Mercury Imports and Exports of Four Tidal Wetlands in the Sacramento Valley

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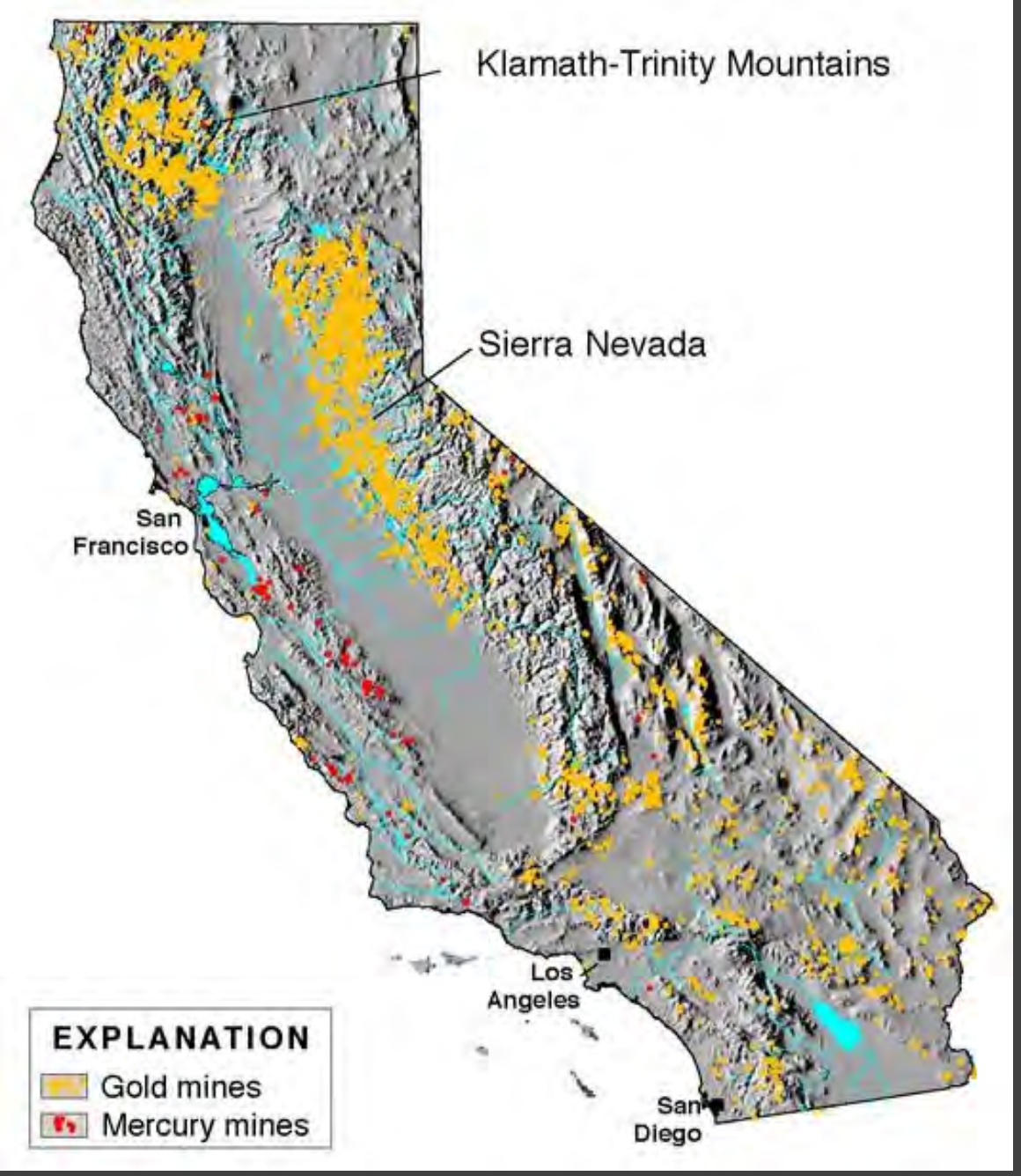
What are we going to talk about?

- Background
- DWR's Involvement
- The Study
- Results and Conclusions



47,000 abandoned mines in California.

Main source = mines*

Wonderful graphic from USGS Fact Sheet 2005-3014 (thank you thank you!)

Mercury vs Methylmercury

Methylmercury is more toxic

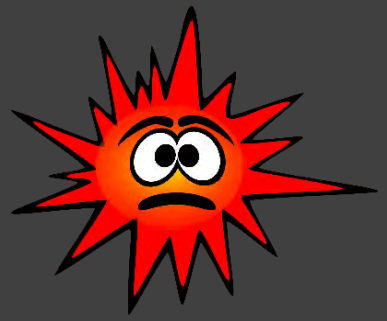
Organic molecule

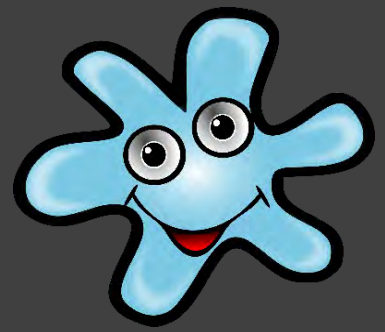
Crosses blood brain barrier

Accumulates in nervous system

Kidney and brain damage

Low oxygen





CROSSES THE BLOOD BRAIN BARRIER

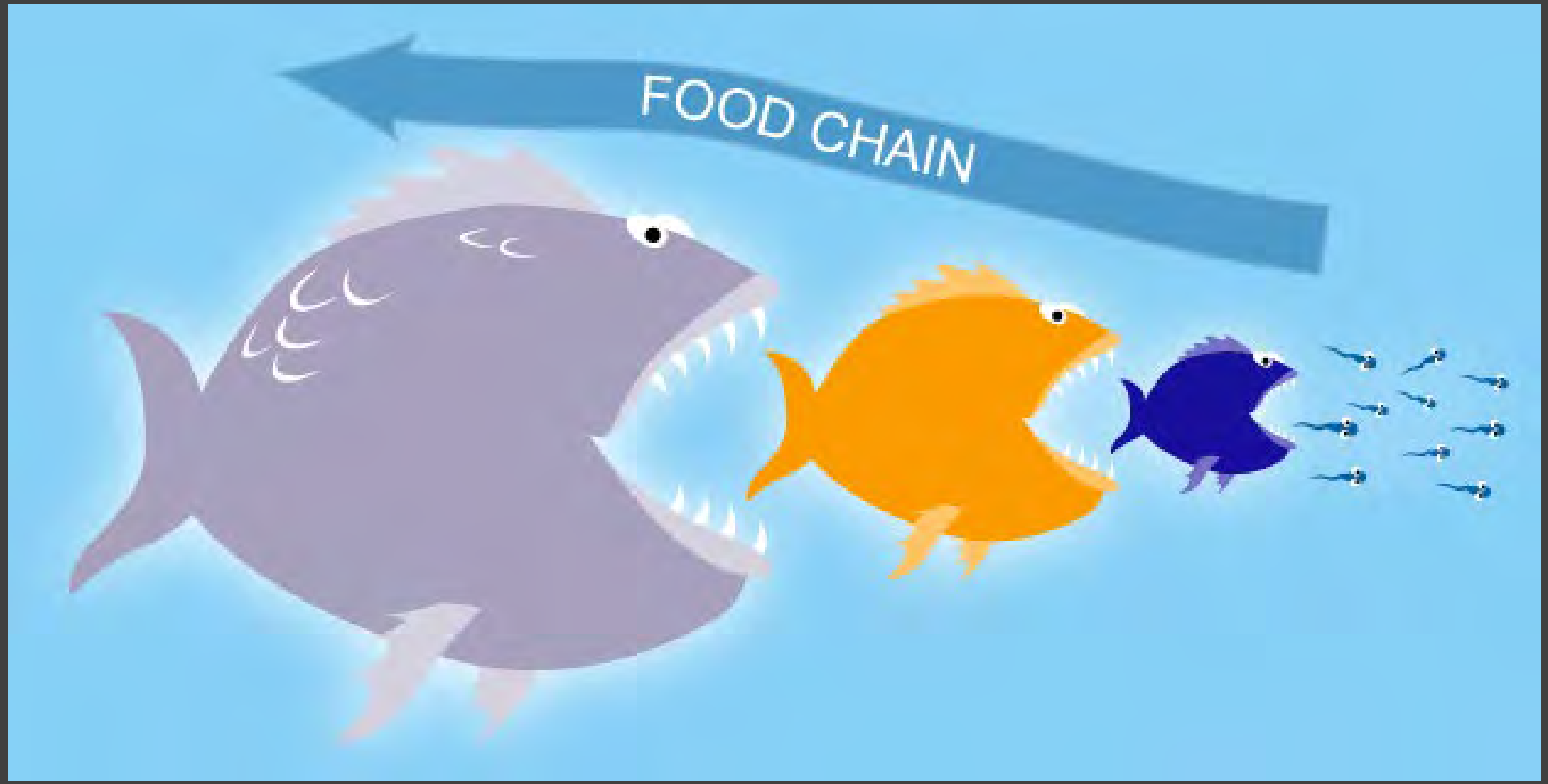
Inorganic Mercury

Methyl mercury

+

Carbon!

Methylmercury, the master bioaccumulator and biomagnifer!



DWR's Involvement

The Study

Four wetlands

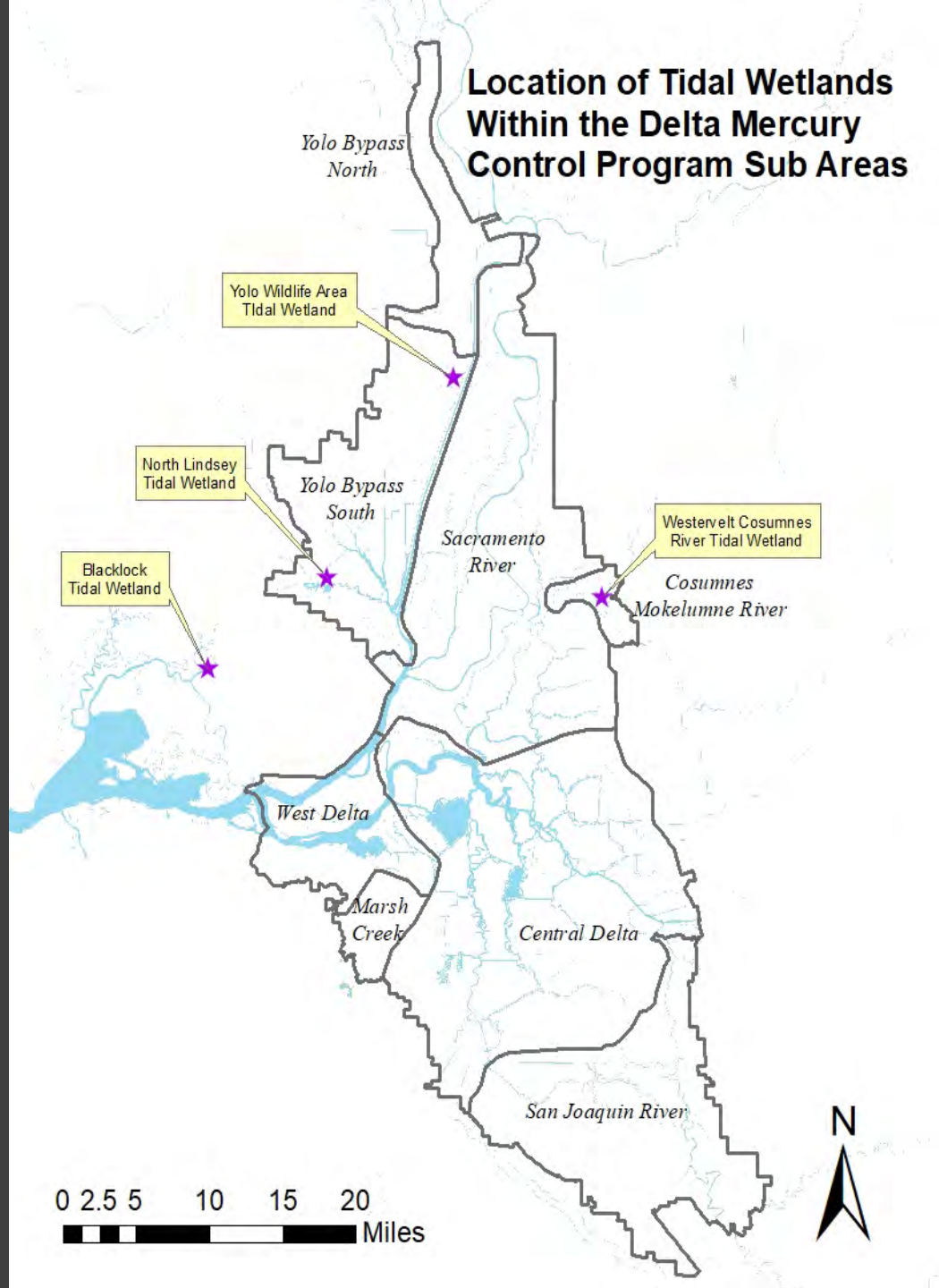
Not hydrodynamically leaky!*

Measured for ONE year

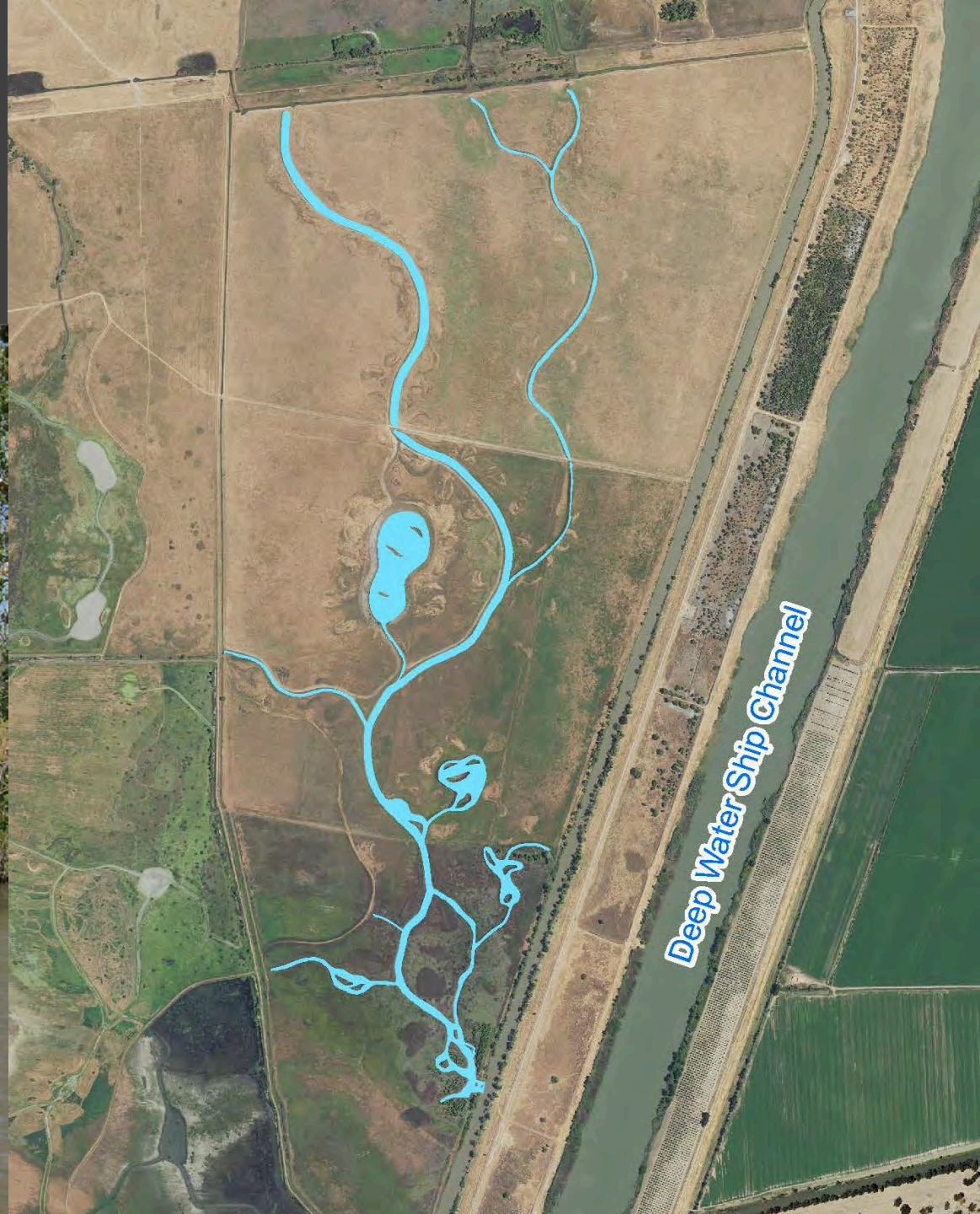
EACH

Imports vs Exports

Monthly Hg and MeHg sampling



Yolo Bypass Wildlife Area Tidal Wetland



Blacklock Tidal Wetland

North Lindsey Slough Tidal Wetland

Westervelt Cosumnes River Tidal Wetland

Hypotheses*

1. Tidal wetlands are a net source of total methylmercury on an annual basis; and

2. Tidal wetlands are a net source of total mercury on an annual basis.

*that we care about for the purposes of this presentation

FLOW
Cubic feet per second (CFS)

X CONCENTRATION
ng/L

= LOAD
grams per tide

We measured…

1. Continuous flow

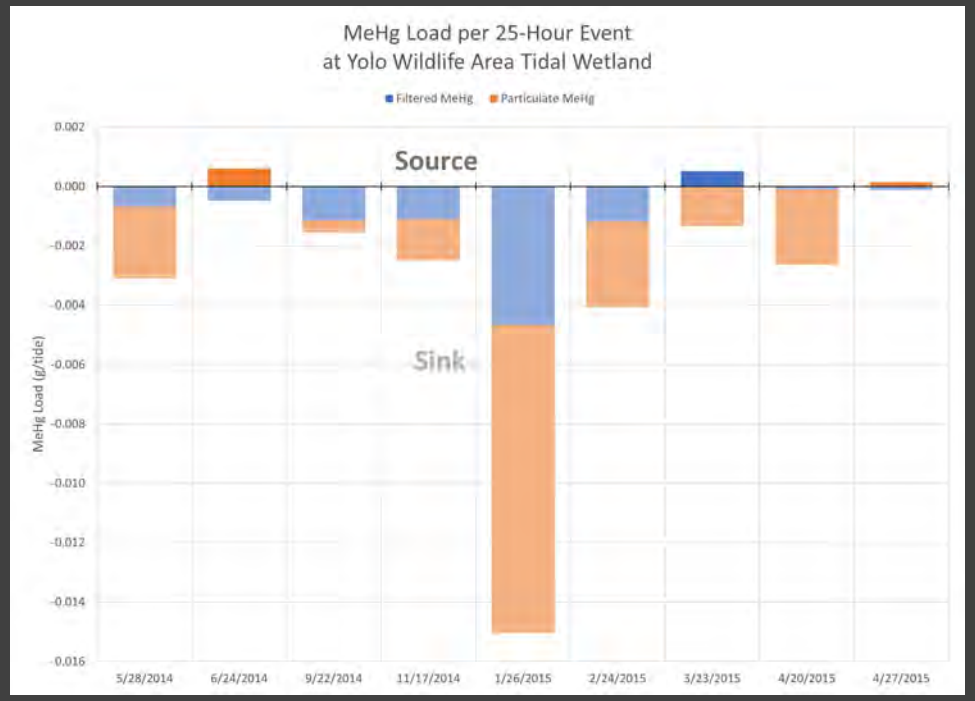
2. Mercury, methylmercury, total suspended solids ~monthly concentrations

Equipment


Westervelt Cosumnes River
Tidal Wetland
Cosumnes River
ADCP Flow Meter
Water Quality Station
Autosampler
Rating Curve Transect

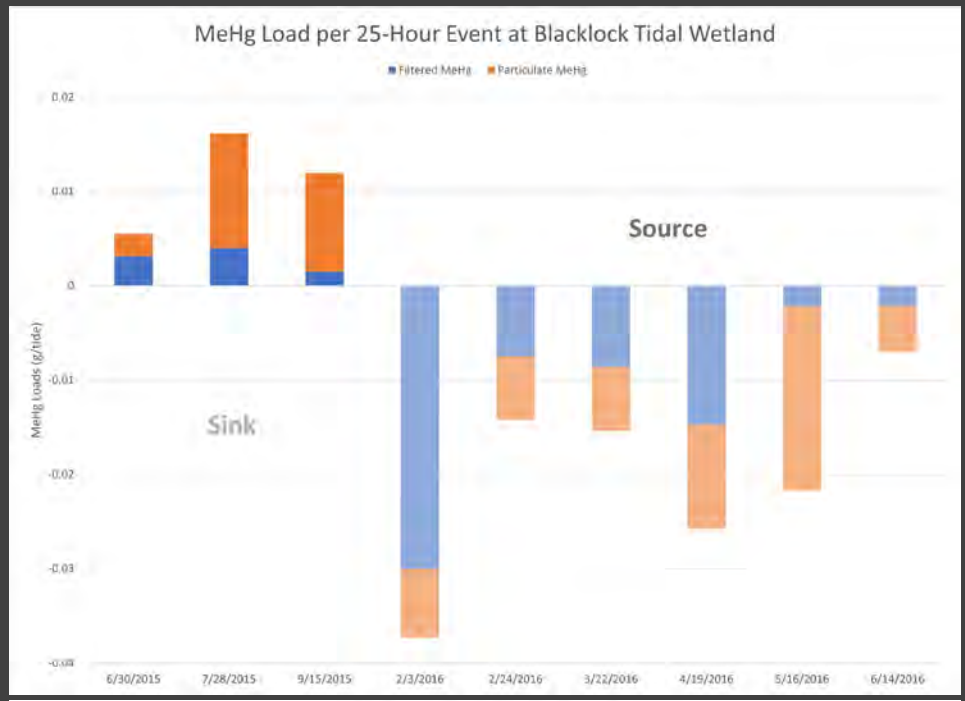
Hypothesis 1

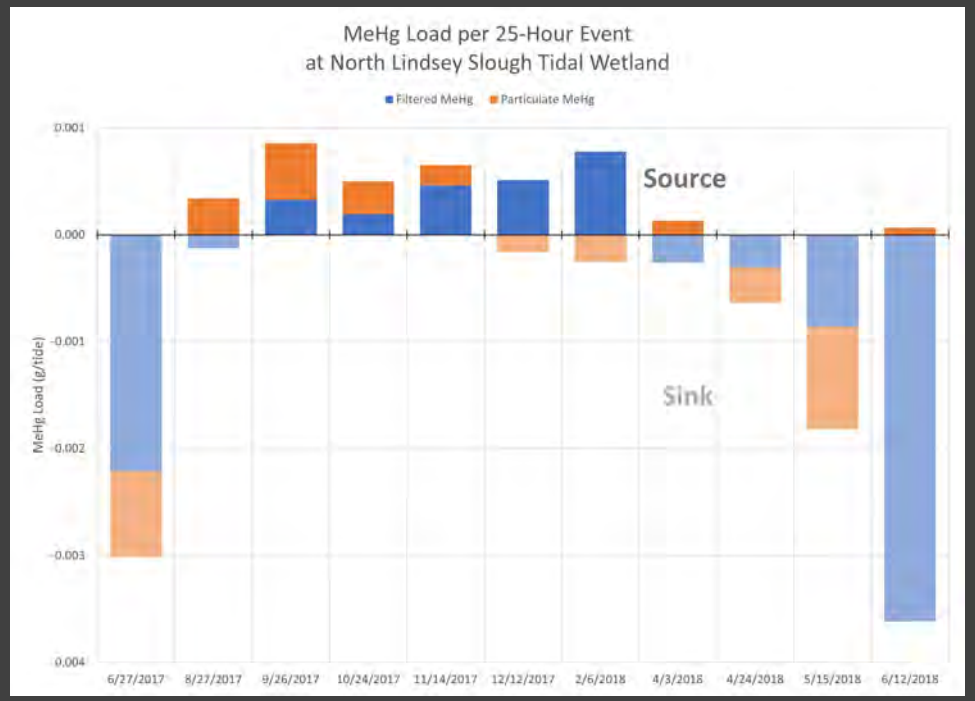
Tidal wetlands are a net source of total MeHg on an annual basis.



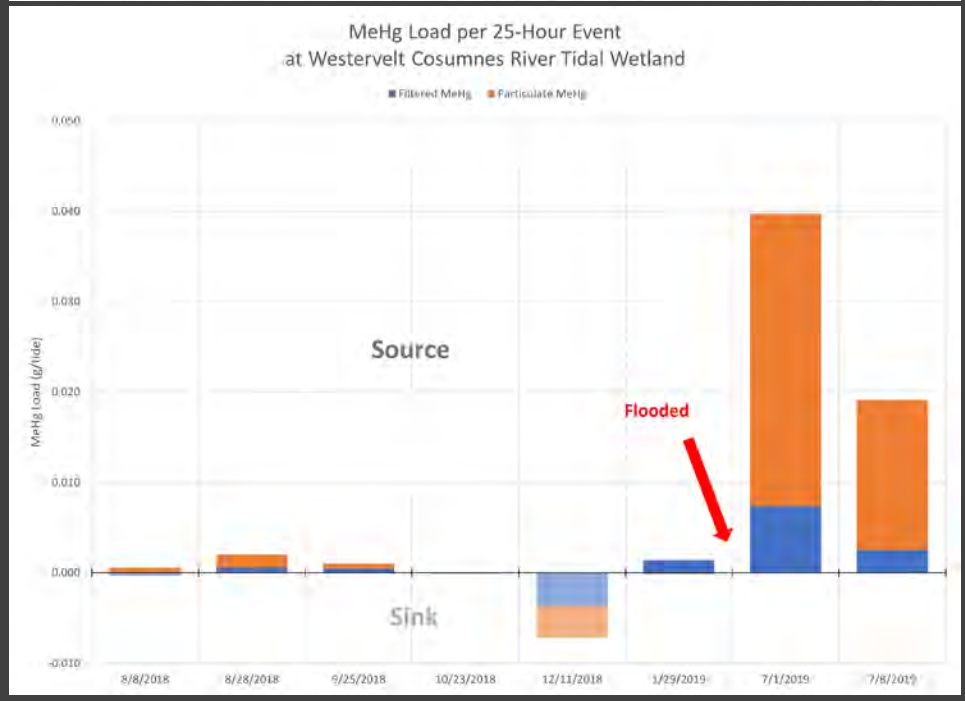
Source

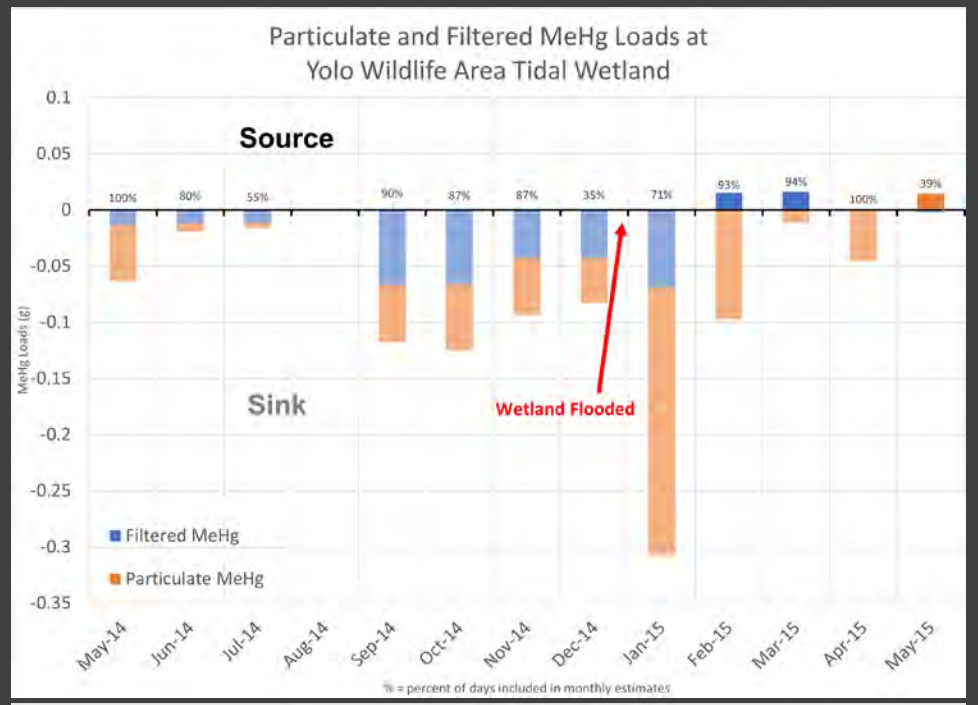
Sink





Methyl mercury per Event





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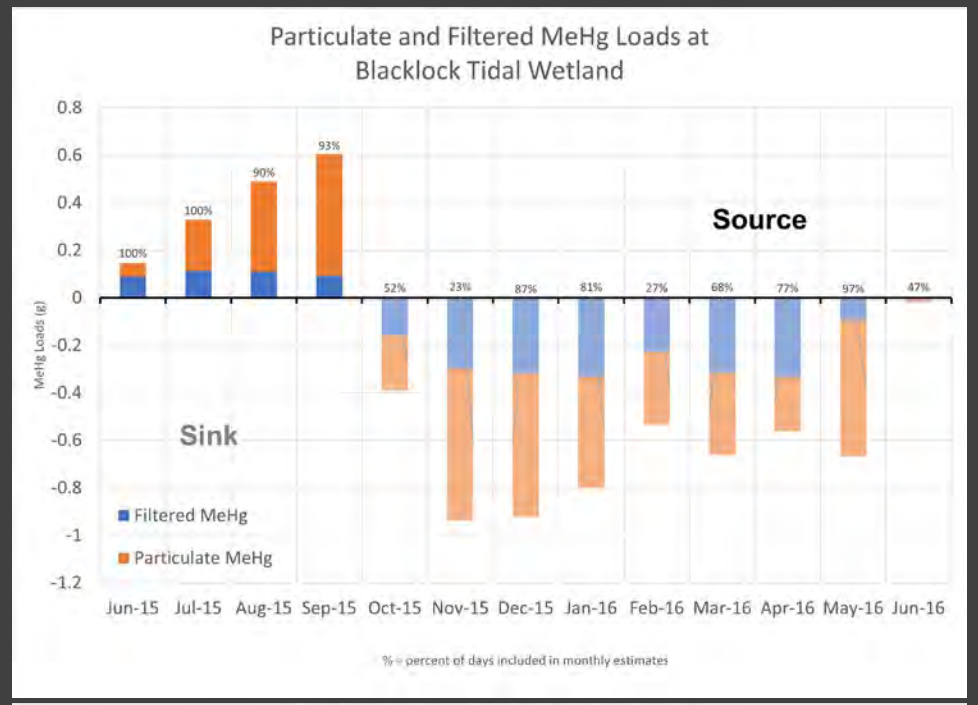
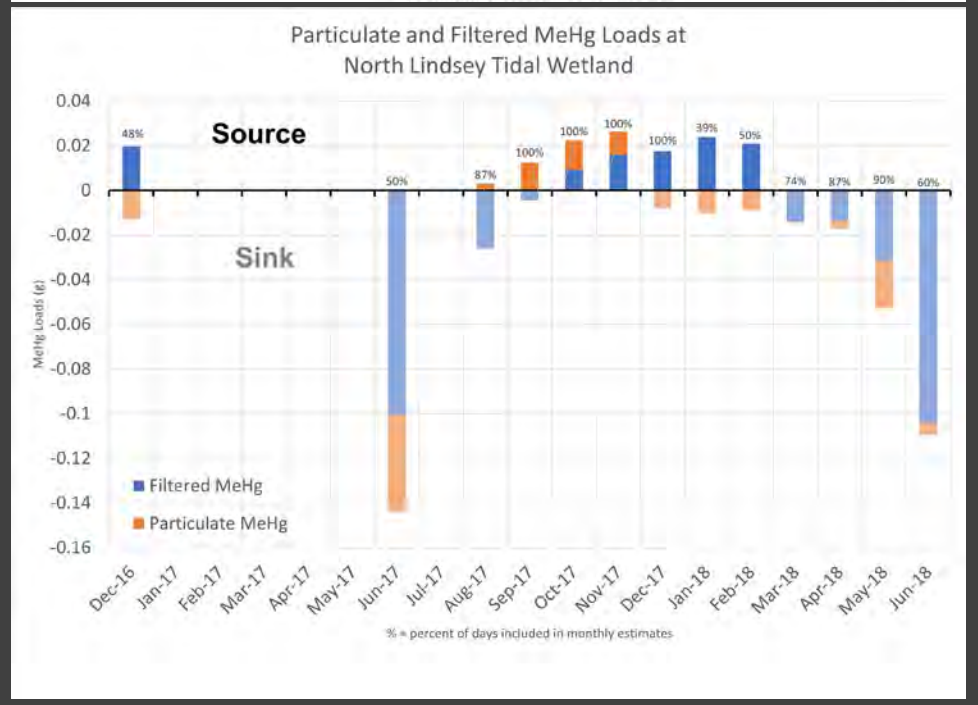
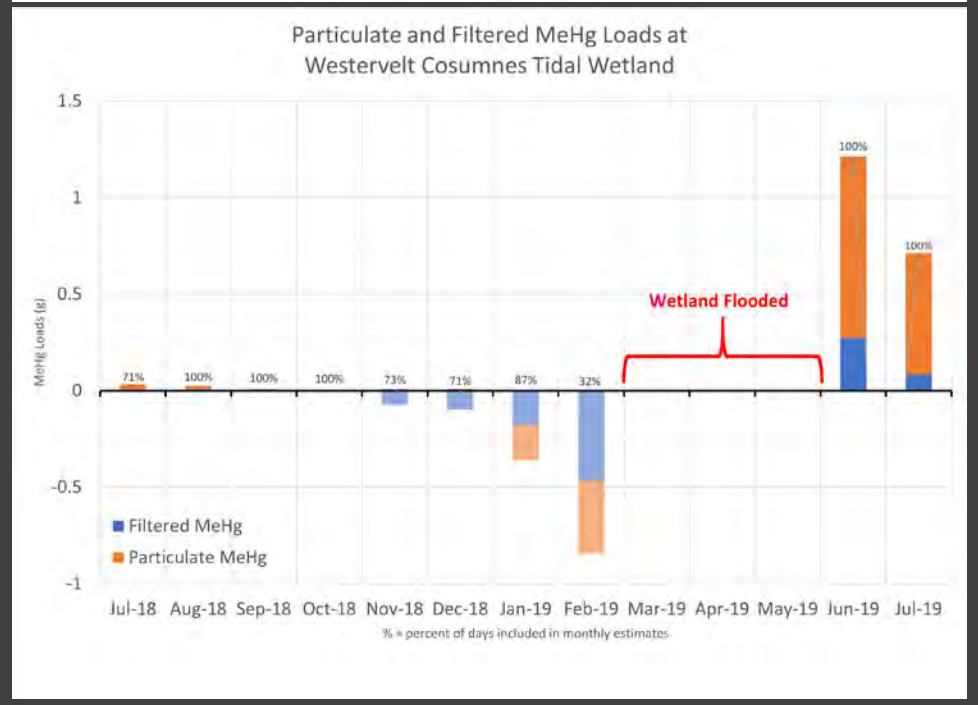




Methyl mercury per Month



Hypothesis 1

Tidal wetlands are a net source of total MeHg on an annual basis.

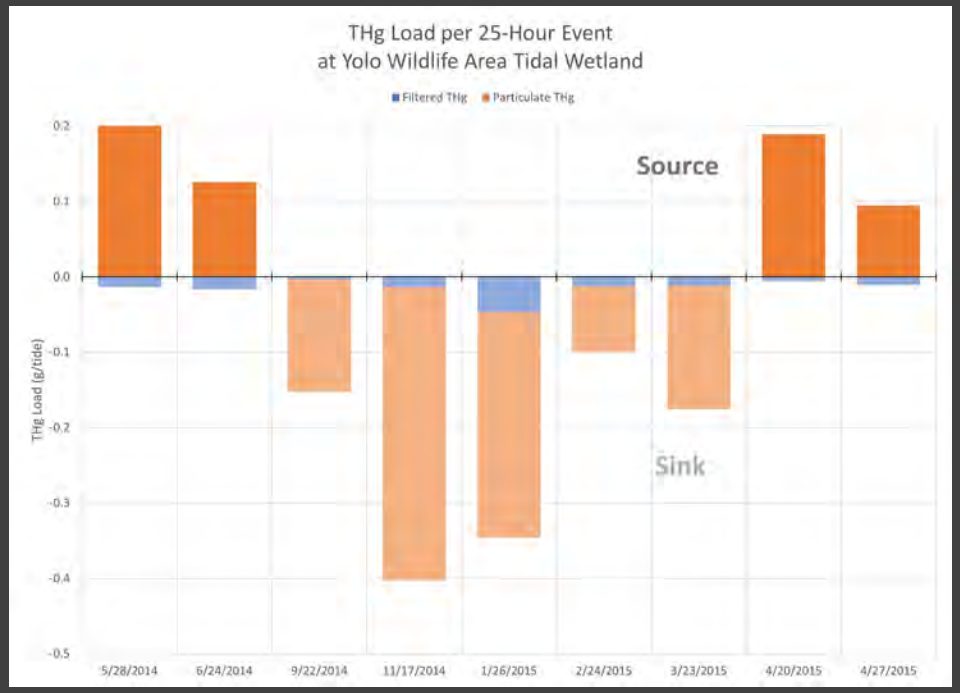
Hypothesis 1

Tidal wetlands are a net source of total MeHg on an annual basis.

Probably not

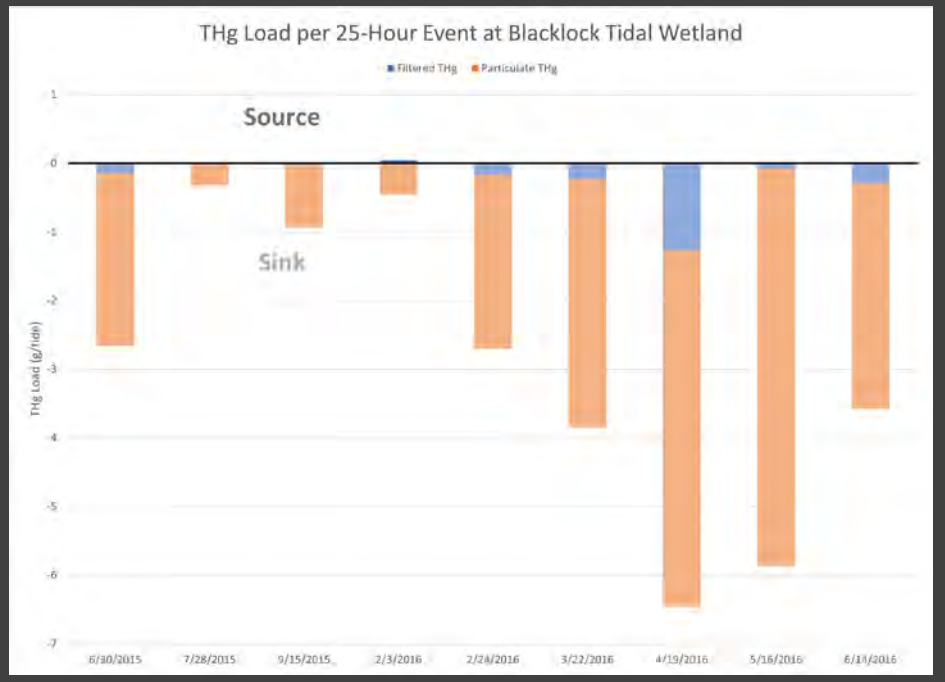
Hypothesis 2

Tidal wetlands are a net source of total THg on an annual basis.

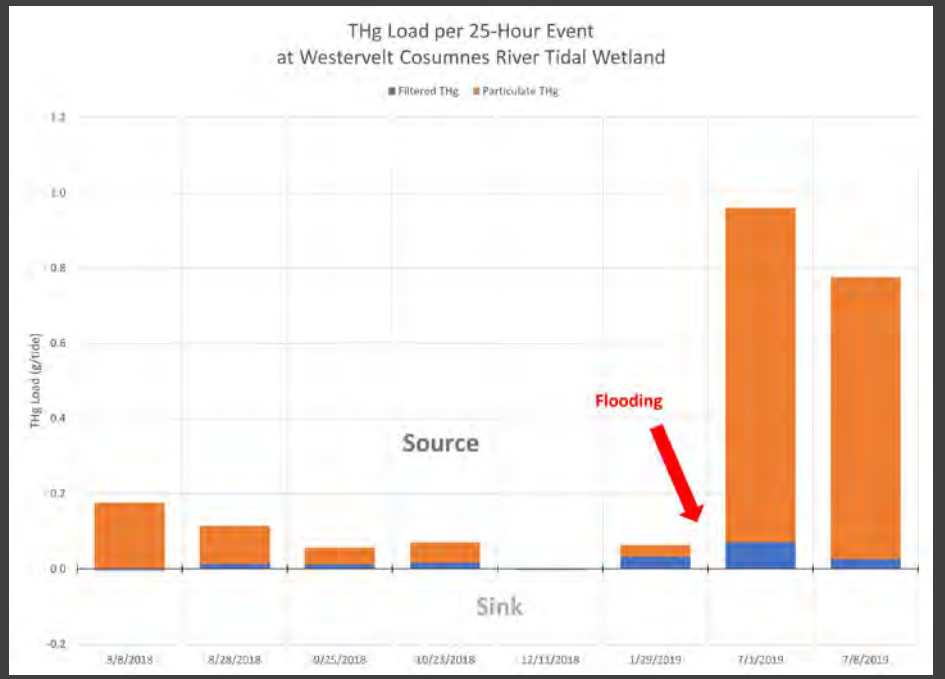


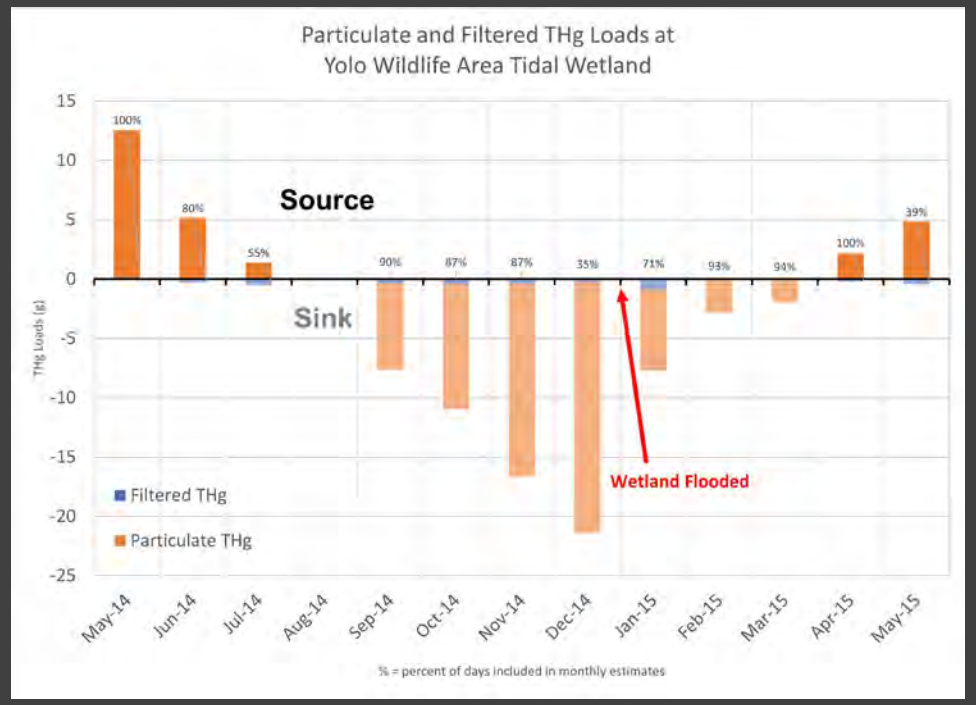
Source

Sink



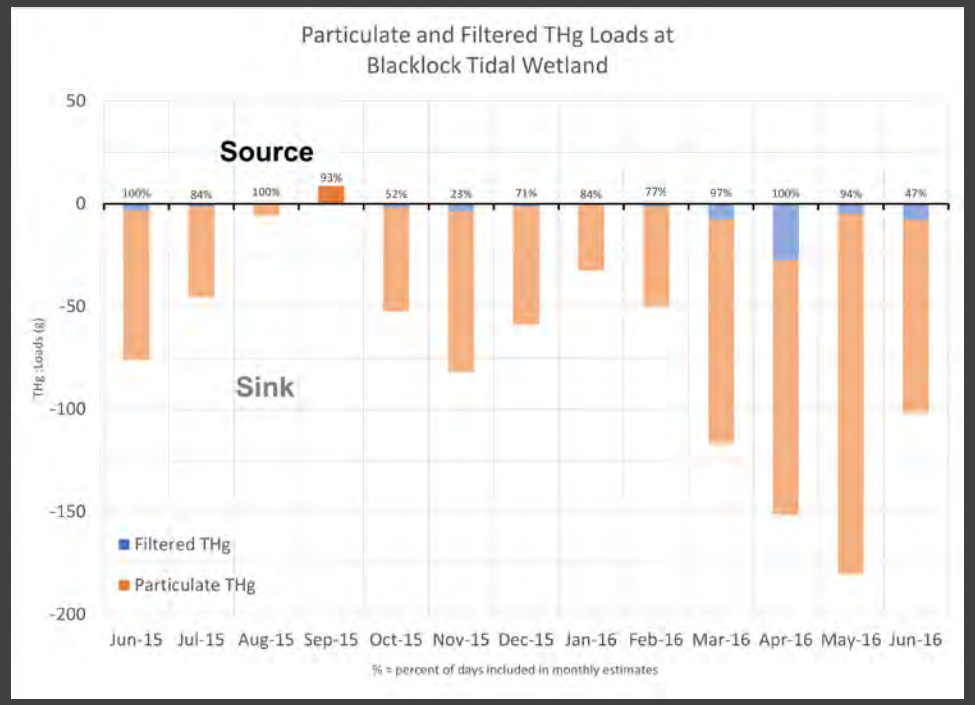
Total Mercury per Event

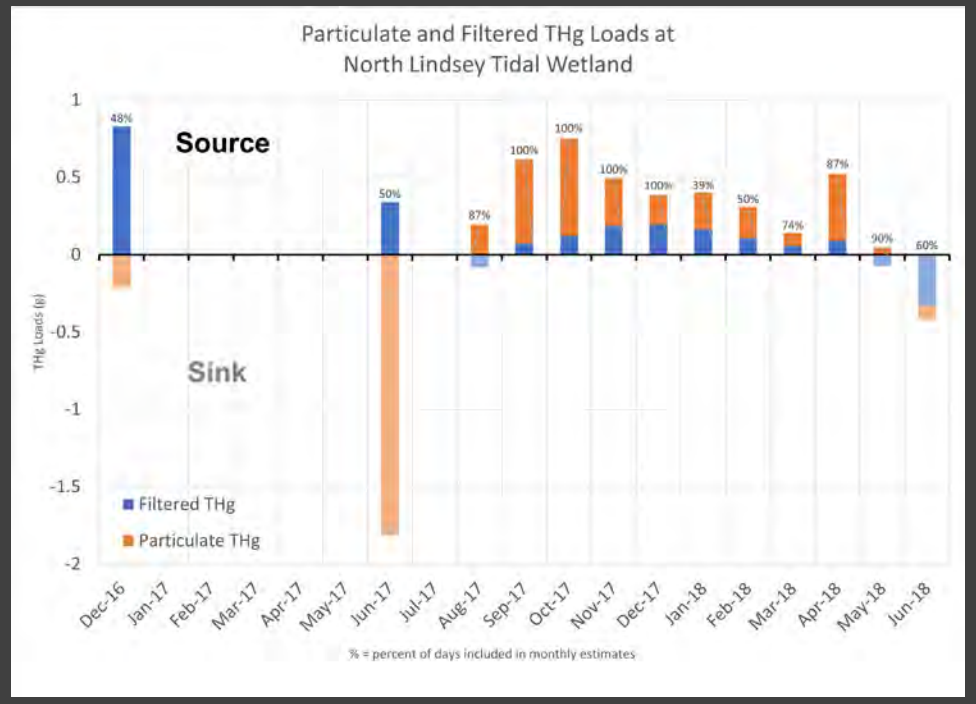




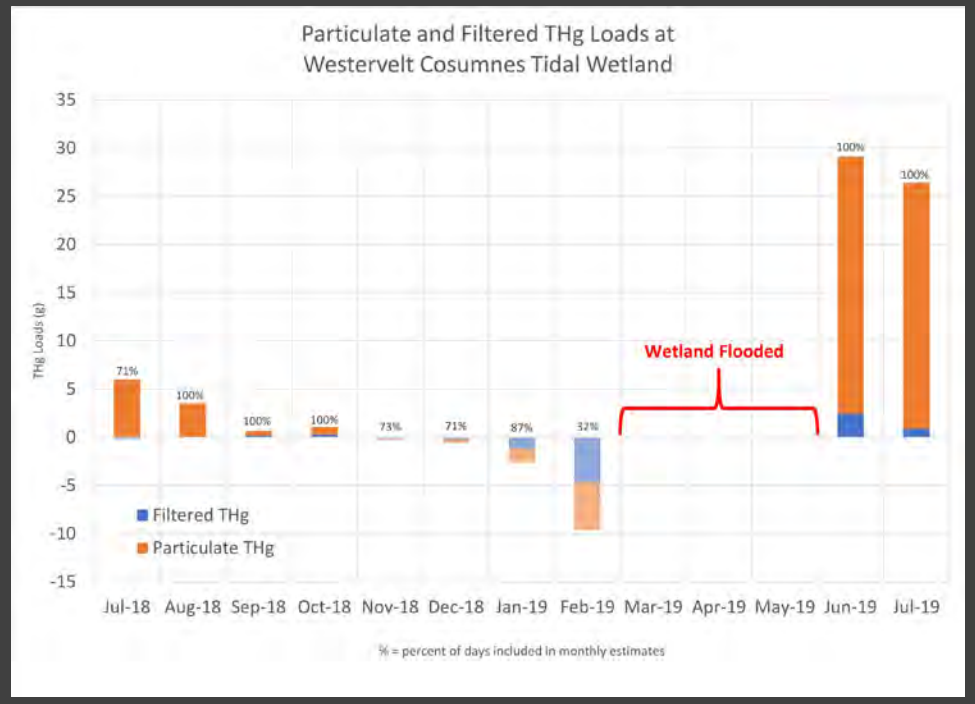
Source

Sink





Total Mercury per Month



Hypothesis 2

Tidal wetlands are a net source of total THg on an annual basis.

Hypothesis 2

Tidal wetlands are a net source of total THg on an annual basis.

Sometimes!

Total Mercury – A More Mixed Result!

- Blacklock and Yolo both likely sinks of total mercury, mostly particulate.
  - Blacklock sunk PARTICLES!
  - Yolo water sink, sunk everything

- North Lindsey possibly source of particulate total mercury
  - Very small historical wetland

- Westervelt likely a source of total mercury
  - Floodplain, lotsa total mercury coming in and out

All the people who helped, thank you!

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Questions?

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