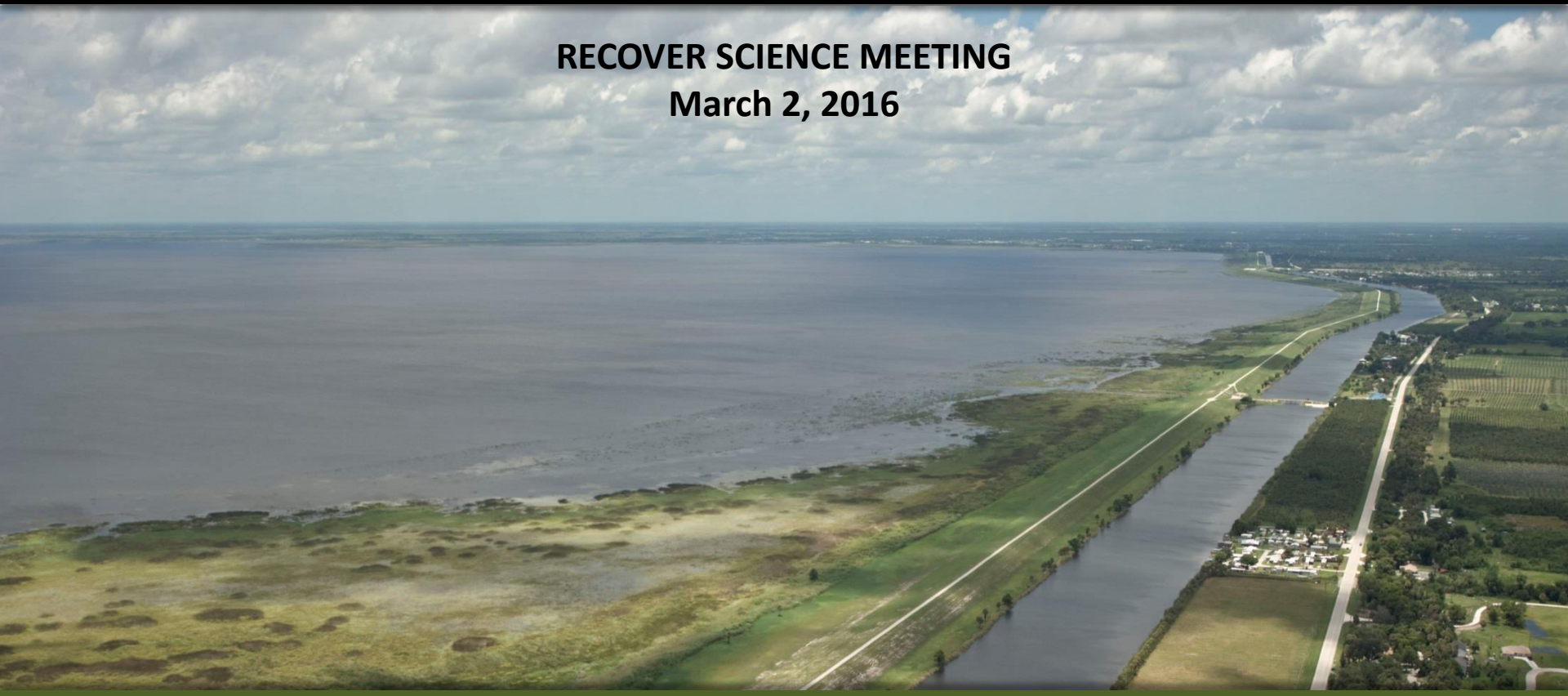


RECOVER SCIENCE MEETING
March 2, 2016

LAKE OKEECHOBEE WATERSHED PHOSPHORUS TRENDS 2001-2009

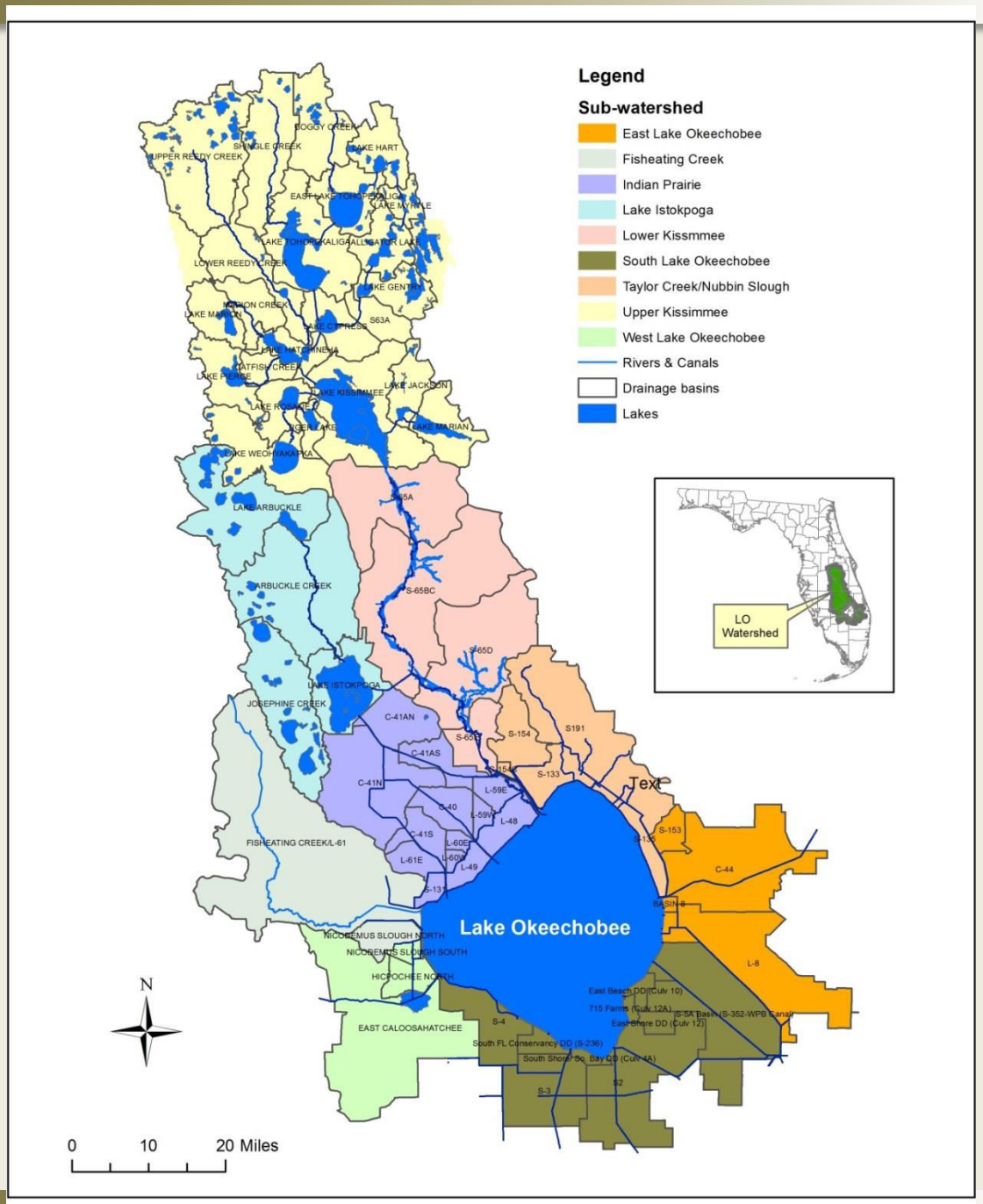
Joyce Zhang
Principal Engineer
Lake and River Ecosystems Section

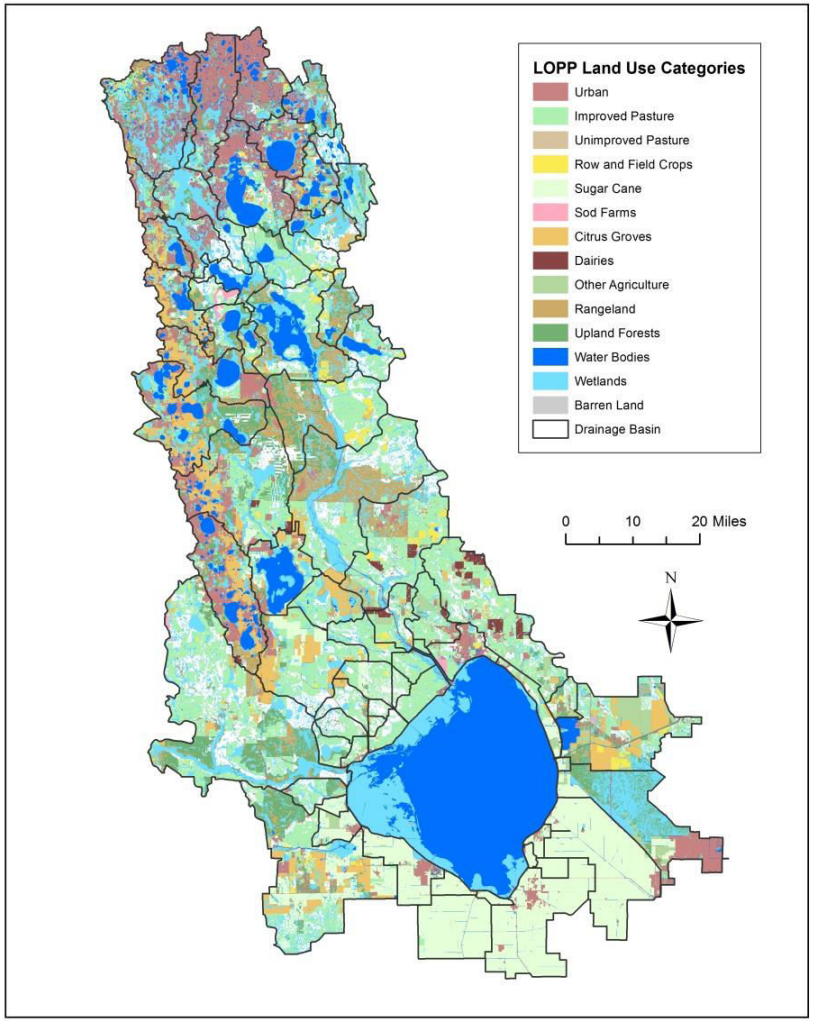
Lake Okeechobee Watershed Phosphorus Trends 2001-2009

- Description of the Lake Okeechobee Watershed
  - Basin and sub-watershed
  - Land use
- Phosphorus trend at the sub-watershed level
  - Flow
  - TP load
  - TP concentration

Study Area

Lake Okeechobee Watershed detailing drainage basins in nine sub-watersheds and major hydrology

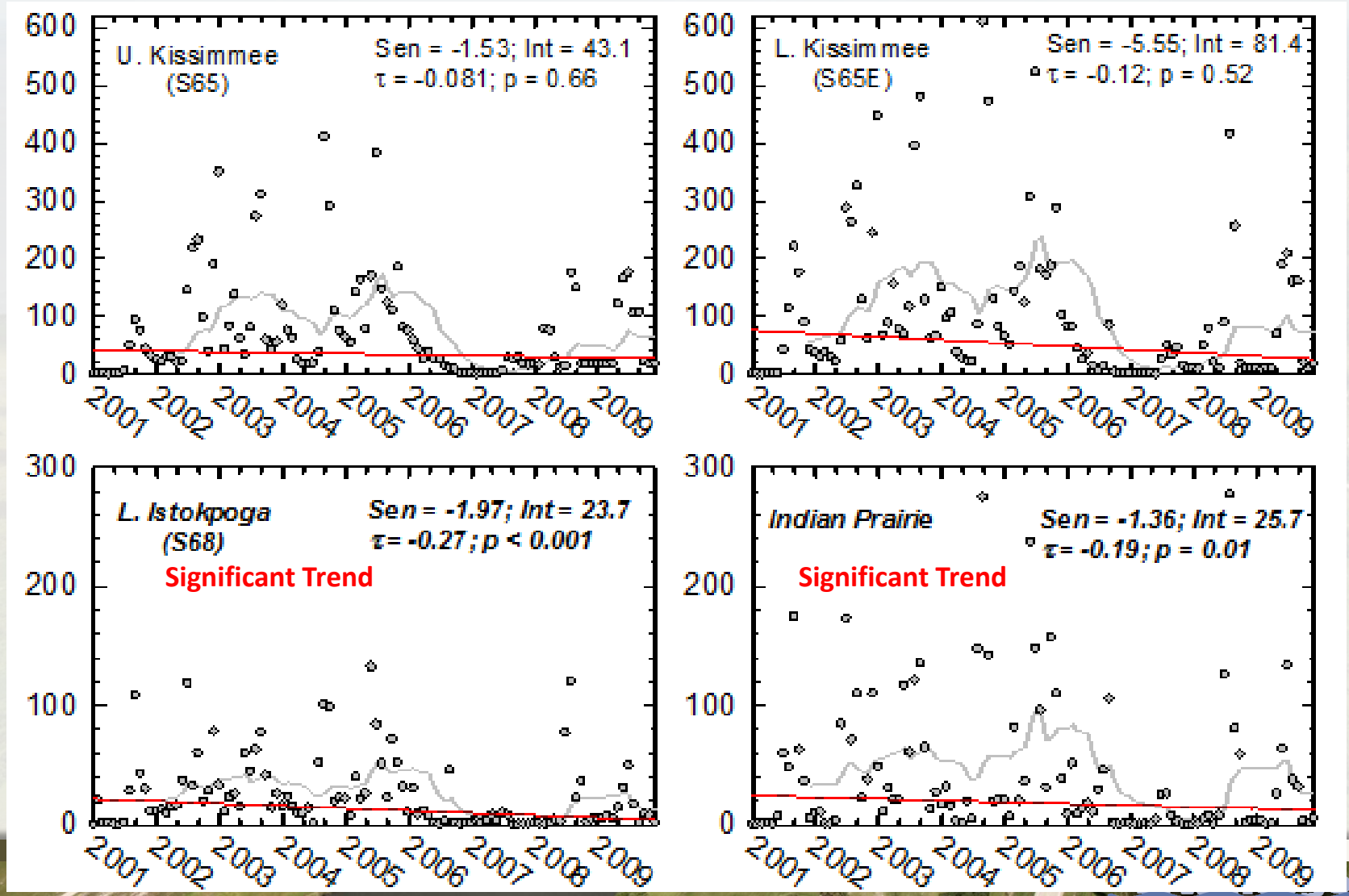




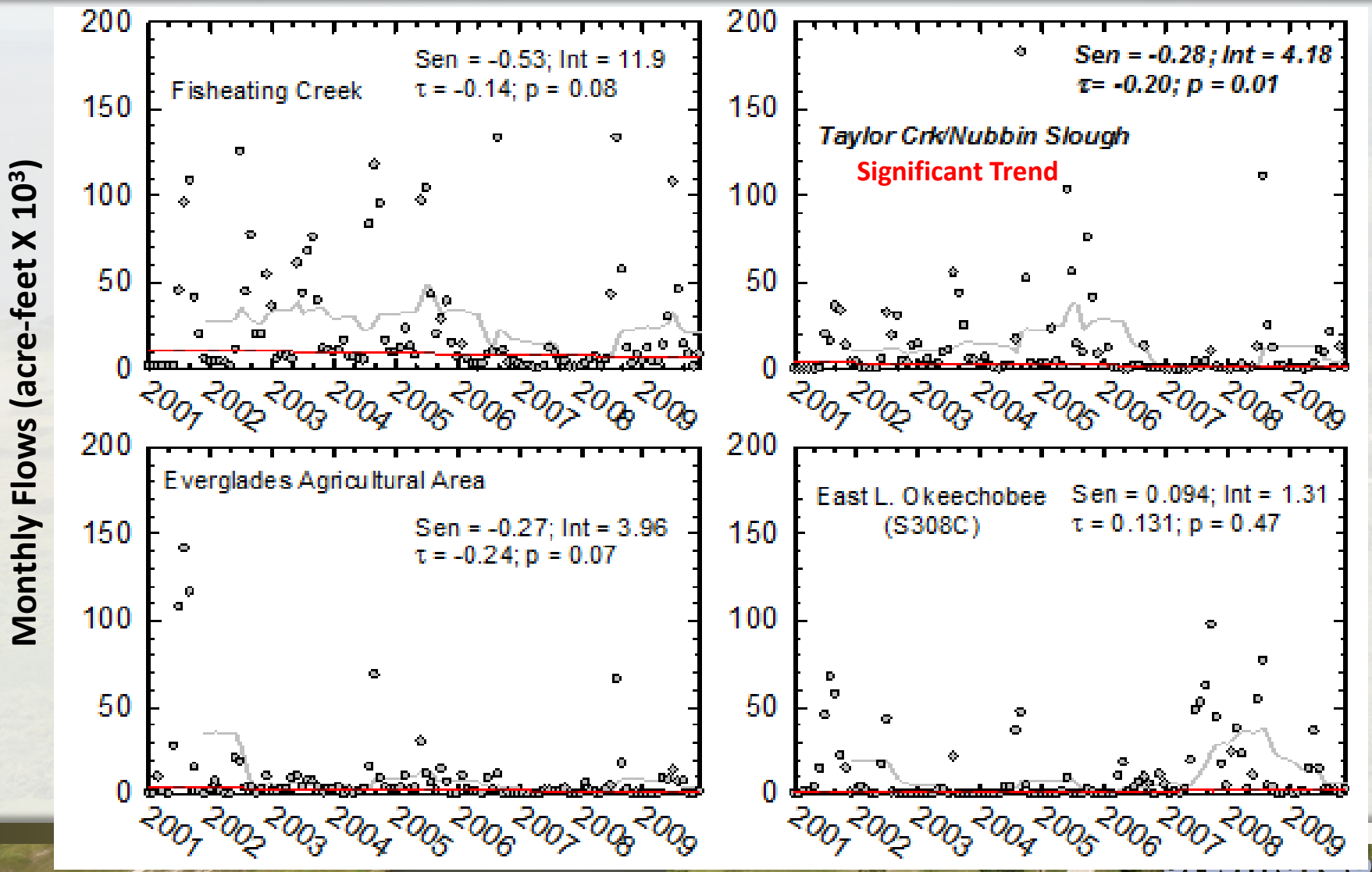
2009 Land Use	Area (acres)	Percent
Urban	**392,617**	**11.4%**
Agriculture	**1,745,558**	**50.6%**
Improved Pasture	684,763	19.8%
Unimproved/Woodland Pasture	300,957	8.7%
Row and Field Crops	35,098	1.0%
Sugarcane	427,279	12.4%
Citrus Groves	199,543	5.8%
Sod Farms	6,355	0.2%
Dairies	19,927	0.6%
Other Agriculture	71,637	2.1%
Rangeland	**206,061**	**6.0%**
Upland Forests	**251,352**	**7.3%**
Water Bodies	**224,863**	**6.5%**
Wetlands	**608,353**	**17.6%**
Barren Land	**21,670**	**0.6%**
Watershed Total Acreage	**3,450,475**	**100%**

Land use distribution detailing Florida FLUCCS level III for agriculture and level I for other land uses in the Lake Okeechobee Watershed.

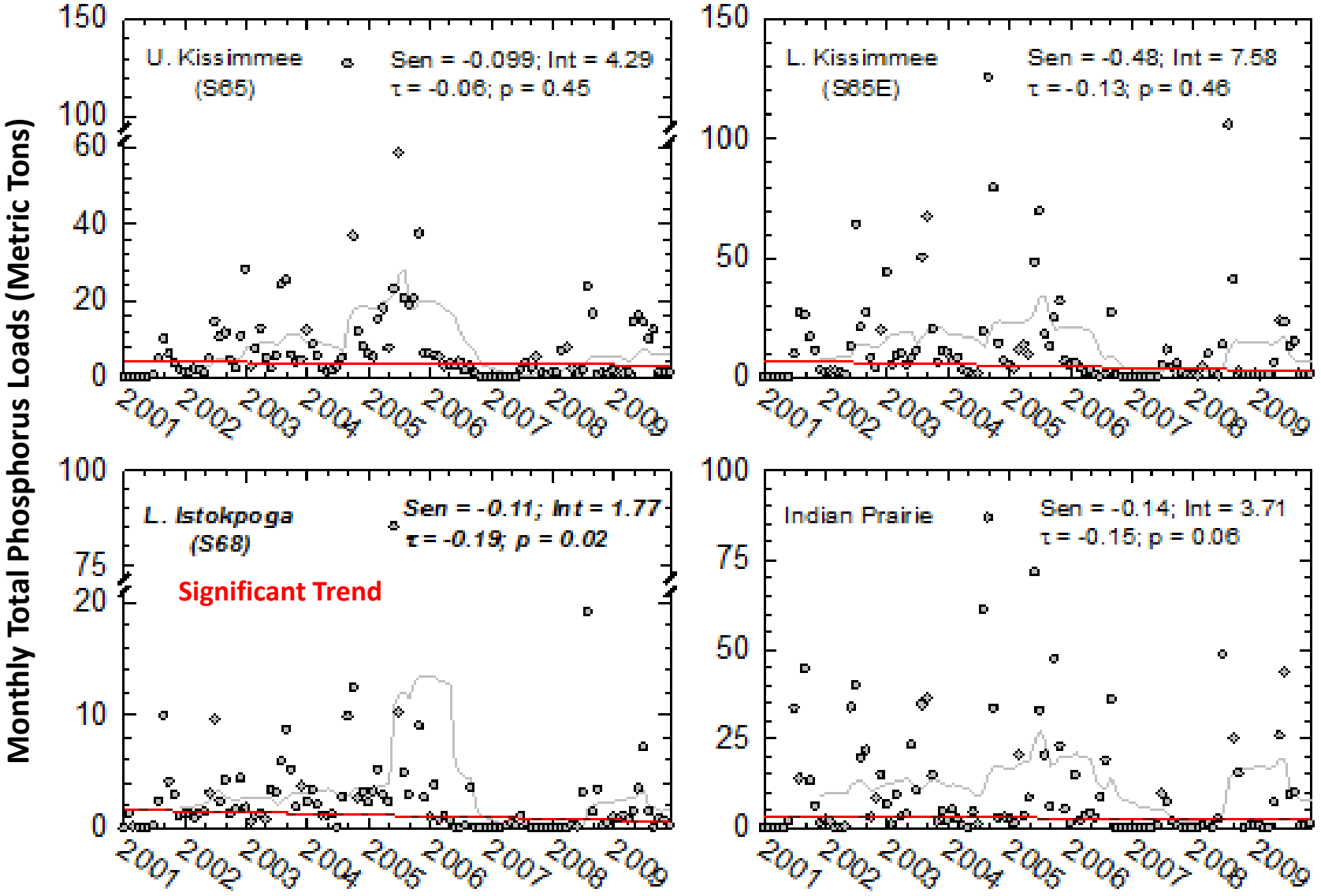
Sub-watershed Monthly Flow Trends (2001-2009)



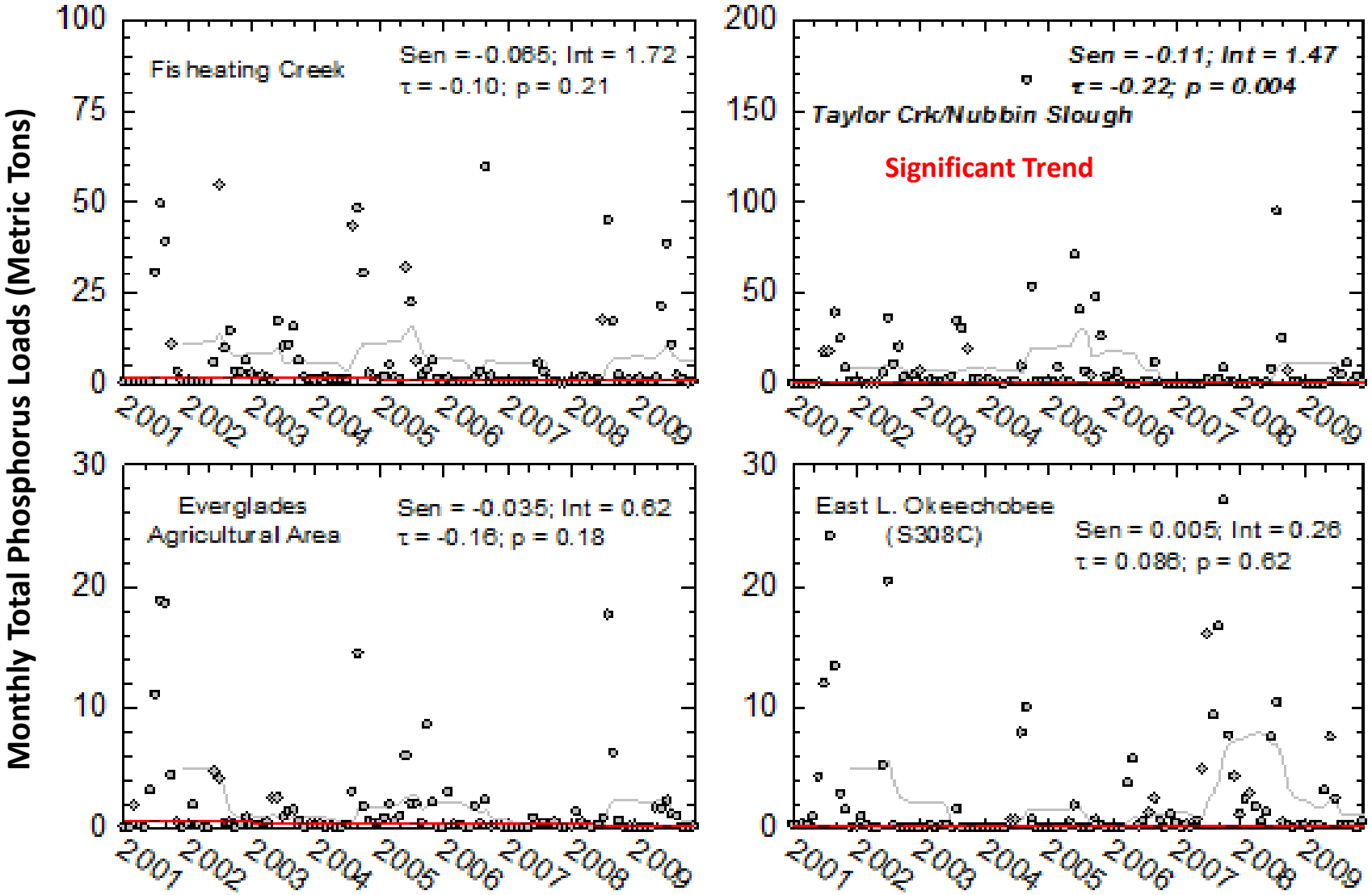
Sub-watershed Monthly Flow Trends (2001-2009) (continued)



Sub-watershed TP Loading Trends (2001-2009)

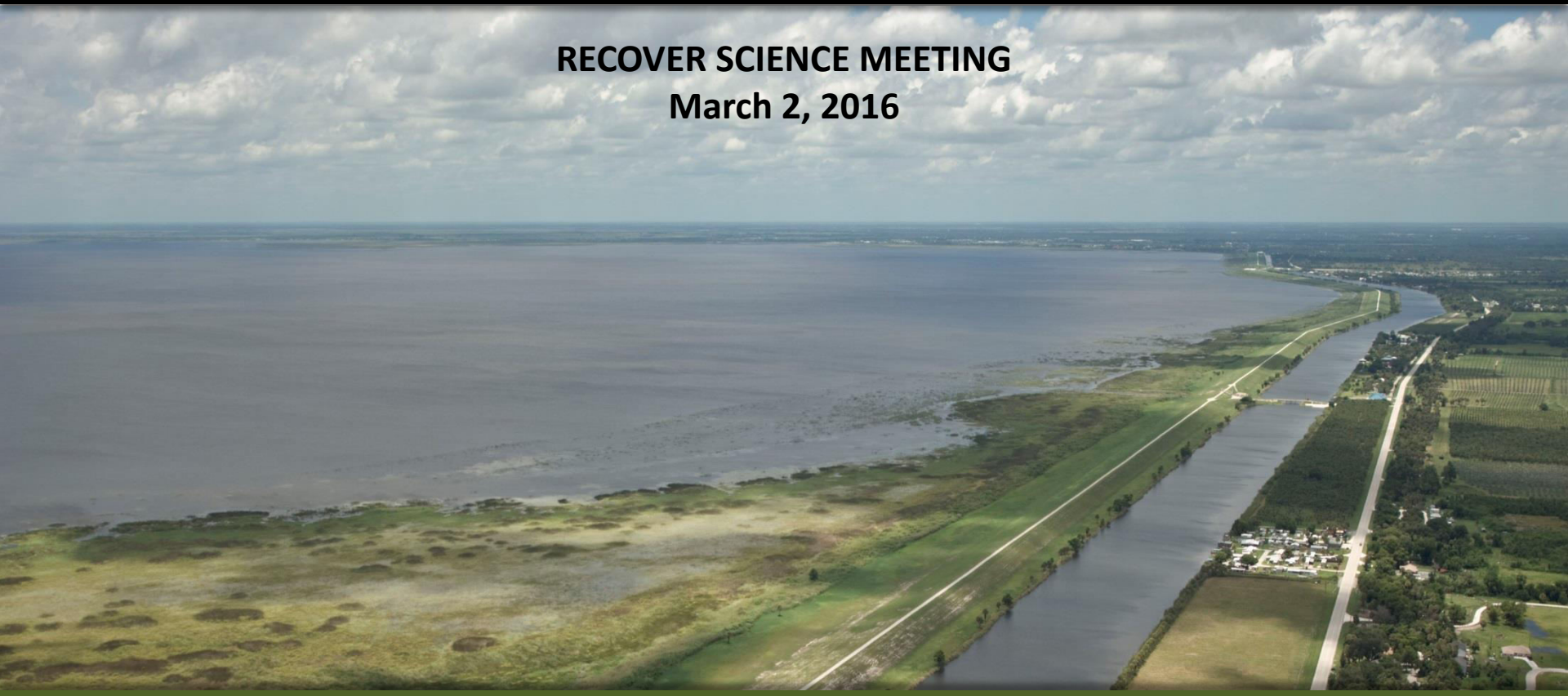


Sub-watershed TP Loading Trends (2001-2009) (Continued)



Summary

- The Lake Istokpoga and Taylor Creek/Nubbin Slough sub-watersheds showed a statistically significant decreasing trend in both monthly flow and TP load during 2001-2009.
- All eight sub-watersheds showed no statistically significant trend in flow-weighted mean TP concentrations for the same period.

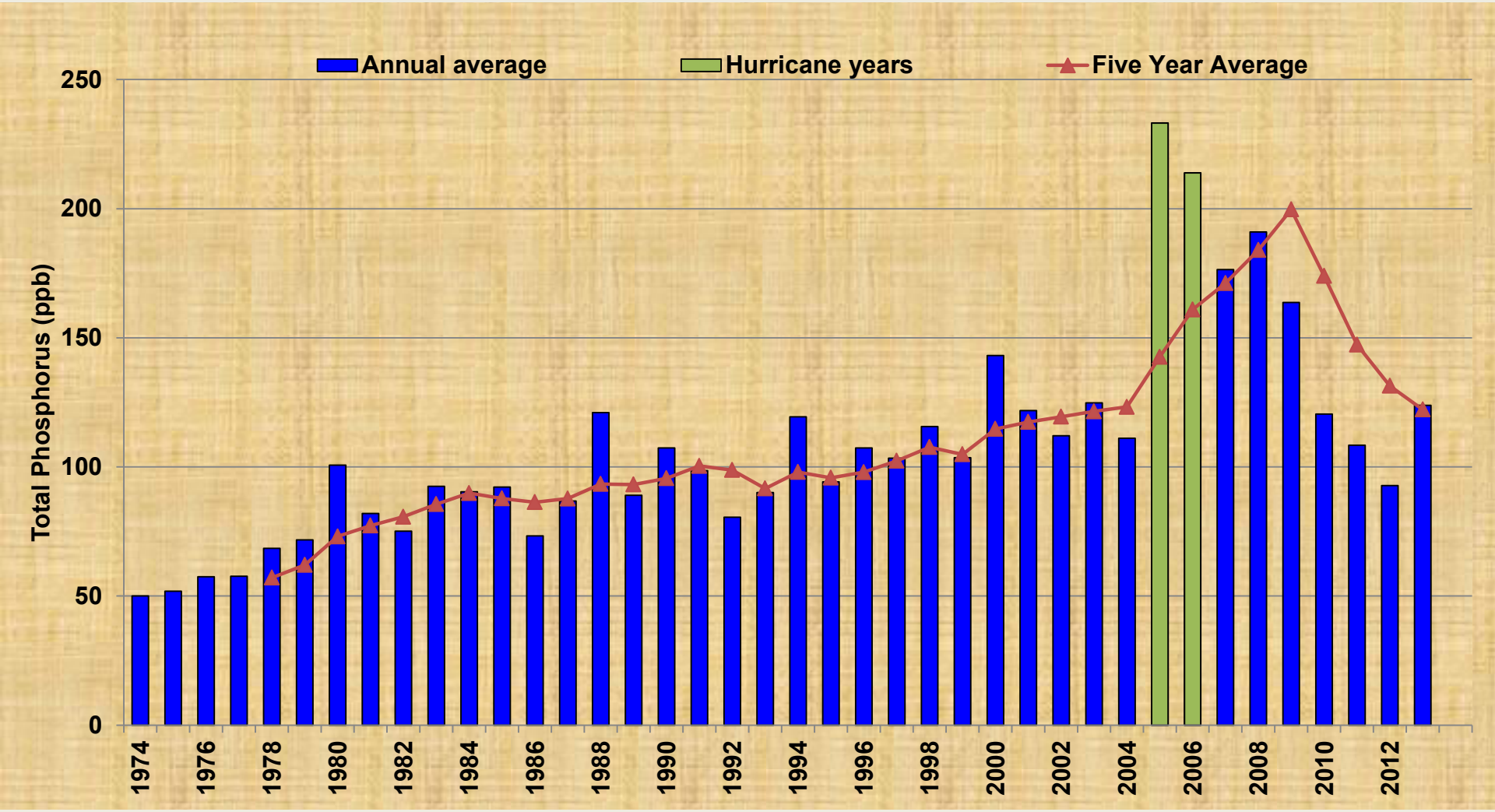


RECOVER SCIENCE MEETING
March 2, 2016

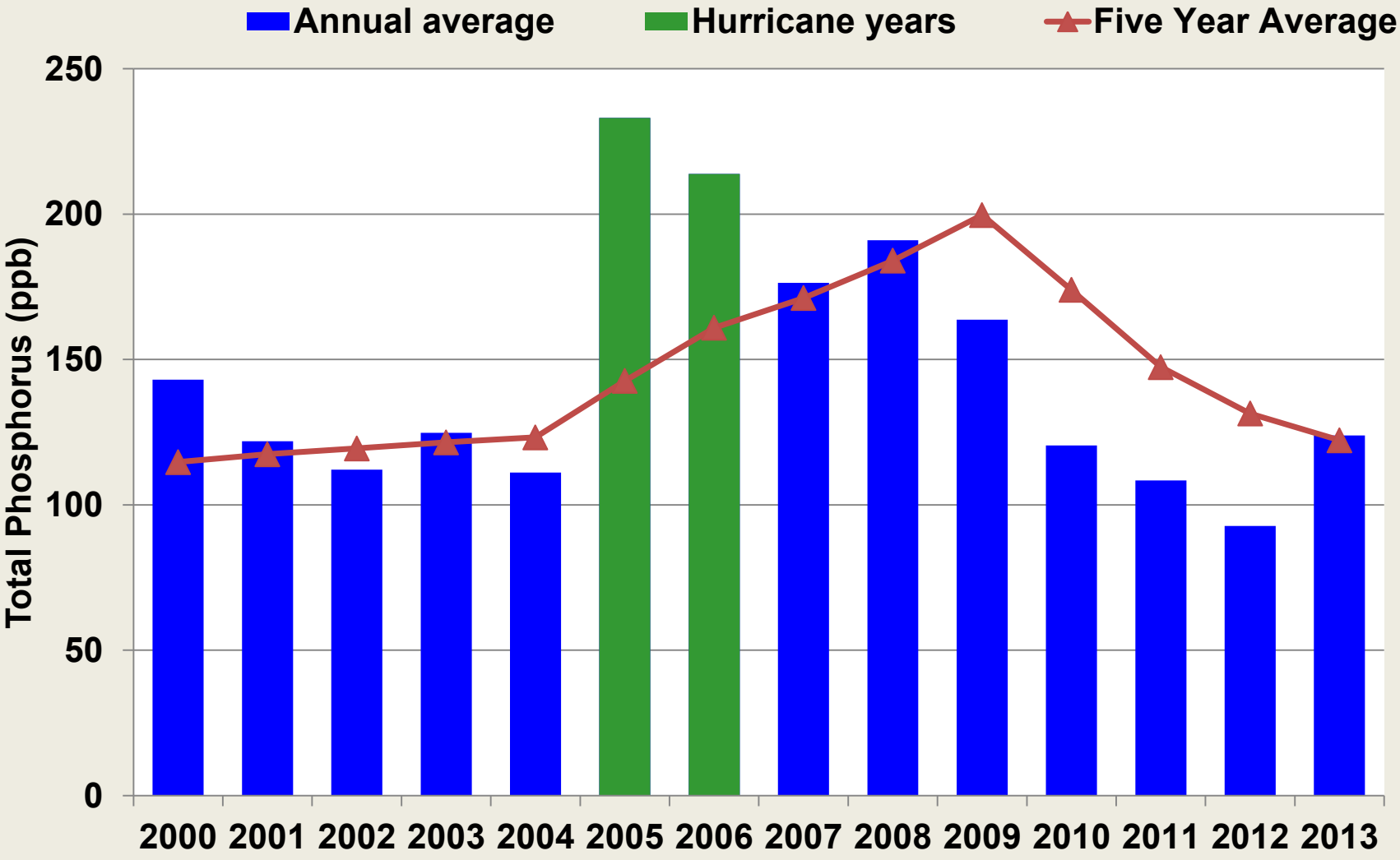
LAKE OKEECHOBEE PHOSPHORUS TRENDS 2000-2013

R. Thomas James
Lead Environmental Scientist
Lake and River Ecosystems Section

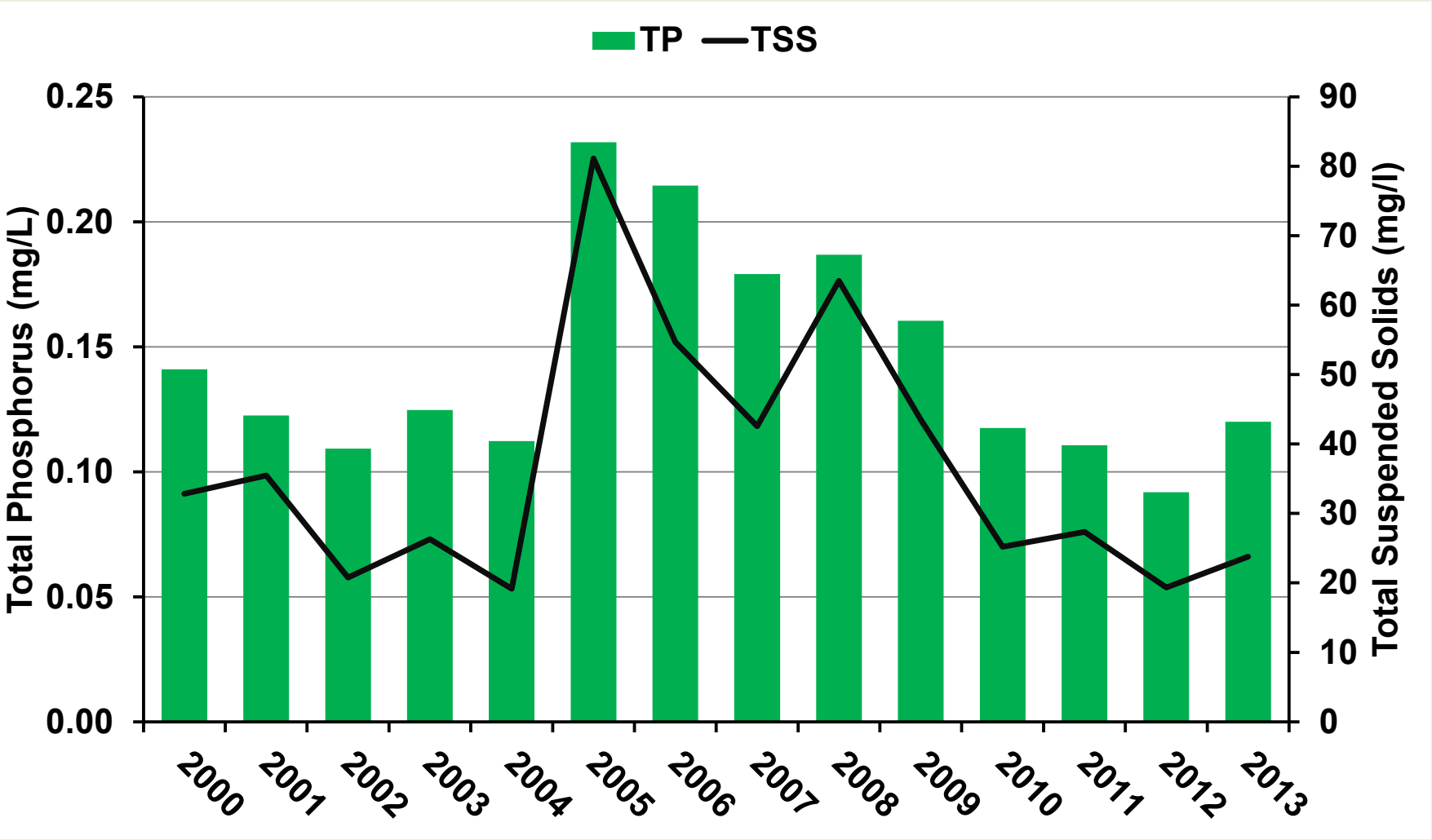
Phosphorus concentrations in Lake Okeechobee by water year (decline after 2005?)



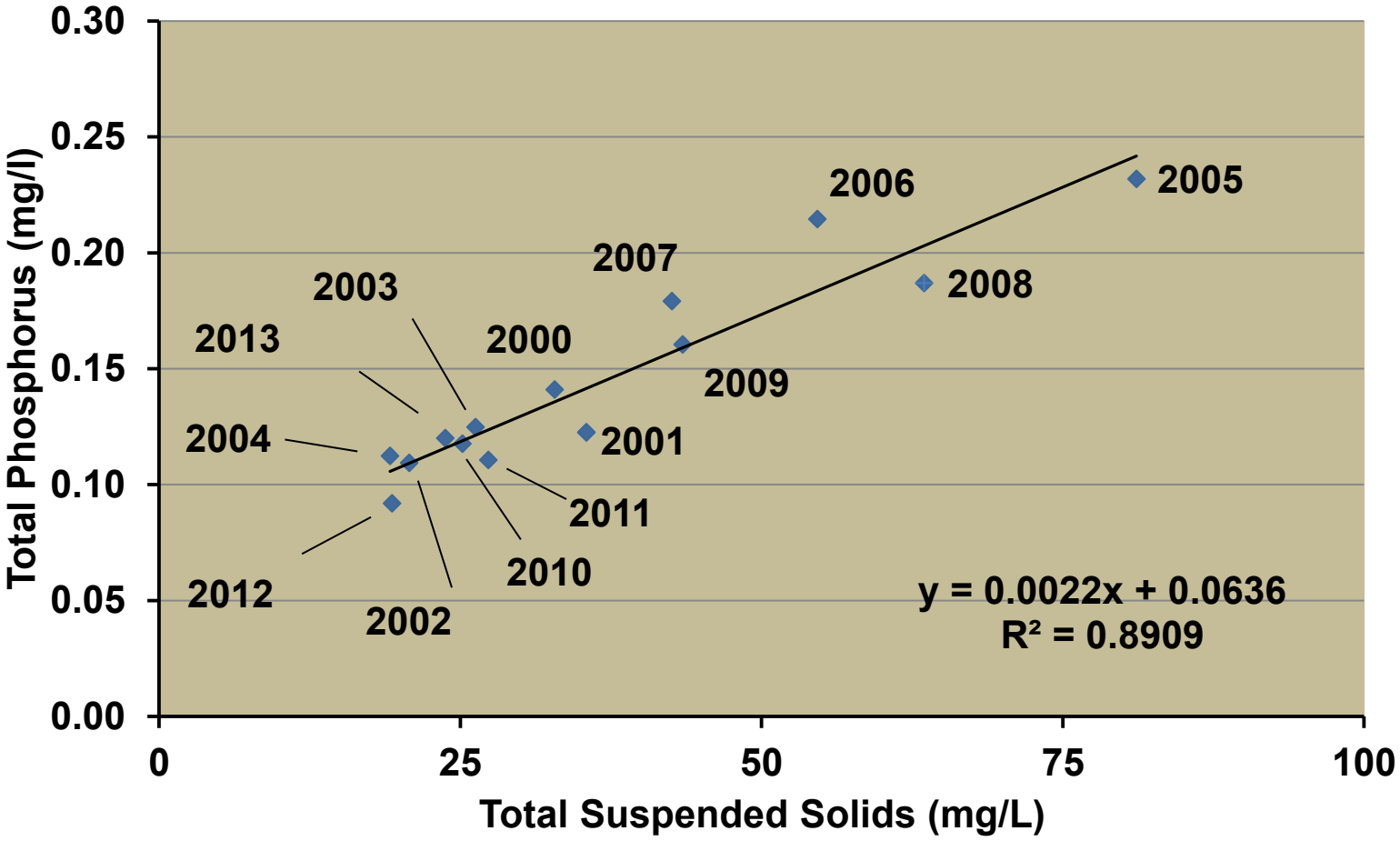
Phosphorus concentrations in Lake Okeechobee by water year (decline after 2005?)



Solids and Phosphorus Concentrations Appear to be Related

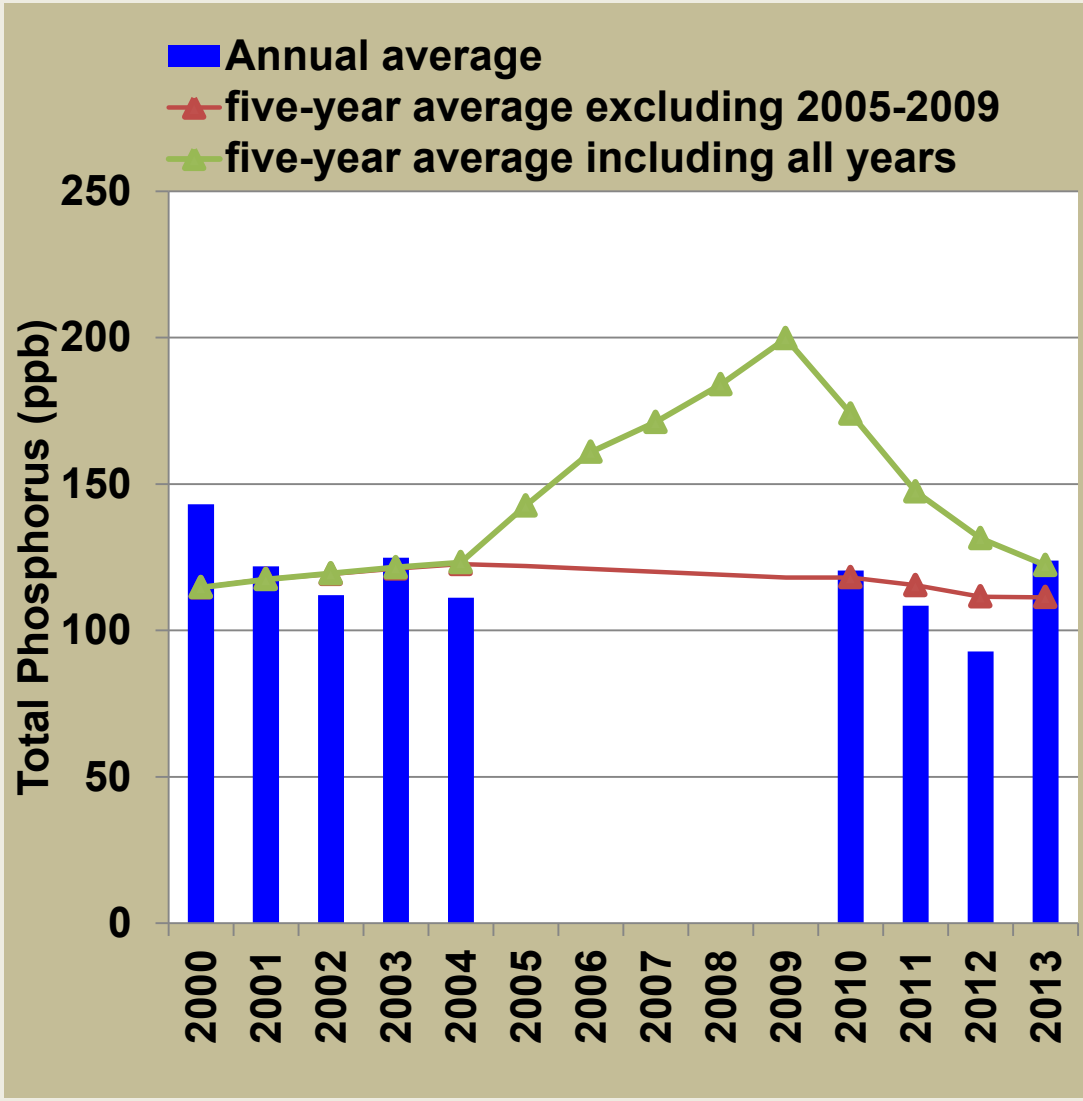


Strong Relationship Between TP and TSS by Year



Excluding Years 2005 to 2009 No Downward Trend

- **Remove water year 2005 to 2009**
  - *Allows for settling and reconsolidation of sediments*
- **Downward trend disappears**
- **TP concentrations after 2009 are nearly the same as pre hurricane period**



Summary

- **TP concentrations influenced by**
  - Sediment resuspension
    - *Affected dramatically by Hurricane events*
    - *Change with time*
- **Current TP concentrations are similar to pre-hurricane values**

Questions?