From Trickle to Flood

Measuring Pollutant Loads to Margin Areas and the Bay

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2017
Two stories, two very different approaches, in sampling key watershed inputs to the margins in Water Year 2017

Story 1: Measuring PCB concentrations in the watersheds draining to San Leandro Bay
How do the margin areas recover once we reduce or stop the flow of pollutants into them?
Regional Watershed Spreadsheet Model (RWSM)
Based on outputs of the RWSM, estimates of annual flow...

83.4 km²
26.6 $10^6$ m³ annual flow
Based on outputs of the RWSM, estimates of PCB loads & yields...

Estimated Annual PCB Load
Export = 986 g
Range: 462 – 1,747 g
Based on settling studies completed for the Prop 13 BMP analysis …

<table>
<thead>
<tr>
<th>Sample/site</th>
<th>PCB (ng/L)</th>
<th>%&lt;25um incl. dissolved</th>
<th>%25-75 um</th>
<th>%&gt;75 um</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z4-201</td>
<td>17</td>
<td>73</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>Z4-203</td>
<td>30</td>
<td>49</td>
<td>23</td>
<td>28</td>
</tr>
<tr>
<td>Z4-204</td>
<td>23</td>
<td>46</td>
<td>21</td>
<td>33</td>
</tr>
<tr>
<td>Z4-205</td>
<td>29</td>
<td>38</td>
<td>31</td>
<td>31</td>
</tr>
<tr>
<td>RS-1003</td>
<td>38</td>
<td>28</td>
<td>26</td>
<td>46</td>
</tr>
<tr>
<td>RS-1004</td>
<td>17</td>
<td>51</td>
<td>16</td>
<td>33</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td><strong>17 - 38</strong></td>
<td><strong>28 - 73 %</strong></td>
<td><strong>13 - 31%</strong></td>
<td><strong>14 - 46%</strong></td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>26</strong></td>
<td><strong>48%</strong></td>
<td><strong>22%</strong></td>
<td><strong>31%</strong></td>
</tr>
</tbody>
</table>

(Yee and McKee, 2010)
Based on recurrence interval analysis in similar, but well-sampled, watersheds...

Estimated loads during different sized storm events:

Storms smaller than 1:1 year event and dry season = 86% of long term load
PCB concentrations in ng/g (ng/L)

- 184 (21)
- 2601 (156)
- 398 (37)
- 36 (7)
- 48 (32)
- 209 (24)
Two stories, two very different approaches, in sampling key watershed inputs to the margins in Water Year 2017

Story 2:
Measuring Hg loads from the Guadalupe River into the Lower South Bay
Water Year 2003
(Oct 1 2002 – Sept 30 2003)
New Almaden Mining District

Guadalupe River Watershed

Lower South Bay

Urban lower watershed

Rural upper watershed
Wet Season Total Mercury (kg)

TMDL Load Allocation = 9.4 kg/yr
Proposed Mobilization Criteria:

- Almaden Reservoir 80% full
- 7-10 inches of antecedent rainfall season to date
- Increased baseflow conditions at the Hwy 101 gauge associated with previous storms
- A rain forecast of 6-12 inches in the Santa Cruz mountains.
“Lester, it’s amazing right now…”
- Sarah Pearce, 12:32 am, January 11
Proportion of flow from the mining district explains 88% of variability in concentrations.
70 kg in Just 1 event!
Many years feel like this…
Once in a while, we get this...

The RMP is ready to go!