PHOSPHORUS MANAGEMENT IN THE OKEECHOBEE BASIN: Current State of Knowledge and Future Directions for Research and Extension/Outreach

June 17, 2009
Phosphorus Loads to Lake Okeechobee

27-year average = 508 metric tons P/year [1981-2008]

TMDL – 140 metric tons P

Data from 2009 SFER Report, SFWMD
Phosphorus Loads from Sub-watersheds of the Okeechobee Basin

Phosphorus Load, mt/year

TCNS  UKR  LKR  IND-Pra  FC  SouthLake  Istokpoga  EastLake  Rainfall
Phosphorus Transfer

Phosphorus

Surface Runoff

Soil Surface

Subsurface transport

Long-Term Storage

Short-Term Storage

Spodic horizon

A
E
Bh
Bw
General Observations

- Approximately 80% of the P imported into the basin is accumulated in upland soils and 10% in wetlands.
- Phosphorus loadings from uplands may be decreasing due to change in land use practices and implementation of BMPs.
- Wetlands and other landscape units have accumulated substantial amounts of P discharged from uplands.
- Wetlands and other landscape units may function as source of P when P loads from uplands decrease.
- Approximately 14,000 metric tons of P was loaded to the lake during 1981-2008.
- Approximately 28,600 metric tons of P accumulated in mud sediments (0-10 cm depth) of the lake.
Multiple scales: Particle to Watershed scale

Hydrologic units
- Uplands
- Ditches
- Canals
- Wetlands
- Streams

Legacy Phosphorus
- Soils
- Sediments
- Vegetation

Phosphorus Control Strategies
- BMPs
- In-situ remediation
- Farm-scale STAs
- Watershed-scale STAs

Phosphorus Transport
- Sub-surface flow
- Surface flow

508 mt P/year

TMDL
140 mt P/year
Phosphorus Management in the Lake Okeechobee Watershed

- Phosphorus storage and release by uplands
- Hydrologic manipulation to increase P retention
- Effectiveness of BMPs
- Phosphorus transport processes in wetlands
- Role of vegetation in P retention and release
- Stability of phosphorus in soils and sediments
- Phosphorus management-Bahiagrass production – New soil test recommendations
- Water treatment residuals – in-situ remediation
- Ecosystem services
- Future research and monitoring needs