

California's Surface Water Ambient Monitoring Program

Data In and Data Out: Status on the SWAMP Database and Tools Being Developed for Biological Data

(Nov 16, 2010)



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Why this talk?

- To provide a glimpse of what tools are available and will be coming through SWAMP and CEDEN
 - Want programs, projects, and field/lab personnel to plan ahead for next year's sampling
 - Contracts, training, etc.



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- To encourage data submittal to CEDEN for greater data use
- To confirm we do not want to replace your data management system



Basic Approach to Data Management

- SWAMP and CEDEN were designed to contain the necessary data elements for storing three event types:
 - Water Quality (WQ) – water/sediment chem & tox, bacteria
 - Tissue (TI) – fish, bivalves, birds, mammals
 - Bioassessment (BA)



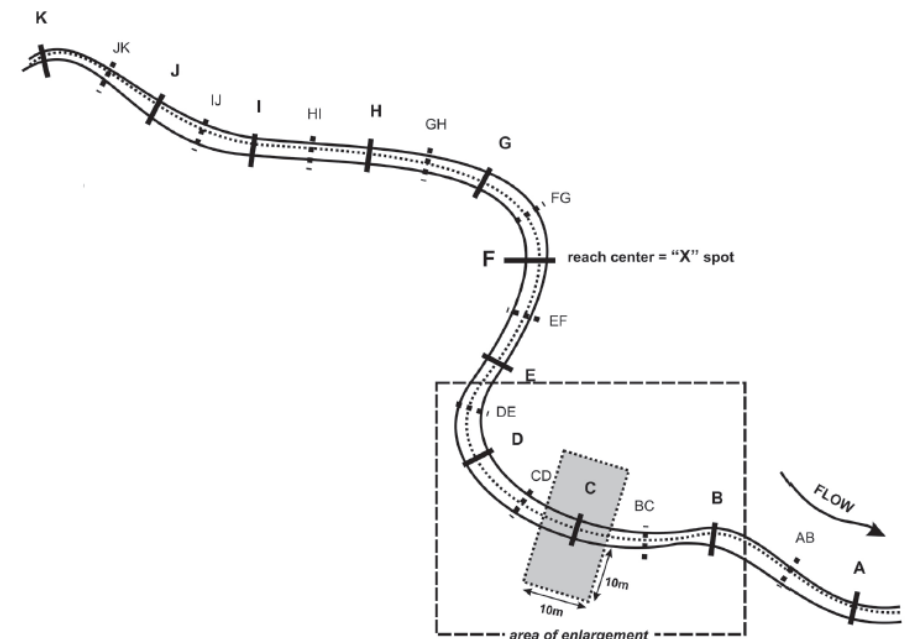
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 - Bioassessment (BA)
- SWAMP was also mandated to store data of ‘known and documented quality’
 - Necessitates a lot of associated metadata



Bioassessment Data

- Need to acknowledge BA data is COMPLEX
 - Develop tools and provide support to help you
- Tools focus on SWAMP Wadeable Streams Full Protocol (2007)
 - Future – SNARL and EMAP protocols
 - Structure exists to store this data but need to develop the underlying look-up values



Data In

- Physical Habitat (PHAB) Data
 - Data Entry Options
 - MS Access Field forms
 - Excel template
 - Flexi-Grid
- Taxonomy Data
 - Data Entry Options
 - Excel template



PHAB Data - MS Access Field Forms

- MS Access front-end application linked to stand alone MS Access back-end shell database
 - Looks similar to hard-copy forms
 - Follows SWAMP WS Full protocol

SWAMP Stream Habitat Characterization Form FULL VERSION Revision Date: October 20 12/30/1899

Site Code: Site Name: Date:

Transect A TRANSECT: ☒ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G ☐ H ☐ I ☐ J ☐ K ☐ Dry Channel ☐ Check before starting if Dry Channel

Wetted Width (m) Bankfull Width (m) Bankfull Height (m) Flag

| Transect Substrates | | | | | | |
|---------------------|----------------------|----------------------|----------------------|---|----------------------|----------------------|
| Position | Dist from LB (m) | Depth (cm) | mm/Size Class Code | CPOM | Cobble Embedment (%) | Flag |
| Left Bank | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="radio"/> P <input type="radio"/> A | <input type="text"/> | <input type="text"/> |
| Left Center | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="radio"/> P <input type="radio"/> A | <input type="text"/> | <input type="text"/> |
| Center | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="radio"/> P <input type="radio"/> A | <input type="text"/> | <input type="text"/> |
| Right Center | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="radio"/> P <input type="radio"/> A | <input type="text"/> | <input type="text"/> |
| Right Bank | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="radio"/> P <input type="radio"/> A | <input type="text"/> | <input type="text"/> |

| Position | Microalgae (thickness Code) | Macroalgae Attached | Macroalgae Unattached | Macrophytes | Flag | Check if Algae Parameters are not being Measured <input type="checkbox"/> |
|--------------|-----------------------------|---|---|---|----------------------|---|
| Left Bank | <input type="text"/> | <input type="radio"/> P <input type="radio"/> A <input type="radio"/> D | <input type="radio"/> P <input type="radio"/> A <input type="radio"/> D | <input type="radio"/> P <input type="radio"/> A | <input type="text"/> | <input type="checkbox"/> |
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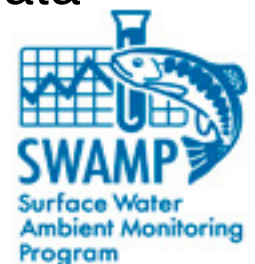
HUMAN INFLUENCE (Left Bank - select only the closest to wetted channel, Channel - recorded presence)
 0=Not Present, B=On Bank, C=Between Bank and 10 m from Channel
 P= > 10m and < 50M of Channel

| | Left Bank | Channel | Right Bank | Flag |
|----------------------|---|---|---|----------------------|
| Walls/Rip-rap/Dams | <input type="radio"/> P <input type="radio"/> C <input type="radio"/> B <input type="radio"/> D | <input type="radio"/> Y <input type="radio"/> N | <input type="radio"/> C <input type="radio"/> B <input type="radio"/> P | <input type="text"/> |
| Buildings | <input type="radio"/> P <input type="radio"/> C <input type="radio"/> B <input type="radio"/> D | <input type="radio"/> Y <input type="radio"/> N | <input type="radio"/> C <input type="radio"/> B <input type="radio"/> P | <input type="text"/> |
| Pavement/Channel Lot | <input type="radio"/> P <input type="radio"/> C <input type="radio"/> B <input type="radio"/> D | <input type="radio"/> Y <input type="radio"/> N | <input type="radio"/> C <input type="radio"/> B <input type="radio"/> P | <input type="text"/> |
| Road/Railroad | <input type="radio"/> P <input type="radio"/> C <input type="radio"/> B <input type="radio"/> D | <input type="radio"/> Y <input type="radio"/> N | <input type="radio"/> C <input type="radio"/> B <input type="radio"/> P | <input type="text"/> |



PHAB Data - MS Access Field Forms

- MS Access front-end application linked to stand alone MS Access back-end shell database
 - Looks similar to hard-copy forms
 - Follows SWAMP Wadeable Streams (2007) Full Protocol
 - Write-only database so data cannot be retrieved within form view once data is saved
 - Provide queries to help with data review and updates
 - Will work on a re-design but not for 2011
 - Trainings via WebEx Webinars in spring and fall
 - Recorded trainings should be available online
 - Help Desk available to speak to a person regarding data and QA issues



Excel Templates – PHAB & Taxonomy

- Available on MLML SWAMP website with examples
- Contains underlying SWAMP data structures
- Can be used for any data type – bioassessment, marine, basic field observations



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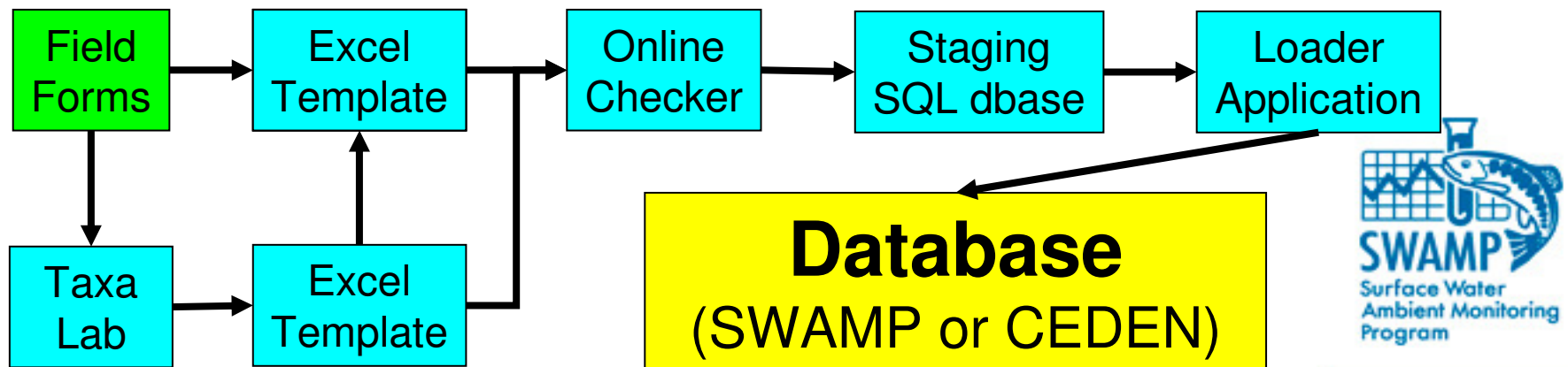
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- Both templates can be checked online for structure and business rules
- We will provide documentation, training, and Help Desk support



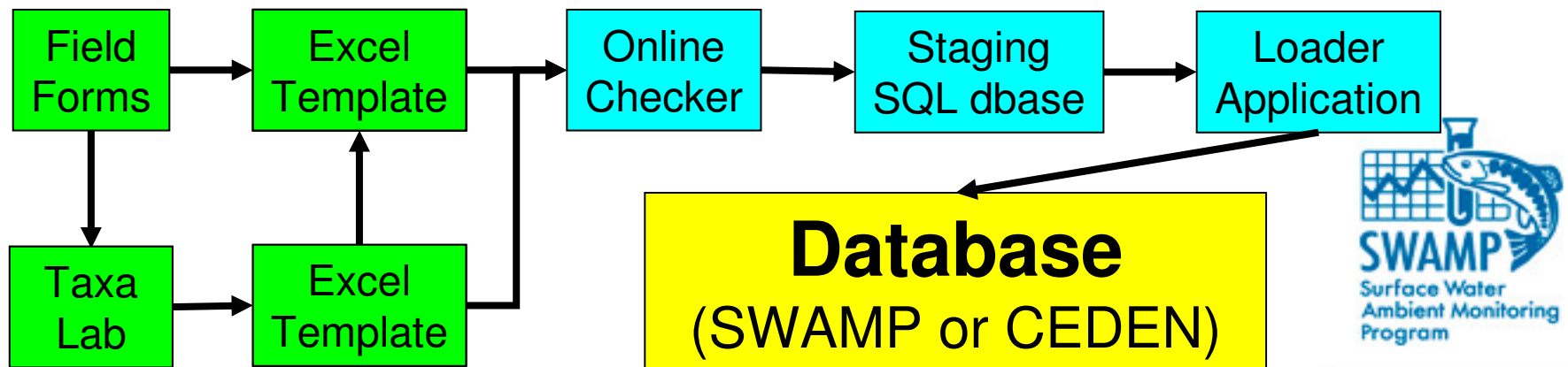
Anticipated Data Submittal Process

- Each spring, package containing MS Access front-end application and stand alone MS Access back-end shell database will be available for data entry (templates available online)



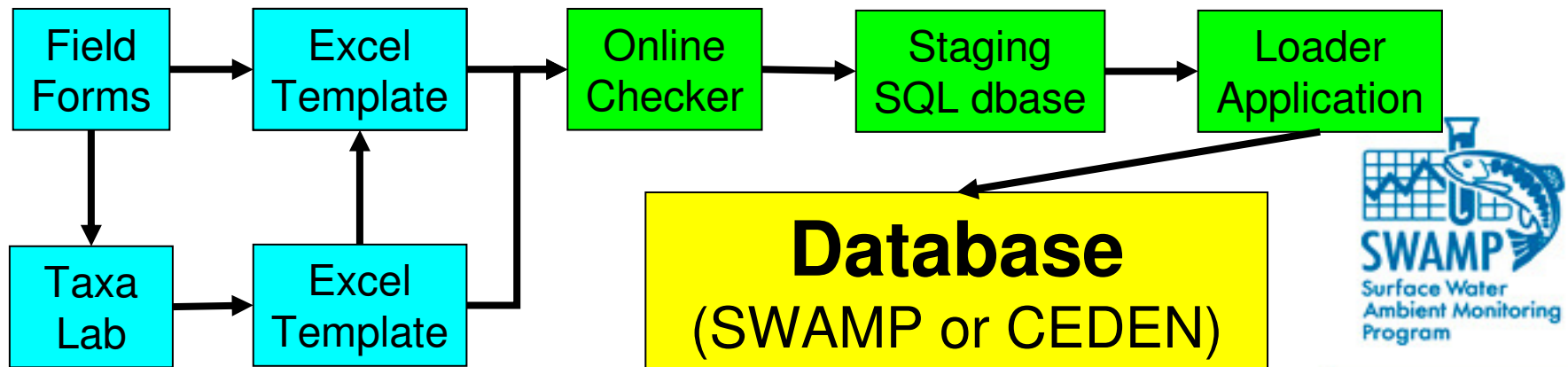
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- When field data is entered and checked within the forms, user exports data to Excel templates (Field and Taxonomy)
 - Taxonomy lab enters data into template and sends back to Project to be combined with PHAB field data



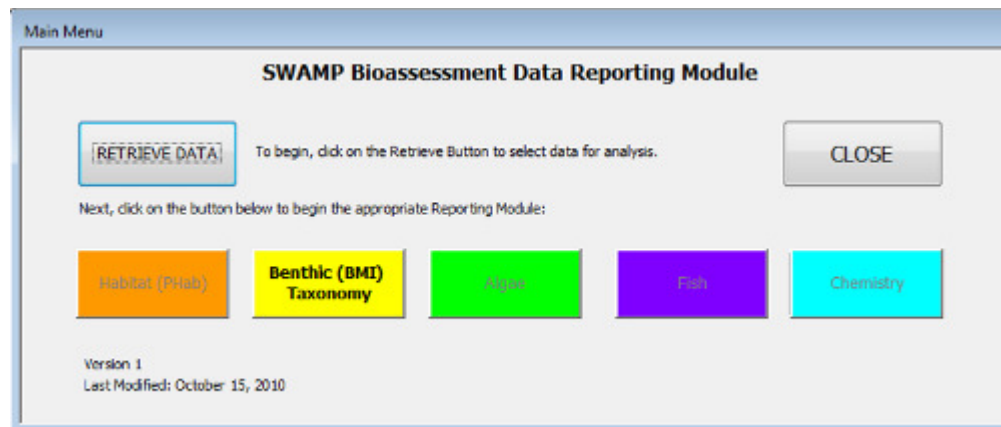
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- User runs completed Excel template through online checker to check for errors against business rules for the SWAMP WS Protocol
 - If no errors, user Submits data to staging SQL database where SWAMP or CEDEN can review data prior to loading
 - Once loaded, user receives confirmation email with unique code and specific output of metrics or indices related to PHAB and BMI data



Data Out

- Historically, relied on CalEDAS Reporting Module (RM) for reporting BMI taxonomy
- Goal for SWAMP is to create RM for:
 - BMI Taxonomy
 - PHAB including Algae
 - Algae Taxonomy
 - Chemistry & Toxicity (water, sediment)
 - Fish
- Data retrieved will be available for all RMs



Reporting Module (RM)

- SWAMP

- MS Access desktop application
- Data imported through internet from SWAMP or CEDEN SQL Server Data Mart
- Full functionality including ability to change settings



Reporting Module (RM)

■ SWAMP

- MS Access desktop application
- Data imported from SWAMP or CEDEN through internet from SQL Server Data Mart
- Full functionality including ability to change settings

■ CEDEN

- Online web application
- Data imported from CEDEN only
- Same underlying structure as SWAMP RM but less functionality
 - Settings defaulted based on reporting requirements



Benthic Macroinvertebrate (BMI) RM

- Building off CalEDAS
 - Same metrics but some updated
 - Adding IBIs
 - Now – SoCal, North Coast
 - Future – Eastern Sierra, Central Valley

Custom Mode

Standard Settings
IBI_SoCal_2005

Standard Taxonomic Effort (STE) List: SAFIT_2007 Program Exclusion: SAFIT_2007 Standard Taxonomic Effort (STE) Level: SAFIT1

Custom Settings : ☒ Sub-Sampling ? ☐ No ☒ Yes Minimum Sample Size: 1 SubSample Count: 500 # Metrics Iterations: 25

GO RESET CLOSE

Taxa Lists Metrics

Metrics Reports Clear

Detail (by location)
Summary (combined Locations)

Metrics Packages Clear

Base
Diversity
Functional Feeding Group
Habit
Sensitivity
Taxonomic Composition

ADVANCED METRICS Clear

| Active IBI Reports | Ecoregion Level | Original Ecoregion | Applied Ecoregion |
|---|-----------------|--------------------|-------------------|
| Southern California IBI 2005 (by Location) | Level3 | 6 | 6 |
| Southern California IBI 2005 (combined Locations) | Level3 | 7 | 7 |

Inactive IBI Reports: Select a Standard Setting to activate

| | |
|---|--------|
| North Coast IBI 2005 (by Location) | Level3 |
| North Coast IBI 2005 (combined Locations) | Level3 |
| Southern California IBI 2012 (by Location) | Level3 |
| Southern California IBI 2012 (by Location) | Level4 |
| Southern California IBI 2012 (combined Locations) | Level3 |
| Southern California IBI 2012 (combined Locations) | Level4 |

ECOREGIONS

| | |
|---|--|
| 6 | Southern/Central California Chaparral/Oak Woodland |
| 8 | Southern California Mountains |

Available Metrics

- Number Elmidae Taxa
- Number Ephemerellidae Taxa
- Number Ephemeroptera Individuals
- Number Ephemeroptera Taxa
- Number EPT Individuals
- Number Gastropoda Individuals
- Number Glossosomatidae Individuals
- Number Hydropsychidae Individuals
- Number Hydropsychidae Taxa
- Number Hydroptilidae Individuals
- Number Individuals per Reach
- Number Individuals per Replicate
- Number Intolerant Diptera Individuals
- Number Intolerant Ephemeroptera Individuals
- Number Intolerant EPT Taxa
- Number Intolerant Individuals
- Number Intolerant Scraper Individuals
- Number Intolerant Taxa
- Number Intolerant Trichoptera Individuals
- Number Mollusca Individuals
- Number Mollusca Taxa

Selected Metrics

- Cumulative EPT Taxa
- Cumulative Taxa
- EPT Index (%)
- EPT Taxa
- Number Amphipoda Individuals
- Number Baetidae Individuals
- Number CF + CG Individuals
- Number CF + CG Taxa
- Number Chironomidae Individuals
- Number Chironomidae Taxa
- Number Chironominae Taxa
- Number Coleoptera Taxa
- Number Collector Filterer Individuals
- Number Collector Filterer Taxa
- Number Collector Gatherer Individuals
- Number Collector Gatherer Taxa
- Number Corbicula Individuals
- Number Crustacea Individuals
- Number Diptera Individuals
- Number Diptera Taxa
- Number Elmidae Individuals

Output: ☒ Unformatted ☐ Formatted

Format: ☒ Crosstab (Horizontal) ☐ Stacked (Vertical)

Output Taxa Records (unformatted text file): ☐ No ☒ Yes

Export Report Export Previous Recordset



Physical Habitat (PHAB) RM

- New development
- Working with Pete Ode and Andy Rehn (DFG-ABL), Revital (RWQCB 2), and Raphael Mazor (SCCWRP) to incorporate metrics
 - EMAP (Kaufmann et al. 1999)
 - SWAMP
 - RWQCB 2
- Will include Algae PHAB data and metrics



Future RMs

- Algae Taxonomy

- Waiting on Master taxa list to be developed so can load data
- Metrics and IBIs based on:
 - SoCal (SCCWRP) and Central Coast (CSUMB) grants
 - Lahontan Basin work (R6 – Tom Suk; Blinn and Herbst)



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- Chemistry and Toxicity

- Water and sediment
- Flat file output and summaries

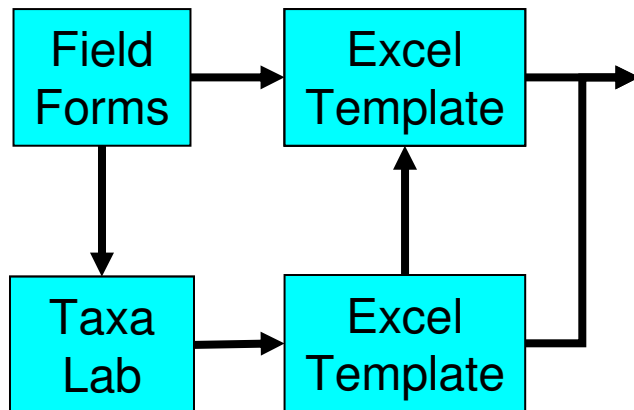


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- Fish
 - ???



SWAMP Data Flow & Timelines

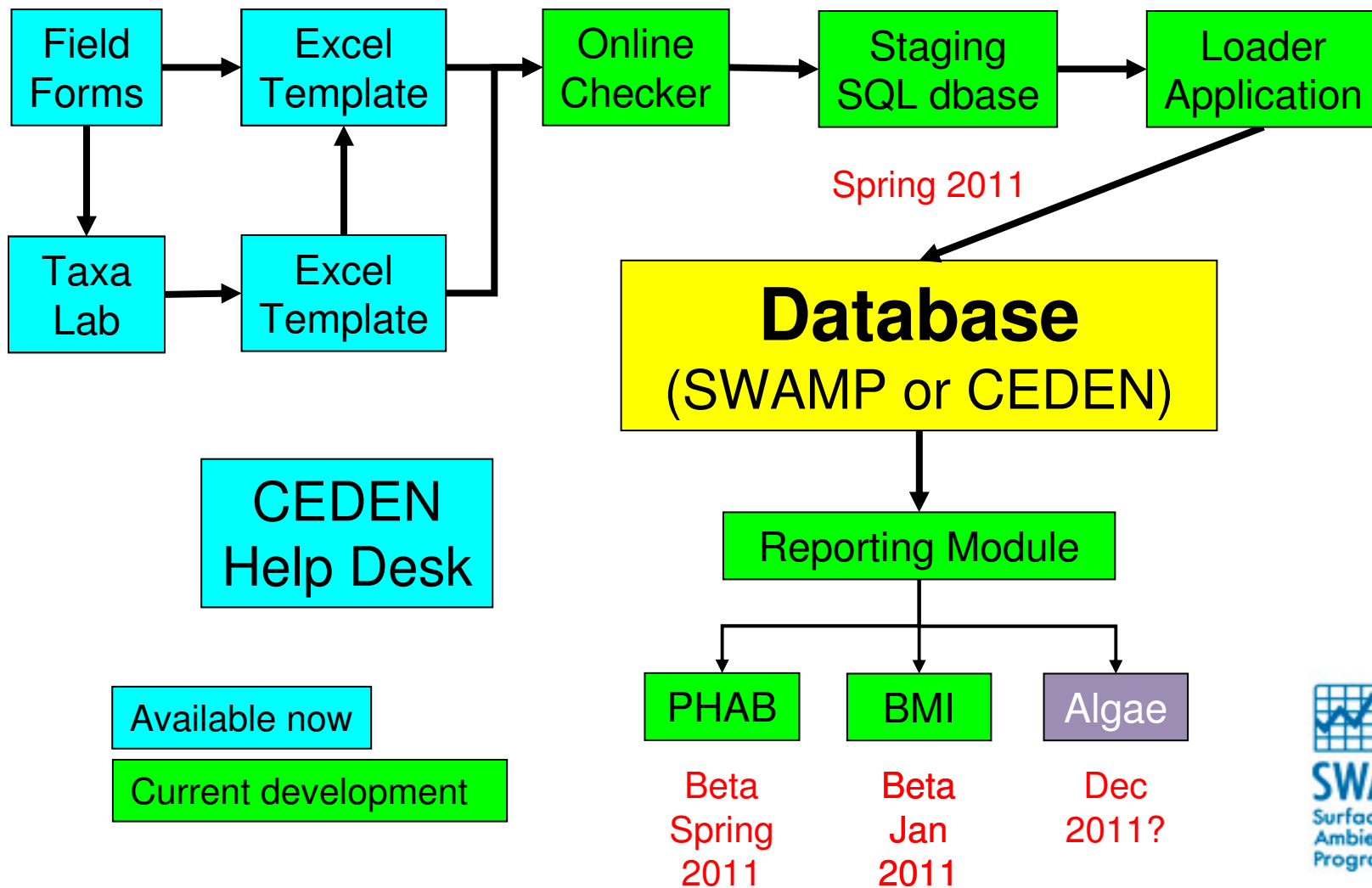


CEDEN
Help Desk

Available now



SWAMP Data Flow & Timelines



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- To use these tools, your program needs to submit data to CEDEN
 - If other programs want to use your data, it needs to be in SWAMP or CEDEN



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 - Write contracts to field and lab crews incorporating the use of these tools
 - Participate in trainings and educate yourself, field crews, and labs
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 - Write contracts to field and lab crews incorporating the use of these tools
 - Participate in trainings and educate yourself, field crews, and labs
 - Set aside funds for data management
- SWAMP plans to have base tools ready by Spring 2011 and CEDEN should be ready to accept and report bioassessment data in Summer 2011 if everything stays on schedule



Contact Information

- Marco Sigala
 - msigala@mlml.calstate.edu
 - 831-771-4173
- MLML SWAMP web site (Docs & Resources)
 - <http://swamp.mpsl.mlml.calstate.edu/>
- Help Desk
 - Data Comparability – Stacey Swenson (swamphelpdesk@mlml.calstate.edu)
 - QA Comparability – Will Hagan (swampqa@mlml.calstate.edu)
- Revital Katznelson (Flexi-Grid)
 - revitalk@sbcglobal.net
- Thanks to SWAMP DMT, Liz Cook, Bruce Bealer, Pete Ode, Doug Post, Andy Rehn, Raphael Mazor, Revital Katznelson

