Environmental Tools to Enable Better Project Planning and Construction

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This Morning’s Focus

- Environmental tools
- Case study
- Questions
USGS topographic maps

- Provides maps of key features
  - Contours
  - Streams, wetlands, open water
  - Land features

- Issues
  - Can be dated
  - Not a regulatory definition
Soil survey maps

- Produced by Natural Resources Conservation Service
- Can be found at
- Location specific
- Hydric soils
- Ecological areas
  - Range sites
Aerial photography

- Various sources
  - Google Earth
  - Driving apps
  - Environmental compliance databases

- Benefits
  - Allow for “forensic delineation”
  - Can assist in identifying key features

- Issues
  - Dated
  - Clarity
  - Not a substitute for field assessment
Floodplains

- Mapping managed by the Federal Emergency Management Agency
  - https://msc.fema.gov/portal/home
- Apps are available for field work
- Items to identify
  - Floodplain
  - Floodway
Floodplains
Protected species

- **Source**
  - Information, Planning and Conservation System
  - [https://ecos.fws.gov/ipac/](https://ecos.fws.gov/ipac/)

- Assist in determining whether threatened and endangered species, designated critical habitat, proposed critical habitat, migratory birds and other natural resources may be affected by project

- Summarizes distribution of important biological resources such as wetlands, refuges, critical habitat, etc.

- Get a preliminary or official USFWS species list

- **Benefits**
  - Location specific
  - Fairly up-to-date information

- **Issues**
  - Can be used as tool to assist, not substitute for field work
National Wetland Inventory maps

- Based off USGS topographic maps
- Used Cowardin classification system
- Source
  - [https://www.fws.gov/wetlands/data/mapper.html](https://www.fws.gov/wetlands/data/mapper.html)

- Benefits
  - Useful tool for toolbox

- Issues
  - Does not map regulatory waterbodies
  - Can be dated
  - Mapping accuracy low
Classification of Wetlands and Deepwater Habitats of the United States

U.S. Department of the Interior
Fish and Wildlife Service
NWI maps - disclaimer

- There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies.
Case Study

- Funded partially by Devon Energy Corp.
- Work performed by University of North Texas and Carter & Burgess staff
Early Screening Concept

- Can prevent unnecessary delays
  - Permitting (General or Individual Permit)
  - Moving a well site late in the establishment period

Early Screening

- Method for predicting occurrence of waters of the U.S.
  - Adequately identify waters of the U.S.
  - Separate waters of the U.S. from non-waters
  - Provide rapid assessment of proposed drilling sites and pipeline routes
Comparison Methods

- **Model**
  - SPOT imagery
  - Digital soil data
  - Digital elevation models
  - Digital ortho photography
  - Cost – $0.01/acre

- **Office delineation**
  - One-meter resolution color-infrared aerial photographs
  - U.S.G.S. Topographic Maps
  - Cost - $0.52/acre
## Results

<table>
<thead>
<tr>
<th></th>
<th>Model</th>
<th>Office Delineations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Prediction</td>
<td>69.0%</td>
<td>84%</td>
</tr>
<tr>
<td>False Positive Prediction</td>
<td>28.8%</td>
<td>15%</td>
</tr>
<tr>
<td>False Negative Prediction</td>
<td>2.1%</td>
<td>1%</td>
</tr>
<tr>
<td>Cost</td>
<td>$0.01 per acre</td>
<td>$0.52 per acre</td>
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Summary

- Lots of good tools for your planning toolbox
- New sources are constantly being updated/added
  - Make sure you’re using up-to-date sources
- Be cautious in relying only on remote sensing tools
  - “Boots on the ground” is the only way to definitively assess an area
Questions?