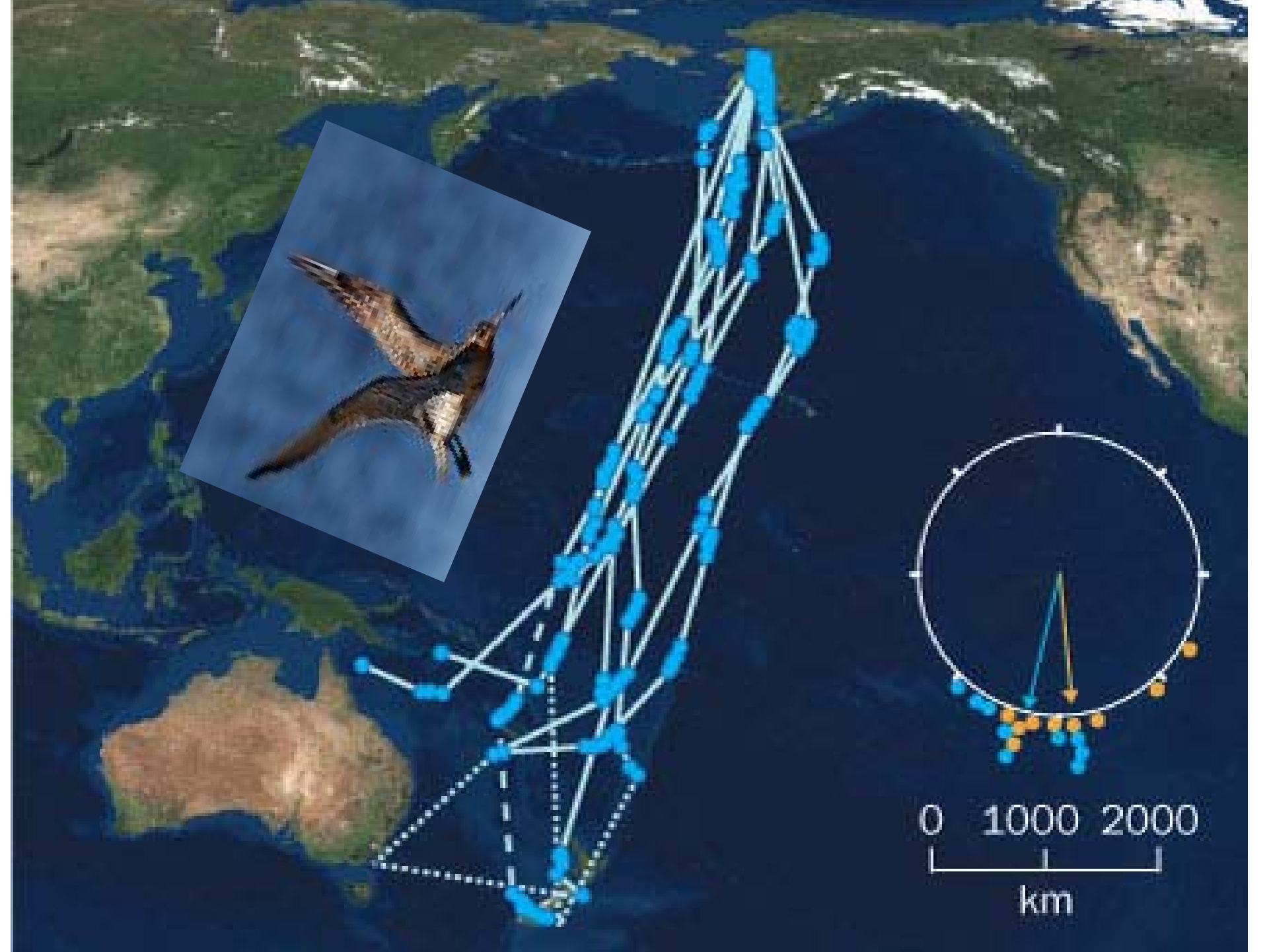
# WRAC Issues Workshop

**March 4, 2009**

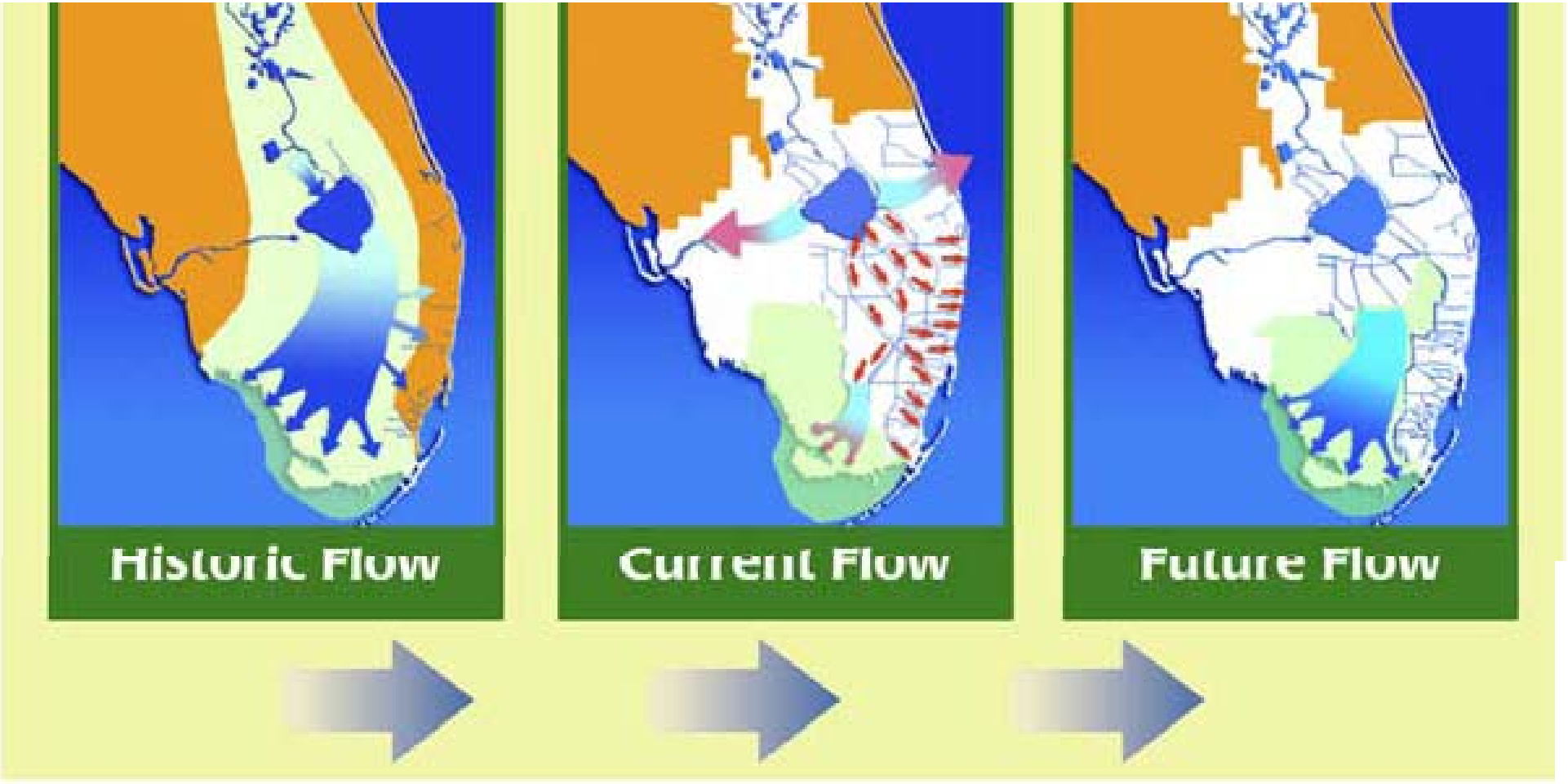
# Audubon perspectives on Reviving the River of Grass

**Paul N. Gray, Ph.D.**

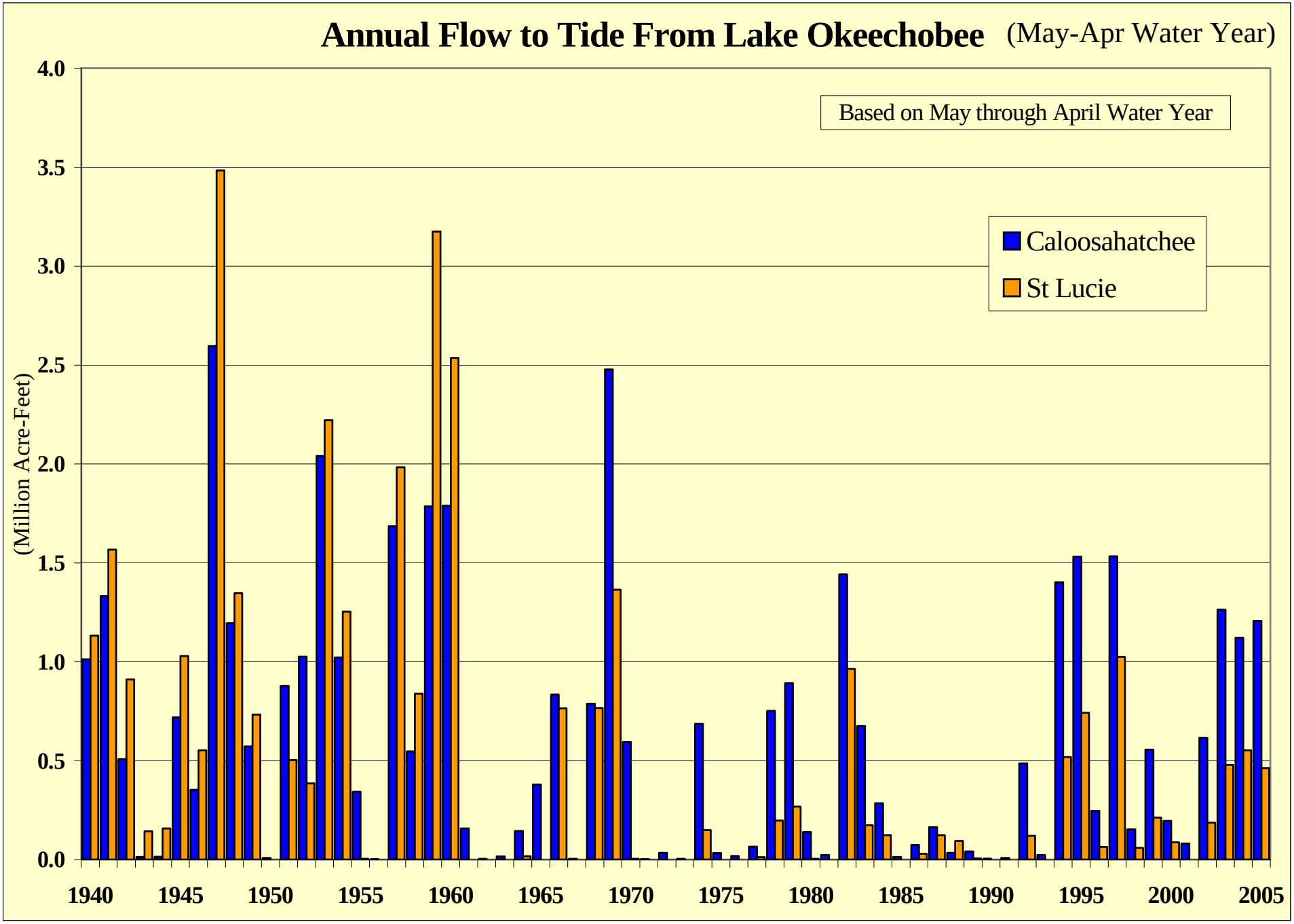
Audubon OF FLORIDA

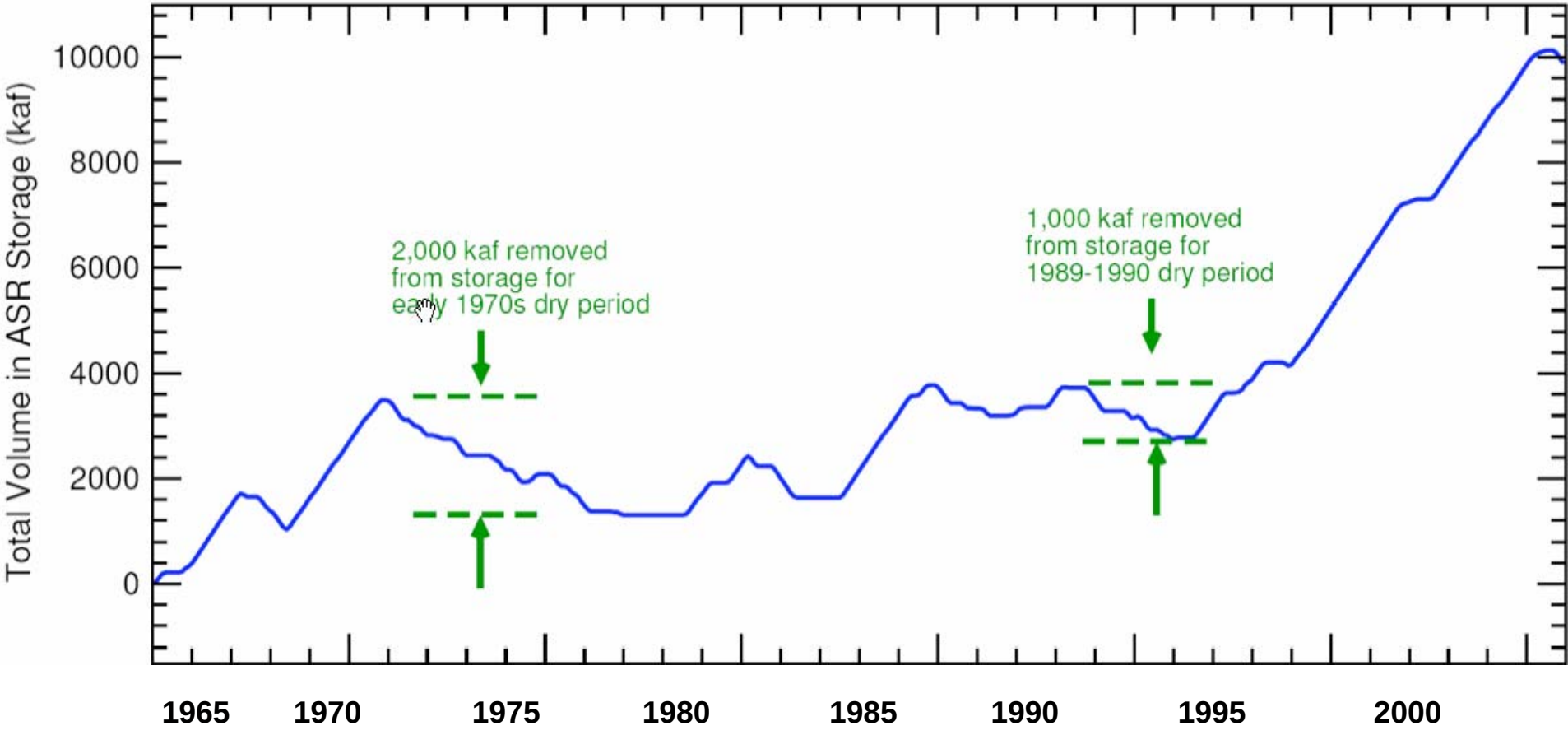

0 1000 2000
km

# Okeechobee water was diverted east and west and needs to be sent back to the Everglades

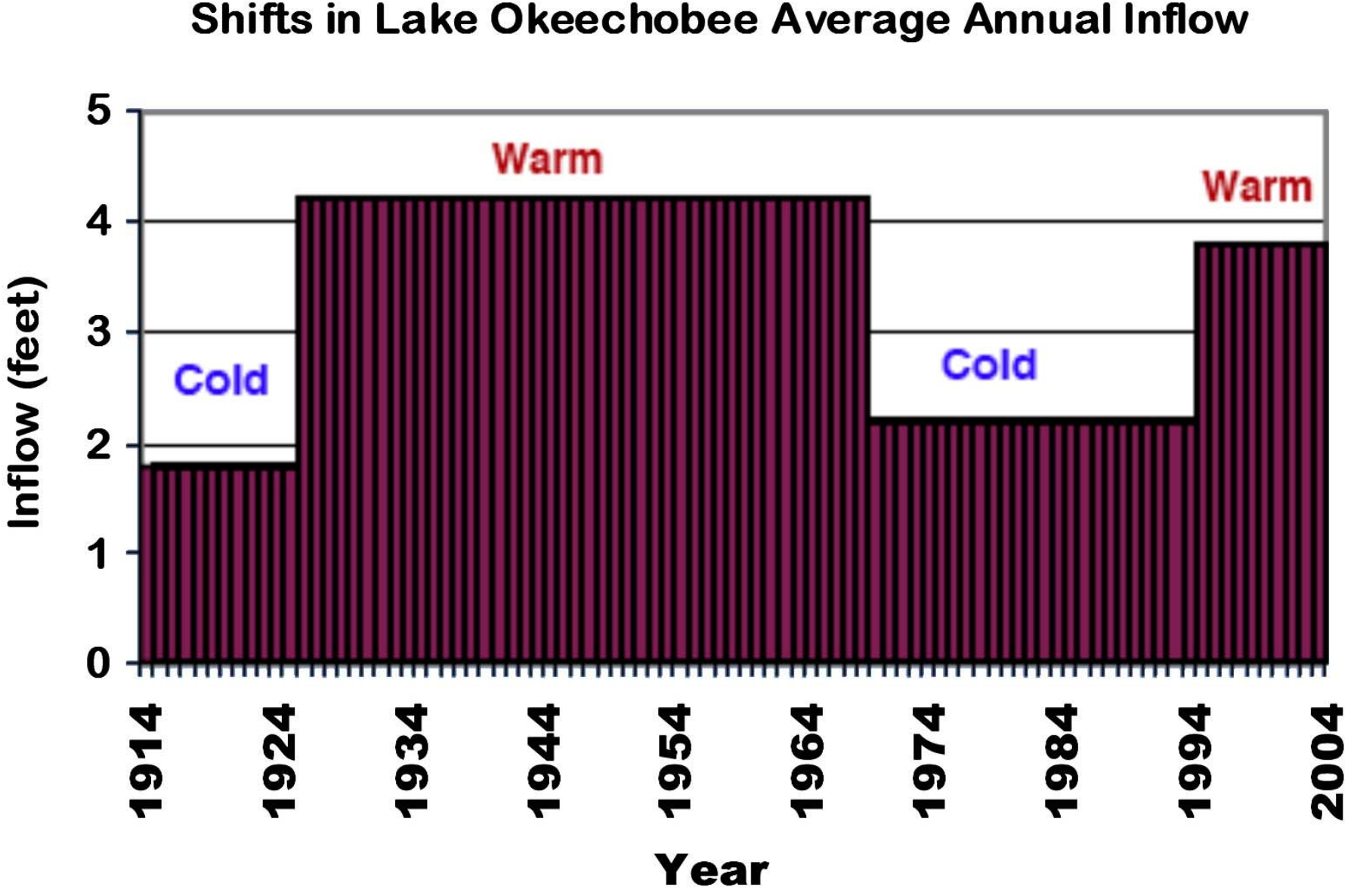


# Annual Flow to Tide From Lake Okeechobee (May-Apr Water Year)





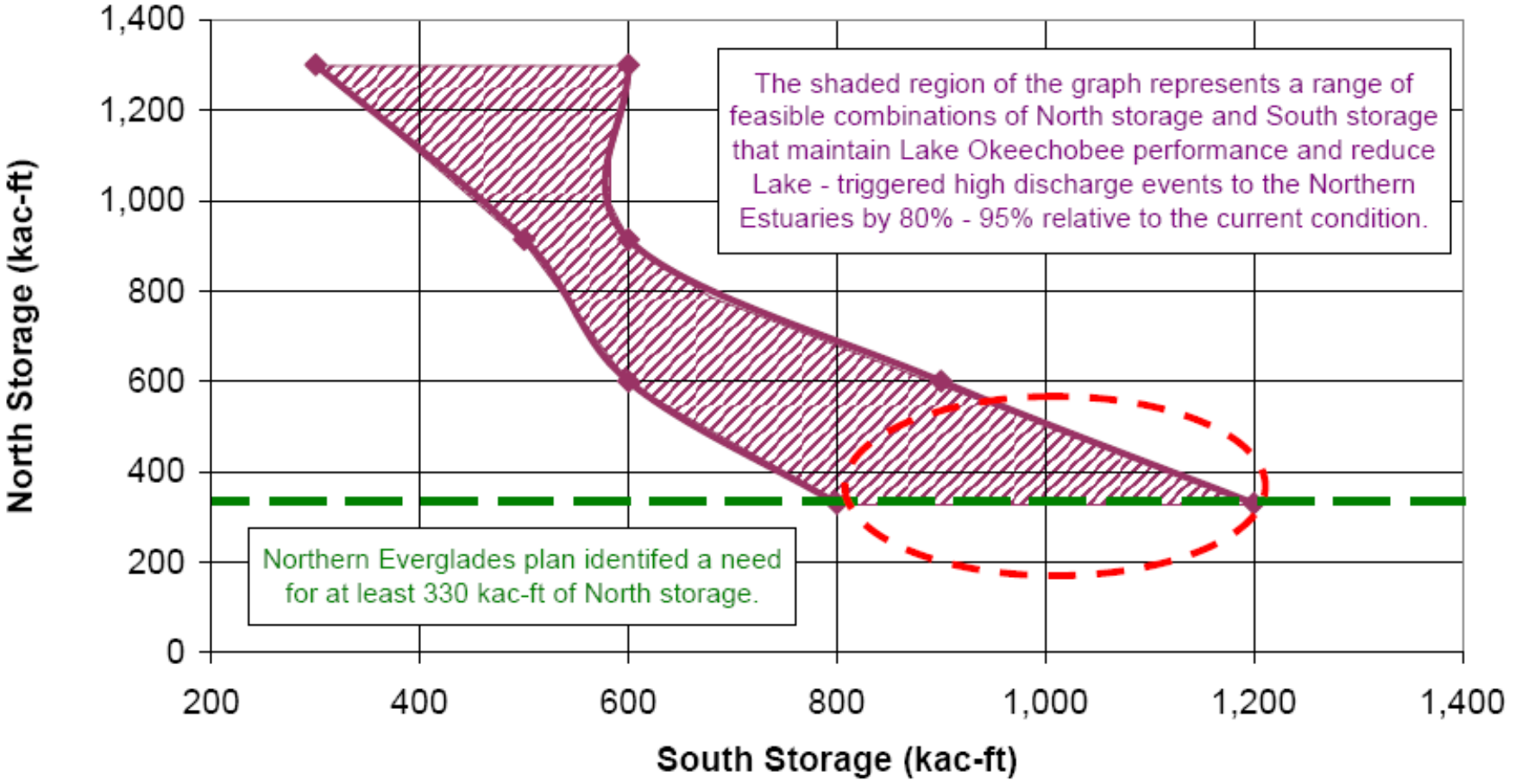

**Estimated ASR storage volumes over time in CERP. (from Van Lent, Everglades Foundation presentation to WRAC Issues Committee 2-19-09)**


Shifts in Lake Okeechobee Average Annual Inflow
Inflow (feet)
5
4
3
2
1
0
Warm
Warm
Cold
Cold
1914
1924
1934
1944
1954
1964
1974
1984
1994
2004
Year

# 2007 “Northern Everglades”

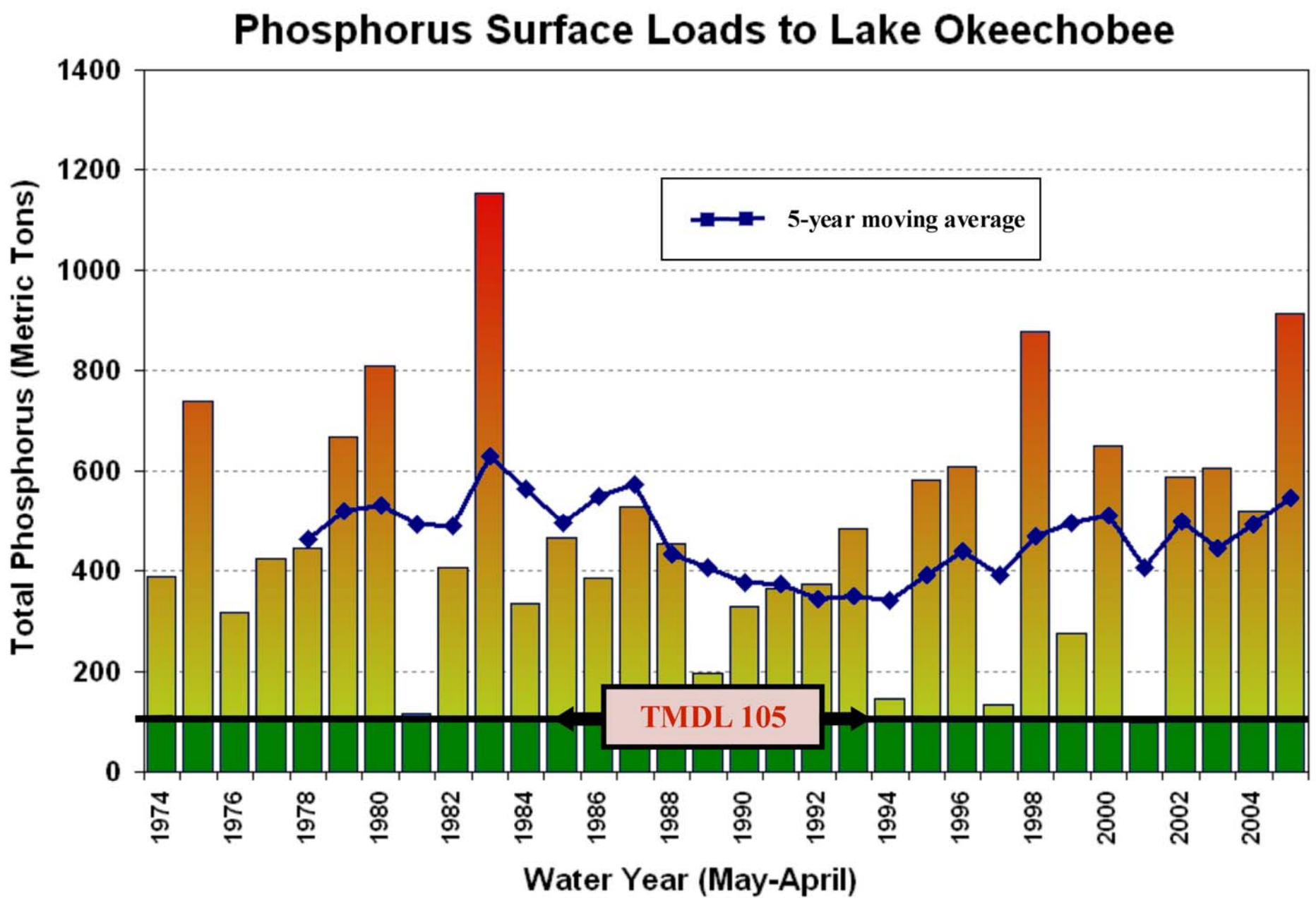
- **900,000-1.3 million acre-feet of storage needed north of lake**
- **But, STA 3-4 can only treat about 250,000 acre-feet of Okeechobee water (less in storm years)**
- **EAA produces another ~1 million acre-feet runoff in average year**
- **ASR technology not able to meet previous goals**

# Comparison of North Storage and South Storage Needed to Reduce Impacts to Northern Estuaries




Analysis maintains minimum Lake Okeechobee performance equivalent to Northern Everglades Baseline of SSB = 37 and SSA = 85.

Based on RESOPS Screening Analysis of 1965 to 2005 Period.


Phosphorus Surface Loads to Lake Okeechobee
Total Phosphorus (Metric Tons)
1400
1200
1000
800
600
400
200
0
5-year moving average
TMDL 105
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
Water Year (May-April)

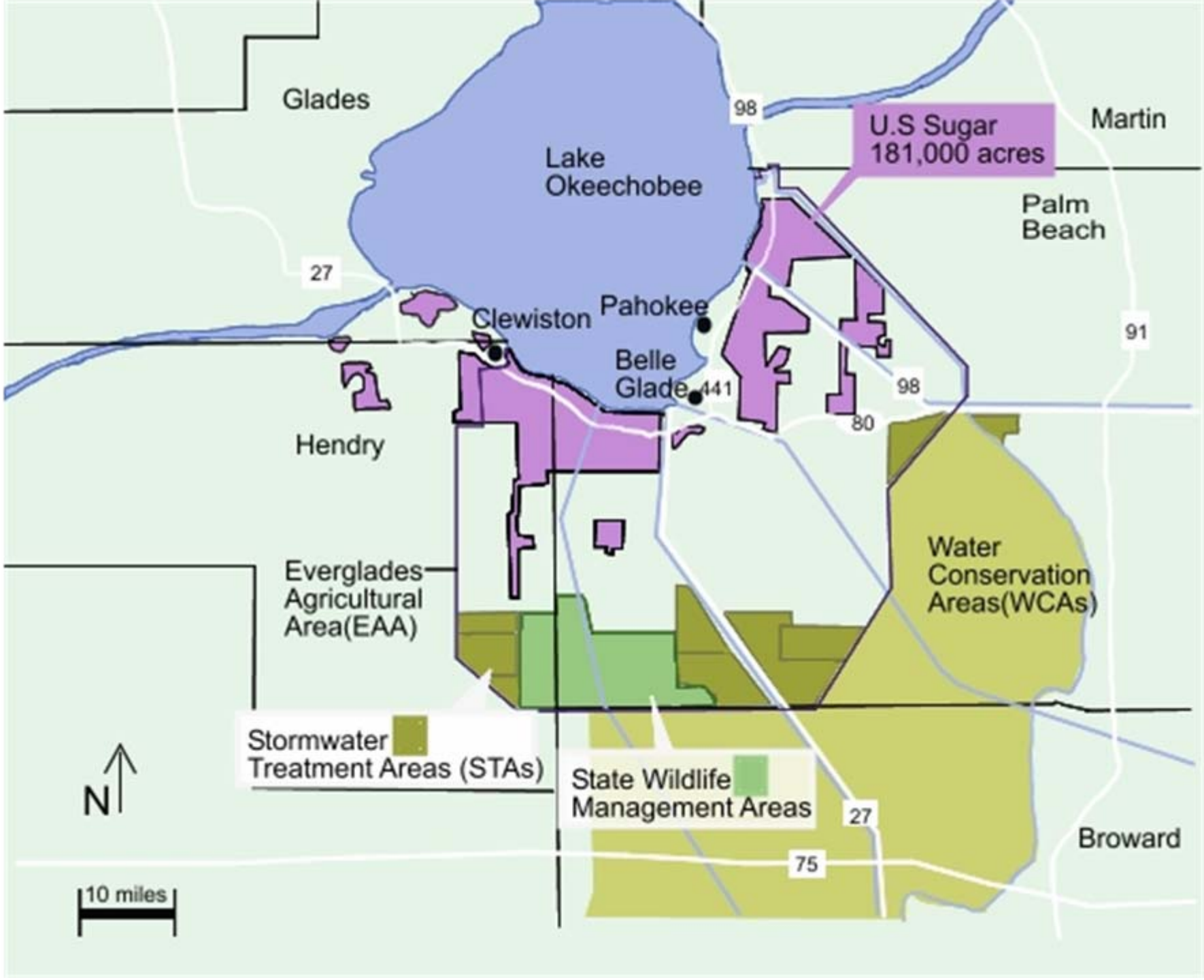
# Upstream vs. downstream storage

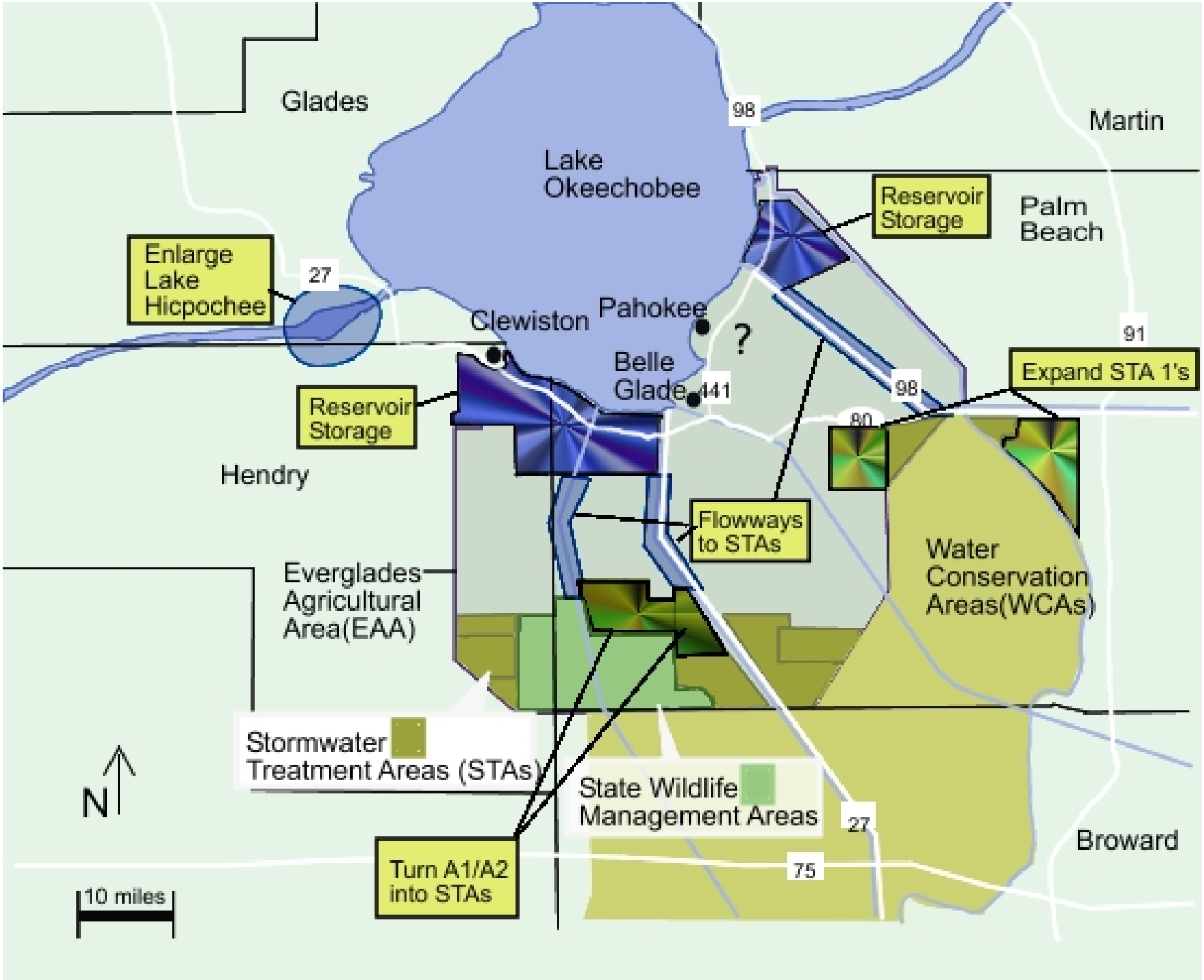
Upstream

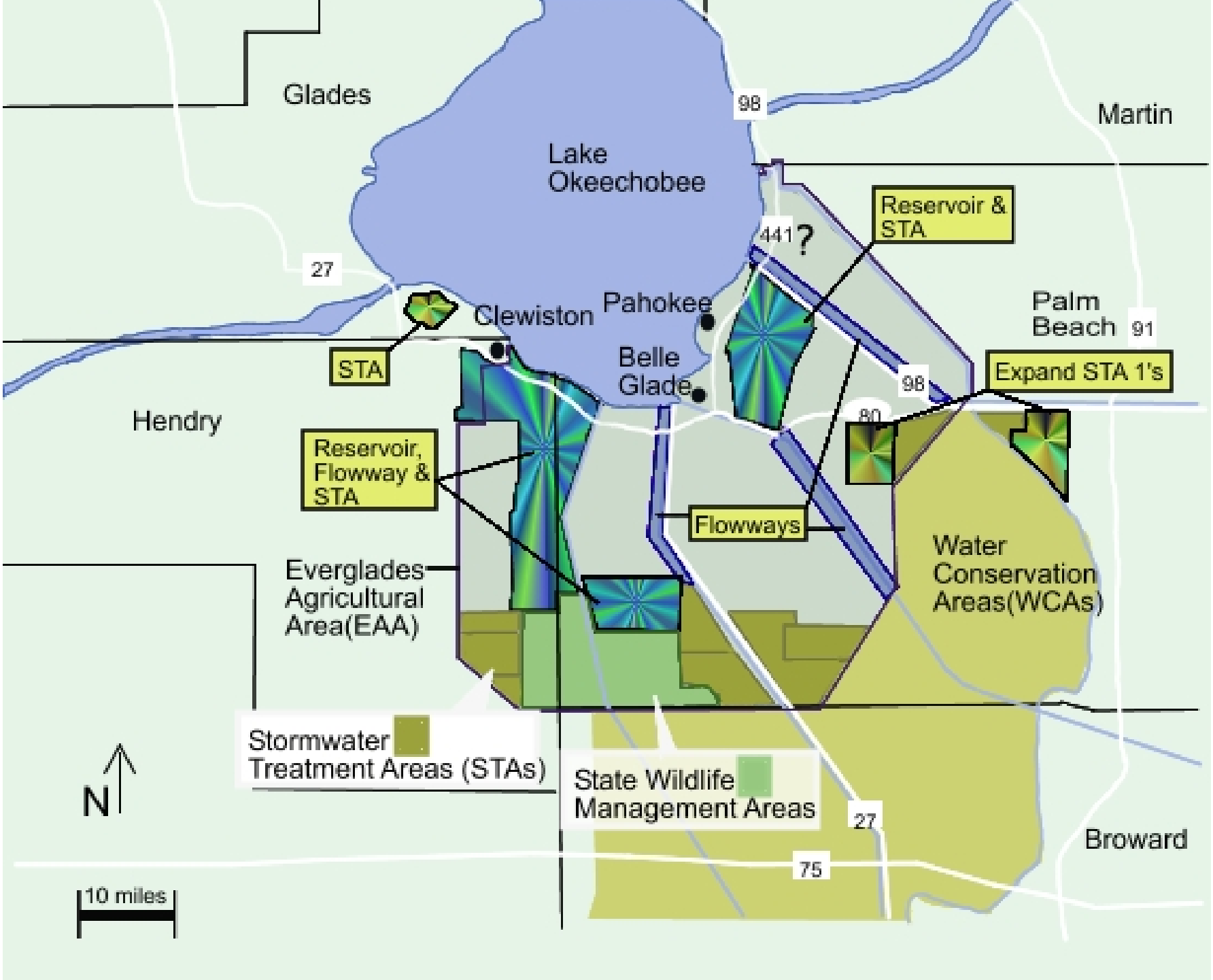
- Allows water cleansing
- Helps avoid extreme low levels (improves water supply for lake)
- Flexibility in directing dry season deliveries
- Large area for projects, with habitat values
- Attenuate inflows (prevent deep water)

Downstream

- Reduce backpumping
- Capture EAA runoff
- Water supply availability for EAA, WCAs
- Footprint efficiency (large structures)
- “Pop-off” valve for Lake during deep water


Glades
Lake
Okeechobee
98
U.S Sugar
181,000 acres
Martin
Palm
Beach
27
Clewiston
Pahokee
Belle
Glade
441
91
98
80
Hendry
Everglades
Agricultural
Area(EAA)
Water
Conservation
Areas(WCAs)
Stormwater
Treatment Areas (STAs)
State Wildlife
Management Areas
27
Broward
75
N
10 miles


Glades
Lake Okeechobee
98
Martin
Reservoir Storage
Palm Beach
Enlarge Lake Hicpochee
27
Clewiston
Pahokee
?
91
Belle Glade
441
98
Expand STA 1's
Reservoir Storage
80
Hendry
Flowways to STAs
Water Conservation Areas(WCAs)
Everglades Agricultural Area(EAA)
Stormwater Treatment Areas (STAs)
N
State Wildlife Management Areas
27
Broward
Turn A1/A2 into STAs
75
10 miles


Glades
Martin
Lake
Okeechobee
98
441
Reservoir &
STA
27
Clewiston
Pahokee
Palm
Beach
91
STA
Belle
Glade
98
Expand STA 1's
80
Hendry
Reservoir,
Flowway &
STA
Flowways
Everglades
Agricultural
Area(EAA)
Water
Conservation
Areas(WCAs)
Stormwater
Treatment Areas (STAs)
State Wildlife
Management Areas
27
Broward
75
N
10 miles

# Questions before final design

- How much extra water can we regularly expect in Okeechobee during wet periods?
- How much of that water can go south, and how much *should*?
- How many STA acres are need to clean the Okeechobee water, especially in wet scenarios?
- Are STAs in the EAA adequate for EAA runoff?
- How much carry-over water would be needed to protect against drought?

# Recommendations

- Finalize the numbers
- Remember ups and downs of different approaches
- Continue other on-going efforts (Northern Everglades, Estuary plans, CERP, KRR)
- Find partners?  Feds, Agricultural operations
- Finish the River of Grass Initiative!!!


Questions/comments?