
   b) Offshore distance: ??
   c) Alongshore distance: ??
6. *Year of Model Development/Application: 2003 - 2006*
7. *Model Grid:*
   a) Grid type: Hybrid (structured-unstructured), boundary-fitted (dynamically tracking shoreline)
   b) Grid resolution (min, avg, max): 100 - 500 m horizontal, 0.3 - 1.0m vertical
8. *Purpose of Model: Minimum Flows and Levels*
9. *Simulation Period: 1.1 years and 4 years*
10. *Validation with Data?: Yes*
11. *Used for Forecasting?: No*

6) 1. Chen, XinJian (SWFWMD)

2. *Water Body:* Lower Hillsborough River estuary (a major tributary to Tampa Bay)

3. *Model Name:* LAMFE
4. *Model Type:*
5. *Model Domain:*
   a) Inshore distance: ~ 10 miles, from the river mouth up to the Tampa Dam

b) Offshore distance: 0
c) Alongshore distance: 0

6. *Year of Model Development/Application: 1995 - 1998, 2002 - 2005*
7. *Model Grid:*
   a) Grid type: Hybrid, boundary-fitted
   b) Grid resolution (min, avg, max): 100 - 500 m horizontal, 0.3 - 1m vertical
8. *Purpose of Model: Minimum Flows and Levels*
9. *Simulation Period: 3.87 years*
10. *Validation with Data?: Yes*
11. *Used for Forecasting?: No*

7) 1. Christian, Dave (SJRWMD)

2. *Water Body:* Northern Atlantic coastal basin

3. *Model Name:* ??
4. *Model Type:* EFDC
5. *Model Domain:*
   a) Inshore distance: ??
   b) Offshore distance: ??
   c) Alongshore distance: ??
6. *Year of Model Development/Application:* in production
7. *Model Grid:*
   a) Grid type: ??
   b) Grid resolution (min, avg, max): ??
8. *Purpose of Model:* ??
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??
12. *Comments:*

8) 1. Crigger, Diane, Greg Graves, and Dana Fike (FDEP)

2. *Water Body*: Lake Worth Lagoon

3. *Model Name:* Conceptual ecological model
4. *Model Type:* NA
5. *Model Domain:*
   a) Inshore distance: ??
   b) Offshore distance: ??
   c) Alongshore distance: ??
6. *Year of Model Development/Application:* ??
7. *Model Grid:*
   a) Grid type: NA
   b) Grid resolution (min, avg, max): NA
8. *Purpose of Model:* examine cause-and-effect relationships of flora and fauna to human-induced and natural conditions within the system
9. *Simulation Period:* NA
10. *Validation with Data?:* NA
11. *Used for Forecasting?:* NA
12. *Comments:* ****Not a computer model**** Altered hydrology of the system allows massive freshwater discharges into the lagoon, which exit via two ocean inlets and influence continental reef systems. These discharges carry large influxes of nutrients, suspended and dissolved organic matter, contaminants, and toxins into the lagoon, affecting the flora and fauna. Additional pressures in this

urbanized coastal area include boating and fishing pressures, as well as loss of natural habitat through physical alterations to the system. A conceptual ecological model of the cause-and-effect relationships of flora and fauna to human-induced and natural conditions within the system was developed. The model consists of ecosystem external drivers and ecological stressors, ecological attributes, and ecological effects, and presents research hypotheses, including the effects of altered volume, timing and distribution of fresh water relative to seagrasses, macroinvertebrates, salinity, fishes, nutrients, toxins, suspended solids, and dissolved organic loads that will assist in the development of a quantitative hydrodynamic model for this system.

9) 1. Cunningham, Brett (Jones Edmunds & Associates, Inc.)

2. *Water Body*: Bays in Sarasota County

3. *Model Name:* Spatially Integrated Model for Pollutant Loading Estimates
4. *Model Type:* ??
5. *Model Domain:* One model was developed for all of Sarasota County and another was extended into Manatee County to pick up the remainder of the Sarasota Bay watershed.
   a) *Inshore distance: ??*
   b) *Offshore distance: ??*
   c) *Alongshore distance: ??*
6. *Year of Model Development/Application:* 2005
7. *Model Grid:* not applicable
   a) *Grid type: ??*
   b) *Grid resolution (min, avg, max): ??*
8. *Purpose of Model:* Pollutant loading
9. *Simulation Period:* Seasonal and annual loading - monthly for approximately 15 years in next phase
10. *Validation with Data?:* Upcoming phase
11. *Used for Forecasting?:* Yes, but not in the same context as most other models in this list
12. *Comments:* Per Gary Raulerson, Sarasota Bay Estuary Program: This is a GIS-based pollutant loading model for Sarasota County, which the SBEP extended to Anna Maria. JEA (I think with PBSJ as a sub) is doing ground-truthing to build on the first year's work. So far the northern portion of Sarasota Bay has not been added. Work should be complete in 2007.

10) 1. Danish Hydraulic Inst, USGS

2. *Water Body*: Tampa Bay

3. *Model Name:* ***??***
4. *Model Type:* finite volume, flexible mesh MIKE 3 FM, finite volume model with 3D hydrodynamic module, fine sediment transport module (MIKE 3 MT) dynamically coupled to the HD model, and ecological module based on ECOLab for Tampa Bay, FLA.
5. *Model Domain:* covers the Tampa Bay and adjacent parts of the Mexican Gulf.
   a) *Inshore distance: ??*
   b) *Offshore distance: ??*
   c) *Alongshore distance: ??*
6. *Year of Model Development/Application: ??*
7. *Model Grid:*
   a) *Grid type: ??*
   b) *Grid resolution (min, avg, max): ??*
8. *Purpose of Model:* establish a general management tool for Tampa Bay; sediment module is being focused on describing suspended sediment transport with relation to the navigational system within the bay. The ecological module has the aim of describing possible consequences of man-made activities on the ecosystem of the bay.
9. *Simulation Period: ??*

10. *Validation with Data?: ??*
11. *Used for Forecasting?: ??*
12. *Editor's comments:* The model will be linked to a large scale Caribbean Model through boundary conditions.

11) 1. Driscol, Andy (Danish Hydraulic Institute)

2. *Water Body*: Tampa Bay to somewhere south of Venice jetties

3. *Model Name:* MikeShe
4. *Model Type:*
5. *Model Domain:* Tampa Bay to somewhere south of Venice Jetties and "way out in the Gulf"
   a) *Inshore distance: ??*
   b) *Offshore distance: ??*
   c) *Alongshore distance: ??*
6. *Year of Model Development/Application:* late 1999 or early 2000
7. *Model Grid:*
   a) *Grid type: ??*
   b) *Grid resolution (min, avg, max): ??*
8. *Purpose of Model:* focus was re-opening of Midnight Pass
9. *Simulation Period: ??*
10. *Validation with Data?: ??*
11. *Used for Forecasting?: ??*
12. *Editor's comments:* Per Mike Heyl, SFWMD: used some of Peter Sheng's tower data that was funded by EPA and SBNEP.

12) 1. Dynamic Solutions LLC

2. *Water Body*: Suwannee River and Estuary

3. *Model Name:* EFDC_Explorer
4. *Model Type:* EFDC Hydrodynamic and Salinity Model; 3-D hydrodynamic and water quality model of salinity
5. *Model Domain:*
   a) *Inshore distance: ??*
   b) *Offshore distance: ??*
   c) *Alongshore distance: ??*
6. *Year of Model Development/Application:*
7. *Model Grid:* included 15 miles of the Suwannee River, ~28 miles of shore line and extended ~18 miles offshore into the Gulf of Mexico and Suwannee Sound.
   a) *Grid type: ??*
   b) *Grid resolution (min, avg, max): ??*
8. *Purpose of Model: ??*
9. *Simulation Period: ??*
10. *Validation with Data?: Yes*
11. *Used for Forecasting?: ??*
12. *Comments:* for USGS; model was successfully calibrated to historical records of flow and salinity.

13) 1. Erickson, Karen (Ericson Consulting Engineers)

2. *Water Body*: Little Sarasota Bay (and maybe a little farther north and south).

3. *Model Name:* ??
4. *Model Type:* circulation model
5. *Model Domain:*
   a) *Inshore distance:* ??

b) Offshore distance: ??
c) Alongshore distance: ??

6. *Year of Model Development/Application:*
7. *Model Grid:*
   a) Grid type: ??
   b) Grid resolution (min, avg, max): ??
8. *Purpose of Model:* ??
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??
12. *Comments:* Per Gary Raulerson, Sarasota Bay EP: part of Sarasota County's permit application to re-open Midnight Pass

14) 1. Graber (?), Hans

2. *Water Body*: Gulf of Mexico and ??

3. *Model Name:* WindGen; WAM Cycle 4.2; ADCIRC coupled models
4. *Model Type:*
5. *Model Domain:*
   a) Inshore distance: ??
   b) Offshore distance: ??
   c) Alongshore distance: ??
6. *Year of Model Development/Application: ??*
7. *Model Grid:*
   a) Grid type: ??
   b) Grid resolution (min, avg, max):
   A) High resolution wind fields from WindGen at 10 km grid spacing from 5 N to 54 N and 30 W to 100 W
   B) High resolution wave fields from WAM Cycle 4.2 at 20 km resolution basin wide and with nesting to 1 km resolution at select areas such as Tampa Bay for example over a grid from 5 N to 54 N and 30 W to 100 W
   C) Storm surge predictions with ADCIRC coupled to wave with grid spacing of 10's km in the open ocean and 100's m near the coast covering the area 5 N to 54 N and 50 W to 100 W
8. *Purpose of Model:* NOPP project on Hurricane Forecasting, realtime wind, wave, surge models
9. *Simulation Period: ??*
10. *Validation with Data?: ??*
11. *Used for Forecasting?:* Yes
12. *Comments:* we run in realtime the above coupled models with time steps of every 15 minutes.

15) 1. Hagen, Scott (UCF)

2. *Water Body*: Atlantic Intracoastal Waterway (AIW)

3. *Model Name:* Three versions of the AIW model exist: 1) Inlet-based; 2) Shelf-based; 3) The full Western North Atlantic Tidal (WNAT) model domain.
4. *Model Type:* 2D model of astronomic tides with wind/pressure forcings (including hurricane storm surge) and inflows
5. *Model Domain:* The entire AIW for the east coast of Florida from south of Lake Worth inlet into southern Georgia and including the St. Johns River through Lake George
   a) Inshore distance: ??
   b) Offshore distance: ??
   c) Alongshore distance: ??
6. *Year of Model Development/Application:* 2006

7. *Model Grid:*
   a) *Grid type:* ??
   b) *Grid resolution (min, avg, max):* ??
8. *Purpose of Model:*
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??
12. *Comments:* Computations for the AIW models are performed with a depth-integrated, finite element model of astronomic tides with wind/pressure forcing including riverine inflows as prescribed. Note that the code is parallelized and implemented on state-of-the-art computing clusters. In addition the model can be coupled to a wave model through wave radiation stress terms.

16) 1. Hagen, Scott (UCF)

2. *Water Body*: Escambia Bay

3. *Model Name:* ??
4. *Model Type:* 2D model of astronomic tides with wind/pressure forcings (including hurricane storm surge) and inflows
5. *Model Domain:* The model includes the Pensacola Pass, Pensacola Bay, Escambia Bay, Blackwater Bay and East Bay
   a) *Inshore distance:* ??
   b) *Offshore distance:* ??
   c) *Alongshore distance:* ??
6. *Year of Model Development/Application:* 2006
7. *Model Grid:*
   a) *Grid type:* ??
   b) *Grid resolution (min, avg, max):* ??
8. *Purpose of Model:* ??
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??
12. *Comments:* The model is connected to two adjacent bay systems via a Gulf Intracoastal Waterway: Perdido Bay to the west and Choctawatchee Bay to the east. The topography of the barrier islands is described to permit overtopping during high surges. Three versions of the Escambia Bay model exist: 1) Inlet-based; 2) Shelf-based; 3) The full Western North Atlantic Tidal (WNAT) model domain. Computations for the Escambia Bay models are performed with a depth-integrated, finite element model of astronomic tides with wind/pressure forcing including overland inflows as prescribed. Note that the code is parallelized and implemented on state-of-the-art computing clusters. In addition the model can be coupled to a wave model through wave radiation stress terms.

17) 1. Hagen, Scott (UCF)

2. *Water Body*: Loxahatchee River Estuary

3. *Model Name:* ??
4. *Model Type:* 2D model of astronomic tides with wind/pressure forcings (including hurricane storm surge) and inflows.
5. *Model Domain:* entire Loxahatchee Estuary including tidal flats and the AIW (through the southern portion of the Indian River lagoon) to Fort Pierce Inlet and beyond Lake Worth Inlet, to the north and south, respectively. In addition, a version with the full Western North Atlantic Tidal (WNAT) model domain is available.
   a) *Inshore distance:* ??
   b) *Offshore distance:* ??

c) Alongshore distance: ??

6. *Year of Model Development/Application:* 2006
7. *Model Grid:*
   a) Grid type: ??
   b) Grid resolution (min, avg, max): ??
8. *Purpose of Model:* ??
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??
12. *Comments:* The computations are performed with a depth-integrated, finite element model of astronomic tides with wind/pressure forcing including riverine inflows as prescribed. Note that the code is parallelized and implemented on state-of-the-art computing clusters. In addition the model can be coupled to a wave model through wave radiation stress terms.

18) 1. Hagen, Scott (UCF)

2. *Water Body*: Western North Atlantic

3. *Model Name:* Western North Atlantic Tidal (WNAT)
4. *Model Type:* depth-integrated, finite element, 2D model of astronomic tides with wind/pressure forcings (including hurricane storm surge) and riverine inflows
5. *Model Domain:* encompasses the Gulf of Mexico, Caribbean Sea, and northern portion of the Atlantic Ocean west of 60° west. The open-ocean boundary extends from the area of Glace Bay, Nova Scotia, Canada to the vicinity of Corocora Island in eastern Venezuela. The domain is bounded on the north, west, and south by the North, Central, and South American coastlines, respectively and covers approximately 8.347×10^6 km^2.
   a) Inshore distance: ??
   b) Offshore distance: ??
   c) Alongshore distance: ??
6. *Year of Model Development/Application:* 2006
7. *Model Grid:*
   a) Grid type: ??
   b) Grid resolution (min, avg, max): ??
8. *Purpose of Model:* ??
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??
12. *Comments:* Note that the code is parallelized and implemented on state-of-the-art computing clusters. In addition the model is coupled to a wave model through wave radiation stress terms. When the WNAT model is employed in a hurricane storm surge and/or astronomic tidal simulation it can be used to provide boundary conditions to a shelf-based or inlet-based model.

19) 1. Hagen, Scott (UCF)

2. *Water Body*: Lower St. Johns River and ICW to Matanzas Inlet

3. *Model Name:* ADCIRC Western North Atlantic Tidal Model (WNAT)
4. *Model Type:* 2D model of astronomic tides with wind/pressure forcings (including hurricane storm surge) and inflows. Three versions of the SJR model exist: 1) Inlet-based; 2) Shelf-based; 3) The full Western North Atlantic Tidal model domain.
5. *Model Domain:* From the inlet at Mayport up to and including Lake George
   a) Inshore distance: ??
   b) Offshore distance: ??

c) Alongshore distance: ??

6. *Year of Model Development/Application:* 2006
7. *Model Grid:*
   a) Grid type: ??
   b) Grid resolution (min, avg, max): mesh resolution ranging from 10 to 450 (in Lake George) meters
8. *Purpose of Model:* extending ADCIRC Western North Atlantic Tide Model into the Lower St. Johns River and ICW to Matanzas Inlet
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??
12. *Comments:* Computations for the SJR models are performed with a depth-integrated, finite element model of astronomic tides with wind/pressure forcing including riverine inflows as prescribed. The code is parallelized and implemented on state-of-the-art computing clusters. In addition the model is coupled to a wave model through wave radiation stress terms.

20) 1. Hagen, Scott (UCF)

2. *Water Body*: Western Atlantic

3. *Model Name:* ***??***
4. *Model Type:* ADCIRC Western Atlantic Tide Model
5. *Model Domain:*
   a) Inshore distance: ??
   b) Offshore distance: ??
   c) Alongshore distance: ??
6. *Year of Model Development/Application:*
7. *Model Grid:*
   a) Grid type: ??
   b) Grid resolution (min, avg, max): ??
8. *Purpose of Model:* to show tidal flows
9. *Simulation Period: ??*
10. *Validation with Data?: ??*
11. *Used for Forecasting?: ??*
12. *Comments:*

21) 1. Hagen, Scott (UCF)

2. *Water Body*: Tampa Bay

3. *Model Name:* ??
4. *Model Type:* 2D model of astronomic tides with wind/pressure forcings (including hurricane storm surge) and inflows.
5. *Model Domain:* includes urban inundation areas around Tampa Bay as described by LIDAR data. The Tampa Bay model is implemented in the full Western North Atlantic Tidal (WNAT) model domain.
   a) Inshore distance: ??
   b) Offshore distance: ??
   c) Alongshore distance: ??
6. *Year of Model Development/Application:* 2006
7. *Model Grid:*
   a) Grid type: ??
   b) Grid resolution (min, avg, max): ??
8. *Purpose of Model:* ??
9. *Simulation Period:* ??
10. *Validation with Data?:* ??

11. *Used for Forecasting?:* ??
12. *Comments:* Computations for the Tampa Bay model are performed with a depth-integrated, finite element model of astronomic tides with wind/pressure forcing including overland inflows as prescribed. Note that the code is parallelized and implemented on state-of-the-art computing clusters. In addition the model can be coupled to a wave model through wave radiation stress terms.

22) 1. Halliwell, George, Villy Kourafalou, and N. Shay (UM, RSMAS)

2. *Water Body*: Gulf of Mexico

3. *Model Name:* Hybrid Coordinate Ocean Model (HYCOM)
4. *Model Type:* Primitive equation ocean general circulation model, hybrid vertical coordinates
5. *Model Domain:* Gulf of Mexico
   a) Inshore distance: 0 km (extends to coastline)
   b) Offshore distance: Entire Gulf of Mexico and Florida Straits
   c) Alongshore distance: Alabama border to Cape Canaveral
6. *Year of Model Development/Application:* 2006
7. *Model Grid:*
   a) Grid type: Mercator
   b) Grid resolution (min, avg, max): about 4 km everywhere
8. *Purpose of Model:* (1) study the ocean response to hurricanes in both the deep ocean and the coastal ocean, (2) improve model performance when forced by hurricanes, (3) provide boundary conditions to the higher resolution Northwestern Florida nested coastal model, as part of Ocean System Simulation Experiments.
9. *Simulation Period:* During individual storms, 2002-2005
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* No
12. *Comments:* This project will include the coastal ocean response to hurricanes that have affected Florida coastal waters since 2004, in particular Charley, Ivan, Katrina, and Rita.

23) 1. Halliwell, George and Josefina Olascoaga (UM, RSMAS)

2. *Water Body*: West Florida Shelf

3. *Model Name:* HYCOM
4. *Model Type:* Primitive equation ocean general circulation model, hybrid vertical coordinates
5. *Model Domain:* 87W to 81.28W; 23.07N to 30.39N
   a) Inshore distance: 2 km
   b) Offshore distance: up to 200 km
   c) Alongshore distance: West Florida Shelf and Florida Keys
6. *Year of Model Development/Application:* 2006
7. *Model Grid:*
   a) Grid type: Mercator
   b) Grid resolution (min, avg, max): about 4 km everywhere
8. *Purpose of Model:* (1) test new model algorithms; (2) used by Josefina Olascoaga and colleagues to study the influence of physical processes on *Karena brevis* (red tide)
9. *Simulation Period:* 2004
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* No
12. *Comments:*

24) 1. Halliwell, George (UM, RSMAS)

2. *Water Body*: West Florida Shelf north of the Keys

3. *Model Name:* HYCOM

4. *Model Type:* Primitive equation ocean general circulation model, hybrid vertical coordinates
5. *Model Domain:*
   a) Inshore distance: 0 km (extends to coastline)
   b) Offshore distance: 100 km
   c) Alongshore distance: Alabama border through Florida Bay
6. *Year of Model Development/Application:* 2006
7. *Model Grid:*
   a) Grid type: curvilinear
   b) Grid resolution (min, avg, max : 3, 4.5, 6 km
8. *Purpose of Model:* (1) test new model algorithms, (2) study the influence of initial and boundary conditions provided to this nested West Florida Shelf coastal model by ocean nowcasts and forecast products developed as part of the Global Ocean Data Assimilation Experiment (GODAE), (3) evaluate HYCOM performance against other ocean model types.
9. *Simulation Period:* 2004-2005
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* Yes
12. *Comments:* The latter effort (#3 under *Purpose)* will be conducted in collaboration with Robert Weisberg and Alexander Barth at the University of South Florida.

25) 1. Harwell, Mark (NOAA), P. Hsieh, W. Huang, E. Johnson, K. Milla, H. Wang, G. Bugna, K. Dillon, C. Hladik, and J. Gentile

2. *Water Body*: Apalachicola Bay

3. *Model Name:* ??
4. *Model Type:* Princeton Ocean Model converted to EFDC and linked directly to EPA WASP WQ model
5. *Model Domain:*
   a) Inshore distance: ??
   b) Offshore distance: ??
   c) Alongshore distance: ??
6. *Year of Model Development/Application:* 2005
7. *Model Grid:*
   a) Grid type: ??
   b) Grid resolution (min, avg, max): ??
8. *Purpose of Model:* working toward ecosystem model
9. *Simulation Period:* ??
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* ??

26) 1. Heyl, Mike (Camp Dresser & McKee, now with SWFWMD)

2. *Water Body*: Sarasota Bay system (including tributaries)

3. *Model Name:* ***??***
4. *Model Type:* VB and spreadsheet input/output models
5. *Model Domain:*
   a) Inshore distance: ??
   b) Offshore distance: ??
   c) Alongshore distance: ??
6. *Year of Model Development/Application:* early 1990's
7. *Model Grid:*
   a) Grid type: ??
   b) Grid resolution (min, avg, max): ??
8. *Purpose of Model:* pollutant loading model

9. *Simulation Period: ??*
10. *Validation with Data?: ??*
11. *Used for Forecasting?: ??*
12. *Comments:*

27) 1. Heyl, Mike (Camp Dresser & McKee, now with SWFWMD)

2. *Water Body*: middle Sarasota Bay (Ringling to Long Bar Point)

3. *Model Name:* Dynhyd/ WASP
4. *Model Type:*
5. *Model Domain:*
   a) *Inshore distance: ??*
   b) *Offshore distance: ??*
   c) *Alongshore distance: ??*
6. *Year of Model Development/Application:* ??
7. *Model Grid:*
   a) *Grid type: ??*
   b) *Grid resolution (min, avg, max): ??*
8. *Purpose of Model:* for the City of Sarasota's Wasteload Allocation at Whitaker Bayou, used the same model to evaluate an RO discharge through Payne Terminal.
9. *Simulation Period: ??*
10. *Validation with Data?: ??*
11. *Used for Forecasting?: ??*
12. *Comments:*

28) 1. Heyl, Mike (Camp Dresser & McKee, now with SWFWMD)

2. *Water Body*: Sarasota Bay system (including tributaries) from south of Venice jetties to upper Sarasota Bay and 'around the corner' to capture Manatee River and all of Manatee County

3. *Model Name:* ***??***
4. *Model Type:* VB and spreadsheet input/output models
5. *Model Domain:*
   a) *Inshore distance: ??*
   b) *Offshore distance: ??*
   c) *Alongshore distance: ??*
6. *Year of Model Development/Application:* early 1990's
7. *Model Grid:*
   a) *Grid type: ??*
   b) *Grid resolution (min, avg, max): ??*
8. *Purpose of Model:* pollutant loading model
9. *Simulation Period: ??*
10. *Validation with Data?: ??*
11. *Used for Forecasting?: ??*
12. *Comments:* Manatee County as part of next phase of NPDES MS4 permitting added the northern extension to Marchand and Collins model of Sarasota Bay. Point of contact - Sia Mollanazar, Manatee County

29) 1. Heyl, Mike (Camp Dresser & McKee, now with SWFWMD)

2. *Water Body*: Manatee River

3. *Model Name:* Dynhyd/WASP

4. *Model Type:* salinity only
5. *Model Domain:*
   a) *Inshore distance: ??*
   b) *Offshore distance: ??*
   c) *Alongshore distance: ??*
6. *Year of Model Development/Application:* ??
7. *Model Grid:*
   a) *Grid type: ??*
   b) *Grid resolution (min, avg, max): ??*
8. *Purpose of Model:* for Manatee County's WUP renewal to SWFWMD.
9. *Simulation Period: ??*
10. *Validation with Data?: ??*
11. *Used for Forecasting?: ??*
12. *Comments:* Manatee County's point of contact for that work was John Zimmerman

30) 1. Huang, Wenrui and W.K. Jones (FSU)

2. *Water Body*: Apalachicola Bay

3. *Model Name:* ??
4. *Model Type:* 3-D model of circulation and salinity
5. *Model Domain:*
   a) *Inshore distance: ??*
   b) *Offshore distance: ??*
   c) *Alongshore distance: ??*
6. *Year of Model Development/Application:* 1997
7. *Model Grid:*
   a) *Grid type: ??*
   b) *Grid resolution (min, avg, max): ??*
8. *Purpose of Model:* circulation and salinity for low river-flow season
9. *Simulation Period: ??*
10. *Validation with Data?: ??*
11. *Used for Forecasting?: ??*
12. *Comments:* Per Lee Edmiston (Apalachicola Nat'l Estuarine Research Reserve): Northwest Florida Water Management District, Water Resources Special Report 97-1. 120 pages.

31) 1. Huang, Wenrui (FSU)

2. *Water Body*: Choctawhatchee Bay

3. *Model Name:* ??
4. *Model Type:* hydrodynamic model
5. *Model Domain:*
   a) *Inshore distance:* ??
   b) *Offshore distance:* ??
   c) *Alongshore distance:* ??
6. *Year of Model Development/Application:* ??
7. *Model Grid:*
   a) *Grid type:* ??
   b) *Grid resolution (min, avg, max):* ??
8. *Purpose of Model:* ??
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??

12. *Comments:* for Florida Dept. of Transportation

32) 1. Huang, Wenrui (FSU)

2. *Water Body*: St. Andrews Bay

3. *Model Name:* ??
4. *Model Type:* hydrodynamic model
5. *Model Domain:*
   a) *Inshore distance:* ??
   b) *Offshore distance:* ??
   c) *Alongshore distance:* ??
6. *Year of Model Development/Application:* ??
7. *Model Grid:*
   a) *Grid type:* ??
   b) *Grid resolution (min, avg, max):* ??
8. *Purpose of Model:* ??
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??
12. *Comments:* for Northwest Florida Water Management District

33) 1. Janicki, Tony (Janicki Environmental)

2. *Water Body*: Upper Charlotte Harbor and lower Peace and Myakka Rivers

3. *Model Name:* ??
4. *Model Type:* WASP model
5. *Model Domain:*
   a) *Inshore distance:* ??
   b) *Offshore distance:* ??
   c) *Alongshore distance:* ??
6. *Year of Model Development/Application:* ??
7. *Model Grid:*
   a) *Grid type:* ??
   b) *Grid resolution (min, avg, max):* ??
8. *Purpose of Model:* ??
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??
12. *Comments:*

34) 1. Jones, Galperin, Wu, and Weisberg (USF)

2. *Water Body*: Apalachicola Bay

3. *Model Name:* ??
4. *Model Type:*
5. *Model Domain:*
   a) *Inshore distance:* ??
   b) *Offshore distance:* ??
   c) *Alongshore distance:* ??
6. *Year of Model Development/Application:* 1994
7. *Model Grid:*
   a) *Grid type:* ??
   b) *Grid resolution (min, avg, max):* ??

8. *Purpose of Model:* Preliminary circulation simulations
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??
12. *Comments:* Per Lee Edmiston (Apalachicola Nat'l Estuarine Research Reserve): Northwest Florida Water Management District, Water resources Special Report 94-2.

35) 1. Kourafalou, Villy (University of Miami/RSMAS)

2. *Water Body*: Southwest Florida Shelf (including Florida Bay) and Straits of Florida (including the Florida Keys)

3. *Model Name: HYbrid Coordinate Ocean Model* (HYCOM)
4. *Model Type:* Primitive equation ocean general circulation model, hybrid vertical coordinates
5. *Model Domain:*
   a) *Inshore distance: ??*
   b) *Offshore distance: ??*
   c) *Alongshore distance: ??*
6. *Year of Model Development/Application:*
7. *Model Grid:*
   a) *Grid type: ??*
   b) *Grid resolution (min, avg, max):* 3.7 km
8. *Purpose of Model:* The South Florida Hybrid Coordnate Model (SoFLA-HYCOM) is the regional model for South Florida coastal seas. It was developed to connect South Florida's shallow coastal environments with the adjacent deep areas in the Straits of Florida and the Gulf of Mexico. The SoFLA-HYCOM is used to provide boundary conditions for the EFDC Florida Bay model, developed by the South Florida Water Management District, in support of the Everglades Restoration Project.
9. *Simulation Period:* 1999-2002; 2004-2006
10. *Validation with Data?:* yes
11. *Used for Forecasting?:* pre-operational capabilities
12. *Comments:* The EFDC Florida Bay model has been one-way nested to SOFLA-HYCOM. To ensure proper connection of Florida Bay processes with the Gulf of Mexico and the Straits of Florida (as well as the global circulation around them), the SoFLA-HYCOM is nested within the North Atlantic HYCOM that includes the Gulf of Mexico and the Caribbean. The regional model acts as a crucial intermediate step from the large to the coastal scale. The model is also used to study air-sea interaction and land-sea interaction processes, especially the effects of regional (South Florida) and remote (Mississippi) rivers on the South Florida ecosystem. *http://oceanmodeling.rsmas.miami.edu/hycom*

36) 1. Kourafalou, Villy and C. Paris; (UM/RSMAS)

2. *Water Body*: Southwest Florida Shelf (including Florida Bay) and Straits of Florida (including the Florida Keys)

3. *Model Name:* HYbrid Coordinate Ocean Model (HYCOM) and BOLTS (Biological Larval Transport System)
4. *Model Type:* Primitive equation ocean general circulation model, hybrid vertical coordinates, coupled with a biological Lagrangian transport model
5. *Model Domain:* 77.4W to 83.8W and 22.8N to 28.6N
   a) *Inshore distance: ??*
   b) *Offshore distance: ??*
   c) *Alongshore distance: ??*
6. *Year of Model Development/Application:* 2006
7. *Model Grid:*
   a) *Grid type:* rectangular

b) Grid resolution (min, avg, max): 3.7 km

8. *Purpose of Model:* Modeling circulation and larval pathways, examine connectivity of Florida Keys with upstream larval sources
9. *Simulation Period:* 2004-2006
10. *Validation with Data?:* not yet
11. *Used for Forecasting?:* no
12. *Comments:* The South Florida Hybrid Coordinate Ocean Model (SoFLA-HYCOM) is a comprehensive, 3-D hydrodynamic model, nested within larger scale models, so that the coastal areas around South Florida are properly connected to the surrounding larger scale oceanic flows. The model provides boundary conditions to limited area models in Florida Bay and the Florida Keys. It is also currently being coupled with a larval transport model to study the effects of hydrodynamics on fish recruitment in the Florida Keys. The model is also used to study air-sea interaction and land-sea interaction processes, especially the effects of regional (South Florida) and remote (Mississippi) rivers on the South Florida ecosystem. http://oceanmodeling.rsmas.miami.edu/hycom/

37) 1. Kourafalou, Villy and George Halliwell (UM, RSMAS)

2. *Water Body*: Florida Keys Marine Sanctuary, Florida Bay and Dry Tortugas Ecological Reserve

3. *Model Name:* HYbrid Coordinate Ocean Model (HYCOM)
4. *Model Type:* Primitive equation ocean general circulation model, hybrid vertical coordinates
5. *Model Domain:* 82.5W to 79.5W; 24.N to 25.5N Mercator grid
   a) *Inshore distance:*
   b) *Offshore distance: ??*
   c) *Alongshore distance: ??*
6. *Year of Model Development/Application:* 2007
7. *Model Grid:*
   a) *Grid type:* rectangular
   b) *Grid resolution (min, avg, max):* ~1 km resolution
8. *Purpose of Model:* Very high resolution. Used to study small (submesoscale) eddy variability in the Florida Current and for biophysical simulations of larval transport.
9. *Simulation Period:* 2004-2006
10. *Validation with Data?:* not yet
11. *Used for Forecasting?:* no
12. *Comments:* Will be compared to coastal radar (WERA) surface current maps.

38) 1. Kourafalou, Villy and George Halliwell (UM, RSMAS)

2. *Water Body*: Northern Gulf of Mexico Shelf (includes the Florida Panhandle)

3. *Model Name:* HYbrid Coordinate Ocean Model (HYCOM)
4. *Model Type:* Primitive equation ocean general circulation model, hybrid vertical coordinates
5. *Model Domain:* 82.8W to 95W and 28.5N to 30.5N
   a) *Inshore distance: ??*
   b) *Offshore distance: ??*
   c) *Alongshore distance: ??*
6. *Year of Model Development/Application:* 2006
7. *Model Grid:*
   a) *Grid type:* rectangular
   b) *Grid resolution (min, avg, max):* currently 2 km, evolving to 1 km
8. *Purpose of Model:* Observing System Simulation Experiments (OSSEs)
9. *Simulation Period: ??*
10. *Validation with Data?:* not yet

11. *Used for Forecasting?:* not yet
12. *Comments:* The ultimate goal of this project will study the impact of new observing systems on the capability of an ocean model (HYCOM) to nowcast and forecast ocean variability along the northern Gulf of Mexico coast. The initial emphasis of this project is to perform the preliminary studies required to design the OSSE. The model will provide boundary conditions to coastal biophysical models in the Northwestern Florida shelf.

39) 1. Kourafalou, Villy and George Halliwell (UM, RSMAS)

2. *Water Body*: Intra-America Seas (includes ALL coastal areas around the State of Florida)

3. *Model Name:* HYbrid Coordinate Ocean Model (HYCOM)
4. *Model Type:* Primitive equation ocean general circulation model, hybrid vertical coordinates
5. *Model Domain:* 35W to 98W and 5S to 30N
   a) *Inshore distance: ??*
   b) *Offshore distance: ??*
   c) *Alongshore distance: ??*
6. *Year of Model Development/Application:* 2007
7. *Model Grid:*
   a) *Grid type:* rectangular
   b) *Grid resolution (min, avg, max):* ~ 4 km
8. *Purpose of Model:* to study circulation in the Intra-America Seas with an emphasis on coastal to loarge scale interactions; the model domain is enlarged to include the Amazon River, so that the impact of Amazon waters (carried through Brazil Current rings) on the eastern Caribbean islands will be examined. The domain includes the Gulf of Mexico and all the Florida Seas and will be employed in hurricane studies.
9. *Simulation Period:* 2004-2006
10. *Validation with Data?:* historical data
11. *Used for Forecasting?:* no
12. *Comments:* This domain offers a comprehensive "Florida" model that includes all coastal seas around the State of Florida.

40) 1. Luther, Mark, S. Meyers, S. Gilbert, V. Subramanian (USF)

2. *Water Body*: Tampa Bay estuary

3. *Model Name:* based on the ECOM-3D version of the Princeton Ocean Model (POM)
4. *Model Type:* 3-dimensional hydrodynamic model
5. *Model Domain:* covers the bay from Egmont Key to the head of the bay and up the tidal reaches of the major tributaries
   a) *Inshore distance:* ??
   b) *Offshore distance:* ??
   c) *Alongshore distance:* ??
6. *Year of Model Development/Application:* early 1990s
7. *Model Grid:*
   a) *Grid type:* ??
   b) *Grid resolution (min, avg, max):* ??
8. *Purpose of Model:* Integrated observing system and circulation, wave, sediment transport, and water quality model
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??
12. *Comments:* has been applied to spill trajectory anlysis, storm surge, water supply issues, and now human pathogen trajectory and fate analysis. It was used in management and mitigation of the Piney

Point phosphate discharges and in the damage assessment of the Cargil phosphate process water spill during Hurricane Francis in 2004. The model became a key component in the permitting process for the Tampa Bay Water seawater desalination facility at Big Bend and was tested in administrative challenges to the permit.

The model system ingests real-time observations of the physical forcing functions for Tampa Bay to produce three-dimensional fields of circulation, temperature, salinity, wave spectra, sediment resuspension, sediment transport, and turbidity, A water quality module is under development. The hydrodynamic model is fully operational in either a nowcast-forecast mode or a hindcast mode and is described on our web site (http://ompl.marine.usf.edu/TBmodel).

41) 1. Ly, Le N. (Applied Science International)

2. *Water Body*: West Florida Shelf

3. *Model Name:* Regional Ocean Modeling System (ROMS)
4. *Model Type:* physical-biological coupled model
5. *Model Domain:*
   - *a) Inshore distance: ??*
   - *b) Offshore distance: ??*
   - *c) Alongshore distance: ??*
6. *Year of Model Development/Application: ??*
7. *Model Grid:*
   - *a) Grid type: ??*
   - *b) Grid resolution (min, avg, max):* has 1- km horizontal resolution and 60 vertical terrain-following levels
8. *Purpose of Model: ??*
9. *Simulation Period: ??*
10. *Validation with Data?: ??*
11. *Used for Forecasting?: Yes*
12. *Comments:* Applied to HAB studies on the WFS to develop a HAB nowcast/forecast model for red tide. A physical-biological coupled model is developed and applied to HAB studies on the WFS to develop a HAB nowcast/forecast model. The primitive equation model is coupled with a biological dynamics model with four components: NPZD (Nutrient, Phytoplankton, Zooplankton and Detritus). The ocean model has realistic physical conditions and realistic bathymetry and wind and is initialized with the physical (monthly mean temperature and salinity climatology blended with CTD data) and biological data for the late summer and early autumn.

42) 1. Madden, Christopher and Amanda McDonald (South Florida Water Management District)

2. *Water Body*: Florida Bay

3. *Model Name:* Florida Bay Seagrass Conceptual Model
4. *Model Type:* ??
5. *Model Domain:*
   - *a) Inshore distance:* ??
   - *b) Offshore distance:* ??
   - *c) Alongshore distance:* ??
6. *Year of Model Development/Application:* ??
7. *Model Grid:*
   - *a) Grid type:* ??
   - *b) Grid resolution (min, avg, max):* ??
8. *Purpose of Model:* ??
9. *Simulation Period:* ??

10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??
12. *Comments:* Per Cindy Heil (FWC-FWRI): another NOAA grant we currently have is working with South Florida Water Management District to supply nutrient and phytoplankton data for the development of a phytoplankton component for Chris Madden's Florida Bay model.

43) 1. Marchand. J.P. and P. Collins (Camp Dresser & McKee)

2. *Water Body*: Sarasota Bay system (including tributaries) to south of Venice jetties

3. *Model Name:* ??
4. *Model Type:* VB and spreadsheet input/output models
5. *Model Domain:*
   a) *Inshore distance: ??*
   b) *Offshore distance: ??*
   c) *Alongshore distance: ??*
6. *Year of Model Development/Application:* 1990's
7. *Model Grid:*
   a) *Grid type: ??*
   b) *Grid resolution (min, avg, max): ??*
8. *Purpose of Model:* pollutant loading model
9. *Simulation Period: ??*
10. *Validation with Data?: ??*
11. *Used for Forecasting?: ??*
12. *Comments:* NPDES MS4 application. John Ryan might be best present contact at CDM. Southward extension of Heyl (CDM) model of Sarasota Bay system.

44) 1. Mooers, Christopher & Inkweon Bang (UM)

2. *Water Body*: Straits of Florida and East Florida Shelf

3. *Model Name:* EFSIS (East Florida Shelf Information System)
4. *Model Type:* Princeton Ocean Model (POM)
5. *Model Domain:* Model domain defined by the model grid points is roughly from Cuba to 31N, 83.5 to 77.5W
   a) *Inshore distance:* 0 km
   b) *Offshore distance:* 200 km
   c) *Alongshore distance:* 1,000 km
6. *Year of Model Development/Application:* 2004/nowcast and forecast of ocean state
7. *Model Grid:*
   a) *Grid type:* orthogonal curvilinear; sigma coordinates in the vertical
   b) *Grid resolution (min, avg, max):* 2 km, 6 km, 14 km; 26 sigma levels
8. *Purpose of Model:* Nowcast and forecast of ocean currents, temperature/salinity, and sea level
9. *Simulation Period:* continually since 1 OCT 2004 in the present configuration
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* Yes
12. *Comments:* It covers from beyond the Dry Tortugas to north of the Georgia border, and from Florida to Cuba and the Bahamas. See http://efsis.rsmas.miami.edu for the graphics of coverage, predicted fields, etc.

45) 1. Mooers, Christopher & Jerome Fiechter (UM)

2. *Water Body*: Straits of Florida and East Florida Shelf

3. *Model Name:* NPZD ecosystem model driven by EFSIS
4. *Model Type:* Princeton Ocean Model (POM)

5. *Model Domain:* Model domain defined by the model grid points is roughly from Cuba to 31N, 83.5 to 77.5W
   a) *Inshore distance:* 0 km
   b) *Offshore distance:* 200 km
   c) *Alongshore distance:* 1,000 km
6. *Year of Model Development/Application:* 2005
7. *Model Grid:*
   a) *Grid type:* orthogonal curvilinear; sigma coordinates in the vertical
   b) *Grid resolution (min, avg, max):* 2 km, 6 km, 14 km; 26 sigma levels
8. *Purpose of Model:* ecosystem model
9. *Simulation Period:* a climatological mean year
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* Not yet
12. *Comments:* not run in real-time, yet.

46) 1. Moore, Chuck, Stergio Dendrou and Ray Walton (then at CDM, now at West Consulting)

2. *Water Body*: Sarasota Bay (and particularly Midnight Pass)

3. *Model Name:* Dynhyd
4. *Model Type:*
5. *Model Domain:*
   a) *Inshore distance:*
   b) *Offshore distance:*
   c) *Alongshore distance:*
6. *Year of Model Development/Application:* 1983
7. *Model Grid:*
   a) *Grid type:*
   b) *Grid resolution (min, avg, max):*
8. *Purpose of Model:*
9. *Simulation Period:* ??
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* ??
12. *Comments:* for Sarasota County. Had some continuous recorders for calibration/verification. R. Walton is contact.

47) 1. Morey, Steve (FSU)

2. *Water Body*: Gulf of Mexico

3. *Model Name:* NCOM Gulf of Mexico model
4. *Model Type:* Navy Coastal Ocean Model
5. *Model Domain:* 15.55N to 31.5N, 98.15W to 80.6W
   a) *Inshore distance:*
   b) *Offshore distance:*
   c) *Alongshore distance:*
6. *Year of Model Development/Application:* 2004 - present
7. *Model Grid:*
   a) *Grid type:* Cartesian
   b) *Grid resolution (min, avg, max):* min 4.5km avg 5km max 5.5km
8. *Purpose of Model:* Gulf of Mexico circulation and process studies
9. *Simulation Period:* 1999 - 2000, mid-2005
10. *Validation with Data?:* Yes

11. *Used for Forecasting?:* No
12. *Comments:* Data assimilative hindcasts forced by satellite-derived fluxes. Also multiple climatology forced simulations.

48) 1. Moustaffa, Zaki (SFWMD)

2. *Water Body*: Estero Bay

3. *Model Name:* ??
4. *Model Type:*
5. *Model Domain:*
   a) *Inshore distance:* ??
   b) *Offshore distance:* ??
   c) *Alongshore distance:* ??
6. *Year of Model Development/Application:* planned for 2008
7. *Model Grid:*
   a) *Grid type:* ??
   b) *Grid resolution (min, avg, max):* ??
8. *Purpose of Model:* Integrate watershed and estuarine models
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??

49) 1. Moustaffa, Zaki (SFWMD)

2. *Water Body*: Florida Bay/Keys

3. *Model Name:* ??
4. *Model Type:*
5. *Model Domain:*
   a) *Inshore distance:* ??
   b) *Offshore distance:* ??
   c) *Alongshore distance:* ??
6. *Year of Model Development/Application:* planned for 2009
7. *Model Grid:*
   a) *Grid type:* ??
   b) *Grid resolution (min, avg, max):* ??
8. *Purpose of Model:* To improve Florida Bay/Keys models
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??

50) 1. Moustaffa, Zaki (SFWMD)

2. *Water Body*: South Florida

3. *Model Name:* ??
4. *Model Type:* watershed topography model
5. *Model Domain:*
   a) *Inshore distance:* ??
   b) *Offshore distance:* ??
   c) *Alongshore distance:* ??
6. *Year of Model Development/Application:* ??
7. *Model Grid:*
   a) *Grid type:* ??
   b) *Grid resolution (min, avg, max):* ??

8. *Purpose of Model:* predicting the impacts of various flow scenarios on watershed wetland hydrographic conditions
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??
12. *Comments:* part of Picayune Strand Restoration Project

51) 1. Moustaffa, Zaki (SFWMD)

2. *Water Body*: Naples Bay

3. *Model Name:* ??
4. *Model Type:* hydrodynamic model
5. *Model Domain:*
   a) *Inshore distance:* ??
   b) *Offshore distance:* ??
   c) *Alongshore distance:* ??
6. *Year of Model Development/Application:* planned for 2008
7. *Model Grid:*
   a) *Grid type:* ??
   b) *Grid resolution (min, avg, max):* ??
8. *Purpose of Model:* ??
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??
12. *Comments:*

52) 1. NOAA National Ocean Service (NOS)

2. *Water Body*: St. Johns River

3. *Model Name:* St. John's River Operational Forecast System (SJROFS)
4. *Model Type:* EFDC hydrodynamic model
5. *Model Domain:*
   a) *Inshore distance: ??*
   b) *Offshore distance: ??*
   c) *Alongshore distance: ??*
6. *Year of Model Development/Application:* 2005
7. *Model Grid:*
   a) *Grid type: ??*
   b) *Grid resolution (min, avg, max): ??*
8. *Purpose of Model:* provides the maritime community with improved short-term predictions of water levels and currents in St. Johns River
9. *Simulation Period: ??*
10. *Validation with Data?: ??*
11. *Used for Forecasting?: Yes*
12. *Editor's comments:* Based on SJRWMD EFDC model. The ocean boundary of the grid is forced with a superposition of the observed subtidal water levels at Mayport and predicted tides. The former are determined using a low-pass filter, and the latter are based on tidal harmonics available at Mayport with a slight adjustment (approximately 5% increase in tidal amplitudes) for matching the model with observations. Salinity is also specified along the ocean boundary to linearly transition from 35 psu at the surface to 36 psu at the bottom.

53) 1. Pratt, Thad (U.S. Army Corps of Engineers)

2. *Water Body*: Biscayne Bay

3. *Model Name:* **??**
4. *Model Type:*
5. *Model Domain:*
   a) *Inshore distance:* ??
   b) *Offshore distance:* ??
   c) *Alongshore distance:* ??
6. *Year of Model Development/Application:* underway
7. *Model Grid:*
   a) *Grid type:* ??
   b) *Grid resolution (min, avg, max):* ??
8. *Purpose of Model:* updating existing hydrodynamic and salinity transport model to help determine the importance of stratification and freshwater inflow on salinity and circulation patterns in Biscayne Bay.
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??
12. *Comments:* Part of the Comprehensive Everglades Restoration Plan (CERP). The data is being used to validate and verify the TABS-MDS model for the CERP- Biscayne Bay Coastal Wetlands Project (BBCW) and as a monitoring tool for the RECOVER Monitoring and Assessment plan (MAP). The revised hydrodynamic model will more closely reflect 3-D salinity conditions and will help determine the importance of stratification and freshwater inflow on salinity and circulation patterns in Biscayne Bay.

54) 1. Sheng, Peter (UF)

2. *Water Body*: Biscayne Bay

3. *Model Name:* ??
4. *Model Type:* CH3D Circulation
5. *Model Domain:*
   a) *Inshore distance:* 12 km
   b) *Offshore distance:* 12 km
   c) *Alongshore distance:* 85 km
6. *Year of Model Development/Application:* 2004/2001
7. *Model Grid:*
   a) *Grid type:* BF Curvilinear
   b) *Grid resolution (min, avg, max):* 200 m / 850 m / 2850m
8. *Purpose of Model:* circulation
9. *Simulation Period:* 30 days
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* No

55) 1. Sheng, Peter (UF)

2. *Water Body*: Caloosahatchee Estuary

3. *Model Name:* ??
4. *Model Type:* CH3D
5. *Model Domain:*
   a) *Inshore distance:* 50 km
   b) *Offshore distance:* 20 km
   c) *Alongshore distance:* 90 km

6. *Year of Model Development/Application:* 1999,2001,2003/1999-2003
7. *Model Grid:*
   a) *Grid type:* BF Curvilinear
   b) *Grid resolution (min, avg, max):* 40 m / 692 m / 3km
8. *Purpose of Model:* for Minimum Flows and Levels
9. *Simulation Period:* 1 yr
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* No
12. *Comments:* an integrated modeling system for estuarine and coastal ecosystems, for SFWMD

56) 1. Sheng, Peter (UF)

2. *Water Body*: Caloosahatchee Estuary

3. *Model Name:* ??
4. *Model Type:* CH3D-IMS
5. *Model Domain:*
   a) *Inshore distance:* 50 km
   b) *Offshore distance:* 20 km
   c) *Alongshore distance:* 90 km
6. *Year of Model Development/Application:* 1999,2001,2003/1999-2003
7. *Model Grid:*
   a) *Grid type:* BF Curvilinear
   b) *Grid resolution (min, avg, max):* 40 m / 692 m / 3km
8. *Purpose of Model:* Water Quality
9. *Simulation Period:* 1 yr
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* No
12. *Comments:* an integrated modeling system for estuarine and coastal ecosystems, for SFWMD

57) 1. Sheng, Peter (UF)

2. *Water Body*: Caloosahatchee Estuary

3. *Model Name:* ??
4. *Model Type:* CH3D-SSMS
5. *Model Domain:*
   a) *Inshore distance:* 50 km
   b) *Offshore distance:* 20 km
   c) *Alongshore distance:* 90 km
6. *Year of Model Development/Application:* 2005/2005, 2006
7. *Model Grid:*
   a) *Grid type:* BF Curvilinear
   b) *Grid resolution (min, avg, max):* 65 m / 450 m/ 1160 m
8. *Purpose of Model:* an integrated storm surge modeling system
9. *Simulation Period:* 5 days
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* Yes
12. *Comments:* Modeling and forecasting of storm surge, wave, and inundation, for SFWMD.

58) 1. Sheng, Peter (UF)

2. *Water Body*: Charlotte Harbor

3. *Model Name: ??*
4. *Model Type:* CH3D

5. *Model Domain:*
   a) *Inshore distance:* 50 km
   b) *Offshore distance:* 20 km
   c) *Alongshore distance:* 90 km
6. *Year of Model Development/Application:* 1999, 2001, 2003/1999-2003
7. *Model Grid:*
   a) *Grid type:* BF Curvilinear
   b) *Grid resolution (min, avg, max):* 40 m / 692 m / 3km
8. *Purpose of Model:* Minimum Flows and Levels
9. *Simulation Period:* 3 months
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* No
12. *Comments:* A 3D model of estuarine and coastal circulation, for SWFWMD.

59) 1. Sheng, Peter (UF)

2. *Water Body*: Charlotte Harbor

3. *Model Name: ??*
4. *Model Type:* CH3D-IMS
5. *Model Domain:*
   a) *Inshore distance:* 50 km
   b) *Offshore distance:* 20 km
   c) *Alongshore distance:* 90 km
6. *Year of Model Development/Application:* 1999, 2001, 2003/1999-2003
7. *Model Grid:*
   a) *Grid type:* BF Curvilinear
   b) *Grid resolution (min, avg, max):* 40 m / 692 m / 3km
8. *Purpose of Model:* Water Quality
9. *Simulation Period:* 3 yr
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* No
12. *Comments:* A 3D model of estuarine and coastal circulation, for SWFWMD.

60) 1. Sheng, Peter (UF)

2. *Water Body*: Charlotte Harbor

3. *Model Name: ??*
4. *Model Type:* CH3D-SSMS
5. *Model Domain:*
   a) *Inshore distance:* 50 km
   b) *Offshore distance:* 50 km
   c) *Alongshore distance:* 100 km
6. *Year of Model Development/Application:* 2005/2004, 2005, 2006
7. *Model Grid:*
   a) *Grid type:* BF Curvilinear
   b) *Grid resolution (min, avg, max):* 40 m / 692 m / 3km
8. *Purpose of Model:* Storm surge
9. *Simulation Period:* 5 days
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* Yes
12. *Comments:* A 3D model of estuarine and coastal circulation, for SWFWMD.

61) 1. Sheng, Peter (UF)

2. *Water Body*: East Florida Coast, East Florida Shelf, Guana-Tolomato-Matanzas NERR, Indian River Lagoon, and St. Johns River

3. *Model Name:* ??
4. *Model Type:* CH3D-SSMS
5. *Model Domain:*
   a) *Inshore distance:* 85 km
   b) *Offshore distance:* 45 km
   c) *Alongshore distance:* 440 km
6. *Year of Model Development/Application:* 2005/2004, 2005, 2006
7. *Model Grid:*
   a) *Grid type:* BF Curvilinear
   b) *Grid resolution (min, avg, max):* 65 m / 450 m/ 1160 m
8. *Purpose of Model:* Storm surge
9. *Simulation Period:* 5 days
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* Yes
12. *Comments:* Development of an Interoperable "Service Oriented Architecture" for Regional Coastal Ocean (Storm Surge) Prediction; SURA, ONR, NOAA.

62) 1. Sheng, Peter (UF)

2. *Water Body*: Guana-Tolomato-Matanzas National Estuarine Research Reserve

3. *Model Name:* ??
4. *Model Type:* CH3D
5. *Model Domain:*
   a) *Inshore distance:* 10 km
   b) *Offshore distance:* 27 km
   c) *Alongshore distance:* 137 km
6. *Year of Model Development/Application:* 2005/2004-2006
7. *Model Grid:*
   a) *Grid type:* Curvilinear
   b) *Grid resolution (min, avg, max):* 65m / 550 m/ 848 m
8. *Purpose of Model:* Circulation/Dispersal
9. *Simulation Period:* 2 months
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* No
12. *Comments:* for National Science Foundation

63) 1. Sheng, Peter (UF)

2. *Water Body*: Indian River Lagoon

3. *Model Name:* ??
4. *Model Type: CH3D-IMS*
5. *Model Domain:*
   a) *Inshore distance:* 20 km
   b) *Offshore distance:* n/a
   c) *Alongshore distance:* 230 km
6. *Year of Model Development/Application:* 1996-2001/1997-1999

7. *Model Grid:* the entire Indian River Lagoon Estuarine System which includes the Mosquito Lagoon, Indian River Lagoon, Banana River, and St. Lucie Estuary. Four tidal inlets are included in the system: Ponce de Leon, Sebastian, Ft. Pierce, and St. Lucie.
   a) *Grid type:* BF Curvilinear
   b) *Grid resolution (min, avg, max):* 45 m / 400 m / 1.5 km
8. *Purpose of Model:* Water quality, to determine pollutant load reduction goals
9. *Simulation Period:* 1 yr
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* No
12. *Comments:* for SJRWMD & FWC

64) 1. Sheng, Peter (UF)

2. *Water Body*: Northwest Florida Coast

3. *Model Name:*
4. *Model Type:* CH3D-SSMS
5. *Model Domain:*
   a) *Inshore distance:* 70 km
   b) *Offshore distance:* 280 km
   c) *Alongshore distance:* 830 km
6. *Year of Model Development/Application: 2005-2007/2005,2006*
7. *Model Grid:*
   a) *Grid type:* BF Curvilinear
   b) *Grid resolution (min, avg, max):* 110 m / 1430 m / 5km
8. *Purpose of Model:* Storm surge
9. *Simulation Period:* 5 days
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* Yes
12. *Comments: For U.S. DOT*

65) 1. Sheng, Peter (UF)

2. *Water Body*: Sarasota Bay

3. *Model Name:* ***??***
4. *Model Type:* CH3D and CH3D-IMS
5. *Model Domain:*
   a) *Inshore distance:* 6 km
   b) *Offshore distance:* 15 km
   c) *Alongshore distance:* 80 km
6. *Year of Model Development/Application:* 1990-1995/1990-1992
7. *Model Grid:*
   a) *Grid type:* BF Curvilinear
   b) *Grid resolution (min, avg, max):* 17 m / 77 m / 3.6 km
8. *Purpose of Model:* (CH3D) Circulation and (CH3D-IMS) water quality, impact of nitrogen load reduction, larval tracking
9. *Simulation Period:* 3 months
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* No
12. *Comments:* for Sarasota Bay National Estuary Program, SWFWMD, FWC

66) 1. Sheng, Peter (UF)

2. *Water Body*: Suwannee River, estuary, and coastal waters

3. *Model Name:* ??
4. *Model Type:* CH3D
5. *Model Domain:*
   a) *Inshore distance:* ??
   b) *Offshore distance:* ??
   c) *Alongshore distance:* ??
6. *Year of Model Development/Application:* under development
7. *Model Grid:*
   a) *Grid type:* ??
   b) *Grid resolution (min, avg, max):* ??
8. *Purpose of Model:* couple the entire Suwannee watershed with the estuary and the coastal waters in the Gulf
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??
12. *Comments:* will be coupling the models with the Navy Gulf of Mexico model for baroclinic calculation and our own unstructured grid model for barotropic calculation.

67) 1. Sheng, Peter (UF)

2. *Water Body*: Northern Gulf of Mexico

3. *Model Name:* ??
4. *Model Type:* CH3D-SSMS
5. *Model Domain:*
   a) *Inshore distance:* 70 km
   b) *Offshore distance:* 155 km
   c) *Alongshore distance:* 550 km
6. *Year of Model Development/Application:* 2005-2007/2005,2006
7. *Model Grid:*
   a) *Grid type:* BF Curvilinear
   b) *Grid resolution (min, avg, max):* 66 m / 570 m / 2.6km
8. *Purpose of Model:* Storm surge
9. *Simulation Period:* 5 days
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* Yes
12. *Comments:* As part of the CH3D-SSMS system, UF has been using ADCIRC and has developed a 2D and 3D unstructured-grid circulation model, using finite volume technique and locally conservative Eulerian-Lagrangian method for the advection terms. This large scale model will produce the open boundary conditions for the CH3D model used for the high resolution coastal grids

68) 1. Sheng, Peter (UF)

2. *Water Body*: St. Johns River

3. *Model Name:* ??
4. *Model Type:* CH3D
5. *Model Domain:*
   a) *Inshore distance:* 140 km
   b) *Offshore distance:* 10 km
   c) *Alongshore distance:* 15 km
6. *Year of Model Development/Application:* 2002,2005/1998

7. *Model Grid:*
   a) *Grid type:* BF Curvilinear
   b) *Grid resolution (min, avg, max):* 55 m / 490 m / 2km
8. *Purpose of Model:* Circulation
9. *Simulation Period:* 1 yr
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* No
12. *Comments:* CH1D Circulation and NBC Dispersion - Oak Ridge National Laboratory and DTRA

69) 1. Sheng, Peter (UF)

2. *Water Body*: Tampa Bay

3. *Model Name:*
4. *Model Type:* CH3D-IMS
5. *Model Domain:*
   a) *Inshore distance:* 50 km
   b) *Offshore distance:* 16 km
   c) *Alongshore distance:* 120 km
6. *Year of Model Development/Application:* 1994-2002/1990-1992
7. *Model Grid:*
   a) *Grid type:* BF Curvilinear
   b) *Grid resolution (min, avg, max):* 105 m / 620 m / 1600 m
8. *Purpose of Model:* Water quality, light attenuation, and seagrass
9. *Simulation Period:* 1 yr
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* No
12. *Comments:* for Tampa Bay Estuary Program

70) 1. Sheng, Peter (UF)

2. *Water Body*: Tampa Bay

3. *Model Name:*
4. *Model Type:* CH3D-SSMS
5. *Model Domain:*
   a) *Inshore distance:* 50 km
   b) *Offshore distance:* 25 km
   c) *Alongshore distance:* 120 km
6. *Year of Model Development/Application:* 2005/2004,2005,2006
7. *Model Grid:*
   a) *Grid type:* BF Curvilinear
   b) *Grid resolution (min, avg, max):* 27 m / 370 m / 11 50 m
8. *Purpose of Model:* Storm surge
9. *Simulation Period:* 5 days
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* Yes
12. *Comments:*

71) 1. Sheng, Peter (UF)

2. *Water Body*: Tampa Bay

3. *Model Name:* ??
4. *Model Type:* CH3D-SSMS
5. *Model Domain:*

a) Inshore distance: 50 km
b) Offshore distance: 20 km
c) Alongshore distance: 120 km

6. *Year of Model Development/Application:* 2002/2003-2006
7. *Model Grid:*
   a) Grid type: BF Curvilinear
   b) Grid resolution (min, avg, max): 27 m / 370 m / 11 50 m
8. *Purpose of Model:* Flood mapping
9. *Simulation Period:* 5 days
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* No
12. *Comments:* Coupled 2-D surge (CH3D)-wave (SWAN) modeling system. High resolution LIDAR topography data was used in conjunction with the NGDC bathymetry data and FDEP beach profile data. Worked with Pinellas County and FEMA to include wave effect in flood insurance rate map for Pinellas County.

72) 1. Sheng, Peter (UF)

2. *Water Body*: Estero Bay

3. *Model Name:* ??
4. *Model Type:* CH3D and CH3D-IMS
5. *Model Domain:*
   a) Inshore distance: 50 km
   b) Offshore distance: 50 km
   c) Alongshore distance: 100 km
6. *Year of Model Development/Application:* 1999, 2001, 2003/? ???
7. *Model Grid:*
   a) Grid type: BF Curvilinear
   b) Grid resolution (min, avg, max): 33 m /670 m/ 2.8km
8. *Purpose of Model:* (CH3D) Minimum Flows and Levels and (CH3D-IMS) water quality
9. *Simulation Period:* 3 yr
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* No
12. *Comments:*

73) 1. Sheng, Peter (UF)

2. *Water Body*: Florida Bay

3. *Model Name:* ??
4. *Model Type:* CH3D
5. *Model Domain:*
   a) Inshore distance: 55 km
   b) Offshore distance: 10 km
   c) Alongshore distance: 75 km
6. *Year of Model Development/Application:* 1995/1993-1995
7. *Model Grid:*
   a) Grid type: BFCurvilinear
   b) Grid resolution (min, avg, max): 40 m/ 300m/ 1km
8. *Purpose of Model:* Tides and Circulation
9. *Simulation Period:* 3 months
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* No

12. *Comments:* for National Park Service

74) 1. Sucsy, Pete (SJRWMD) with FDEP and U.S.ACE

2. *Water Body*: Lower SJR basin

3. *Model Name:* ??
4. *Model Type:* 3-D hydrodynamic model
5. *Model Domain:*
   a) *Inshore distance:* ??
   b) *Offshore distance:* ??
   c) *Alongshore distance:* ??
6. *Year of Model Development/Application:* under development
7. *Model Grid:*
   a) *Grid type:* ??
   b) *Grid resolution (min, avg, max):* ??
8. *Purpose of Model:* ??
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??
12. *Editor's comments:* A description of the various water quality monitoring efforts currently under way within the LSJRB is presented in the LSJRB Water Quality Monitoring Program Atlas, a publication of the District.

75) 1. Sucsy, Pete and Morris (SJRWMD)

2. *Water Body*: Lower St. Johns River

3. *Model Name:* St. John's River Operational Forecast System (SJROFS)
4. *Model Type:* EFDC hydrodynamic model
5. *Model Domain:* extends from the Atlantic Ocean to the upstream boundary at Buffalo Bluff.
   a) *Inshore distance: ??*
   b) *Offshore distance: ??*
   c) *Alongshore distance: ??*
6. *Year of Model Development/Application:* 2001
7. *Model Grid:* 2,210 water cells are embedded within a transformed 188 x 105 rectangular computational grid
   a) *Grid type:* orthogonal, boundary-fitted, structured grid
   b) *Grid resolution (min, avg, max):* Cell length sizes range from 2,040 m to 81 m. there are six stretched, sigma vertical layers.
8. *Purpose of Model:* simulate the period of 1/1/1995 – 11/30/1998
9. *Simulation Period: ??*
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* No
12. *Comments:* Linked to a WQ model for the lower St. Johns River. To facilitate the development of a nowcast/forecast system for the Coastal Storms Initiative, the SJRWMD model was transferred to the Coast Survey Development Laboratory for adjustments so that operational nowcasts and forecasts could be made.

76) 1. Sucsy, Pete and Stewart (SJRWMD)

2. *Water Body*: Sebastian River and adjacent Indian River

3. *Model Name:* ***??***
4. *Model Type:* 3-D hydrodynamic and salinity model
5. *Model Domain:*

a) Inshore distance: ??
b) Offshore distance: ??
c) Alongshore distance: ??

6. *Year of Model Development/Application:* 2004
7. *Model Grid:*
   a) Grid type: ??
   b) Grid resolution (min, avg, max): ??
8. *Purpose of Model:* study the effects of freshwater inflows, and to set guidelines for management of future freshwater discharges
9. *Simulation Period: ??*
10. *Validation with Data?: ??*
11. *Used for Forecasting?: ??*
12. *Comments:*

77) 1. Taylor Engineering

2. *Water Body*: St. Augustine Inlet

3. *Model Name:* ??
4. *Model Type:* 2-D
5. *Model Domain:*
   a) Inshore distance: ??
   b) Offshore distance: ??
   c) Alongshore distance: ??
6. *Year of Model Development/Application:* ??
7. *Model Grid:*
   a) Grid type: ??
   b) Grid resolution (min, avg, max): ??
8. *Purpose of Model:* for evaluation of erosion/shoaling in St. Augustine Inlet
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??
12. *Comments:* as part of the inlet management plan

78) 1. Unknown

2. *Water Body*: Apalachicola Bay

3. *Model Name:* ??
4. *Model Type:* complete 3-D hydrodynamic
5. *Model Domain:*
   a) Inshore distance: ??
   b) Offshore distance: ??
   c) Alongshore distance: ??
6. *Year of Model Development/Application:* mid-1990s
7. *Model Grid:*
   a) Grid type: ??
   b) Grid resolution (min, avg, max): ??
8. *Purpose of Model:* circulation
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??

12. *Comments:* Per Lee Edmiston (Apalachicola Nat'l Estuarine Research Reserve): an older model of Apalachicola Bay circulation from the mid-90's, based on data collected by the NWFWMD and Apalachicola NERR.

79) 1. U.S. Army Corps of Engineers

2. Water Body: South Florida

3. *Model Name:* Natural Systems Model (Watershed)
4. *Model Type:* ??
5. *Model Domain:*
   a) *Inshore distance:* ??
   b) *Offshore distance:* ??
   c) *Alongshore distance:* ??
6. *Year of Model Development/Application:* ??
7. *Model Grid:*
   a) *Grid type:* ??
   b) *Grid resolution (min, avg, max):* ??
8. *Purpose of Model:* estimate hydrologic conditions in various watersheds with and without canals and other human structures
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??
12. *Comments:* Part of the SW Florida Feasibility Study

80) 1. Vansant; (M.S. Thesis, FSU)

2. *Water Body*: Apalachicola Bay

3. *Model Name:* ??
4. *Model Type:* numerical model
5. *Model Domain:*
   a) *Inshore distance:* ??
   b) *Offshore distance:* ??
   c) *Alongshore distance:* ??
6. *Year of Model Development/Application:* 1980
7. *Model Grid:*
   a) *Grid type:* ??
   b) *Grid resolution (min, avg, max):* ??
8. *Purpose of Model:* tidal currents
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??
12. *Comments:*

81) 1. Walsh, John (USF)

2. *Water Body*: West Florida Shelf

3. *Model Name:* ***??***
4. *Model Type:* an adaptation of the Regional Ocean Modeling System (ROMS) circulation model, nested within the 1/12 degree Hybrid Coordinate Ocean Model (HYCOM)
5. *Model Domain:*
   a) *Inshore distance: ??*
   b) *Offshore distance: ??*
   c) *Alongshore distance: ??*

6. *Year of Model Development/Application:*
7. *Model Grid:*
   a) Grid type: ??
   b) Grid resolution (min, avg, max): ??
8. *Purpose of Model:* red tide prediction
9. *Simulation Period: ??*
10. *Validation with Data?: ??*
11. *Used for Forecasting?: ??*
12. *Comments:* To deal with the nearshore boundary conditions of nutrients and their seaward transfer, he is also implementing an adaptation of Bob Weisbergs finite volume coastal ocean model. Many of John's PhD students have also developed models of various subcomponents of his larger models (e.g. Jason Lenes-*Trichodesmium* dynamics, Brian Darrow-benthic pelagic coupling).

82) 1. Wang, John & Helena Solo-Gabriele (UM, RSMAS/AMP)

2. *Water Body*: Biscayne Bay & Hobie Cat Beach

3. *Model Name:* CAFE with microbes
4. *Model Type:* Hi-res finite element hydrodynamic model with fate and transport. 2D application of 3D terrain following vertical coordinate model.
5. *Model Domain:*
   a) Inshore distance: To shoreline
   b) Offshore distance: 5 km
   c) Alongshore distance: 100 km
6. *Year of Model Development/Application:* underway
7. *Model Grid:*
   a) Grid type: Finite Element
   b) Grid resolution (min, avg, max): 15 m/200 m/3000 m
8. *Purpose of Model:* assess human health risks and environmental effects on microbial pollution in recreational marine waters (beach area)
9. *Simulation Period:* 1965 - 2005
10. *Validation with Data?:* Yes
11. *Used for Forecasting?:* Have not, but could be
12. *Comments:* This work is part of a project within the NIEHS and NSF supported Oceans and Human Health Center of the University of Miami with cooperation from NOAA and Fl Dept of Health.

83) 1. Weisberg, Robert H., Lianyuan Zheng, Alex Barth, and Aida Alvera (*Ocean Circulation Group*, USF)

2. Water Body: Tampa Bay, Charlotte Harbor, and West Florida Shelf

3. *Model Name:* Finite Volume Coastal Ocean Model (FVCOM)
4. *Model Type:* finite difference model with a sigma coordinate in the vertical; 3-D, baroclinic, and mass conserving
5. *Model Domain:*
   a) Inshore distance: ??
   b) Offshore distance: ??
   c) Alongshore distance: ??
6. *Year of Model Development/Application:* 2003, 2004
7. *Model Grid:*
   a) Grid type: ??
   b) Grid resolution (min, avg, max): min <500 m
8. *Purpose of Model:* ??
9. *Simulation Period:* ??

10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??
12. *Comments:* To link the WFS with the major estuaries, in particular Tampa Bay and Charlotte Harbor, we use the Finite Volume Coastal Ocean Model (FVCOM). With unstructured triangular grids in the horizontal the FVCOM allows us to include the estuaries at high resolution (presently less than 500m in Tampa Bay and Charlotte Harbor) without nesting. As a finite difference model with a sigma coordinate in the vertical FVCOM is 3-D, baroclinic, and mass conserving. The model is forced by tides, river discharges, winds, and heat fluxes. We are experimenting with nesting in HYCOM to provide open boundary values and hence the effects of the Loop Current on the WFS as in our West Florida Shelf model. A 2004 case study was provided to the Florida Fish and Wildlife Research Institute for a habitat suitability modeling study (Rubec et al., 2005).

84) 1. Weisberg, Robert H., Lianyuan Zheng, Alex Barth, and Aida Alvera (*Ocean Circulation Group*, USF)

2. *Water Body*: Charlotte Harbor estuary system, inclusive of the Caloosahatchee River, Estero Bay, and the adjacent Gulf of Mexico

3. *Model Name:* ECOM_si
4. *Model Type:* 3-D, baroclinic
5. *Model Domain:*
   a) *Inshore distance: ??*
   b) *Offshore distance: ??*
   c) *Alongshore distance: ??*
6. *Year of Model Development/Application:* 2001
7. *Model Grid:*
   a) *Grid type: ??*
   b) *Grid resolution (min, avg, max): ??*
8. *Purpose of Model: ??*
9. *Simulation Period: ??*
10. *Validation with Data?: ??*
11. *Used for Forecasting?: ??*
12. *Comments:* The model is forced by tides, freshwater discharges, and winds.

85) 1. Weisberg, Robert H, Lianyuan Zheng, Alex Barth, and Aida Alvera (*Ocean Circulation Group*, USF)

2. *Water Body*: Tampa Bay, Sarasota Bay, Manatee River, Pinellas Co. ICW, and the adjacent WFS

3. *Model Name:* FVCOM
4. *Model Type:* 3-D, baroclinic
5. *Model Domain:*
   a) *Inshore distance:* ??
   b) *Offshore distance:* ??
   c) *Alongshore distance:* ??
6. *Year of Model Development/Application:* 2004
7. *Model Grid:*
   a) *Grid type:* ??
   b) *Grid resolution (min, avg, max):* ??
8. *Purpose of Model:* describe the Tampa Bay circulation as driven by rivers, tides, and winds
9. *Simulation Period:* ??
10. *Validation with Data?:* ??

11. *Used for Forecasting?:* ??
12. *Comments:* This model also includes the intracoastal waterways, the four bridge causeways, plus Sarasota Bay and the Manatee River. Results for Tampa Bay are given in Weisberg and Zheng (2006).

86) 1. Weisberg, Robert H. and Lianyuan Zheng (*Ocean Circulation Group,* USF)

2. *Water Body*: Rookery Bay, Naples Bay, and Henderson Creek, inclusive of the bounding Gulf of Mexico

3. *Model Name:* FVCOM
4. *Model Type:* 3-D, baroclinic
5. *Model Domain:*
   a) Inshore distance: ??
   b) Offshore distance: ??
   c) Alongshore distance: ??
6. *Year of Model Development/Application:* 2006
7. *Model Grid:*
   a) Grid type: ??
   b) Grid resolution (min, avg, max): max = 150m; min = 10m
8. *Purpose of Model:* predict salinity variations resulting from freshwater inflow scenarios
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* Yes
12. *Comments:* The resolution is 150 m at the open boundary and increases to 10 m in Henderson Creek.

87) 1. Weisberg, Robert H., Alex Barth, Aida Alvera, and Lianyuan Zheng (Ocean Circulation Group, USF)

2. *Water Body*: Eastern Gulf of Mexico and West Florida Continental Shelf (WFS)

3. *Model Name:* Regional Ocean Model System (ROMS) nested in the 1/12° Atlantic Hybrid Coordinate Ocean Model (HYCOM)
4. *Model Type:* 3-D, baroclinic nowcast/forecast circulation model; ROMS is a hydrostatic, 3-D, primitive equation, free surface model using an s-coordinate in the vertical
5. *Model Domain:* from west of the Mississippi River to the Florida Keys
   a) Inshore distance: ??
   b) Offshore distance: ??
   c) Alongshore distance: ??
6. *Year of Model Development/Application:* 2004
7. *Model Grid:*
   a) Grid type: ??
   b) Grid resolution (min, avg, max): ~4 km near coast
8. *Purpose of Model:* Circulation
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* Yes
12. *Comments:* The WFS ROMS model bathymetry is based on the ETOPO5 with modifications to correct certain deficiencies. The horizontal curvilinear grid has a resolution of ~ 4 km near the coast. To account for deep-ocean effects, particularly by the Gulf of Mexico Loop Current, this regional model is nested in the data assimilative HYCOM maintained by the Naval Research Laboratory. The regional model is further driven by winds, heat flux and rivers. Nowcast/forecasts for model state variables including particle trajectory simulations are available at http://ocgweb.marine.usf.edu. The model is also used for hindcast studies.

The present WFS ROMS/HYCOM model evolved from previous applications of the Princeton Ocean Model (POM) with a similar regional domain. Numerous hindcast studies were published with quantitative comparisons made against available observing system data. A review of these (Weisberg et al., 2005) is available.

88) 1. Weisberg, Robert H., Lianyuan Zheng, Alex Barth, and Aida Alvera (USF)

2. *Water Body*: Eastern Gulf of Mexico and West Florida Shelf

3. *Model Name:* FVCOM
4. *Model Type:* finite difference, 3-D, baroclinic
5. *Model Domain:*
   a) *Inshore distance:* ??
   b) *Offshore distance:* ??
   c) *Alongshore distance:* ??
6. *Year of Model Development/Application:* ??
7. *Model Grid:*
   a) *Grid type:* uses unstructured grids horizontally but solves the equations of motion by finite difference and hence is mass conserving in its 3-D, baroclinic usage
   b) *Grid resolution (min, avg, max):* ??
8. *Purpose of Model:* For higher resolution over the inner shelf and the estuaries
9. *Simulation Period:* ??
10. *Validation with Data?:* ??
11. *Used for Forecasting?:* ??
12. *Comments:* This FVCOM construct also has provision for a biological sub-model. Both the ROMS/HYCOM and the FVCOM models have provision for fully 3-D Lagrangian particle tracking.

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