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Sediment Transport and Capacity Change in Three Reservoirs, Lower Susquehanna River Basin, Pennsylvania and Maryland 1900-2012

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Why USGS report?

- USGS has been the lead in investigating sediment transport in the Susquehanna River Basin.
- USGS conducted 5 extensive bathymetric and sediment coring studies since 1990 documenting reduced reservoir storage capacity.
- In 2012, USGS (B. Hirsch) study indicated the Conowingo Reservoir is at or near capacity and concentrations and loads likely increasing past 10-15 years.
- Expand on information USGS presented in soon to be published LSRWA assessment report (USACE and MD)

Preliminary Findings (LSRWA report)

- All three reservoirs are in "dynamic equilibrium". A repeated scour/deposition cycle with no long-term change in capacity.
- Conowingo is trapping less sediment and associated nutrients due to loss of capacity and increased velocity in the reservoirs.
- The majority of the sediment is derived from the watershed, not the reservoirs.
- The implementation of the WIP's will have a far larger influence on the health of the Bay in comparison to scoured sediments.

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Expanded Findings USGS Report

- Upper two Reservoirs at capacity, Conowingo over 90% capacity; in "dynamic equilibrium"
- Historically, sediment loads have decreased by about 50% over the past century.
- Conowingo trapping capacity decreased over time
- Conowingo Reservoirs "rate of filling" is different from the other reservoirs.
- About 70% of the sediment is from the watershed; 30% derived (scoured) from the reservoirs.

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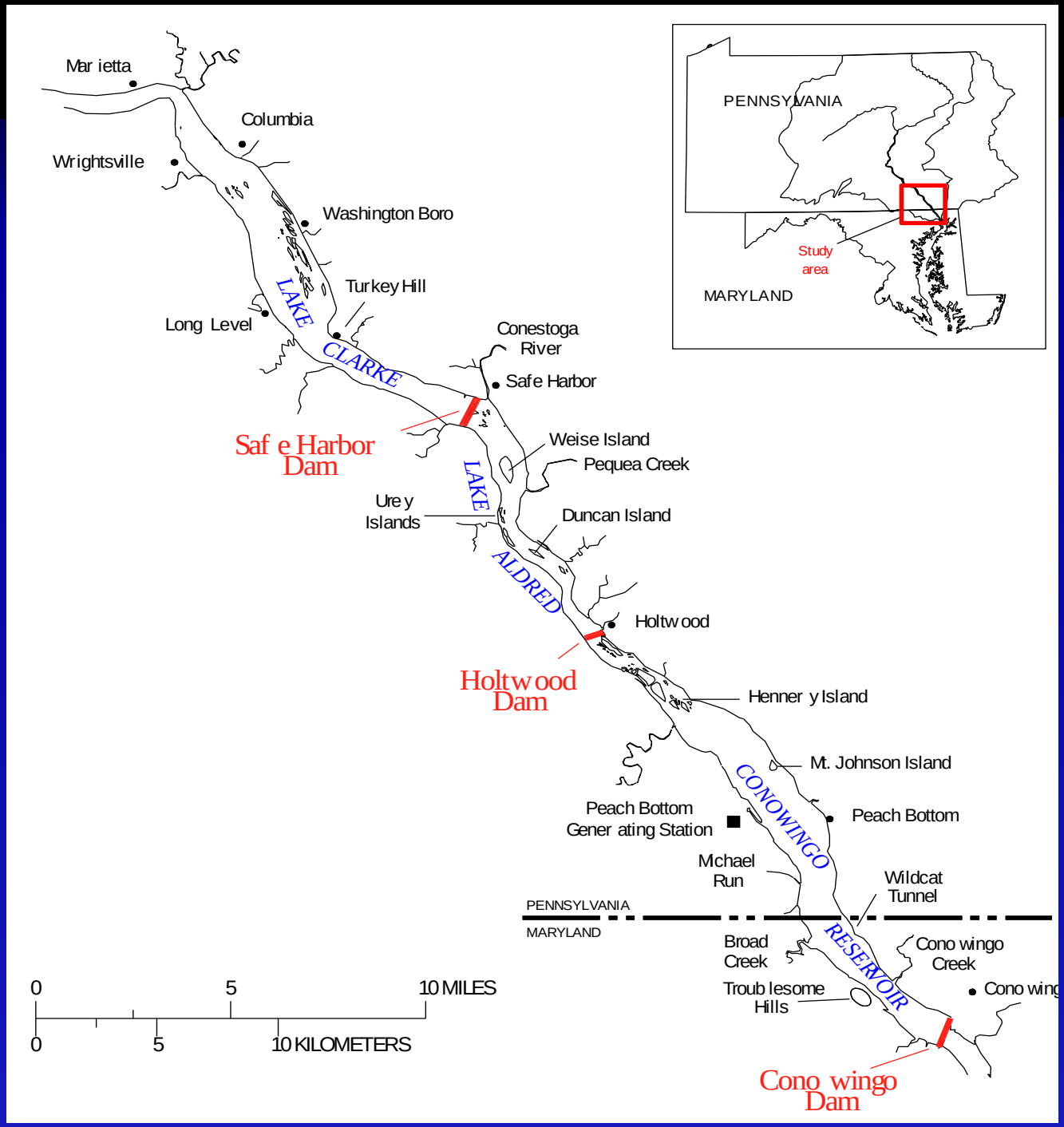

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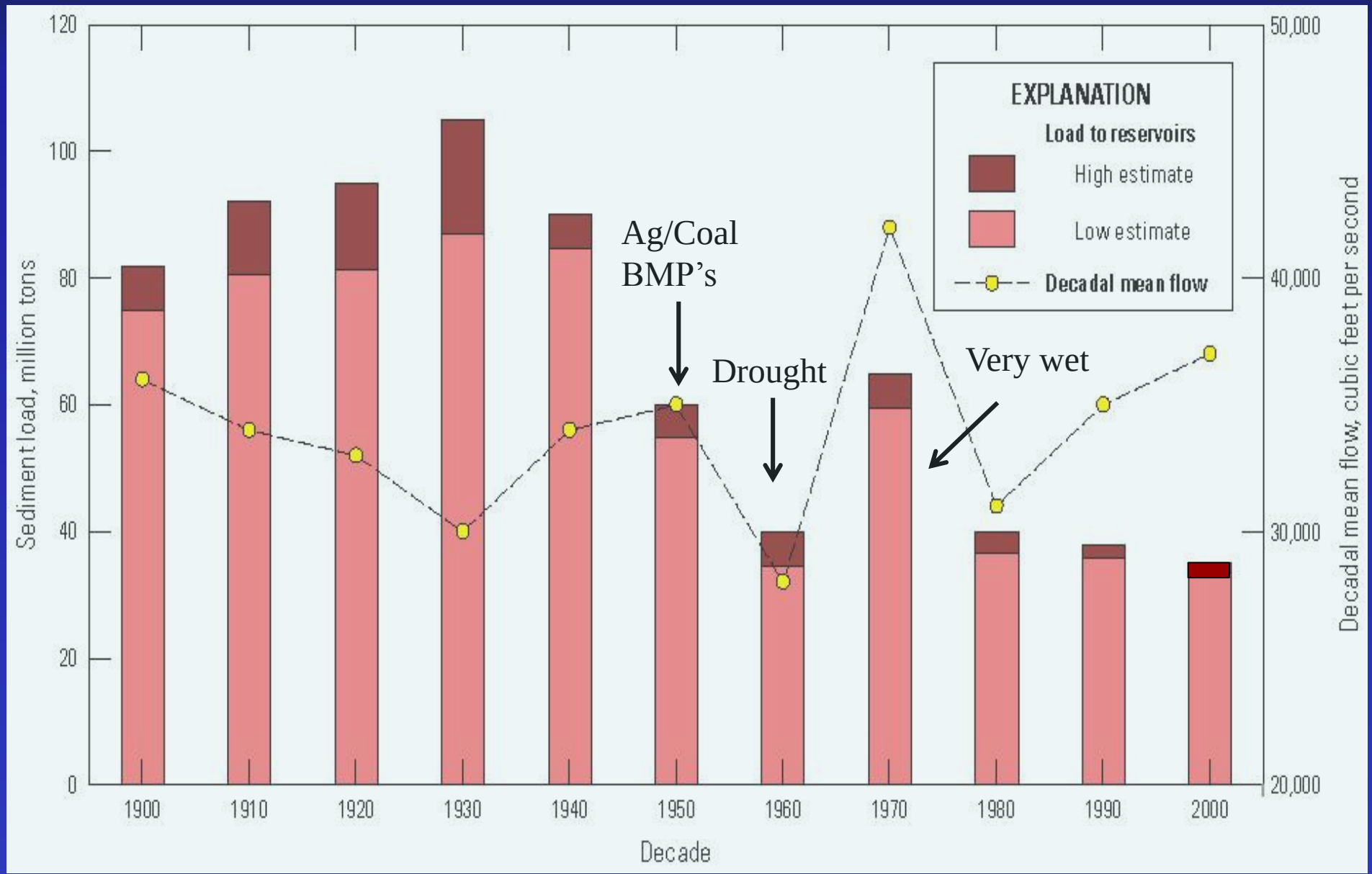
Wendy McPherson (USGS) - 9/20/04

Historical Sediment Transport



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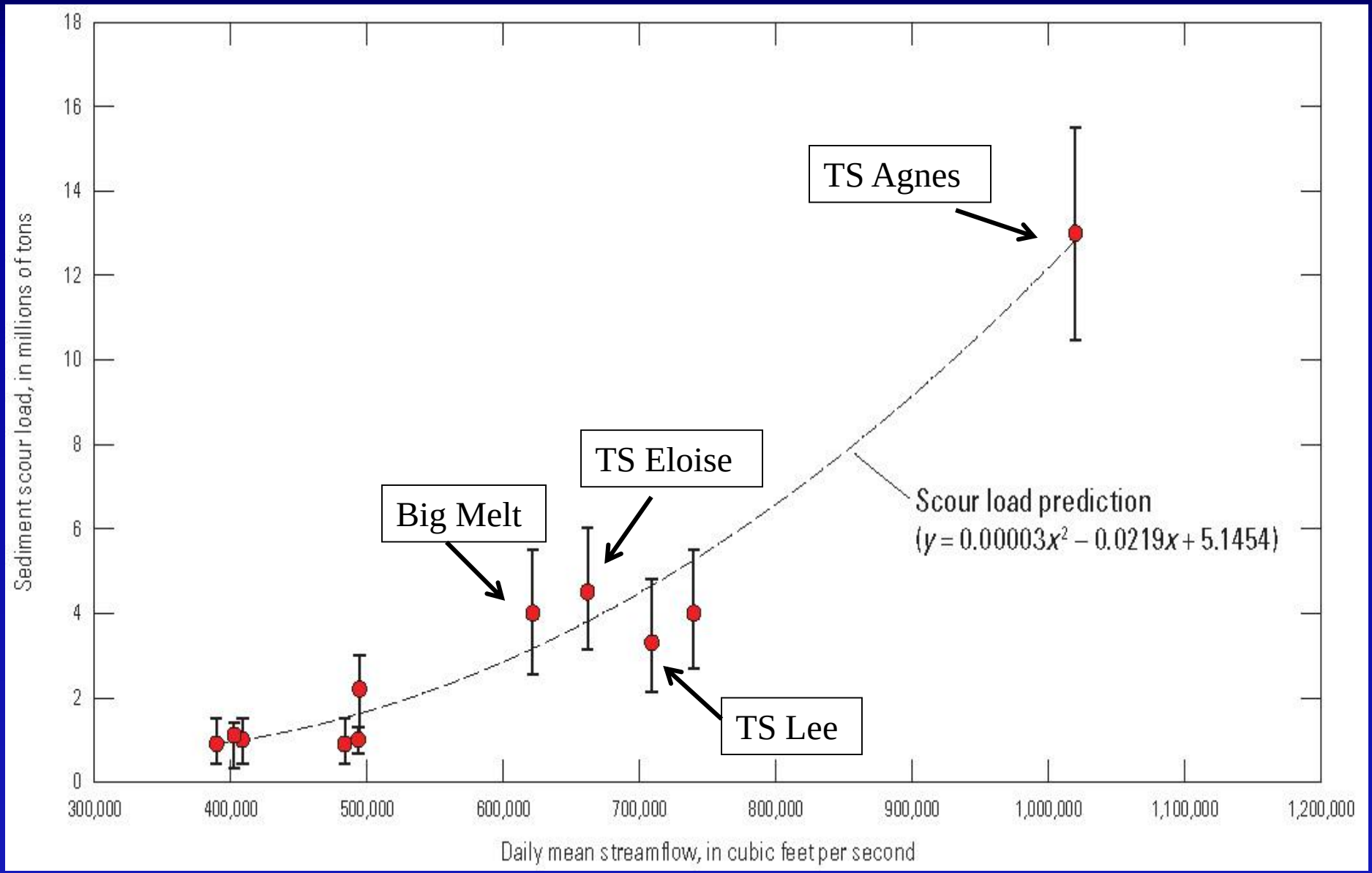
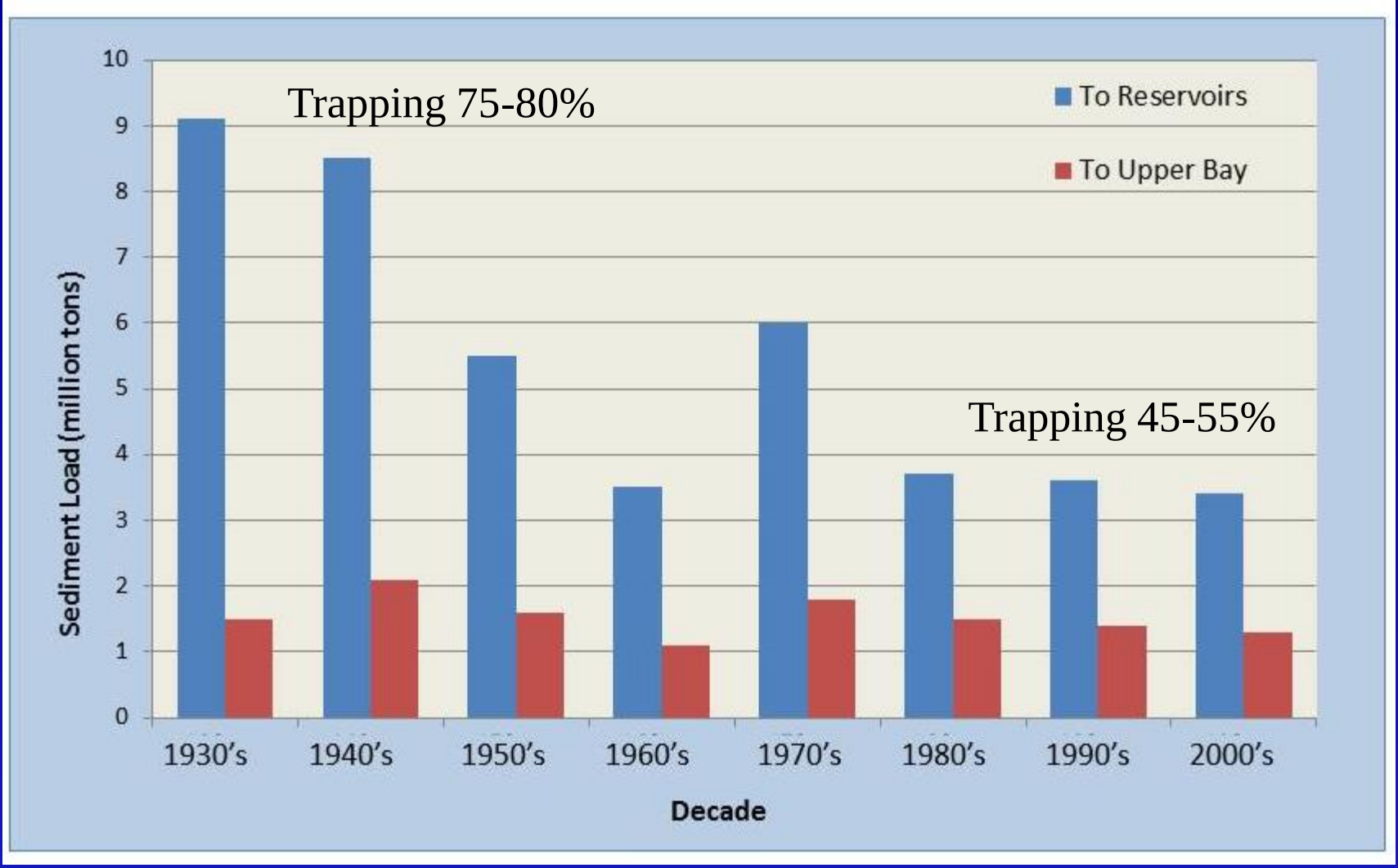
Coal Piles

Predicted Scour Load vs. Daily Mean flow



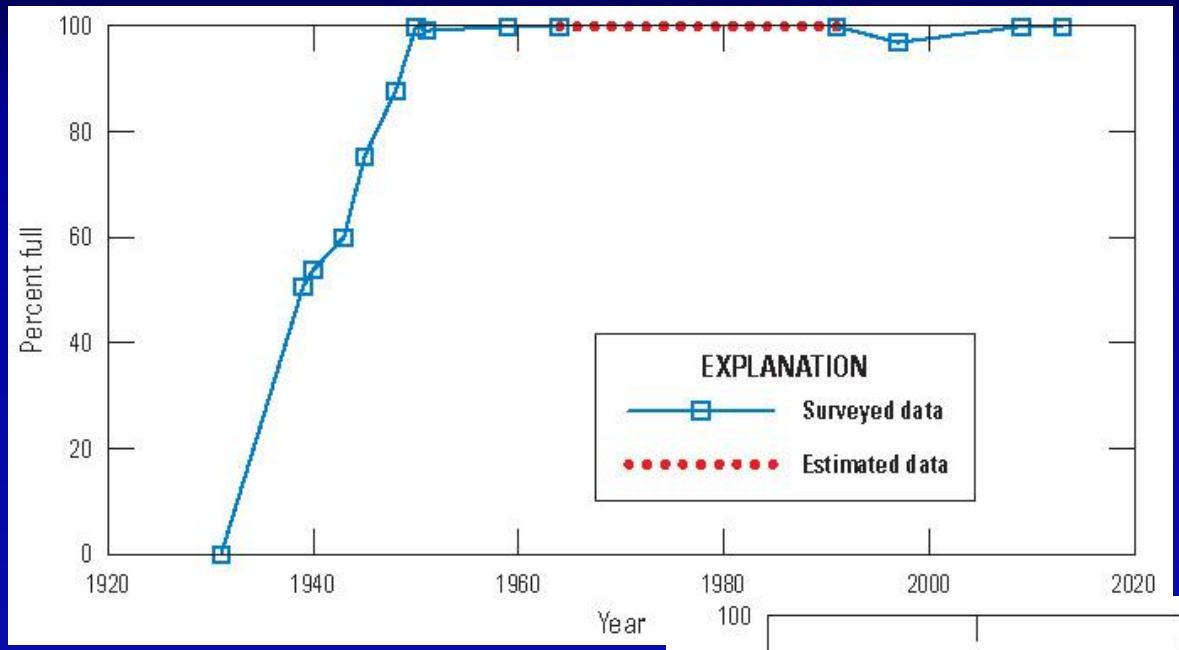
Trapping and Loads to the Bay

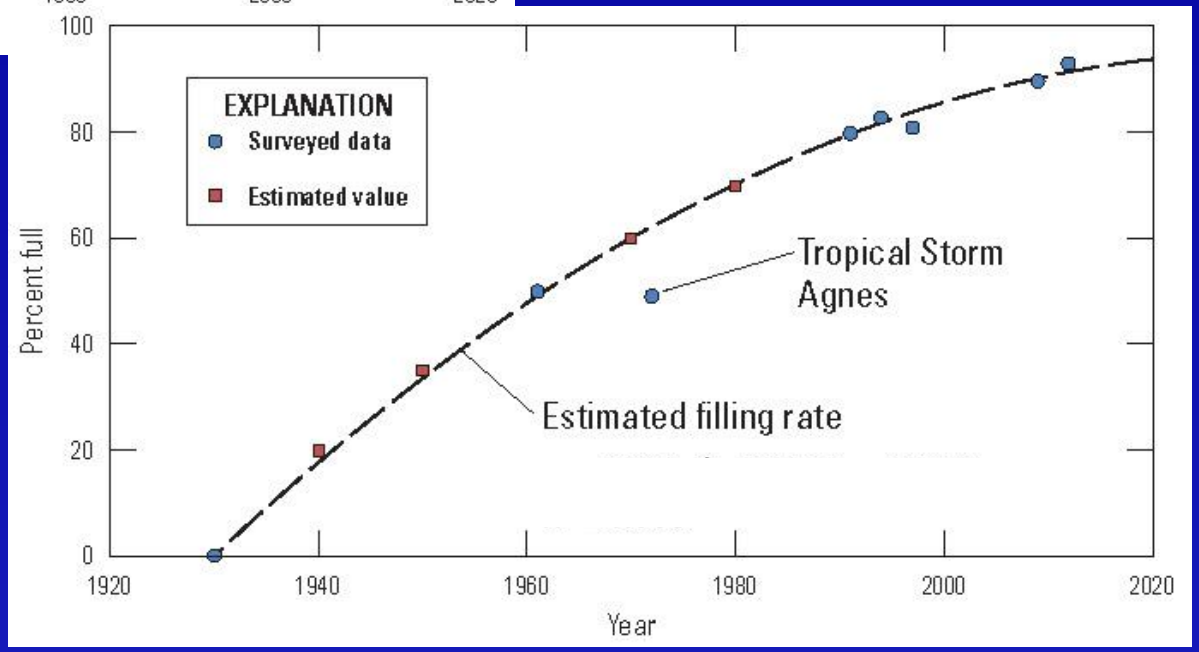


Sediment Ratio

- USACE report mentions 80/20
  - Based on 2008-2011 Model Runs
  - One scour event
  - Represents Conowingo Reservoir only
- USGS report mentions 70/30
  - Based on 1900-2012 data
  - 20 scour events
  - Represents all three reservoirs
- Conowingo contributes about 1/2 to 2/3 of scoured sediment (mass)

Comparison of Volume Change





Final Thoughts

- USGS report expands on the new USACE report
- No conflicts in the “message”
- Report provides unique perspective on sediment transport and reservoir dynamics in the Lower Susquehanna River.