Los Angeles and Long Beach Harbors and San Pedro Bay Modeling Update

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Topics

- Modeling Status

- Extending Simulation Period

- Waterbody Mass Flux/Balance

- Preliminary Response to Comments

Modeling Status

- TAC Meeting May 2008
  - Presented May 2008 Version of Report
- Added Long-Term 4 Year Simulations and Responses to Comments on May 08 Report
  - February 2009 Report
- Comments Lead to Resolution of Salinity and Sediment Problems
  - Salinity and Sediment Memo Summer 09
- Revised Long-Term Simulations and Resolved Additional Comments
  - February 2010 Report

Modeling Status

- Ongoing Work
  - Extend Simulation Period to Allow Evaluation of Longer Term Response
  - Waterbody Mass Flux/Balance
 - Develop Simulation Scenarios to Support TMDL

Extending Model Simulation Period

- Current Simulation Period Spans 4 Years, 2002-2005

- This Period Can Be Extended to 5 Years by Including 2001

- Use of Years Prior to 2001 Is Problematic

- Not Feasible to Add Historical Years After 2005 Due to Watershed Model

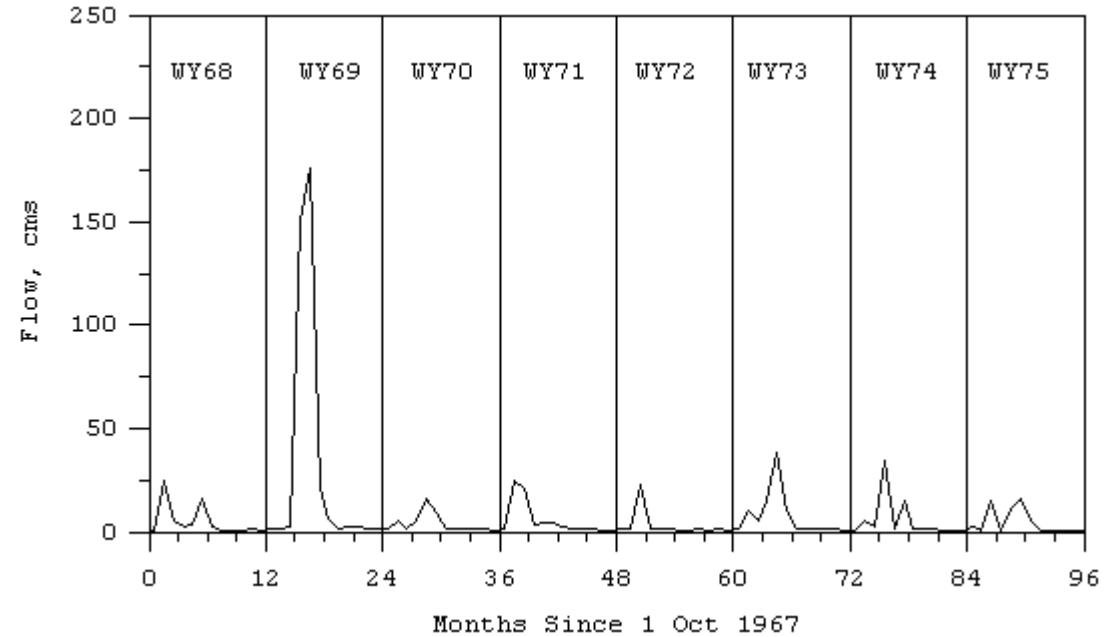- Create Synthetic Extended Period by Reusing 2001-2005

Extending Model Simulation Period

- Analyzed 40 Years of LA River Flow
  - Monthly Averaged Flow
  - Daily Flow
- Compared these with 2001-2005
- Each of the 40 Years Associated with One of the 2001-2005 Years
- Monthly and Daily Give Similar Frequencies

**01 – 05
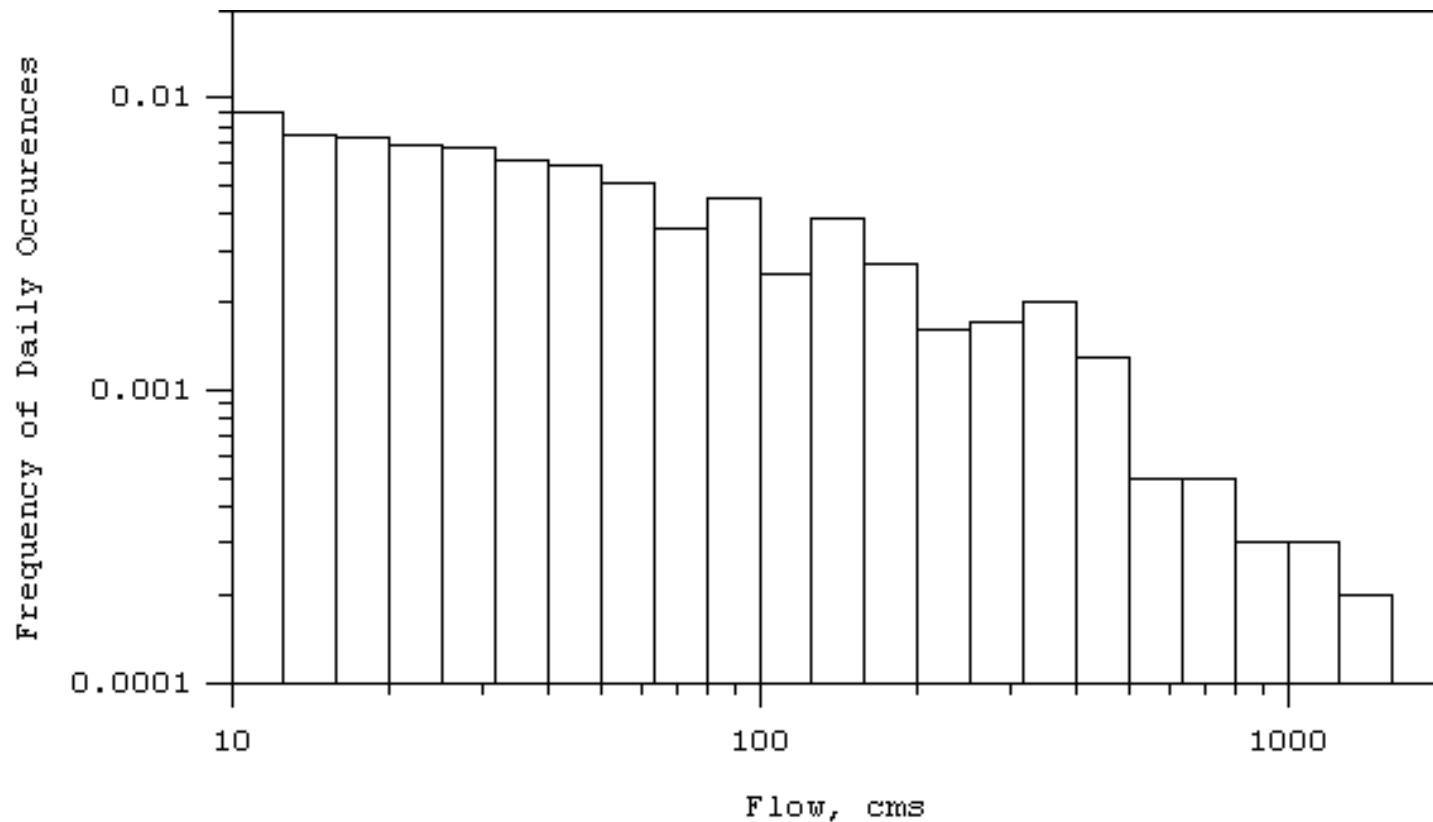Simulation
Years
(also Historical)**
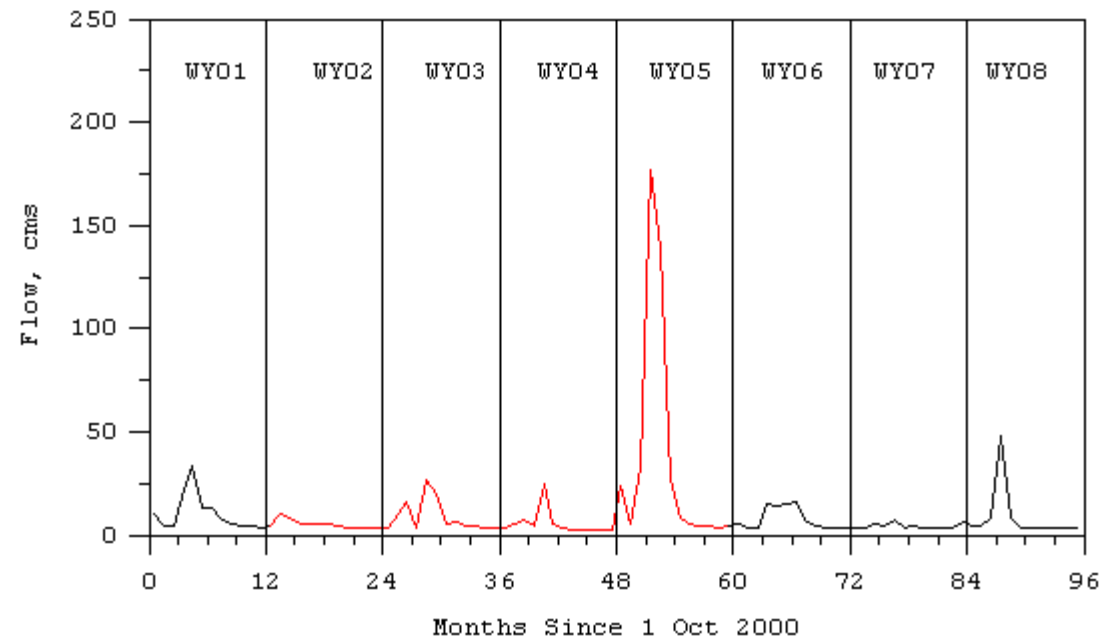
**68 – 75
Historical Years**

Frequency of Simulation Years Being Similar to Historical Years

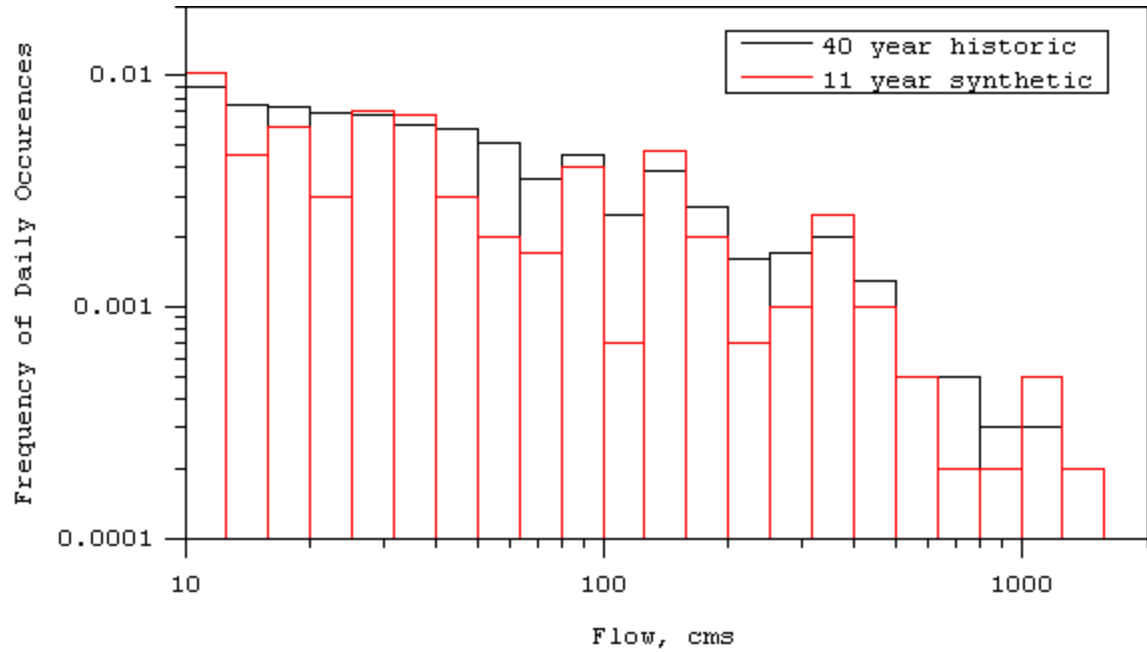| Simulation Year	Number of Monthly Best Matches	Fractional Frequency for Monthly	Number of Daily Best Matches	Fractional Frequency for Daily	Preliminary Proposed Fractional Frequency
2001	12	0.300	11	0.275	0.300
2002	10	0.250	14	0.350	0.300
2003	6	0.150	5	0.125	0.125
2004	7	0.175	5	0.125	0.150
2005	5	0.125	5	0.125	0.125

Use Frequency of Occurrence Histogram to Determine Best Combinations
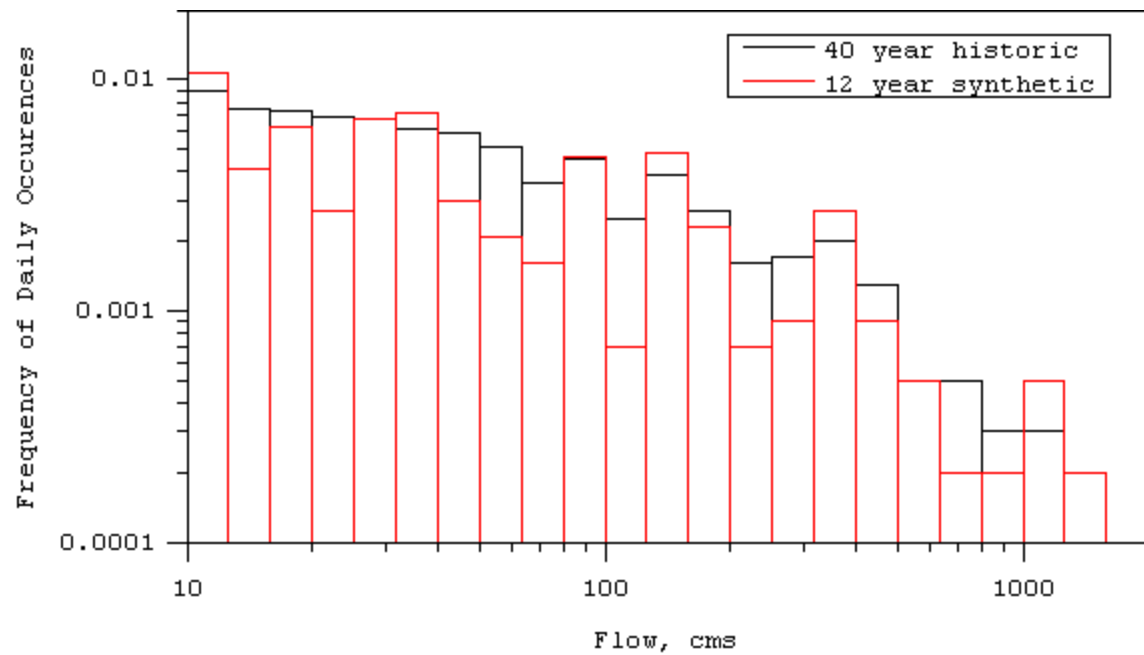## (Below Based on Historical 40 Years)

Examples of Synthetic Periods of 11, 12, and 13 Years

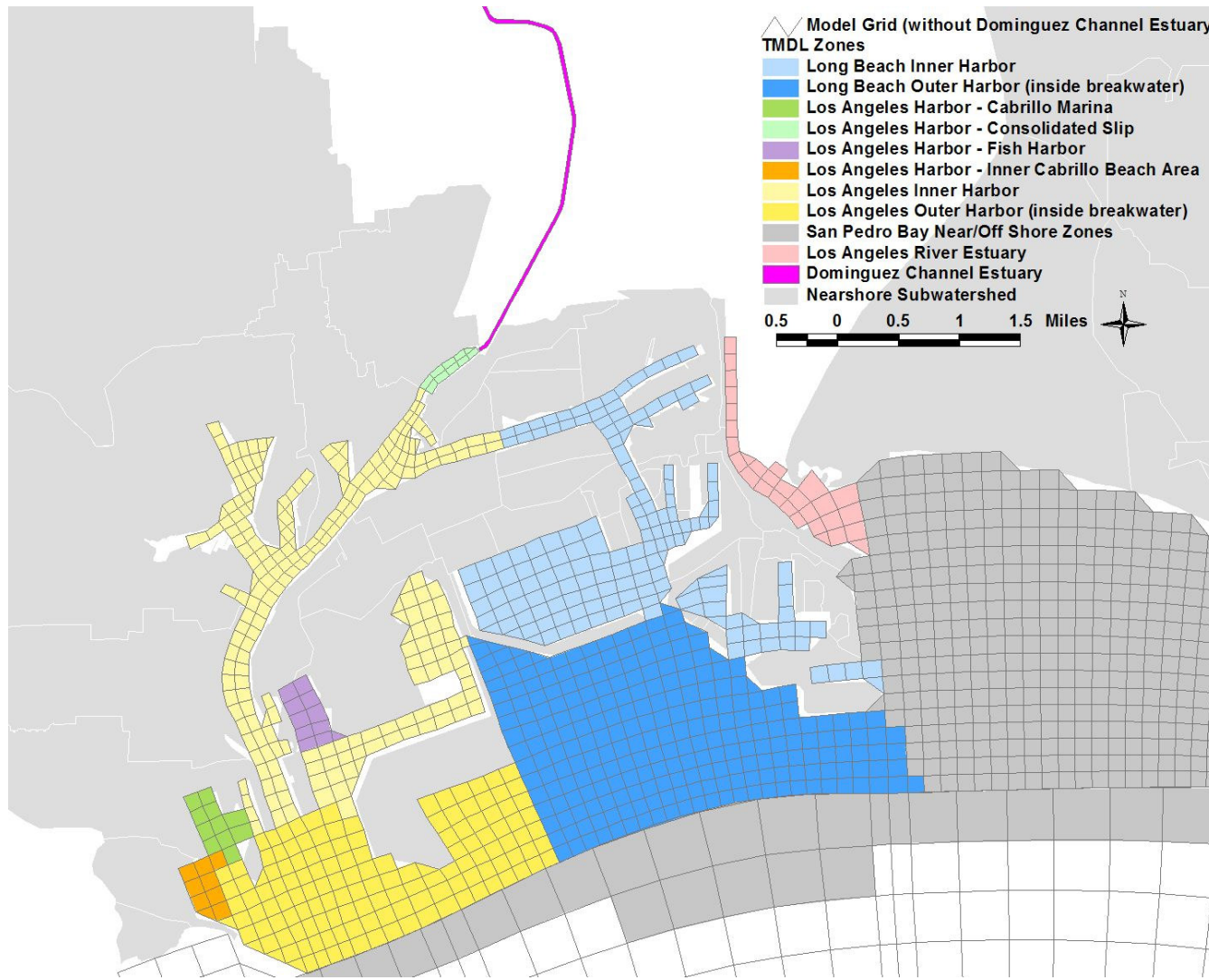| Simulation Year	Number of Occurrences 11 years	Number of Occurrences 12 years	Number of Occurrences 13 years
2001	3	4	4
2002	4	4	4
2003	1	1	2
2004	2	2	2
2005	1	1	1

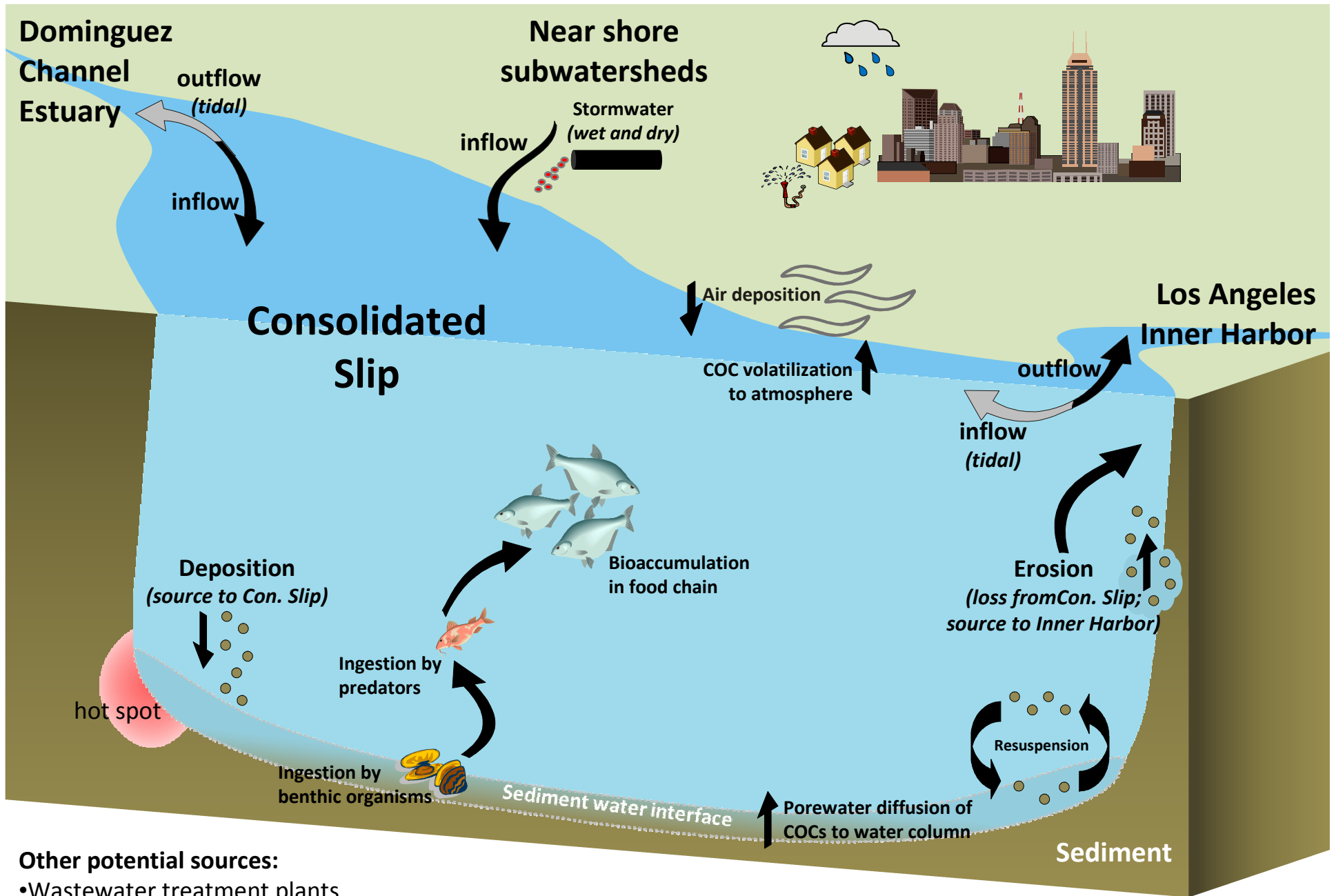# 11 Years

12 Years

Waterbody Mass Flux/Balance

- Identify/Quantify
  - "Upstream" Input
  - Sediment Bed Source/Sink
  - "Downstream" Export
- Sediment Bed Source/Sink Divided Into:
  - Erosion and Deposition of Particulate Phase
  - Pore Water Diffusion of Dissolved Phase
- Test on Consolidated Slip

Greater Harbors Waterbodies

Model Grid (without Dominguez Channel Estuary)
TMDL Zones
- Long Beach Inner Harbor
- Long Beach Outer Harbor (inside breakwater)
- Los Angeles Harbor - Cabrillo Marina
- Los Angeles Harbor - Consolidated Slip
- Los Angeles Harbor - Fish Harbor
- Los Angeles Harbor - Inner Cabrillo Beach Area
- Los Angeles Inner Harbor
- Los Angeles Outer Harbor (inside breakwater)
- San Pedro Bay Near/Off Shore Zones
- Los Angeles River Estuary
- Dominguez Channel Estuary
- Nearshore Subwatershed

0.5 0 0.5 1 1.5 Miles

Some Responses to Comments

- Hourly Flow and Concentrations
  - Los Angeles River
  - San Gabriel River
  - Dominguez Channel (Including Laterals)
- Nearshore Watersheds Use Daily Flows and Concentrations
- Distribution of Nearshore Watershed Inflow Point Merits Discussion