

Evaluating the use of Mobile Applications for Fisheries Stream Surveys

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Background

- Collection methods
 - Recording data on paper in field
 - Data entry at end of season
 - Statewide stream survey database
- Request from biologists
 - Option to enter data in the field
 - Store coordinates for all points/sites
- Previous mobile projects
 - Law enforcement, Chronic Wasting Disease
 - Available ArcPad 7 licenses and Trimble Recons



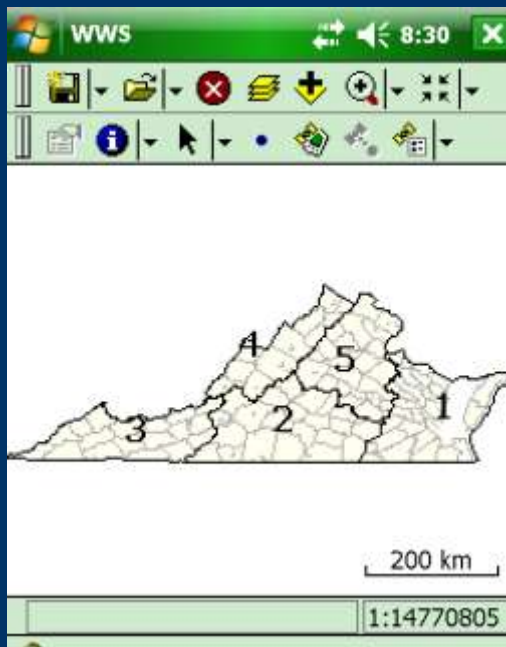
Challenges

- Different regions with specific input values
- Varying level of end user skills
- Limited skills of developer
- Storage space on mobile units
- Related table structure
- Integration with statewide Access database



Map layers

- Vector features - converted using ArcPad toolbar
- Topo maps – add manually
 - Converted Nat'l Geo topos to .sid using a multi-band procedure
- Scale dependencies



Interface

- Customized default configuration file (.apx)
 - Made default toolbars invisible
 - Created toolbars with limited buttons
 - Simplify options for user
 - Increase usable space
 - Custom Tools
 - Delete selected site and fish
 - Delete all features
 - Zoom to region
 - Zoom to set scale

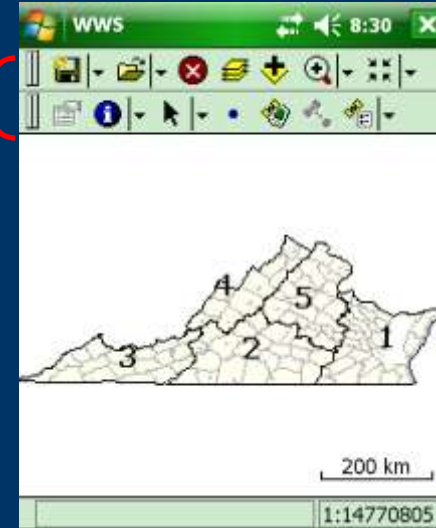
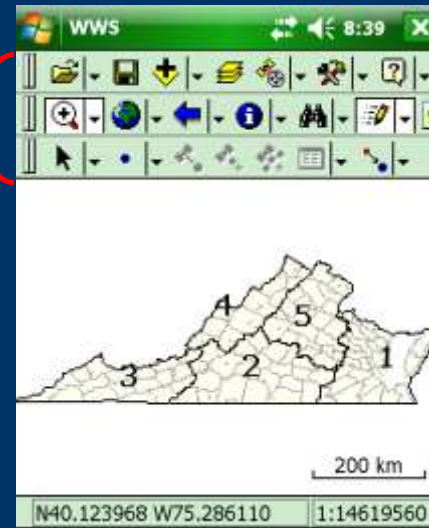


Table structure

- Structure similar to statewide Access .mdb
- 1 main table (Sites) and 3 related tables (Fish data)
 - Sites – (point shapefile)
 - Individual Fish (Fish.dbf)
 - Fish by Centimeter class (FClass.dbf)
 - Fish by Summary data (FSum.dbf)
- Primary Key (PTID)
 - Different starting number for each region and unit
 - Procedure to assign next consecutive number as PTID
 - Code to write this value to related tables



Forms

- Layer configuration file (.apl) for Sites
- Add point using GPS or manually
- Multiple pages/tabs
 - Site 1, Site 2, Fish, Class, Sum, Map
- Drop down controls
- Default values
- Control placement

WWS Video record 3

WWS Data Entry

Region 4 Collection 10/3/08

Stream Trib

Station Temp (c) 0 DO 0

Effort (sec) 0 Time

Collector

County

Sample Type

Site Site 2 Fish Class

ok X

WWS 8:13

WWS Data Entry

Region 4 Collection 10/3/08

Stream North Fork Shenandoah Trib

Station Temp (c) 0 DO 0

Effort (sec) 0 Time 8:13:37 AM

Site Site 2 Fish Class

123 1 2 3 4 5 6 7 8 9 0 - =

Tab q w e r t y u i o p []

CAP a s d f g h j k l ; ' /

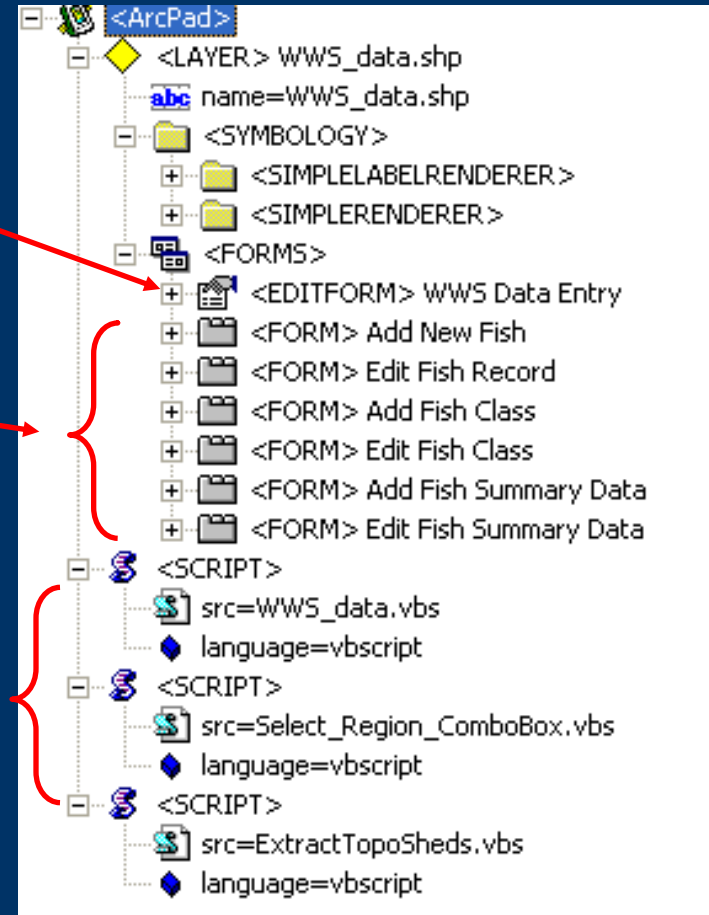
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Ct áü ' \ ↓ ↑ ← →



Forms

- ArcStudio
- Main form (EDITFORM) for Site data
- Six separate forms for adding and editing fish data
- Fish forms open from within main form using event procedures in .vbs



Forms

WWS 7:06

WWS Data Entry

Fish sampled at this site:

Add Fish Edit Fish Delete Fish

Fish Class Sum Map

Add New Fish

Fish

Length (mm) Weight (g)

Envelope Anom.?

Notes

Tag? Tag

Health Mark

123 1 2 3 4 5 6 7 8 9 0 - = <

Tab q w e r t y u i o p []

CAP a s d f g h j k l ; ' "

Shift z x c v b n m , . / <

Ctl á ü ` \ _ < > <

ok ✖

WWS Data Entry

Fish sampled at this site:

SMB : Length: 11 : Weight: 23
SMB : Length: 012 : Weight: 026
LMB : Length: 020 : Weight: 033

Add Fish Edit Fish Delete Fish

Fish Class Sum Map

Forms

WWS Data Entry

Centimeter Classes:

Add Class **Edit Class** **Delete Class**

WWS Data Entry

Summary Data:

Add Sum **Edit Sum** **Delete Sum**

WWS

Add Fish Class

Fish: **Class** | **Fish**

Fish: **Bluegill**

Length class (cm) #

Total Weight (g)

Notes: Anomalies?

ok **X**

WWS

Add Fish Summary Data

Fish: **Sum** | **Class** | **Fish**

Fish: **Bluegill**

Total Weight (g)

Max Length Min Length

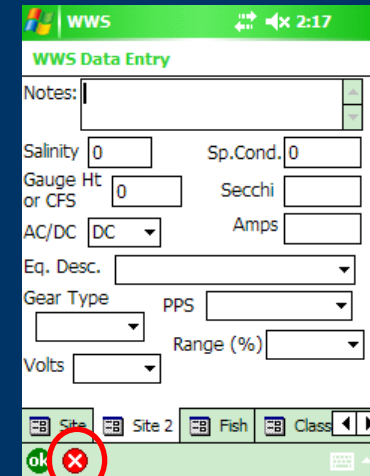
Notes: Anomalies?

ok **X**

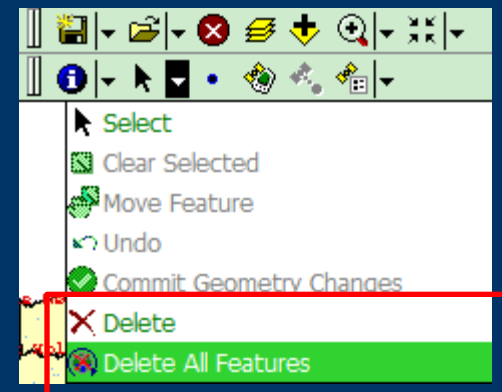


Related tables

- No referential integrity
- Risk of orphaned records
 - Cancelling records
 - OnQueryCancel event of page
 - Confirm intent to cancel
 - OnCancelEvent of form
 - Remove fish records for that point if new
 - Deleting records
 - Delete selected feature custom button
 - Remove site all related fish records
 - Delete all features custom button
 - Removes all records in all tables

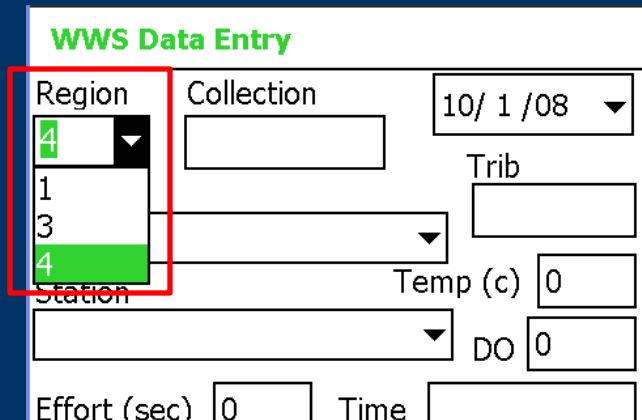


The screenshot shows a web browser window titled 'WWS' with a 'WWS Data Entry' form. The form contains several input fields: 'Notes', 'Salinity' (0), 'Sp. Cond.' (0), 'Gauge Ht. or CFS' (0), 'Secchi', 'AC/DC' (DC), 'Amps', 'Eq. Desc.', 'Gear Type' (pps), 'Volts', and 'Range (%)'. At the bottom of the form, there are navigation buttons for 'Site', 'Site 2', 'Fish', and 'Class'. A red circle highlights a button with a red 'X' icon, likely representing a cancel or delete action.



Enhancements

- Regional values
 - Unique lists of streams, sites and collectors
 - Maintain one master table for deployment
 - Reduce number of list values in combobox
 - Procedure runs on SelectChange event of Region box
 - Populates other controls with only relevant values



WWS Data Entry

Region: 4 (dropdown menu open showing 1, 3, 4)

Collection: [text box]

10/ 1 /08 (date dropdown)

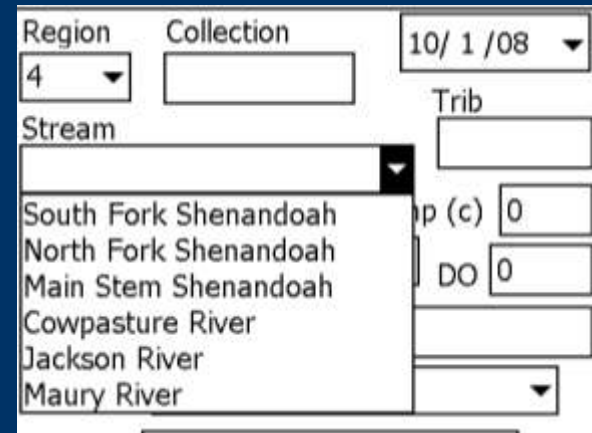
Trib: [text box]

Temp (c): 0

DO: 0

Effort (sec): 0

Time: [text box]



Region: 4

Collection: [text box]

10/ 1 /08

Stream: [dropdown menu open showing South Fork Shenandoah, North Fork Shenandoah, Main Stem Shenandoah, Cowpasture River, Jackson River, Maury River]

Trib: [text box]

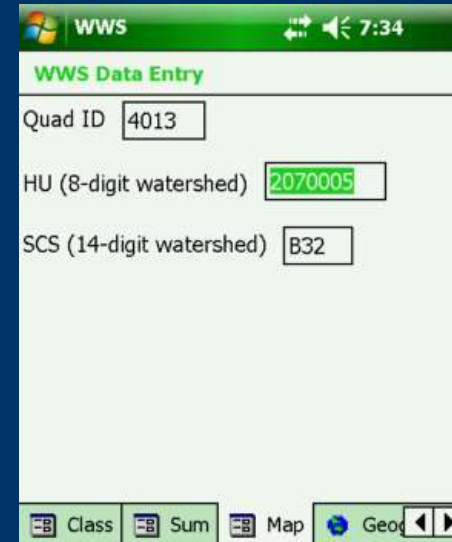
Temp (c): 0

DO: 0



Enhancements

- Auto fill page in background
 - Script called from OnLoad event of Main form
 - Controls are filled in by extracting values from 'invisible' map index layers
 - User does not have to activate page



WWS Data Entry

Quad ID

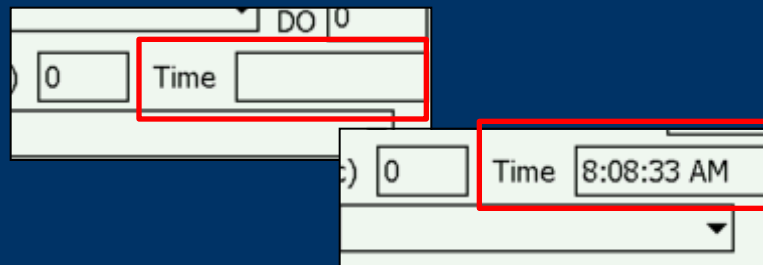
HU (8-digit watershed)

SCS (14-digit watershed)

Class Sum Map Geod

The screenshot shows a mobile application interface for 'WWS Data Entry'. It features three text input fields: 'Quad ID' with the value '4013', 'HU (8-digit watershed)' with the value '2070005', and 'SCS (14-digit watershed)' with the value 'B32'. The 'HU' field is highlighted with a green border. At the bottom, there are four buttons labeled 'Class', 'Sum', 'Map', and 'Geod', along with navigation arrows.

- Custom time stamp



DO | 0

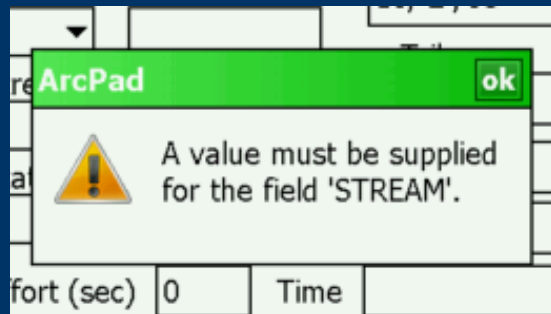
0 Time

0 Time 8:08:33 AM

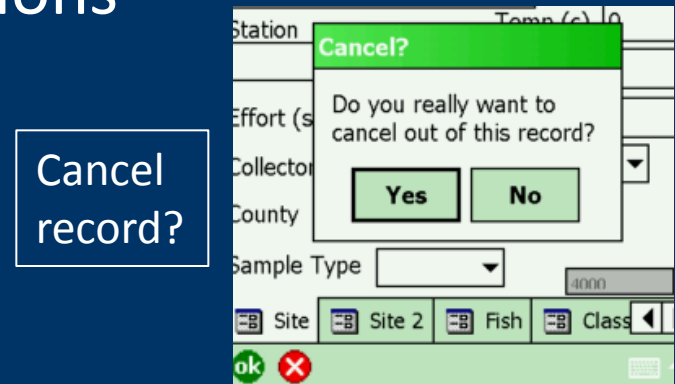
The image shows two overlapping screenshots of a form control. The top screenshot shows a 'Time' label next to an empty text input field. The bottom screenshot shows the same 'Time' label next to a text input field containing the timestamp '8:08:33 AM'. Both 'Time' labels and their respective input fields are highlighted with red rectangular boxes.

Enhancements

- Designing some controls as mandatory



- Dialog boxes to confirm actions



Delete all features?

Results

- Issues with GPS connectivity
 - Reset unit after syncing
- Extra step to load “Add fish” form
 - Overall time savings?
- Continue evaluating application
 - Demand for mobile entry
 - Research potential improvements
 - Alternatives for software and hardware



Thank you

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