

**Ecosystem-Scale Selenium Modeling in Support of Fish and Wildlife  
Criteria Development for the San Francisco Bay-Delta Estuary, California  
Administrative Report**

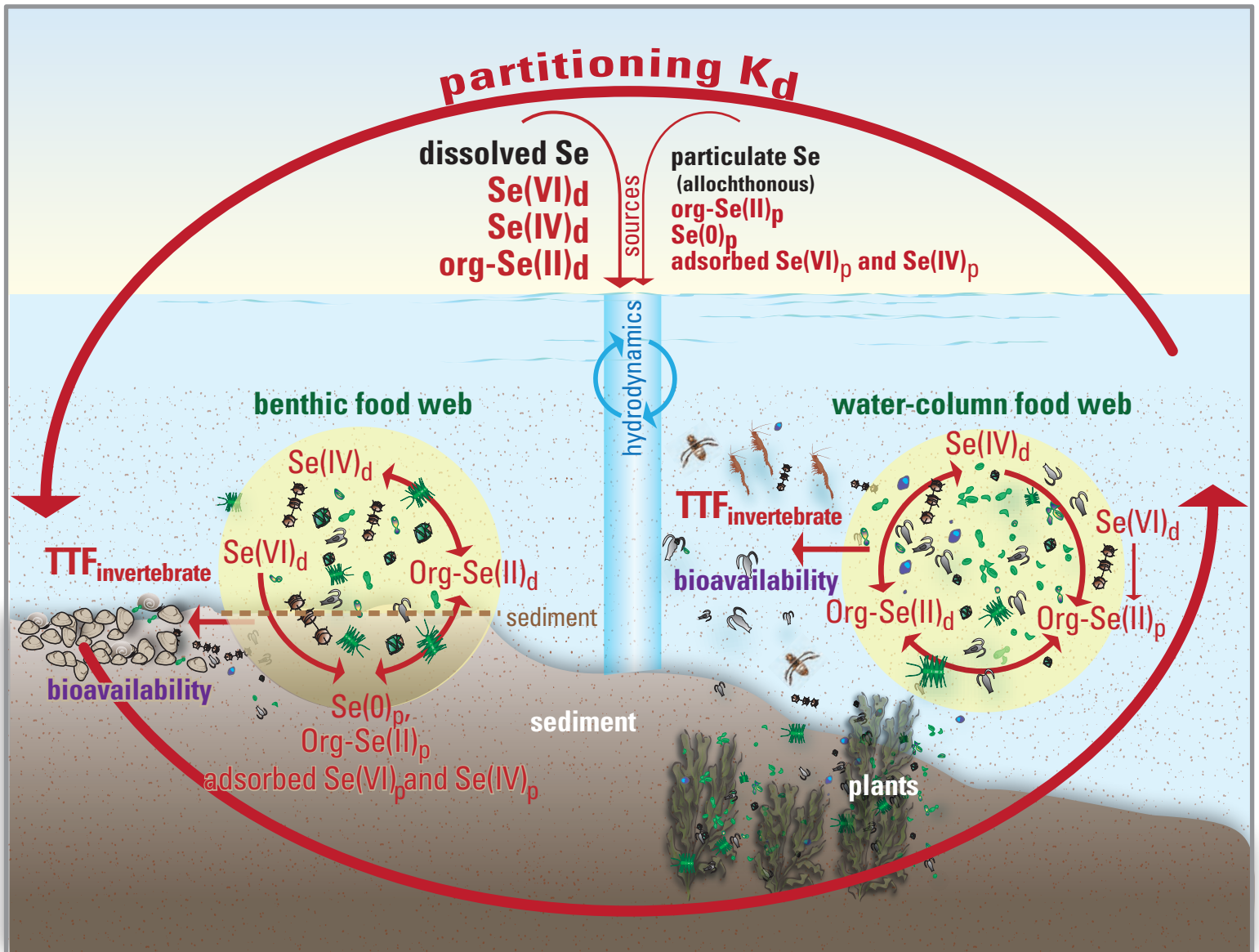
*Figure 13b*

U.S. Department of the Interior

U.S. Geological Survey

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Find the full report and other attachments at <http://www.epa.gov/region9/water/ctr>



[adapted from Figure 1, Luoma and Presser (2009)]

### transformation reactions

- **uptake by plants**  
[assimilatory reduction of  $\text{Se(VI)}_d$ ,  $\text{Se(IV)}_d$  and  $\text{org-Se(II)}_d$  to  $\text{org-Se(II)}_p$ ]
- **sequestration by sediments**  
[dissimilatory reduction of  $\text{Se(VI)}_d$  to  $\text{Se(0)}_p$ ]
- **adsorption of  $\text{Se(VI)}_d$  and  $\text{Se(IV)}_d$  onto particle surfaces**
- **recycling as part of decay** [ $\text{org-Se(II)}_p$ ]

$$K_d = \frac{\text{particulate material Se}^*}{\text{dissolved Se}}$$

\*phytoplankton, periphyton, detritus, inorganic suspended material, biofilm, sediment and/or attached vascular plants

Figure 13. Conceptual details of environmental partitioning reactions between dissolved and particulate selenium.