

Appendix C: Performance Measure Evaluation Model Summary

Integrated PM	Evaluation tool	Comments
Greater Everglades		
GE-1	NSM 4.6	
GE-2	NSM 4.6	
GE-3	NSM 4.6	
GE-5	ELM	but will not be used until ELM undergoes peer review
GE-6	ELM	will use structure flows and concentrations until ELM is peer reviewed
GE-7	NA	
GE-8	NA	
GE-9	NA	
GE-10	ELM	until then SFWMM predicted STA bypass flows
GE-11	NA	
GE-12	NA	
GE-13	NA	
GE-14	NA	
GE-15	SFWMM	but will use an alternative with finer spatial scale when product is available
GE-16	SFWMM and NSM	
GE-17	NA	
GE-18	NSM conditions	but not used as evaluation tool
GE-19	NA	
GE-20	Evaluation tools still under development	but NSM is used for the predictive metric and target
GE-21	Evaluation tools still under development	but compare to 2050base, possibly use ATLSS but needs further cal/val and then peer review
GE-22	Evaluation tools still under development	but target is compared to NSM
GE-23	no evaluation tool	
GE-24	Targets based on SFWMM output and NSM	
GE-25	NSM and ATLSS	but evaluation tools still under development
GE-26	NA	
GE-27		possibly use ATLSS but needs further cal/val and then peer review
Lake Okeechobee		
LO-1	SFWMM	
LO-2	SFWMM	
LO-3	SFWMM	
LO-4	LOWQM	
LO-5	no model target or evaluation protocol developed	
LO-6	LOWQM v 3.0	
LO-7	Previously LOWQM but withdrawn due to high variability	

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LO-8	Previously LOWQM but withdrawn, will likely be LOEM once available	LOEM= Lake O Environment Model
LO-9	probably will be LOEM once product is available	
LO-10	none at this time	
LO-11	NA	
LO-12	NA	
LO-15	NA	
LO-16	NA	
LO-18	NA	
Northern Estuaries		
NE-1	SFWMM v 5.0	
NE-2	SFWMM is used to predict flows at selected structures	
NE-3	SFWMM v 5.0	
NE-4	SFWMM and 3D hydrodynamic model in development	
NE-5	NA	
NE-6	based on NSM but not used as target or evaluation tool	
NE-7	SFWMM v 5.0	unclear, based on NE-A1
NE-8	SFWMM v 5.0	unclear, based on NE-A2
NE-10	CEM based on NSM but not used for target or evaluation	
NE-11	No model based evaluation or model targets	
NE-12	No model based evaluation or model targets	
NE-13	CEM based on NSM but not used for target or evaluation	
NE-14	CEM based on NSM but not used for target or evaluation	
NE-15	CEM based on NSM but not used for target or evaluation	
NE-16	CEM based on NSM but not used for target or evaluation	
NE-17	CEM based on NSM but not used for target or evaluation	
Southern Estuaries		
**Please note that many of the SE PMs are based on the Florida Bay Florida Keys Feasibility Study models		
SE-1	multivariate linear regression (MLR) statistical models using output from SFWMM	
SE-2	multivariate linear regression (MLR) statistical models using output from SFWMM	
SE-3	SFWMM	flows through specific structures

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SE-4	multivariate linear regression (MLR) statistical models using output from SFWMM	Target is based on NSM, evaluated using MLR of data from SFWMM or Manatee Flow and Stage models
SE-5	SFWMM	
SE-6	SFWMM	SFWMM discharges from the S-27 and S-28 structures are used for the evaluation protocol
SE-7	SFWMM	SFWMM discharges from the S-23 structures are used for the evaluation protocol
SE-8	SFWMM	SFWMM discharges from the S-29 structures are used for the evaluation protocol
SE-9	multivariate linear regression (MLR) statistical models using output from SFWMM	Output from the SFWMM for each CERP alternative are post-processed using multivariate linear regression (MLR) statistical models
SE-10		Achieving NSM water levels at the three primary water level stations—CP, P33, and EVER7—is the target for this performance measure.
SE-11	SFWMM	
SE-12	None at this time	Input data to the pink shrimp model will be from the FBFKFS hydrodynamic and seagrass models.
SE-13	SFWMM	
SE-14*	None at this time	A bioenergetic model (such as by Wuenschal (2002)) that considers environmental factors, such as salinity and temperature, may be employed for the evaluation
SE-15	None at this time	
SE-16	None at this time	
SE-17	None at this time	The water quality model will also estimate the proportion of algal biomass that is two taxonomic groups – cyanobacteria and diatoms. For zones 2-5, a decrease in the biomass of cyanobacteria from the 2000 base is targeted. For all zones, the target for the biomass of diatoms is no increase above the 2000 base.
SE-18	None at this time	Evaluation of alternatives will require the development and validation of water quality models that can accurately estimate light penetration depth, in the form of total PAR in units of Einsteins of photons $m^{-2} sec^{-1}$ throughout Florida Bay and adjacent waters within the study area. Light intensity will be predicted by models for several depths through the water column from data or functions describing light at the water surface, and expressed in terms of per cent surface irradiance at the bottom of the water column (Madden and Hunt, 2001)
Water Supply		
WS-1	SFWMM	
WS-2	SFWMM	
WS-3	SFWMM	
WS-4	SFWMM	
WS-5	SFWMM	
WS-6	SFWMM	

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References and notes:	
SE-11	<p>Conceptual models have been developed to assess the mechanisms and conditions leading up to the die-off (cf. Madden and Hunt 2001; PMC 2003). Details are provided in a recent review of Florida Bay seagrass research (PMC 2003).</p> <p>PMC. 2003. Seagrass Ecology (Zieman et al.). In: A synthesis of research on Florida Bay. www.aoml.noaa.gov/flbay</p>
SE-12: Pink Shrimp model	<p>Browder, J. A., Z. Zien-Eldin, M. M. Criales, M. B. Robblee, S. Wong, T. L. Jackson, and D. Johnson. 2002. Dynamics of pink shrimp (<i>Farfantepenaeus duorarum</i>) recruitment potential in relation to salinity and temperature in Florida Bay. <i>Estuaries</i> 26(6B): 1355-1371</p>
Adult pink shrimp harvest (FBFKFS-PM)	<p>Pink shrimp harvest will be calculated from statistical models of harvest as a function of Everglades hydrologic conditions (Sheridan 1996, Ehrhardt and Legault 1999). These conditions will be predicted by TIME or hydrologic models that are used to evaluate FBFKFS alternatives.</p>
SE-14	<p>Wuenschel, M.J. 2002. Bioenergetics of larval and juvenile spotted seatrout (<i>Cynoscion nebulosus</i>). Ph.D. dissertation. State University of New York, Syracuse, NY, USA.</p>
FBFKFS lobster model	<p>A lobster population model, similar to that of Butler (2003), will be used in the FBFKFS</p> <p>Butler, M. J. IV. 2003. Incorporating ecological process and environmental change into spiny lobster population models using a spatially explicit, individual-based approach. <i>Fisheries Research</i> 65: 63-79.</p>