

Harris Chain of Lakes TP loading estimates

TMDL Baseline (1991-2000),
Future (2010),
Updated (2001-2010)

Baseline period (1991-2000) TP loading estimates

- Major tributaries (Palatlakaha River and tributaries connecting lakes)
 - Daily discharge volumes measured at dams
 - TP concentrations measured generally monthly
- Atmospheric deposition
 - Network of rain gauges in or near basin
 - TP in rainfall and in dry deposition measured from wet/dry deposition collector located near Lake Apopka

Baseline period (1991-2000) TP loading estimates

- Stormwater runoff
 - No direct measurements in basin; estimated by modeling approach, based on studies conducted elsewhere that determined runoff from different types of land use
 - Data needed for estimates - maps of drainage basins, land use, soil type, distance of drainage subbasins from lake, and rainfall
 - Runoff estimates based on 1987 and 1995 land use maps
 - Stormwater treatment assumed for land developed after 1987; treatment efficiency based on studies in Florida

Baseline period (1991-2000) TP loading estimates

- Septic tanks
 - No direct measurements in basin; estimated by modeling approach, based on studies conducted elsewhere
 - Assumed no loading from houses within service areas of municipal wastewater treatment plants (WWTP), or from areas served by package treatment plants located > 200 m from lakes
 - All houses outside of WWTP service areas and package plants within 200 m of lakes assumed to contribute septic tank loading
 - Number of contributing houses estimated from 1995 aerial photos
 - Fixed per capita TP release through septic tanks

Baseline period (1991-2000) TP loading estimates

- Muck farms - permit records of discharges when available, otherwise estimated by relating available data to rainfall
- SJRWMD restoration areas - TP measurements, combined with pump records or stormwater runoff methods
- Point sources - FDEP permit files
- Springs - periodic measurements of TP and discharge volumes

Future (2010) TP loading projection

- Assemble existing (2005) land use map:
 - 2002 Lake County map (unincorporated areas)
 - SJRWMD and Lake County conservation area maps
 - City existing land use maps (Tavares, Leesburg, Mt. Dora)
 - City of Eustis future land use map
 - Orange County 2020 future land use map
 - SJRWMD 2000 land use map (other cities, north Griffin basin)

Future (2010) TP loading projection

- Estimate stormwater TP loading for existing (2005) conditions using new land use map and same methods as used for baseline period (1991-2000)
- Extrapolate to 2010
 - Eustis and Orange County future land uses - no change in stormwater runoff from 2005
 - Other areas - continue trends in loading from 1995 to 2005 land use

Future (2010) TP loading projection

- Septic tanks
 - New count of contributing houses from 2004 aerial photos
 - Extrapolate to 2010 by continuing trends in loading from 1995 to 2004
- SJRWMD restoration areas - assume 1 lb TP/acre/year

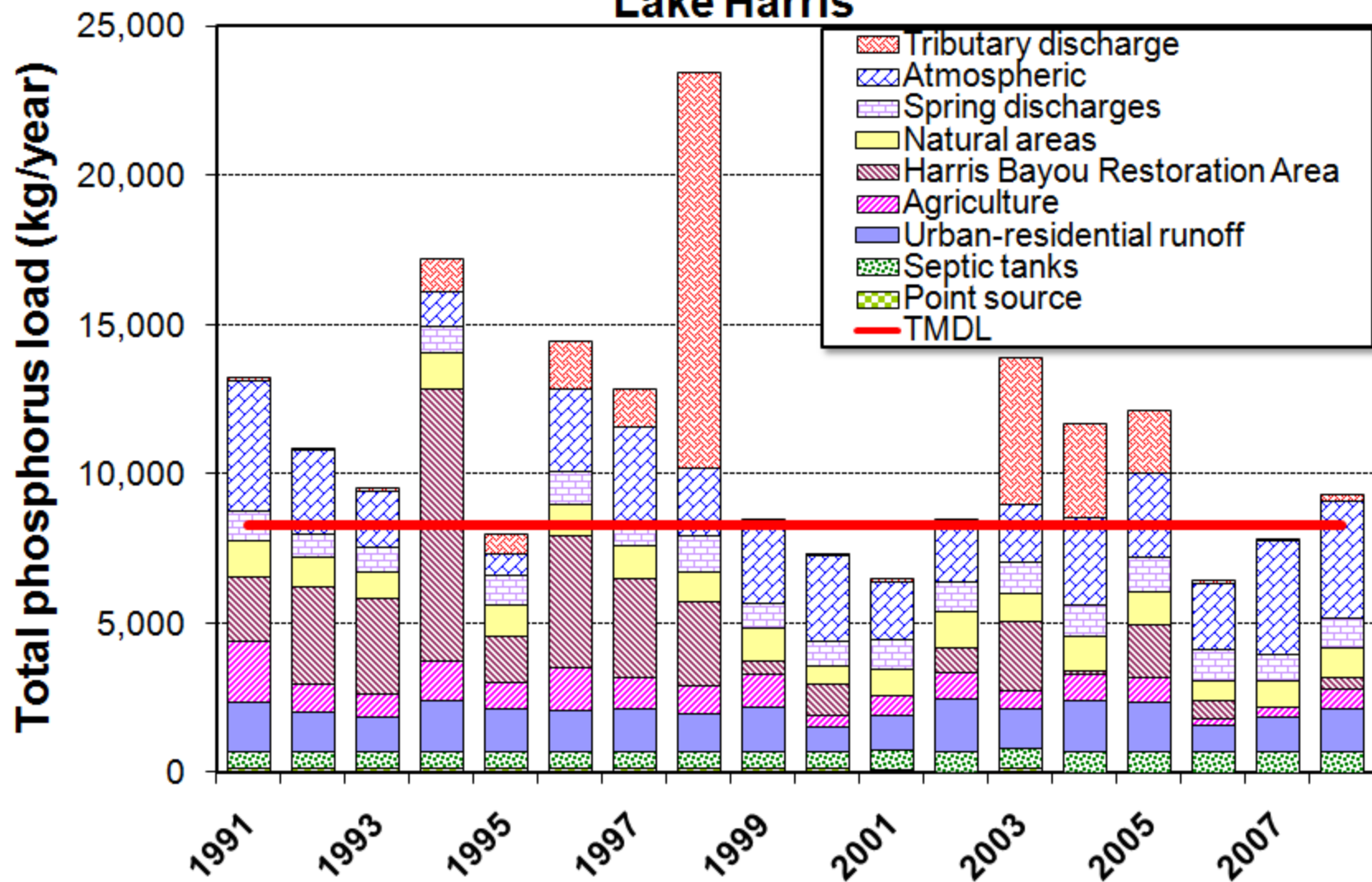
Future (2010) TP loading projection

- Tributary loads from Palatlakaha River or from upstream lakes - assume to change proportionately to the loads to those upstream basins
- Other sources assumed no change in loading from baseline (atmospheric, springs, remaining muck farms, point sources)

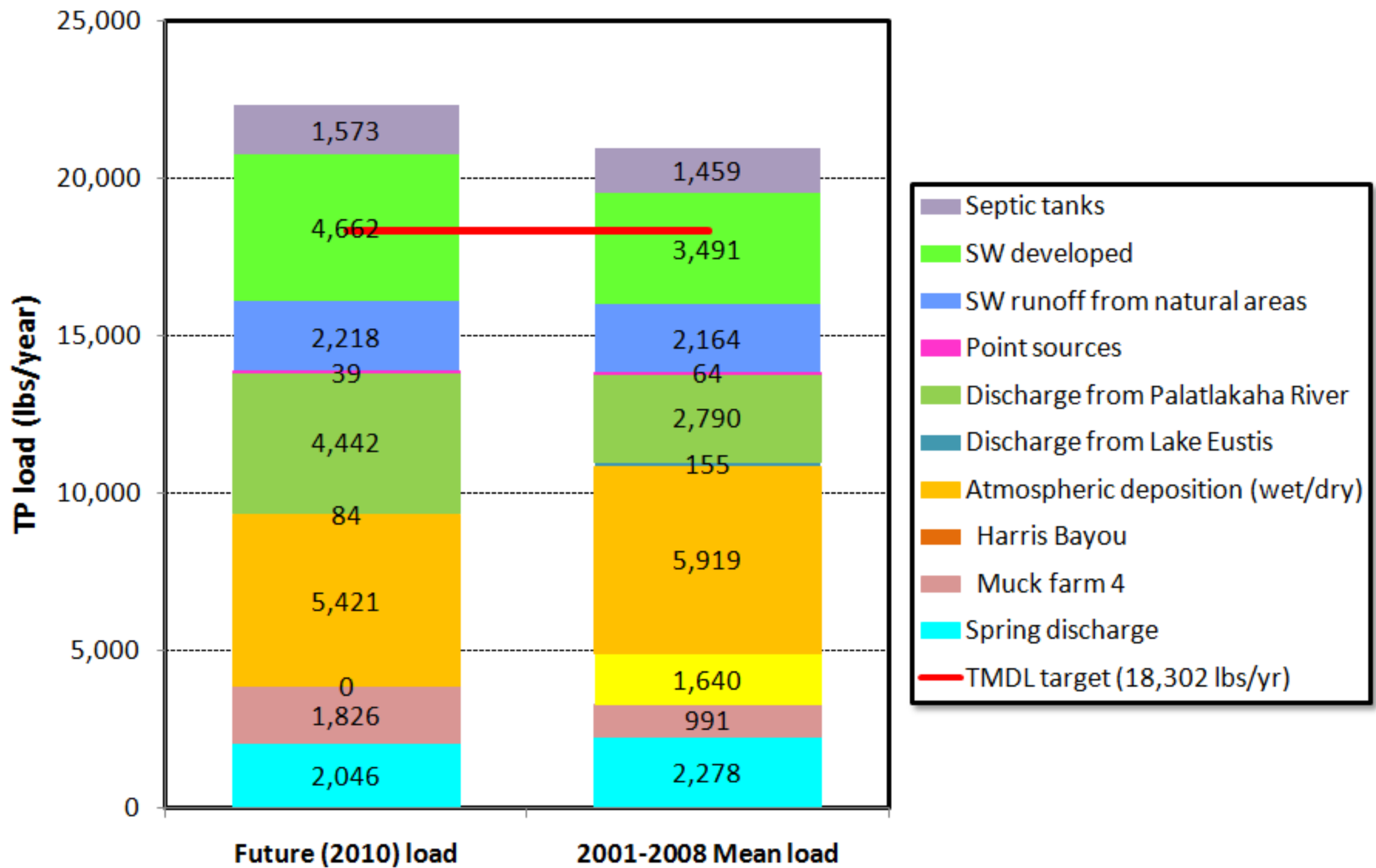
Updated (2001-2010) TP loading estimates

- Generally use same methods as for baseline period, except use Doppler radar rainfall estimates, instead of a limited number of rain gauges
- Incorporate stormwater projects identified in BMAP
- Stormwater runoff based on 2000 and 2004 land use maps
- Septic tank loading estimates based on 2004 aerial photos
- Point source loading estimates last updated 2006

Estimated annual external total phosphorus loads to Lake Harris



Lake Harris comparison of projected future (2010) TP load with mean 2001-2008 TP loads



Issues to consider in updating TP load estimates

- Land use mapping - new 2009 land use map under development, completion expected by 2011. Should this new map be used in stormwater loading estimates?
 - To obtain an ERP where existing ambient water quality does not meet state water quality standards, an applicant must demonstrate that the proposed activity will result in a net improvement in the parameters that do not meet water quality standards.

Issues to consider in updating TP load estimates

- Can we incorporate an estimate of effects of wastewater re-use on stormwater runoff?
- Are there now available maps that show houses on septic systems within WWTP service areas?