TAKING THE HISTORICAL MAPS OF GRAND LAKE MEADOWS ONLINE

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Grand Lake Meadows
Grand Lake Meadows

- Largest freshwater marsh/wetland in the province
- ‘Floodplain Wetland’ classification
  - In any given year, ~85% of area is inundated by seasonal floodwaters
- Diverse ecology and its abundant wildlife
  - The presence of Grand Lake
  - Extensive floodplains
  - The presiding water levels over the growing season
- Earliest recorded settlers (in the 1600s) were the Wolastoqiyik and Mi’kmaq peoples
- Class II Protected Natural Area (1990)
  - Limits use to low-impact recreation activities and traditional food gathering
- GLM Project Management Committee
  - To raise awareness of cultural and historical significance of this area

Previous research

- Catalog vascular plant species and characterize different habitats and plant communities (Nature NB)
- Fauna and Flora [Papoulias et al., 2006]
- Waterfowl and Tree species, [Zelazny, 2013]
- Extensive research regarding fish and bird species [Legere 2001]
- Archaeological study [Blair, 2004]
- ...
Research Question

- Can previously unknown information about Grand Lake Meadows be uncovered through the analysis of historical maps?

Objectives:
- Review the historical map collections
  - Provincial Archives of New Brunswick
- Record the socio-economic and geomorphological changes of Grand Lake Meadows
  - (as documented by the historical map collections)
- Promote historical significance of Grand Lake Meadows
  - Web-based map mashup and educational content

Archives

- Provincial Archives of New Brunswick (PANB)
  - "collects, preserves, and makes available" historical records for the province of New Brunswick
- Predicted
  - Find historical maps dating back to 17th century
- Classes:
  - Land Grant, Land grant survey plans, crown lands maps & plans, hydrographic, cadastral land grants, campsite petitions... town plot plans,
- Actual
  - Nearer the end of the 18th century
    - (Earliest map in study area: 1785)
  - Majority of maps: Land Grants
Georeference

- Images georeferenced in Quantum GIS

Map Scan Coverage

ID Features of Interest

- Map Analysis
- Digitize
  - Property boundaries and ownership
  - Wetland
  - Buildings
  - Settler origin

Enrich Historical Map Findings

- Review previous research
- Discussion with local historians
- Data from PANB & Service New Brunswick (SNB)

Link to PANB Website
Map Mashups

- MapServer
- Web Map Service
- OpenLayers
- jQuery

- GGE 5403
  - (Web Mapping and Geospatial Web Services)
- GGE6408
  - (Geospatial Web)

A: Open Layers map window, default pan and zoom tools
B: Toggle auxiliary data (images or digitized features via jQuery Accordion Panel)
C: Background map choice
D: reset Map

Historic Map Mashups
<input type="checkbox" name="overlay" value="ckRS655343" id="msRS655343" onClick="toggleControl(this);">

```html
function toggleControl(element)
if (element.value == "ckRS655343") {
    RS655343.setVisibility(element.checked);
}
```

Add in collapsible and toggled layers: 1st argument = Name of the function. 2nd argument = If statement to define action. 3rd argument = Set default visibility of the element (set checkbox to empty)

```html
<input type="checkbox" name="overlay" value="ckRS655343" id="msRS655343" onClick="toggleControl(this);">
<img src="../../Web_HistoricalMaps/clickable/PANB/RS655-34/RS655-34_SU_Plan53a.png" width="50" height="37">
<br>1932: French Lake to Maquapit Lake, Land Ownership
</div>
```

Image, thumbnail, checkbox, and description of layer to legend

```html
<script>
$(document).ready(function()
{ $("#slidRS655343").slider({
    range: "min", animate: "fast",
    max: 100, value: 75,
    slide: function(event, ui) {
        RS655343.setOpacity(ui.value / 100);
        $("#sliRS655343").val(ui.value);
    });
});
```

Slider transparency script
WMS-T & Feature Information

```javascript
function update_date() {
    var string = OpenLayers.Util.getElement('year1').value + "/'" +
                 OpenLayers.Util.getElement('year2').value;
    DigProperty.mergeNewParams({'time':string});
}
// Function added to the script of HTML file for updating feature data based on date
```

```html
//------layer definition
NAME "DigSettlers" METADATA
"wms_timeextent" "1700/2012"
"wms_timeitem" "Year"
"wms_time default" "1700"
"wms_enable_request" "*"
END

//WMS-T Metadata items required (and optional) for WMS-T support in MapServer Mapfile
```

WMS-T & Feature Information

```javascript
//get_feature_info
map.events.register('click', map, function (e) {
    if (DigProperty.getVisibility()) {
        OpenLayers.Util.getElement('attr_data').innerHTML = "Retrieval of data...
Please wait...";
        var url = DigProperty.getFullRequestString(
            REQUEST: "GetFeatureInfo",
            EXCEPTIONS: "application/vnd.ogc.se_xml",
            BBOX: DigProperty.map.getExtent().toBBOX(),
            X: e.xy.x,
            Y: e.xy.y,
            INFO_FORMAT: "text/html",
            FONT: "c:/ms4w/fontlist/times.ttf",
            ENCODING: "utf-8",
            // FEATURE_COUNT: 1,
            QUERY_LAYERS: DigProperty.params.LAYERS,
            WIDTH: DigProperty.map.size.w,
            HEIGHT: DigProperty.map.size.h });
        OpenLayers.Util.getElement('requestp').innerHTML = url;
    // to see the URL
    OpenLayers.loadURL(url, '', this, setHTML);
    } else {
        OpenLayers.Util.getElement('attr_data').innerHTML = "Data Layer is not activated";
    }
}
// Get feature info based on map selection
```

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WMS-T & Feature Information

```javascript
function setHTML(response) {
    OpenLayers.Util.getElement('attr_data').innerHTML = response.responseText;
}
```

// Get attribute data from .html file

```
DATA "C:\ms4w\Apache\htdocs\glm\Web_HistoricalMaps\shapes\DigSettlers.shp"
TEMPLATE "C:\ms4w\Apache\htdocs\glm\Web_HistoricalMaps\shapes\Settlers.html"
```

// Link to template file in MapServer Mapfile

OpenLayers & KML

![Map of Grand Lake Meadows](image.png)
Web Site Structure

Index

Home
- a) About Grand Lake Meadows
- b) Historical Activities
- c) Present Day Activities

History
- a) Why historical maps
- b) 1700s
- c) 1800s
- d) 1900s
- e) 2000s
- f) Summary of Changes

Geography
- a) Historical Map Overlays
- b) Property & Wetland Changes
- c) Early Settlers
- d) Coverage area of maps

Puzzles
- a) History Puzzles
- b) Geography Puzzles

Go
- a) A visual tour
- b) What can you do?

Educational Content

- Puzzles and Quizzes
  - Hypertext Preprocessor (PHP), Scalable Vector Graphics (SVG) & jQuery
- Teachers only section
  - Exercises based on Historical Thinking Project
PHP Quizzes

<?php

$questions = array(
    array( // Questions
        'question' => 'Identify the mode of transportation in the 1700s:',
        'options' => array('A' => 'Horse and buggy', 'B' => 'Stagecoach', 'C' => 'Steamboat', 'D' => 'Carriage'),
        'correct_answer' => 'B',
    ),
    array( // Questions
        'question' => 'What are the main modes of transportation in the 1700s?:
        'options' => array('A' => 'Horse and buggy', 'B' => 'Stagecoach', 'C' => 'Steamboat', 'D' => 'Carriage'),
        'correct_answer' => 'B',
    ),
)

$correct_answers = array()

for ($i = 0; $i < count($questions); $i++) {
    $correct_answers[$questions[$i]['question']] = $questions[$i]['correct_answer'];
}

$template = "<html><body><form action="quiz.php" method="post">
  Question: $question<br>
  <select name="q-$i">
    <option value="A">$a</option>
    <option value="B">$b</option>
    <option value="C">$c</option>
    <option value="D">$d</option>
  </select><br>
  <input type="submit" value="Submit">
</form></body></html>";

foreach ($questions as $question) {
    $template = str_replace(array('question', 'a', 'b', 'c', 'd'), array($question['question'], $question['options']['A'], $question['options']['B'], $question['options']['C'], $question['options']['D']), $template);
}

// Output the quiz
.getString($template);
Puzzles

Teachers Resources
Conclusions

- To review the historical map collections held at the Provincial Archives and the University of New Brunswick

- Record the socio-economic and geomorphological changes of Grand Lake Meadows
  - (as documented by the historical collections)

- Promote historical significance of Grand Lake Meadows through development and deployment of a web based map mash-up and educational program

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