Assessing Water Quality with Maps, XML and Duct Tape

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TetraTech
Clean Water Act (1972) (33 USC § 1251 et seq.)

Sec. 303(d)(1)(A) -- “Each State shall identify those waters within its boundaries for which the effluent limitations required by [...] this title are not stringent enough to implement any water quality standard applicable to such waters.”

Sec. 305(b) -- “Each State shall prepare and submit to the [EPA] Administrator [biennially] a report which shall include: ”
- description of navigable waters
- Recreation/wildlife support
- clean up status
- economic impacts
- non-point sources and control

303(d) / 305(b) Integrated Report
“303(d)-list” process

- Send to State Board
- Regional Board Approval
- Draft Revision
- Data Solicitation
- Staff Analysis of Data
- Lines of Evidence and Decisions
- Draft Regional 303(d)-list

18-24 Months

Public Comment / Hearings

Draft

Revision
“303(d)-list” process

12-24 Months

US EPA Approval

Send to US EPA

Compilation of Regional Lists

Regional process begins for next cycle

Staff Review Regional Decisions

Draft State 303(d)-list

State Board Approval

Draft Revision

Public Comment / Hearings

Send to US EPA

US EPA Approval
CalWQA process

Data assessed and listing decisions made in CalWQA

Integrated Report sent to USEPA ATTAINS

Regional staff provide WB information

Create/update WB in GeoWQA

State Board releases Integrated Report

Regional staff revise or approve WB

Load WB XML to CalWQA

Approve

Revise
<table>
<thead>
<tr>
<th>Batch Job ID</th>
<th>XML Created Date</th>
<th>XML Created By</th>
<th>XML Uploaded Date</th>
<th>XML Uploaded By</th>
<th>Water Body Count</th>
<th>Water Body Change Count</th>
<th>Notes</th>
<th>Delete</th>
<th>Validation Results</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>06/04/2014 15:10:48</td>
<td>SBucknam</td>
<td>06/04/2014 17:17.32</td>
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<td>1</td>
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<td>Chollias Creek remap.</td>
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<td>02/25/2014 17:02:19</td>
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<td>wbyname update</td>
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<td>04/30/2013 10:40:53</td>
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<td>2</td>
<td>GeoWBS water bodies new in CalWQA</td>
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### Water Body Change List

| Batch Job Id: | 281 |
| XML Created By: | sbucknam |
| XML Uploaded By: | sbucknam |
| XML Created Date: | 06/04/2014 15:10:48 |
| XML Uploaded Date: | 06/04/2014 17:20:19 |
| Water Body Count: | 1 |

### Water Body Id/ Water Body Name

<table>
<thead>
<tr>
<th>Region</th>
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<tbody>
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### Results

<table>
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<tr>
<th>Select to Migrate</th>
<th>XML WB Change ID</th>
<th>Region Flag</th>
<th>Parent Water Body ID</th>
<th>Child Water Body ID</th>
<th>Child Water Name</th>
<th>Water Type</th>
<th>Comments</th>
<th>Validation Results</th>
<th>Migrated?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1101</td>
<td>9</td>
<td>Bulk</td>
<td>CAR9082200001999902008140725</td>
<td>Chollas Creek</td>
<td>River &amp; Stream</td>
<td></td>
<td></td>
<td>No</td>
</tr>
</tbody>
</table>

### Results

Jump to page 1 of 1
Water Bodies

Search for Water Bodies

Water Body Name
chollas creek

Region
Any

Listing Cycle
Any

Sort By Field
Any

Retired Water Bodies
Exclude Retired

Refresh List

List Selected Water Bodies

2 of 2 Result(s) Displayed

Jump to page 1 50 10 Go

Region | Water Body ID | Map It | Water Body Name | No. of LOEs | View
--- | --- | --- | --- | --- | ---
9 | CAR9082200019990208140725 |  | Chollas Creek | 23 | LOEs
9 | CAB908220001999021012831 |  | San Diego Bay Shoreline, near Chollas Creek | 3 | LOEs
### Water Body Change List

<table>
<thead>
<tr>
<th>Water Body Id/ Water Body Name</th>
<th>Region</th>
<th>Lineage Flag</th>
<th>Parent Water Body ID</th>
<th>Child Water Body ID</th>
<th>Child Water Name</th>
<th>Water Type</th>
<th>Comments</th>
<th>Validation Results</th>
<th>Migrated?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
<tr>
<td>1102</td>
<td>9</td>
<td>Split</td>
<td>CAR908220000200080825092534</td>
<td>CAR9082200002140604056204</td>
<td>Switzer Creek below confluence</td>
<td>River &amp; Stream</td>
<td>Split Switzer Creek at confluence with unnamed tributary to better reflect area of impairment.</td>
<td>green</td>
<td>No</td>
</tr>
<tr>
<td>1103</td>
<td>9</td>
<td>Split</td>
<td>CAR908220000200080825092534</td>
<td>CAR9082200002140604056013</td>
<td>Switzer Creek above confluence</td>
<td>River &amp; Stream</td>
<td>Split Switzer Creek at confluence with unnamed tributary to better reflect area of impairment.</td>
<td>green</td>
<td>No</td>
</tr>
</tbody>
</table>
### Handle LOE/Decision for Water Body Change

**Water Body Change Type:** Split  
**Region:** 9  
**Listing Cycle:** Current  
**Parent Water Body:** CAR9082200020080825092534 - Switzer Creek  
**Child Water Bodies:**  
- Switzer Creek below confluence: CAR9082200020140604056204  
- Switzer Creek above confluence: CAR9082200020140604056013  
**Water Body Change Comment:** Split Switzer Creek at confluence with unnamed tributary to better reflect area of impairment.

### Step 1. Select the child water body for which each LOE decision combination should be reproduced.

<table>
<thead>
<tr>
<th>LOE Decision from parent water body</th>
<th>CAR9082200020140604056204 - Switzer Creek below confluence</th>
<th>CAR9082200020140604056013 - Switzer Creek above confluence</th>
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</thead>
<tbody>
<tr>
<td>7048 - 16725</td>
<td></td>
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</tr>
<tr>
<td>7158 - 16726</td>
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<tr>
<td>7053 - 16727</td>
<td></td>
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<tr>
<td>7052 - 16763</td>
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<td>7154 - 16764</td>
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<td>7156 - 16766</td>
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<tr>
<td>7155 - 28873</td>
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</tbody>
</table>
GeoWQA – CalWQA Integration

• CalWQA does not store geometry
• CalWQA standardized logic enforces operations and rules to protect data integrity
• GeoWQA XML uploads staged in database
• Extensive record-level data validity errors reported (e.g., cannot reuse WBID or name of retired water body)
• Audit history is tracked on waterbody records and their details are presented through change reports
CalWQA – ATTAINS Integration

- CalWQA generates attribute-rich ATTAINS XML from "approved" (archived) listing years (read-only, Water Board and EPA-approved)
- Derived values (e.g., category) are dynamically calculated from same rules as rest of system for consistent reporting
- Tabular "preview" versions of ATTAINS output available for QA prior to submission
- Outputs are not stored, but can be regenerated from read-only records for past years as needed
On-going issues

- Creating “large” and “small” water bodies
- Long term HEM tool support
- NHD issues
  - No state steward
  - Needing to synchronize reachcodes between cycles
Next Steps

• Incorporate Basin Plan data directly into GeoWQA
• Develop linkages from GeoWQA to new assessment tools being developed
• Integrate additional relevant spatial water quality data (e.g., monitoring sites)
• HEM tool integration –incorporate new services USGS develops, or modify HEM code to further integrate it with GeoWQA.