SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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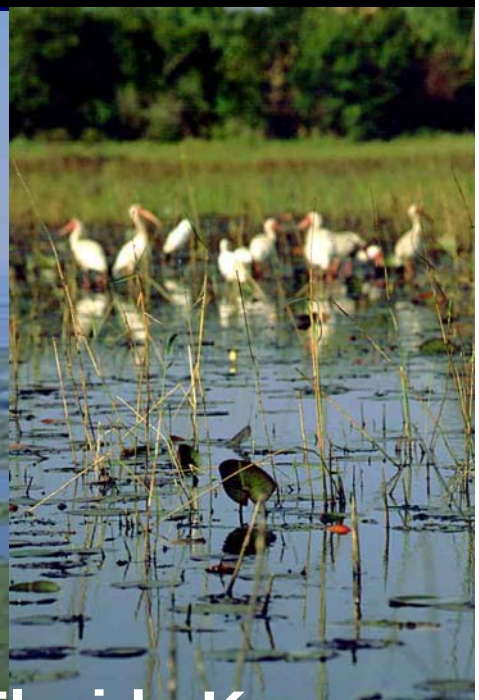
Evaluation of CERP Restoration Scenarios

Linking Regional, Coastal, Hydrodynamic and Trophic Models

Michael Kohler, M.S., GISP
Lead GIS Specialist
MARCO Water Engineering
CERP GIS Contractor, SFWMD



Foreword

This presentation is about the Florida Bay Florida Keys Feasibility Study being done for CERP. The focus of the slides are on the general aspects of the models and the processes used to display model output.

The presenter is a contractor and not a representative of SFWMD and will make every attempt to answer general questions about the FBFKFS methodology. The results of the FBFKFS modeling and output will not be shown or discussed.

CERP Restoration Scenarios

- Produce a cascade of models that describe the natural systems of Florida Bay and Everglades National Park.
- Link the regional system models to smaller sub-regional models.
- Link trophic models to sub-regional models to evaluate effects of regional system on Florida Bay and ENP.

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Models Used For FBFKFS

SFWMD RSM
SFWMD SFWMM
USGS TIME
EFDC Hydrodynamic
EFDC Water Quality
HYCOM Model
Seagrass
Pink Shrimp
Lobster
Fish
Birds

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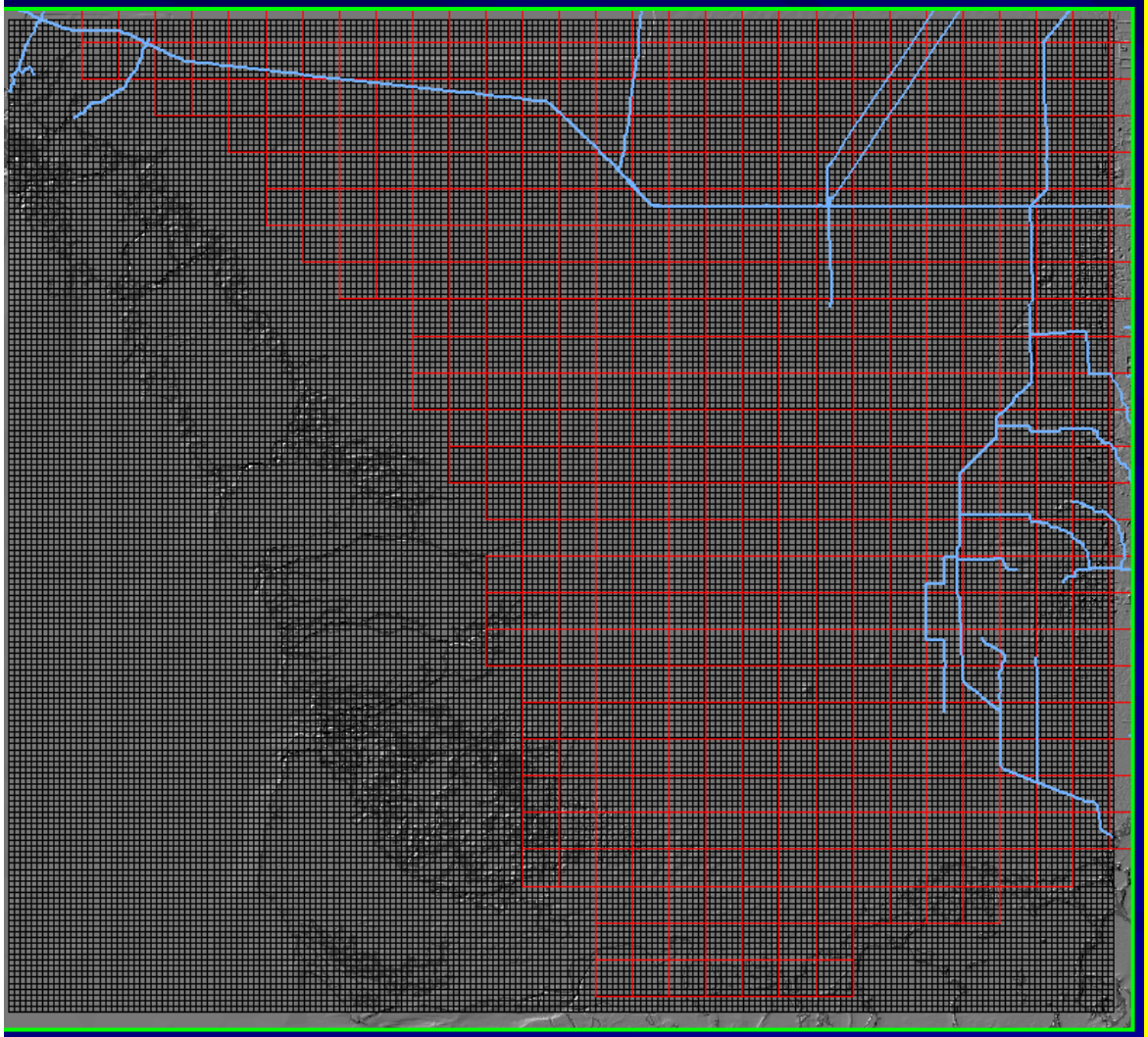
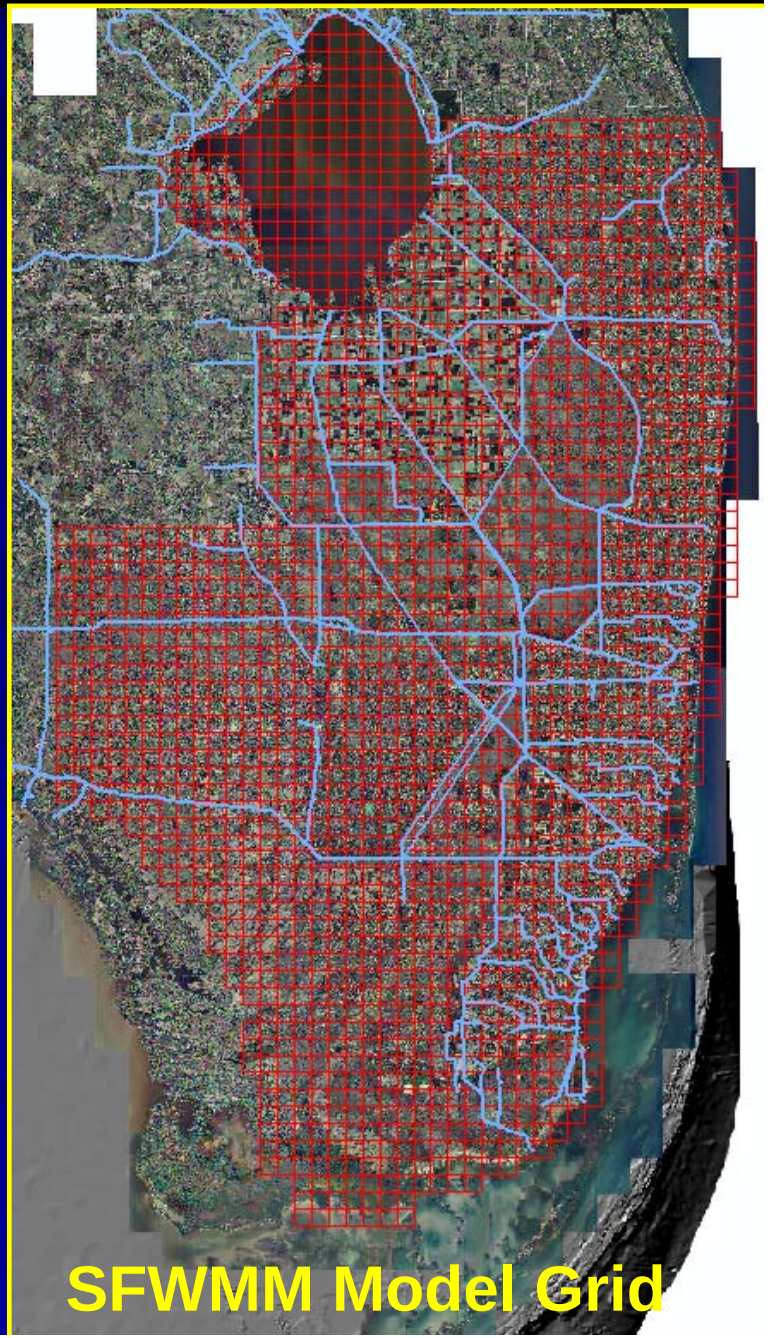
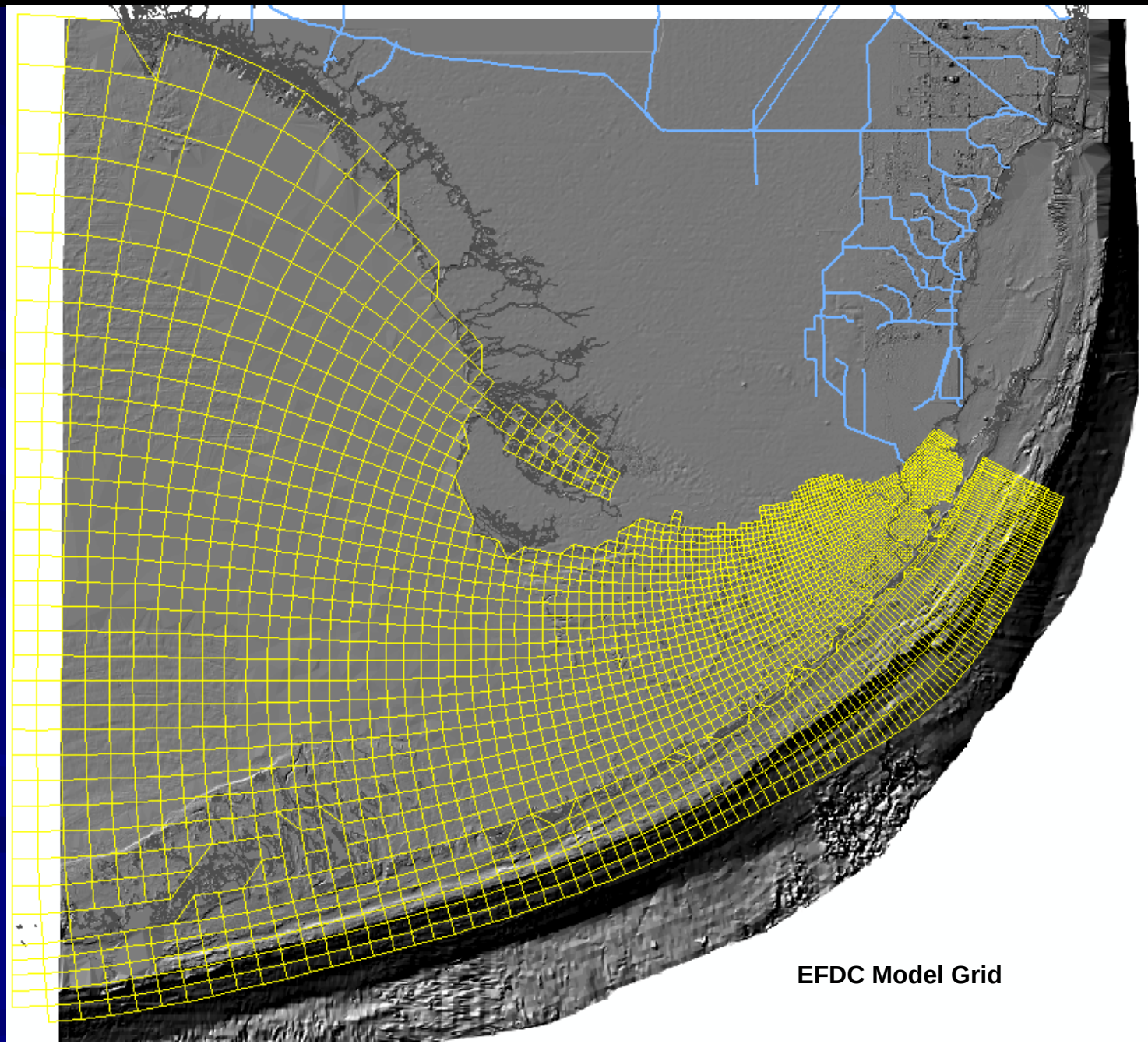


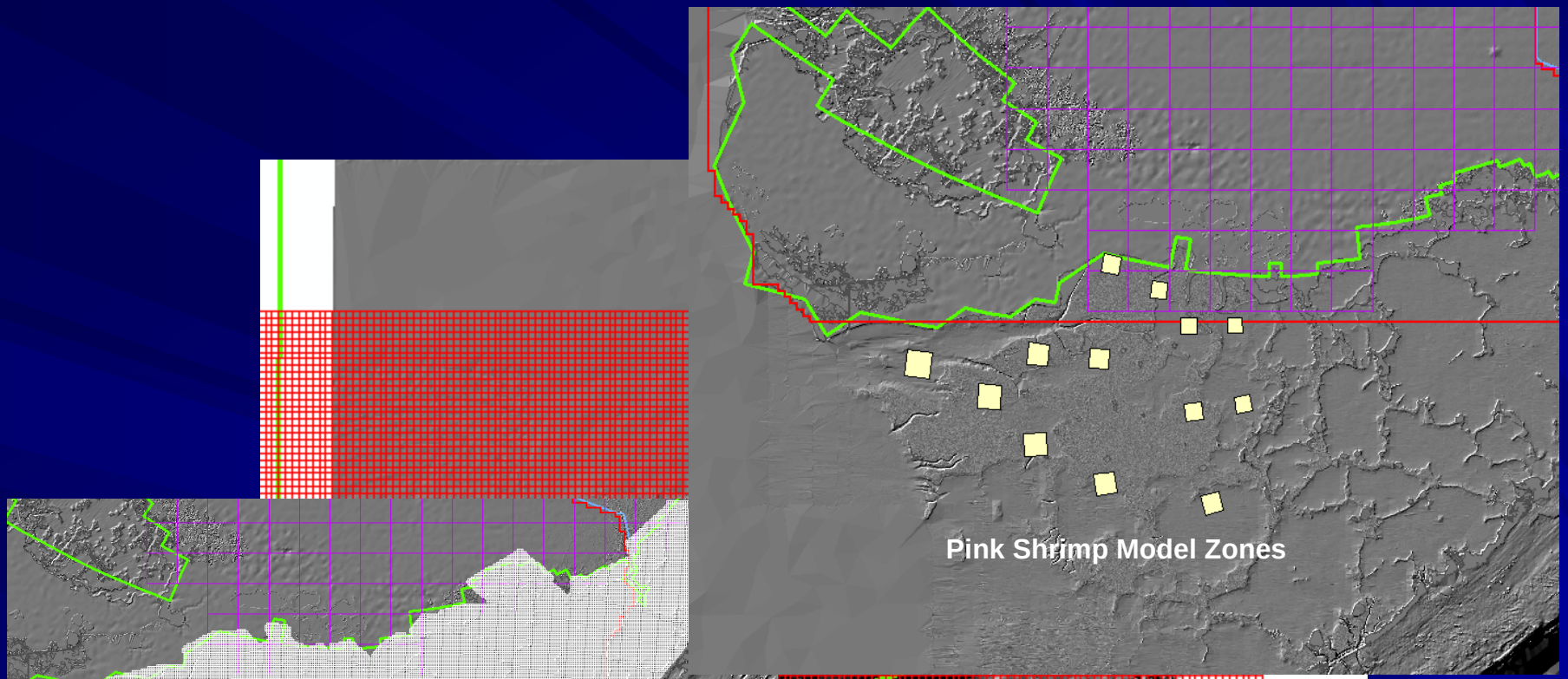
TIME Model Grid

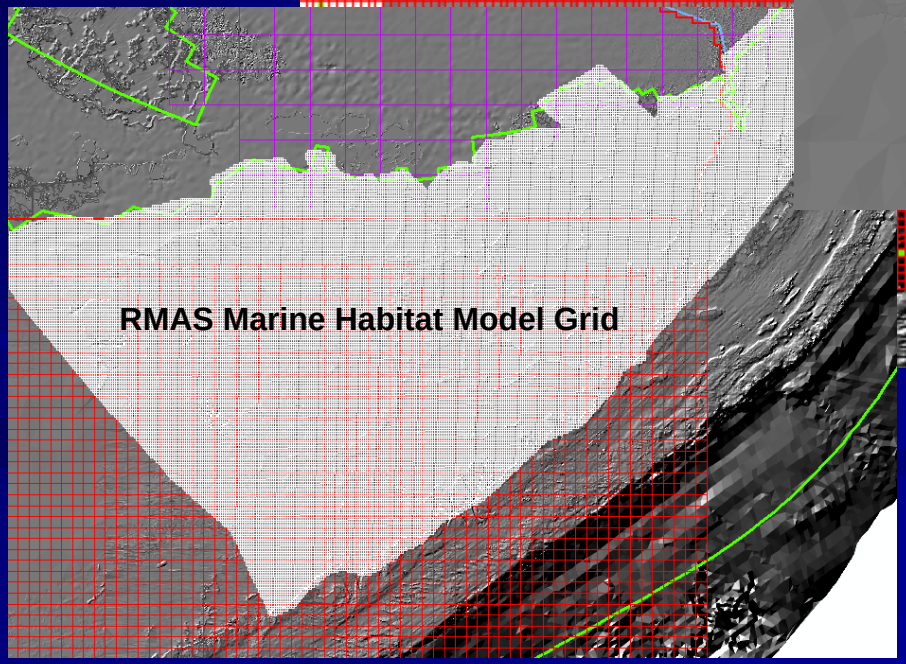


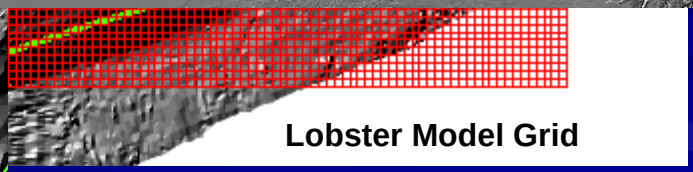
SFWMM Model Grid



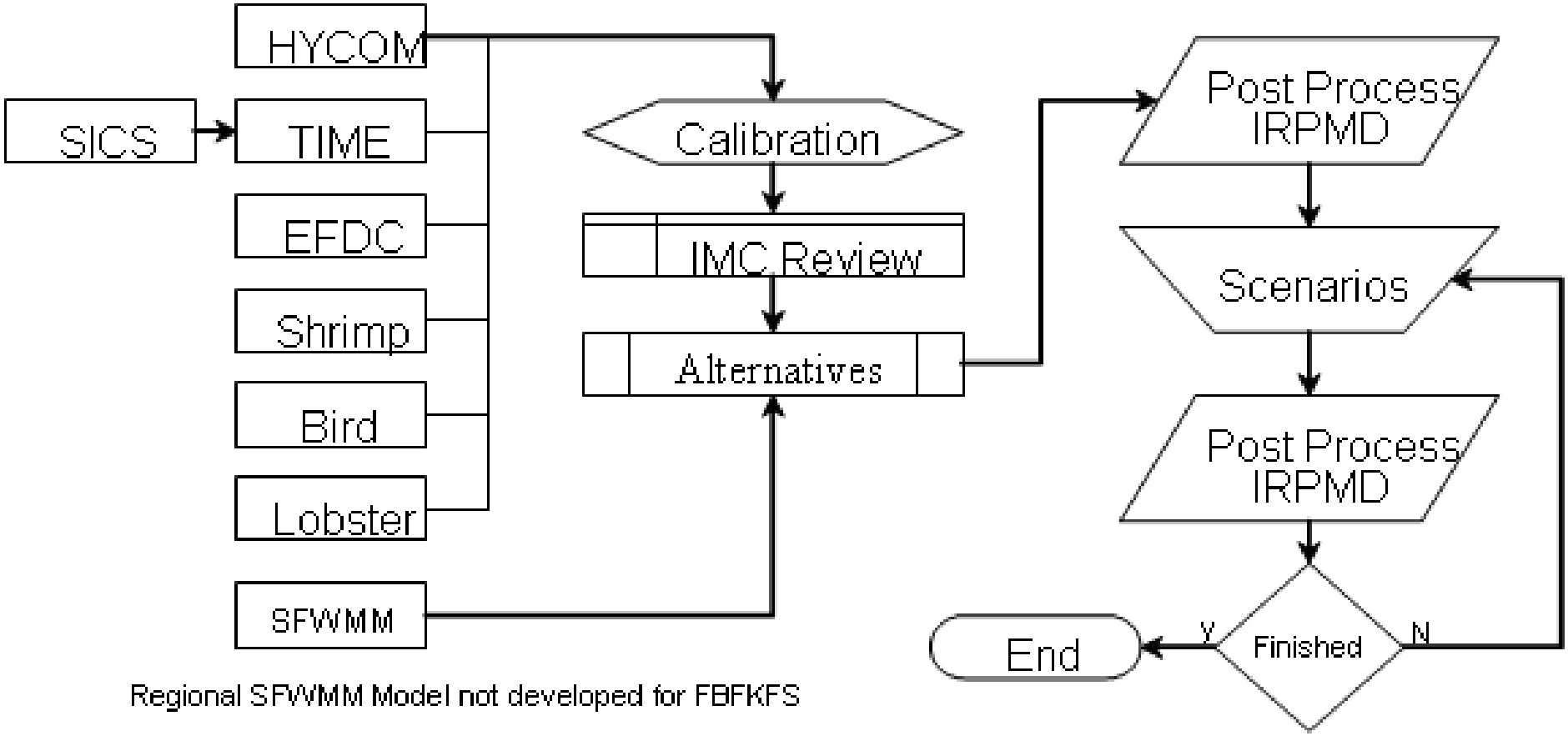
EFDC Model Grid


Pink Shrimp Model Zones


RMAS Marine Habitat Model Grid


Lobster Model Grid

FBFKFS Modeling Process



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Model Interactions

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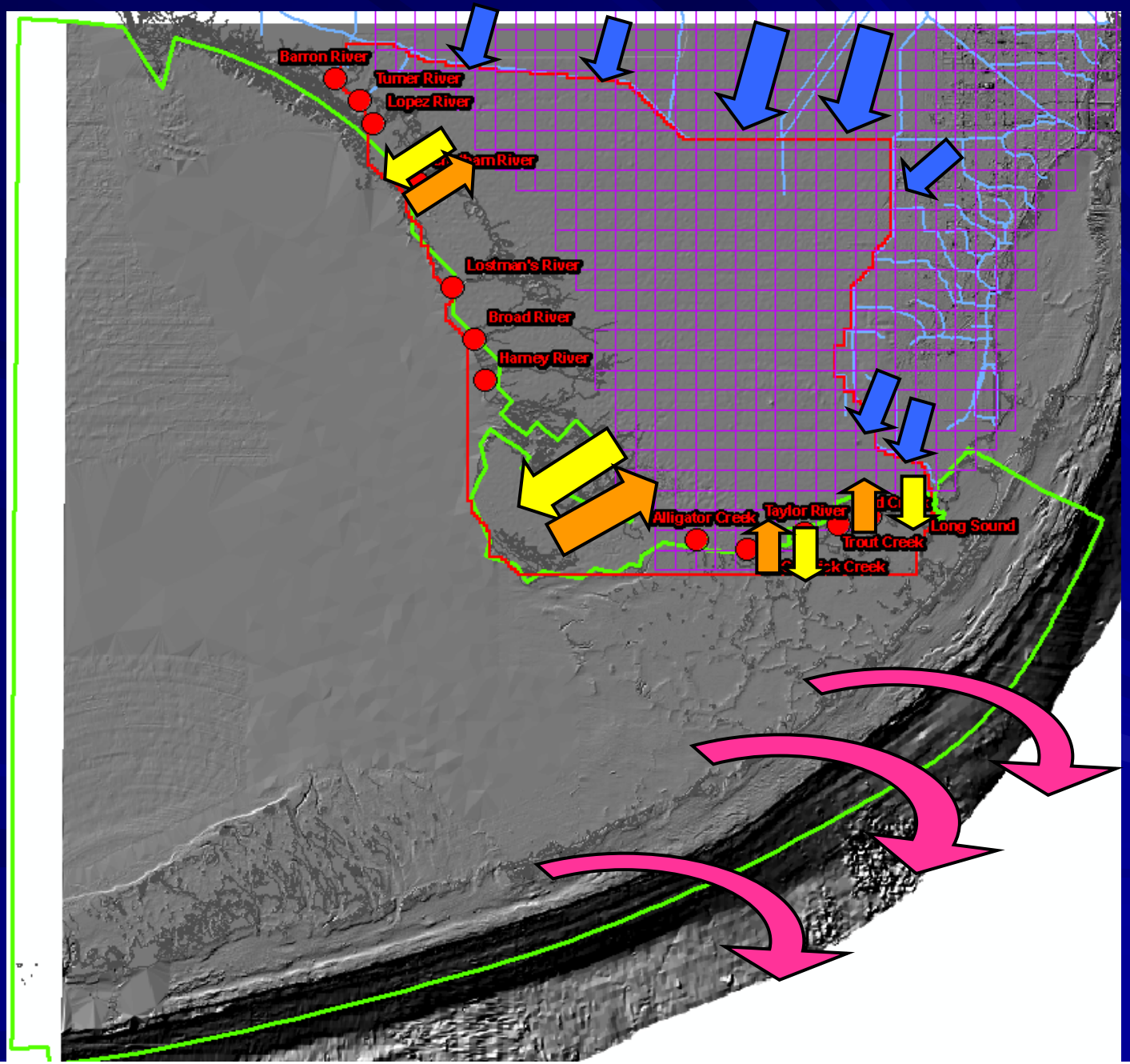


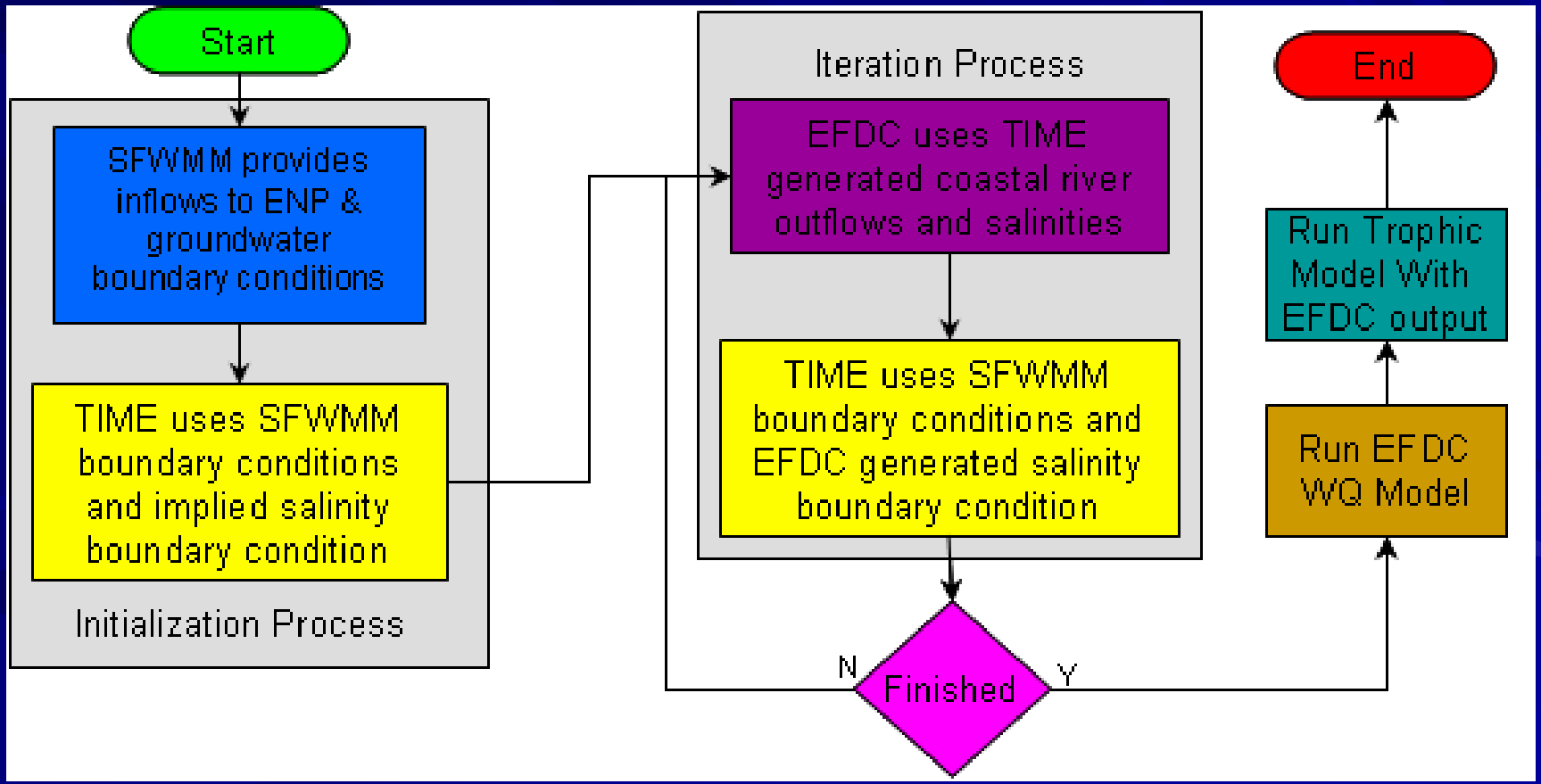
SFWMM Inputs

TIME Outputs
EFDC Inputs

EFDC Outputs
TIME Inputs

EFDC Output
Trophic Input

FBFKFS Iteration Process



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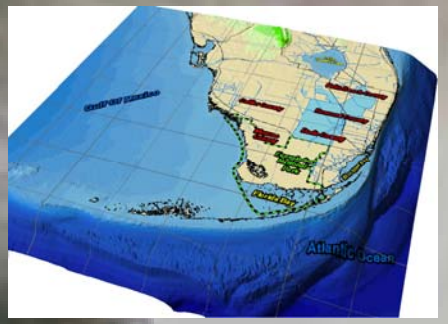
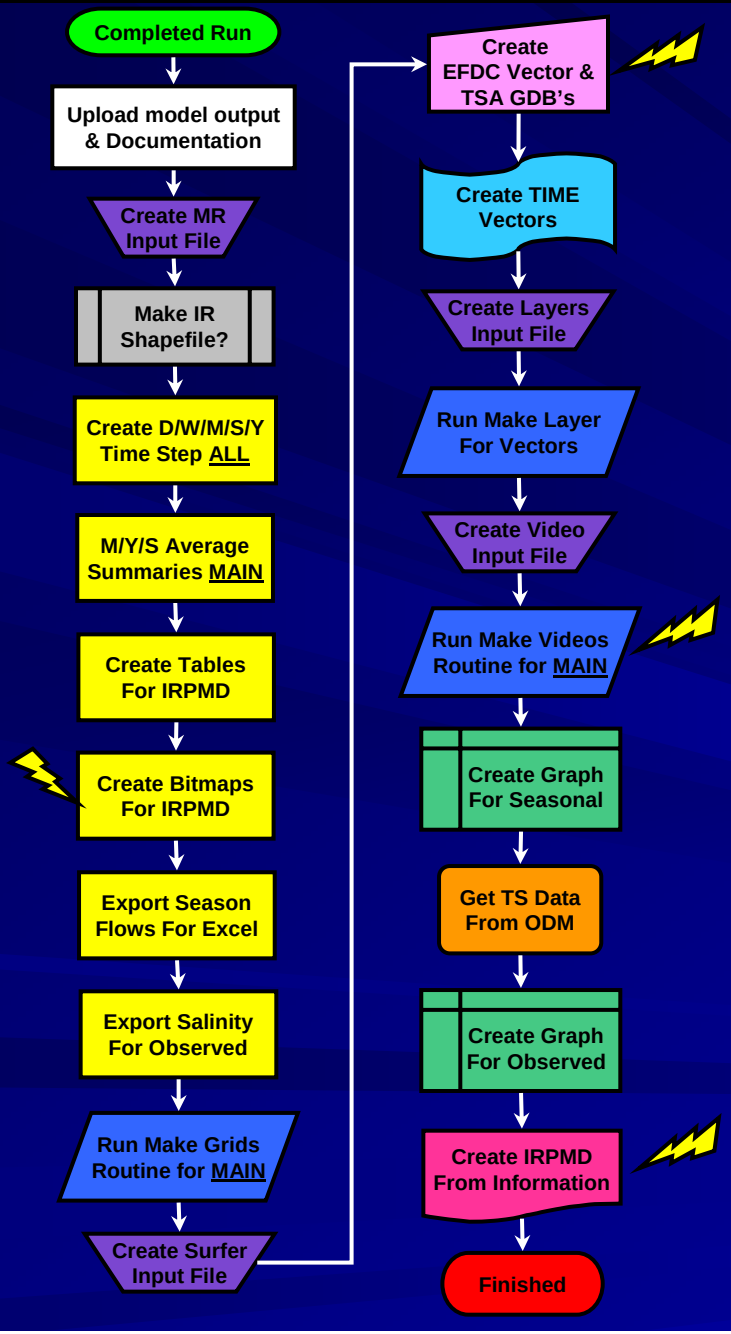
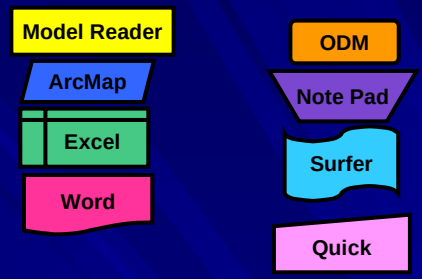


Indicator Region Performance Measure Document Creation And Model Post Processing



ALL Parameters
EFDC: TBD
TIME: TBD

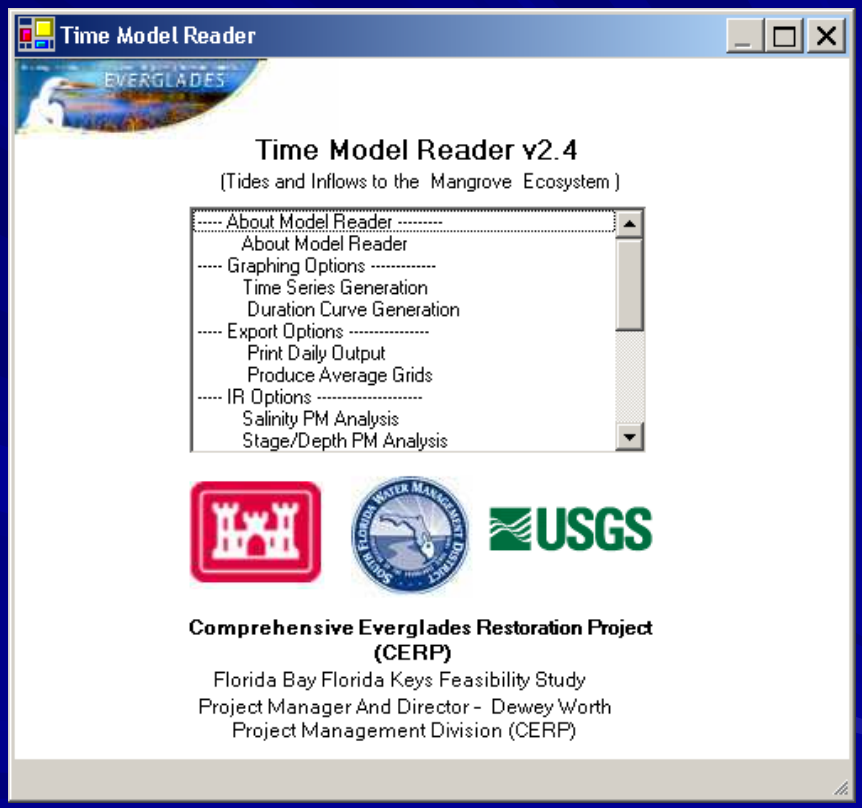
MAIN Parameters
EFDC: Sal, Temp, FLX, FLY,SGRS
TIME: Sal, Depth, Stage, FLX, FLY



- Flowchart illustrates the different steps used to create the IRPMD and prepare for the initial performance review by PDT.
- All parameters is not really ALL of them. Just a portion to be determine by PDT.
- The MAIN parameters group is designed to present the information that is needed to assess the ability of the model in relation to the expectations of the scenario's goals.

Model Reader

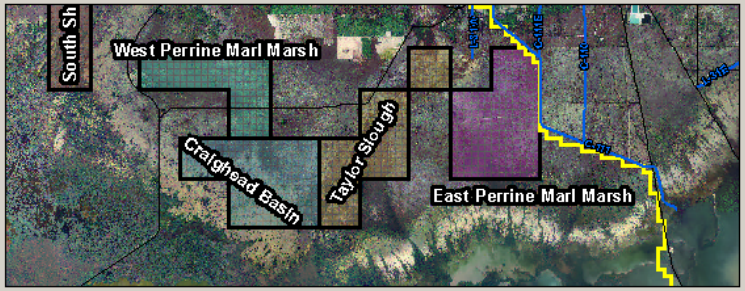
- Description of program
- Time Series
- Duration Curves
- Daily Output
- Weekly, Monthly, Seasonal & Yearly averages
- Salinity Performance Measures
- Stage/Depth Performance Measures
- SW/GW Flow Performance Measures
- Multiple Model Run Graphing
- Coastal River Flows
- Data Manipulation Options
- Grid Manipulation Options
- Create PDF Files



Taylor Slough

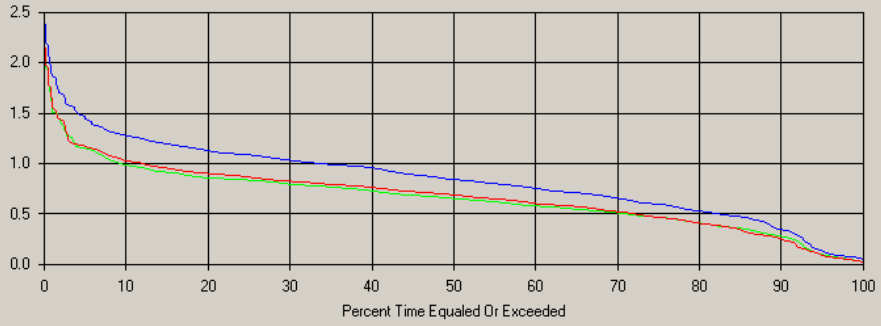
Duration Curve For Depth Above Ground (ft) For TIME Model

File Plot



Weekly Duration Curve Of Depth Above Ground (ft) Simulated At IR: Taylor Slough

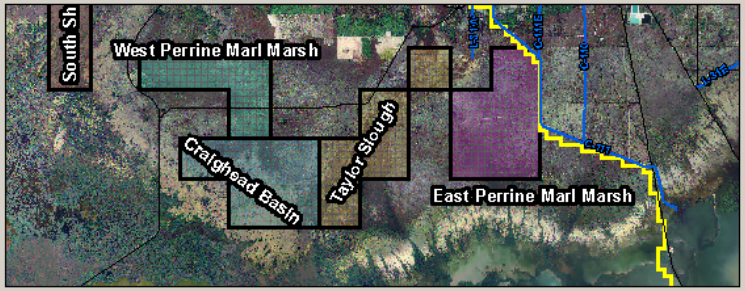
Bi11 : Med:0.69 Ai18 : Med:0.66 Ci13 : Med:0.85



Plot Generated on 9/10/2007

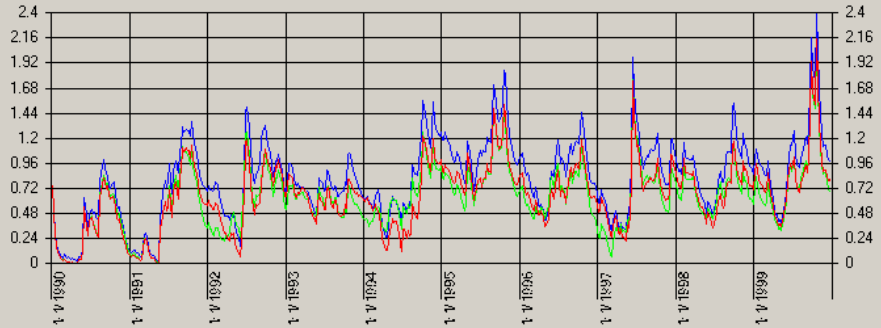
Time Series For Depth Above Ground (ft) For TIME Model

File Plot



Weekly Depth Above Ground (ft) Simulated At IR: Taylor Slough

Bi11 : Avg: 0.65 Ai18 : Avg: 0.63 Ci13 : Avg: 0.82



Plot Generated on 9/10/2007

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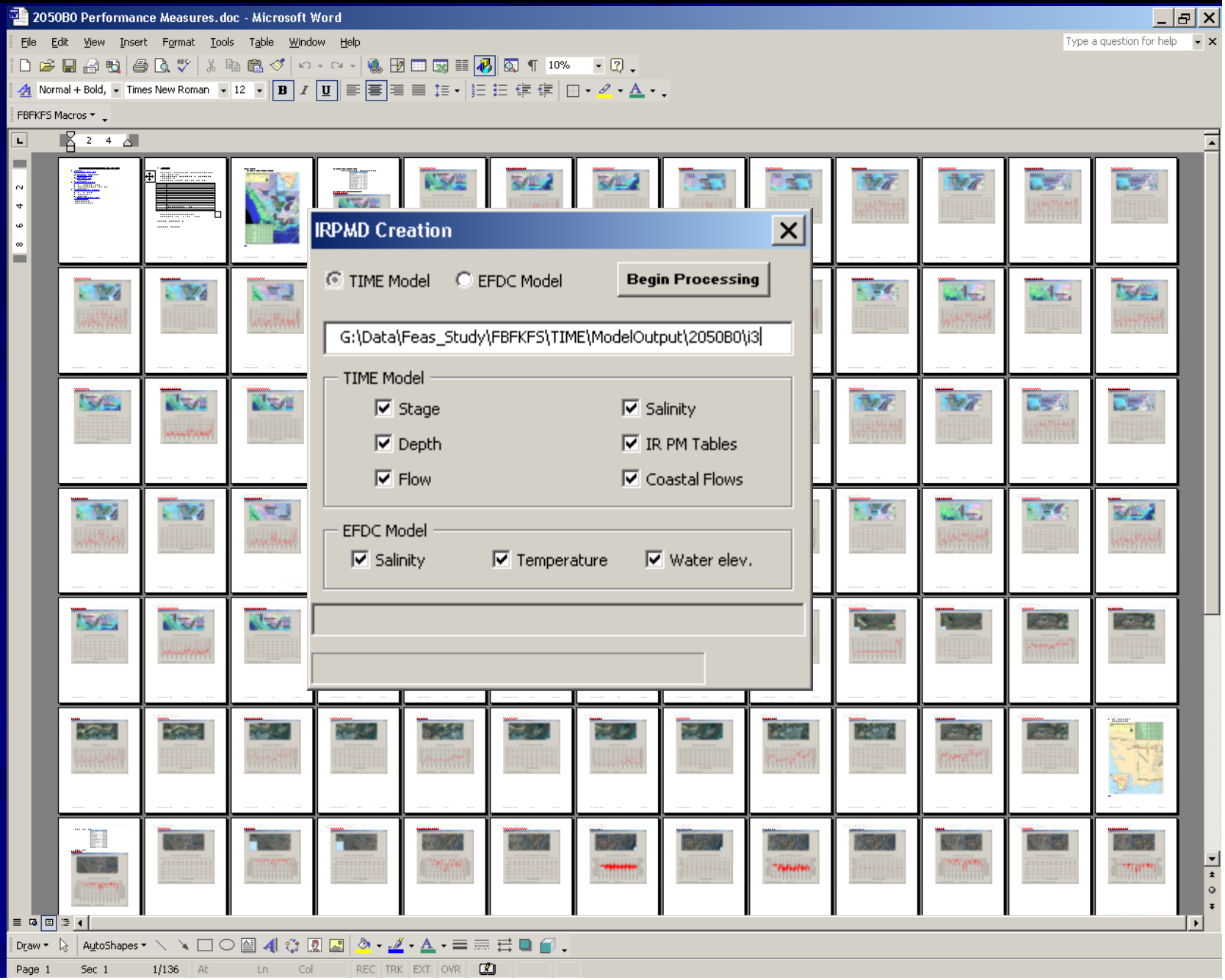
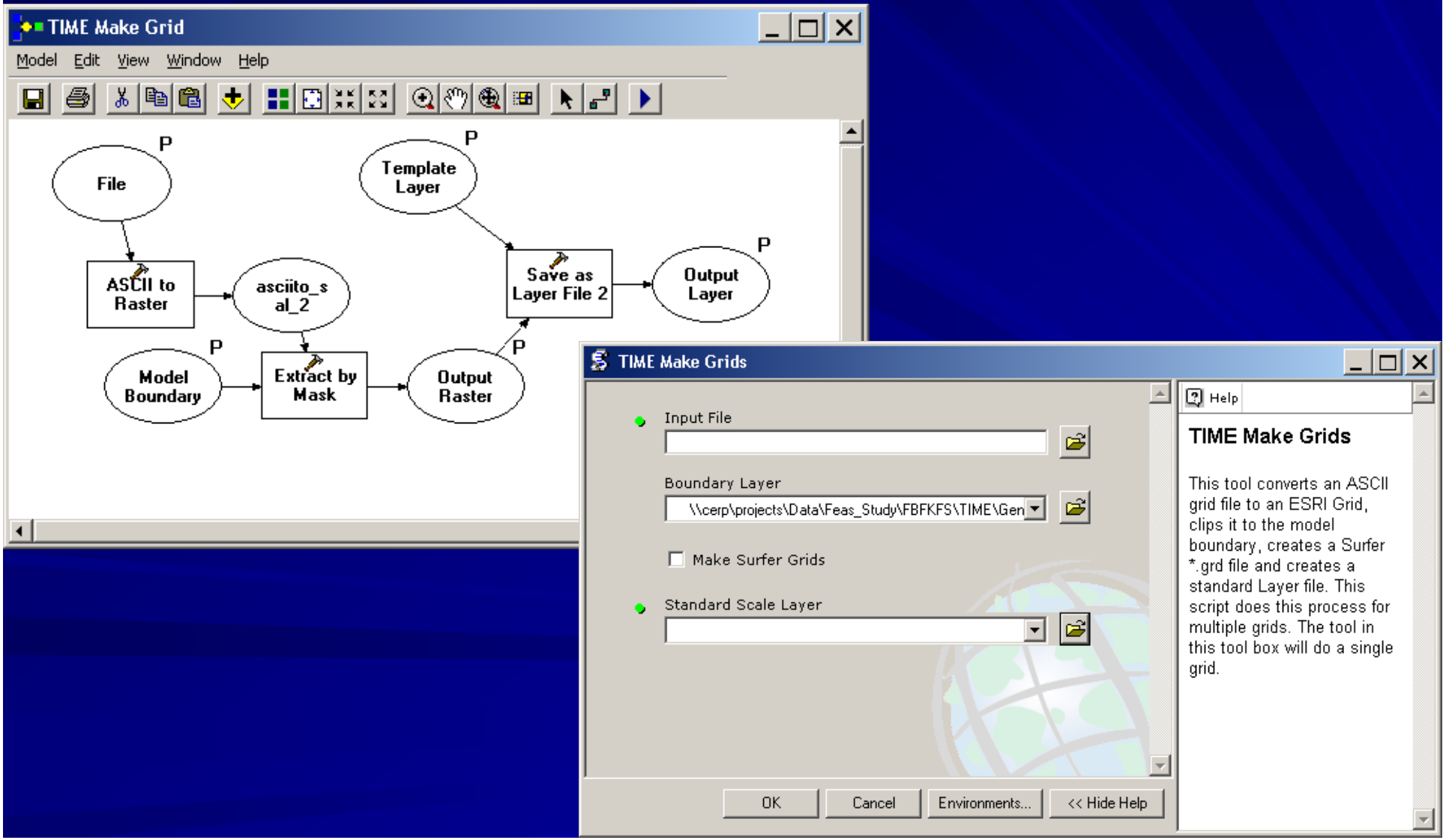
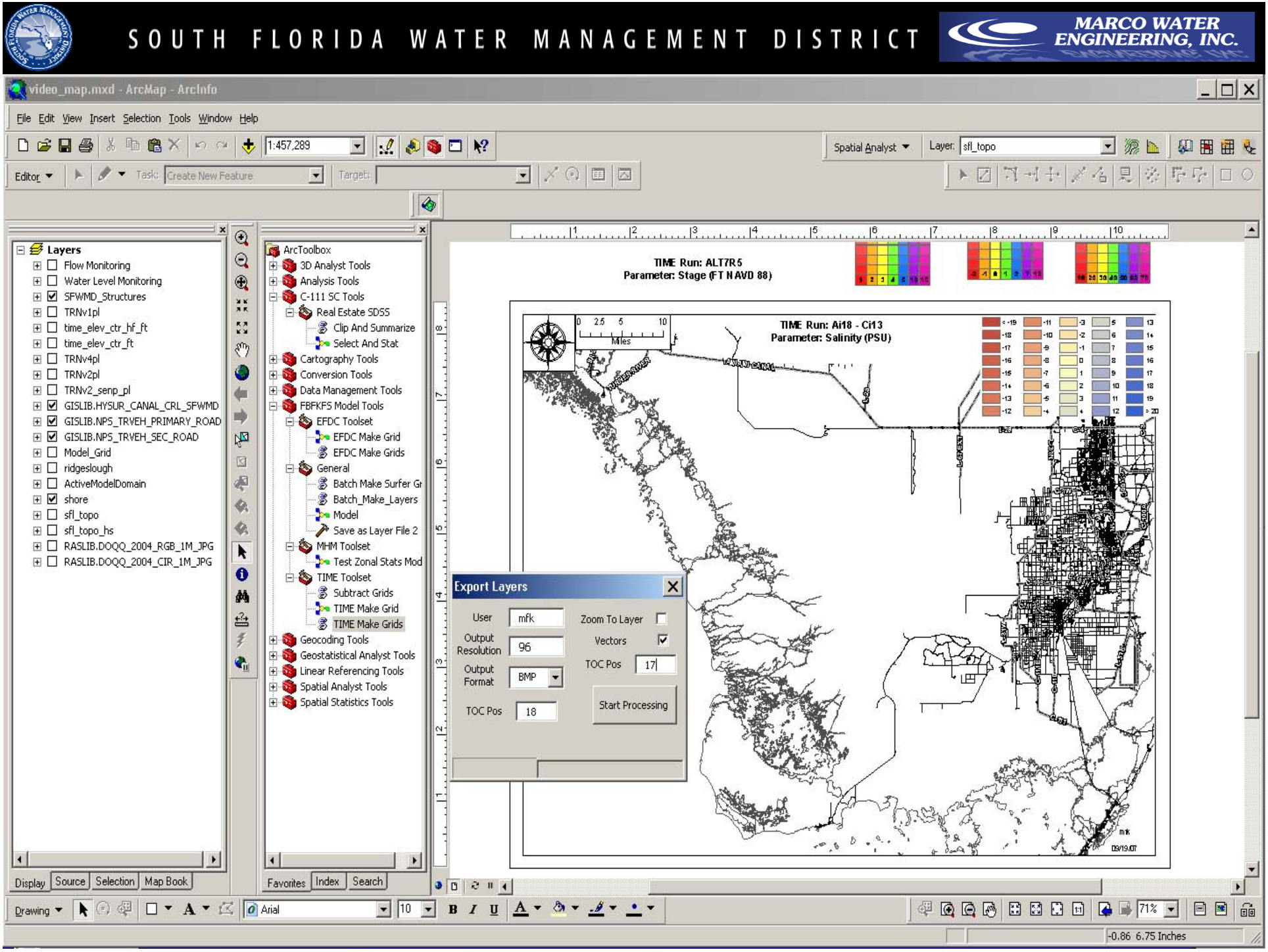
The Final IRPMD



TIME Make Grids Python Script




SOUTH FLORIDA WATER MANAGEMENT DISTRICT
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Spatial Analyst
Layer: sfl_topo
Editor
Task: Create New Feature
Target:
Layers
Flow Monitoring
Water Level Monitoring
SFWMD_Structures
TRNv1pl
time_elev_ctr_hf_ft
time_elev_ctr_ft
TRNv4pl
TRNv2pl
TRNv2_senp_pl
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GISLIB.NPS_TRVEH_PRIMARY_ROAD
GISLIB.NPS_TRVEH_SEC_ROAD
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ridgeslough
ActiveModelDomain
shore
sfl_topo
sfl_topo_hs
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3D Analyst Tools
Analysis Tools
C-111 SC Tools
Real Estate SDSS
Clip And Summarize
Select And Stat
Cartography Tools
Conversion Tools
Data Management Tools
FBFKFS Model Tools
EFDC Toolset
EFDC Make Grid
EFDC Make Grids
General
Batch Make Surfer Gr
Batch_Make_Layers
Model
Save as Layer File 2
MHM Toolset
Test Zonal Stats Mod
TIME Toolset
Subtract Grids
TIME Make Grid
TIME Make Grids
Geocoding Tools
Geostatistical Analyst Tools
Linear Referencing Tools
Spatial Analyst Tools
Spatial Statistics Tools
Favorites Index Search
TIME Run: ALT7R5
Parameter: Stage (FT NAVD 88)
TIME Run: Ai18 - Ci13
Parameter: Salinity (PSU)
Miles
Export Layers
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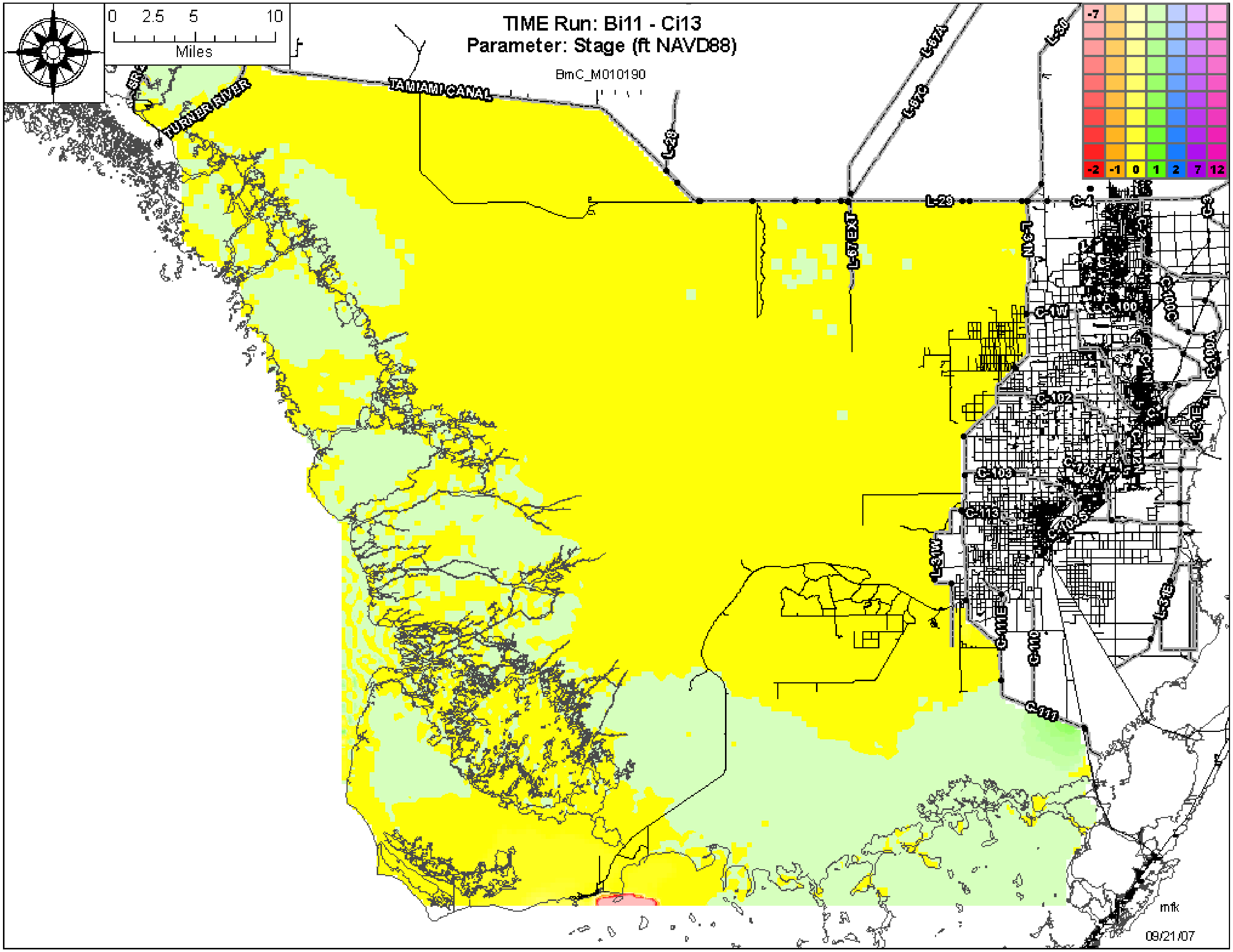

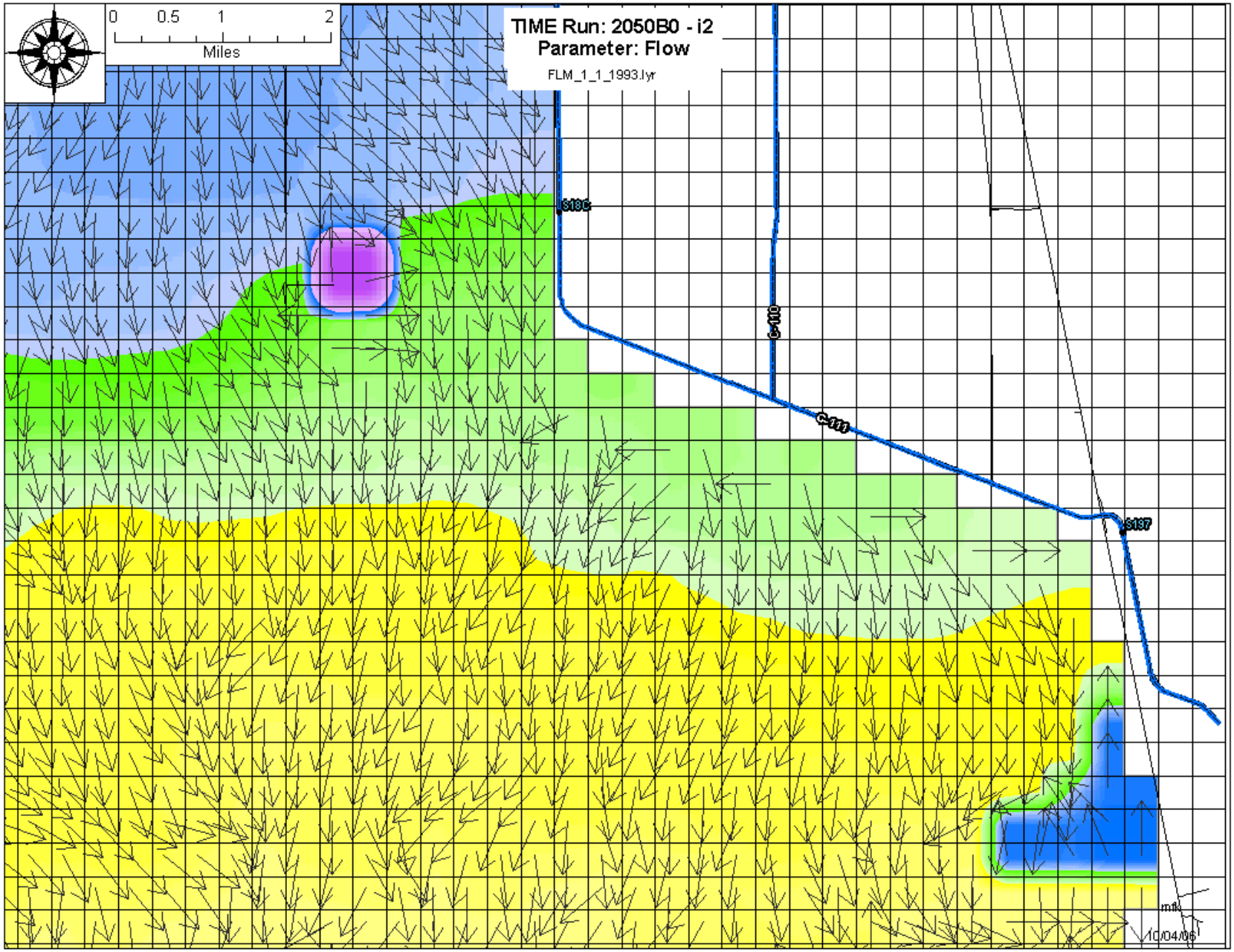
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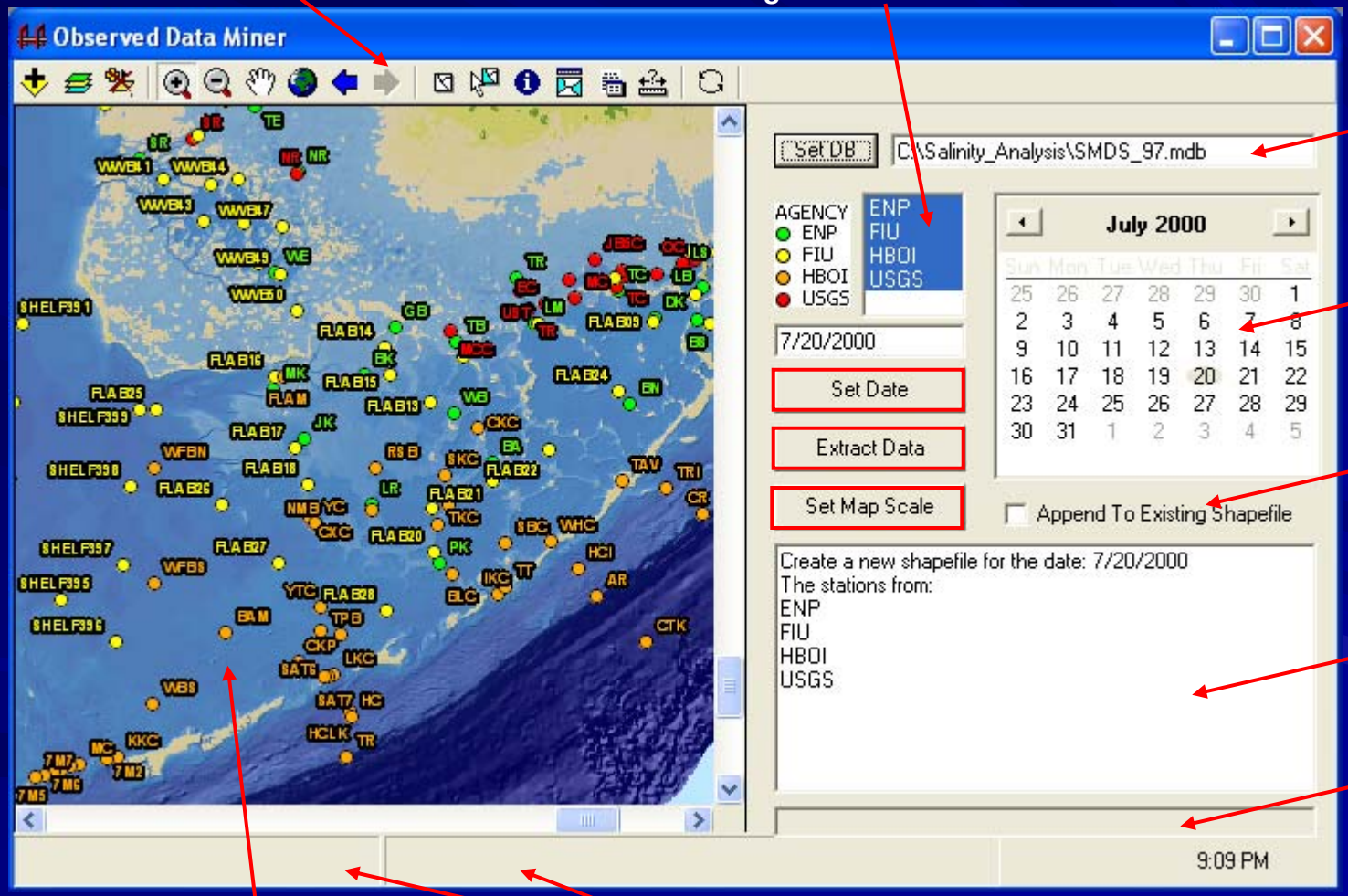


Standard GIS Tools

Agencies To Extract

Database

Date To Extract

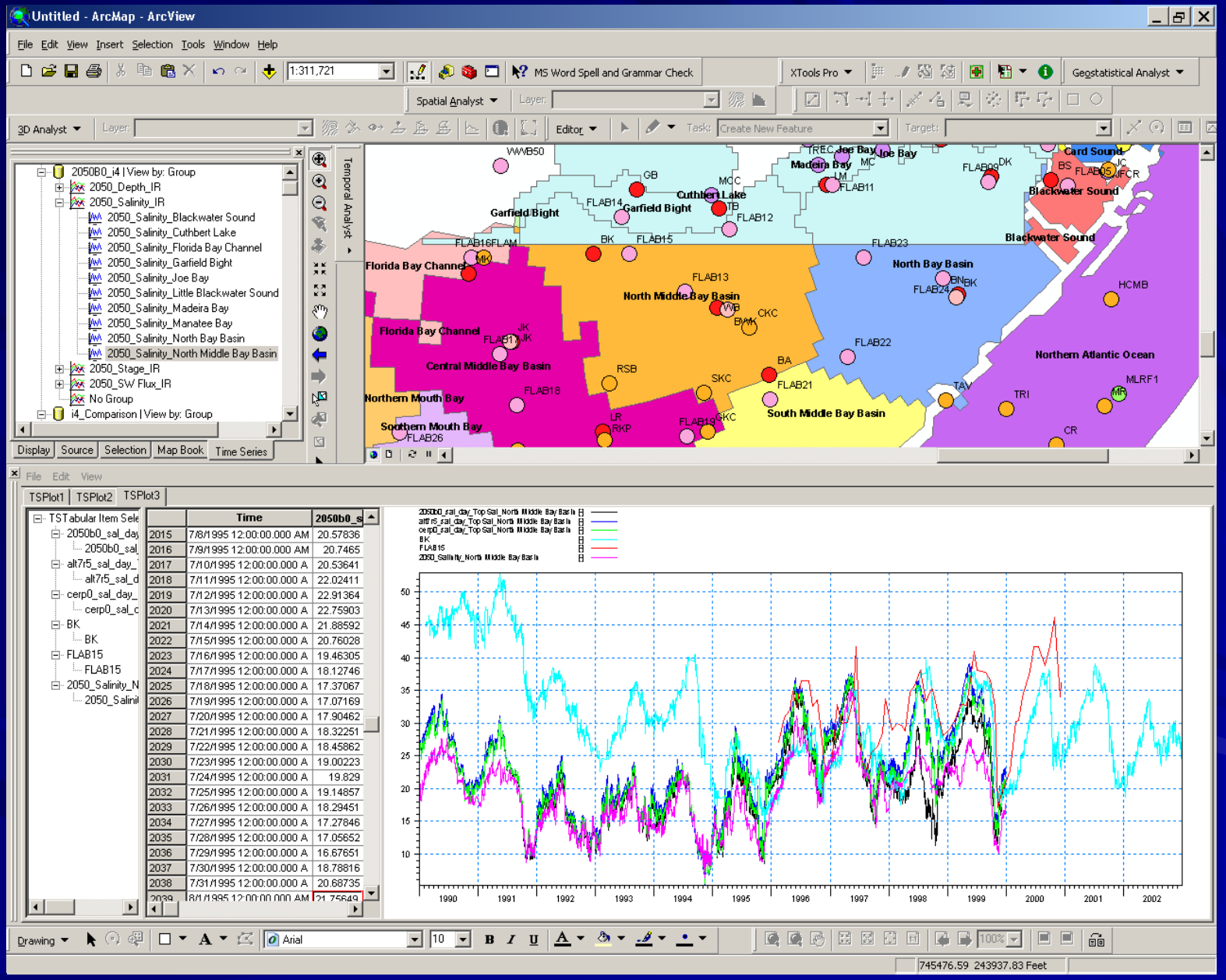
Append To Existing File

Text Box To Update User

Progress Bar To Update User

Map Showing The Stations by Agency

Status Bar Panels To Update User


Untitled - ArcMap - ArcView
File Edit View Insert Selection Tools Window Help
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MS Word Spell and Grammar Check
XTools Pro
Geostatistical Analyst
Spatial Analyst
3D Analyst
Editor
Task: Create New Feature
Target:
2050B0_i4 | View by: Group
2050_Depth_IR
2050_Salinity_IR
2050_Salinity_Blackwater Sound
2050_Salinity_Cuthbert Lake
2050_Salinity_Florida Bay Channel
2050_Salinity_Garfield Bight
2050_Salinity_Joe Bay
2050_Salinity_Little Blackwater Sound
2050_Salinity_Madeira Bay
2050_Salinity_Manatee Bay
2050_Salinity_North Bay Basin
2050_Salinity_North Middle Bay Basin
2050_Stage_IR
2050_SW Flux_IR
No Group
i4_Comparison | View by: Group
Display Source Selection Map Book Time Series
Temporal Analyst
Florida Bay Channel
Garfield Bight
Cuthbert Lake
Joe Bay
Madeira Bay
Card Sound
Blackwater Sound
North Bay Basin
North Middle Bay Basin
Central Middle Bay Basin
Northern Mouth Bay
Southern Mouth Bay
South Middle Bay Basin
Northern Atlantic Ocean
TSPlot1 TSPlot2 TSPlot3
TSTabular Item Sele
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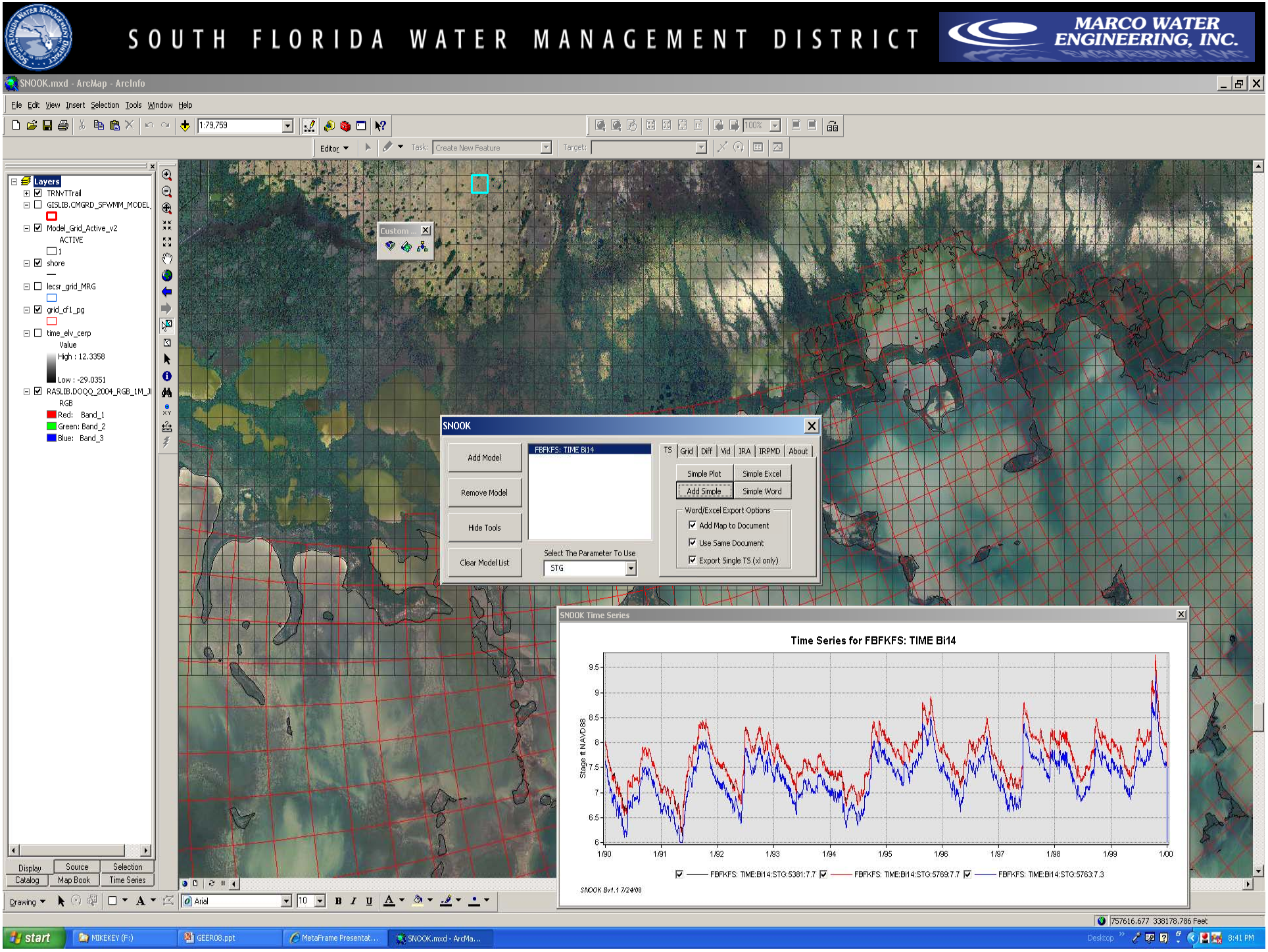
The SNOOK Model Reader Application

What is SNOOK?

- Snook is the next generation of model output GIS analysis.
- Utilizes different software where needed
- Main program interface is controlled from ArcMap.
- Main function is to provide spatial and temporal analysis of modeling output.

Spatial
a**N**d
Temp**O**ral
Output
Kit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SNOOK.mxd - ArcMap - ArcInfo
File Edit View Insert Selection Tools Window Help
Layers
TRNvTTrail
GISLIB.CMGRD_SFWMM_MODEL
Model_Grid_Active_v2
ACTIVE
1
shore
lecsr_grid_MRG
grid_cf1_pg
time_elv_cerp
Value
High : 12.3358
Low : -29.0351
RASLIB.DOQQ_2004_RGB_1M_J
RGB
Red: Band_1
Green: Band_2
Blue: Band_3
SNOOK
Add Model
Remove Model
Hide Tools
Clear Model List
FBFKFS: TIME Bi14
Select The Parameter To Use
STG
TS
Grid
Diff
Vid
IRA
IRPMD
About
Simple Plot
Simple Excel
Add Simple
Simple Word
Word/Excel Export Options
Add Map to Document
Use Same Document
Export Single TS (xl only)
SNOOK Time Series
Time Series for FBFKFS: TIME Bi14
Stage ft NAVD88
FBFKFS: TIME:Bi14:STG:5381:7.7
FBFKFS: TIME:Bi14:STG:5769:7.7
FBFKFS: TIME:Bi14:STG:5763:7.3
SNOOK Bv1.1 7/24/08
start
8:41 PM

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Microsoft Excel - Book1

File Edit View Insert Format Tools Data Window Help

Type a question for help

Arial 10

L18

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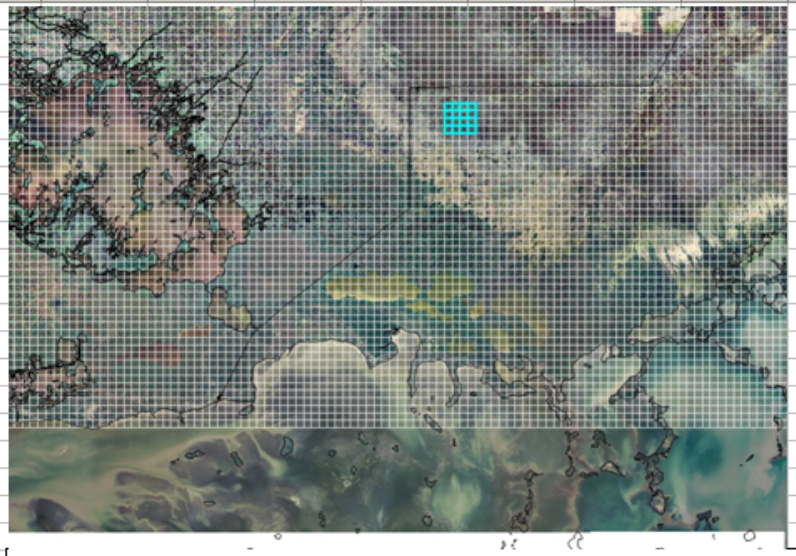

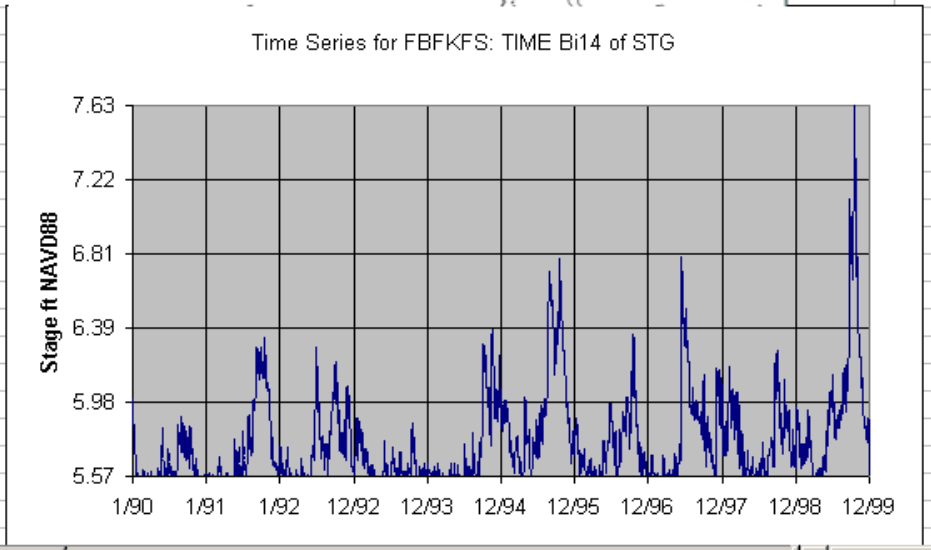

Sheet1 Sheet2 Sheet3

Ready

NUM

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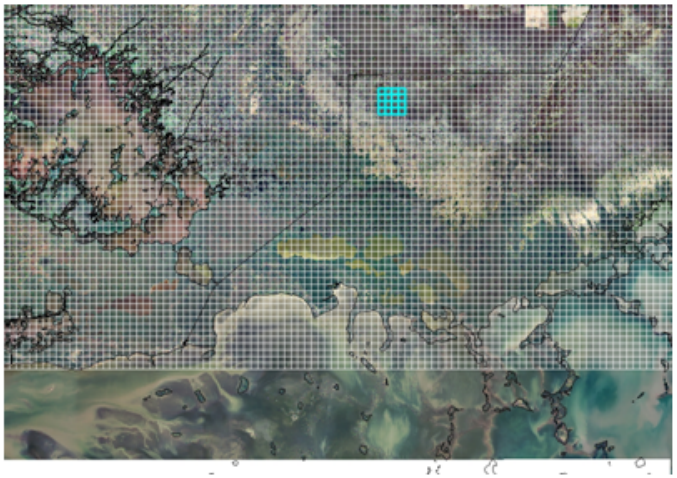
Document1 - Microsoft Word

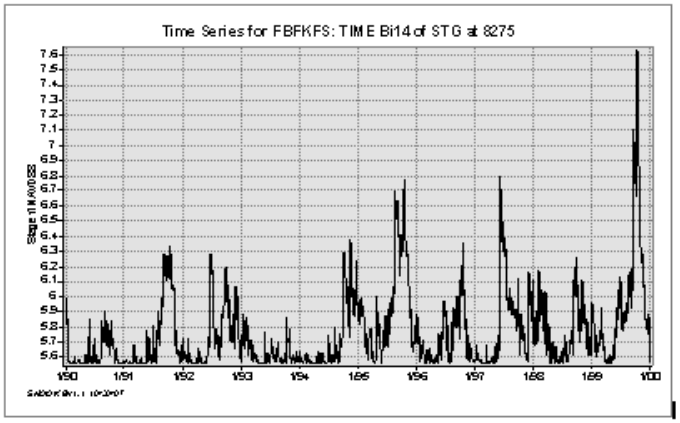
Handwriting Drawing Pad

File Edit View Insert Format Tools Table Window Help

Type a question for help

70% Read Times New Roman 12





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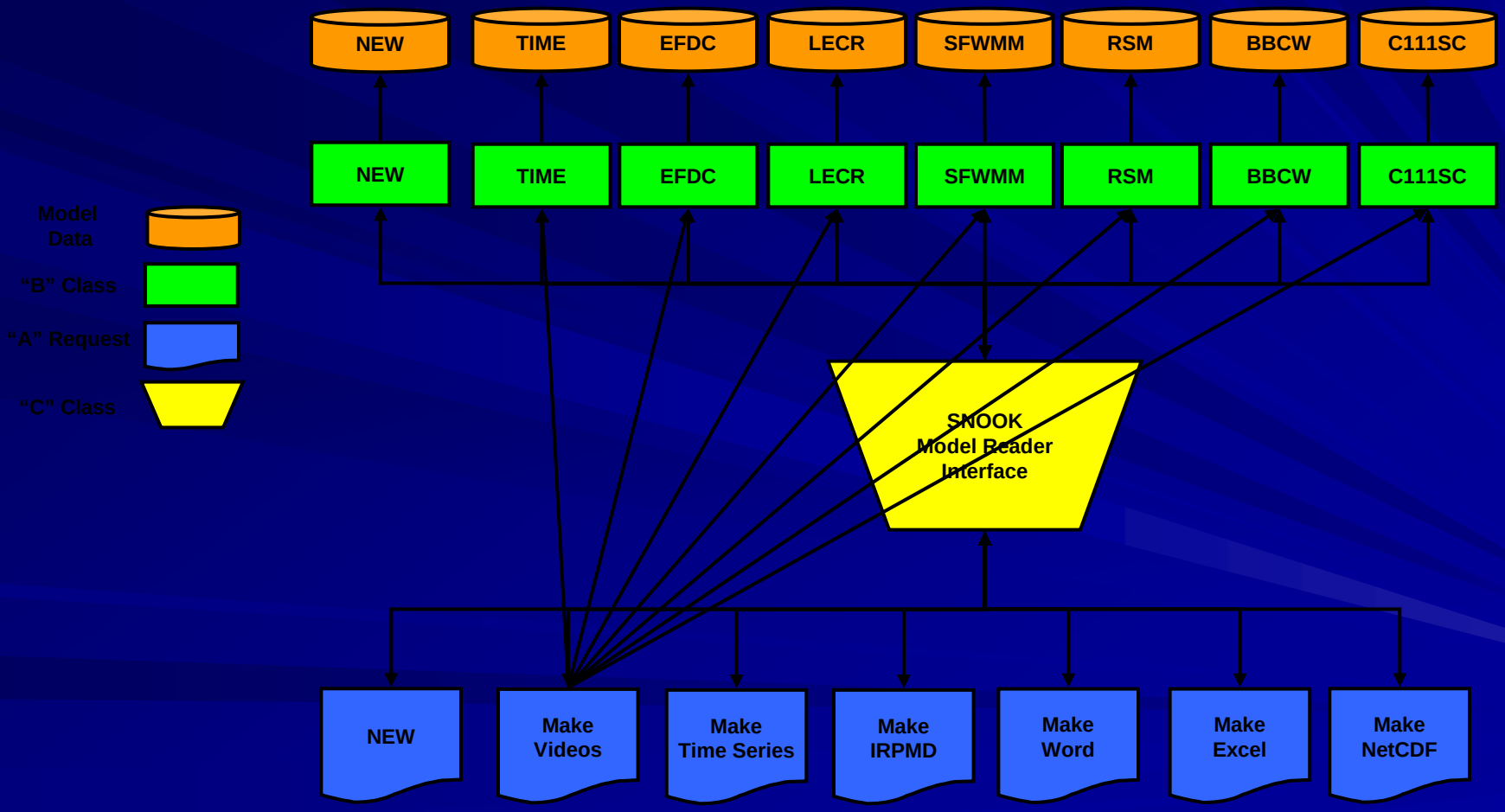
SNOOK Conceptualization



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Questions