Implementing/Automating the U.S. Army Corp of Engineers Wetland Determination Form: Survey123, WAB, and Geocortex
Agenda

• Why build apps to fill in a paper form?
• What apps we built
• Pro’s/Con’s
• Lessons learned
• How we feel about it
Why?

Design

Build

Show

vhb

NYGeoCon 2017
Meet VHB

1,350 passionate professionals including engineers, scientists, planners, designers, GIS professionals, developers

25 offices along the East Coast

Founded in 1979

* Acquired Fountains Spatial in 2016

Core services
Transportation Planning & Engineering
Civil Engineering
Planning & Design
Environmental

Markets
Transportation agencies
Institutions
Real estate
Federal government
Energy
VHB’s Applied Technology Group

- 50 staff focused on external technology services
  - Over 20 application/database developers
  - Over 30 GIS Analysts/CAD Technicians
- Esri Experience
  - Business Partner for over 16 years
  - Enterprise License Agreement
  - Business Partner Advantage Program (BPAP)
  - ArcGIS Online Specialty Campaign Certification
- Microsoft Experience
  - Enterprise License Agreement
  - Azure Cloud Solution Partner
  - SQL Server – on-premise & cloud
  - Power BI – business analytics
Wetland Determination Form (WDF)

The project was a result of internal initiatives:
• to improve field survey and data reporting efficiency via mobile applications,
• to promote data collection consistency across offices and regions,
• and to develop a database of field information;

Purpose: To automate, as much as possible, the data collection and creation of the U.S. Army Corp of Engineers Wetland Determination Data Form
USACE WDF Project

Consists of 2 applications:

- Mobile application - enter information in the field regarding potential wetlands
- Web application - view, QA/QC, edit, post process and create reports.
Region differences

Three versions of the WDF form for the field app, one for each region:

- NCNE - Northcentral Northeast
- EMP - Eastern Mountains and Piedmont
- AGCP - Atlantic and Golf Coast

Key Differences:

- Wetland Hydrology indicators (Primary and Secondary)
- Hydric Soil Indicators and Indicators for Problematic Hydric Soils
- Species (Tree, Sapling, Shrub, Herb, Vine) and regional Indicators
Field app
Technology Used

- Survey123 for ArcGIS
- AGOL hosted feature service
Five pages

• Main Data page – 25 primary questions plus 7 additional
• Hydrology – 8 primary questions plus 4 additional
• Vegetation – Tree/Sapling/Shrub/Herb/Woody Vine – each with plot size and type and multiple species along with % cover
• Soils – multiple soils with depth, matrix color and %, texture; each with multiple Redox values; plus 6 primary questions and 1 additional
• Summary – multiple photos including directions and comments

One of each type, with no additional, yields 35 questions
Additional Questions

Some answers prompt additional questions
Check boxes vs radio buttons

• Check boxes – used for Multiple Select answers
• Radio button (aka dot items) – Single Select answers
Autocomplete

Single Select with autocomplete search
Related Records

- Add related record
- Delete
- Related records
Thoughts from the Developer

Pros:
• Survey123 form created within excel file
• AGOL Groups and feature services are easy to access and create
• Able to load on all iOS or Android devices

Cons:
• Development cycle of S123 didn’t allow certain needed features
• Need sub meter location detection
Two back office Web maps/apps

1. WAB Web App
2. Geocortex Web App

Functions:
• Webmap for QA/QC
• Worksheet calculations
  • Dominance Test
  • Prevalence Index
  • Stratum Indicator Status
  • Stratum Dominance Species Test
• PDF output
1. WAB Web App
Technology Used

• AGOL
• Web AppBuilder
• Javascript
• C# for pdf generation
Field Data Manager Web Application

• Need to be connected to VHB network or VPN
• Need an AGOL account
Thoughts from the Developer

• Pro: WAB provides an interface in which custom widgets fit seamlessly

• Con: Changes to AGOL layers sometimes requires multiple steps to republish

• Lesson Learned: Applying edits to AGOL can sometimes be slow. To prevent timeouts, use a save queue and send the edits one at a time.
2. Geocortex Web App
Technology Used

- Geocortex Essentials
  - Report Designer
  - Workflow Designer
  - HTML5 2.8 viewer
Geocortex Data Viewer
Geocortex Data Viewer

Wetland Determination Report Generation Map

Please use this webmap to view field investigations made with our Wetland Determination Form using ESRI's Survey123. Field/CAD data can be added, along with editing, adding, and removing features, along with generating the designated report for your region.

Please contact Elizabeth Aboysia at ea@nbs.com or Michael Swanson at mswanson@nbs.com with any questions, comments, or help with any potential errors.
Geocortex Data Viewer

Regional Forms define color symbology
Filter #1

Filter by Project

- Prompts the list of all records values for the Project field
- Allow single or multiple select
- Filter only shows those records in the map extent
Filter #2

Filter by Date

- Prompts the list of all records values for the Date Created field
- Allow single or multiple select
- Filter only shows those records in the map extent
Filter #3

Filter by Creator

- Prompts the list of all records values for the Creator field
- Allow single or multiple select
- Filter only shows those records in the map extent
Editing Point Values:
- Select Point
- Click “Edit Features”

For updating Soil and Vegetation Information:
- Select Point
- Click “View Additional Details”
- Click “Create A New Related Feature”
Post Process and Report

Selection Options

• Point Item
• Select Rectangular Area
• Select Current Map Extents
Thoughts from the Developer

• Pro: Very little coding needed for web map
• Con: Geocortex developer documentation hard to find on some topics
• Lessons Learned: The developer’s first web map used by others:
  • Constantly look for Improvements and version updates
  • Ideas for implementation after used multiple users
  • Limits – can this idea get integrated?
Thoughts from PM

• Geocortex Site took less time to create, for many reasons:
  • Easier to use platform, no coding
  • Second version, no learning the project’s purpose (calculations were understood)
  • more difficult to customize?

• The usual hurtles:
  • staff commitment
  • deliverables and sign offs
  • Training – new ideas mean a little ‘hand holding’ when training on new procedures

• Success:
  • Limited roll-out this field season, successful so far.
  • Next field season year will be used through-out.
Questions and Thank you