New Hampshire Land Conservation Mapper

Pennsylvania State University
Geography 596A: Peer Review
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Outline

- Problem Statements

- Project Goals and Objectives

- Research

- Design and Methods

- Wrap Up

Problem Statements

- Most New Hampshire towns have no GIS capability of their own.

  - Conservation Commissions have no ready means of gauging the relative ecological value of a potential conservation parcel.

  - Planning Boards have no ready means of assessing the environmental impacts of proposed developments.

- No capability exists to allow towns or agencies to provide updates to the state Land Conservation database layer.

Current Situation

- State provides GIS data viewing tool, the GRANIT Data Mapper

- Land Conservation one of several themes

- Displays currently protected lands on top of suitable base map

    - No conservation value assessment capability

    - No data input capability

Problem Statements

GRANIT Data Mapper Land Conservation Theme

Problem Statements

Project Goals and Objectives

- Develop an interactive web mapping environment that:
  - Replicates the core GRANIT Data Mapper functionality for the Land Conservation theme.
  - Provides means for users to generate a Land Conservation Value assessment.
  - Provides means for users to submit new Land Conservation parcels to GRANIT staff.
- Personal goal: Learn Adobe Flex and the ESRI ArcGIS Server Flex API.

Project Goals and Objectives

Research Questions

- What are the design aspects of other online interactive GIS data viewers?

- Are there other existing interactive web maps that support:

  - Parcel input?

  - Land Conservation Value Analysis?

- What are some of the important considerations in land conservation?

- What land conservation value assessments have already been carried out for the state that can be applied in this project?

New Hampshire Wildlife Action Plan

- Development led by NH Fish and Game within the federal government State Wildlife Grants program

- Predictive model delineates 16 habitat types that support the states most at risk species

- Habitats also tiered by statewide and regional ecological condition

- Delineates unfragmented blocks of land

Research
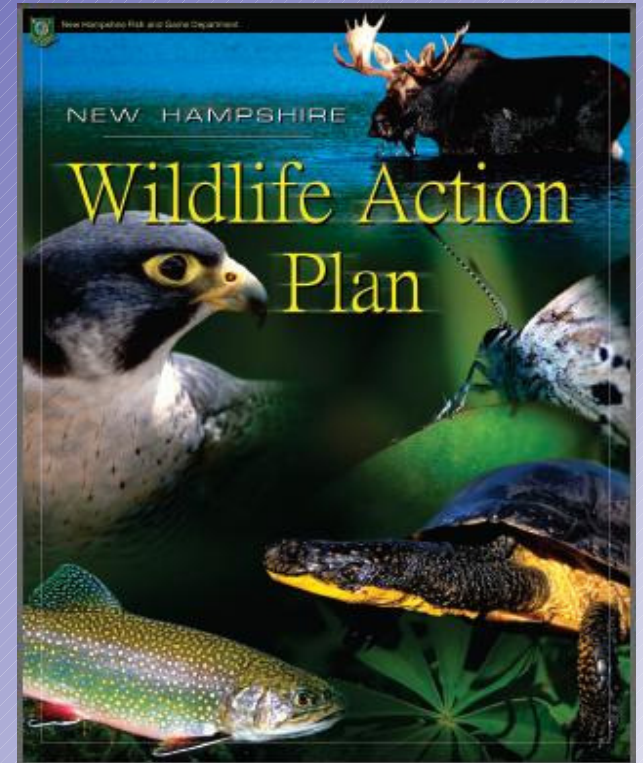
New Hampshire Natural Services Network

- Collaborative effort between planning and natural resource professionals

- Single layer that identifies:

  - water supply lands

  - flood storage lands

  - productive soils

  - important wildlife habitat

Research
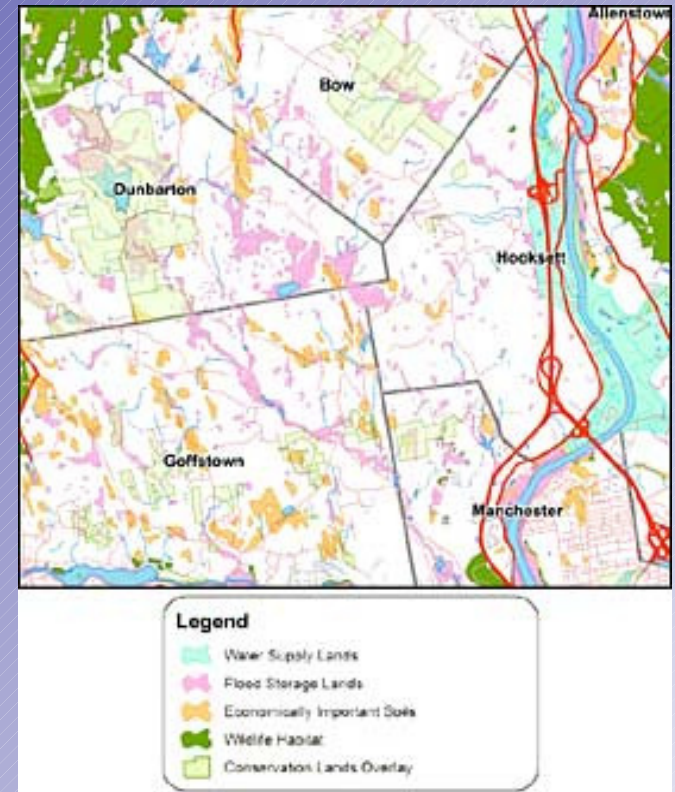
The Land Conservation Plan for New Hampshire's Coastal Watersheds

- State initiative that establishes conservation priorities for the 990 square miles and 46 towns that comprise New Hampshire's coastal watersheds

- Plan provides:

  - Resource maps

  - Co-occurrence models

  - Conservation Focus Areas

The Land Conservation Plan For New Hampshire's Coastal Watersheds

The Nature Conservancy

August 2006

Research
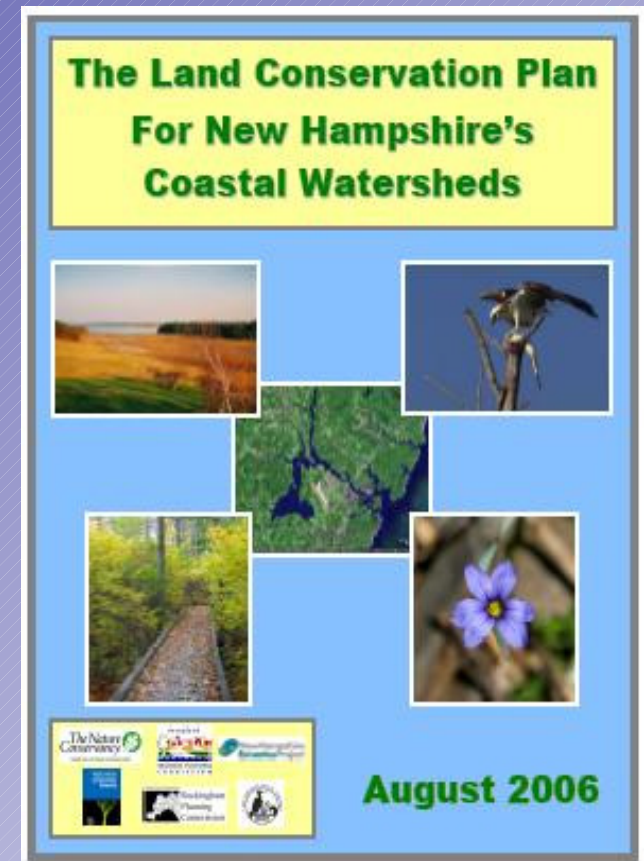
Design and Methods

- Web Client

- Adobe Flex & ArcGIS Server Flex API

- ESRI ArcGIS Server

  - Map Services

  - Geoprocessing Services

  - Feature Service

Web Client

- Basic map and navigation controls

- Multiple selectable base maps

- Standard and optional active map layers

- Means to sketch out a parcel and generate a Land Conservation Value Analysis report

- Means to sketch out a parcel, record parcel attributes, and submit to draft Land Conservation feature class

Design and Methods

WebClient Prototype: Flex Sample Viewer

Design and Methods

Adobe Flex & ArcGIS Server Flex API

Design and Methods
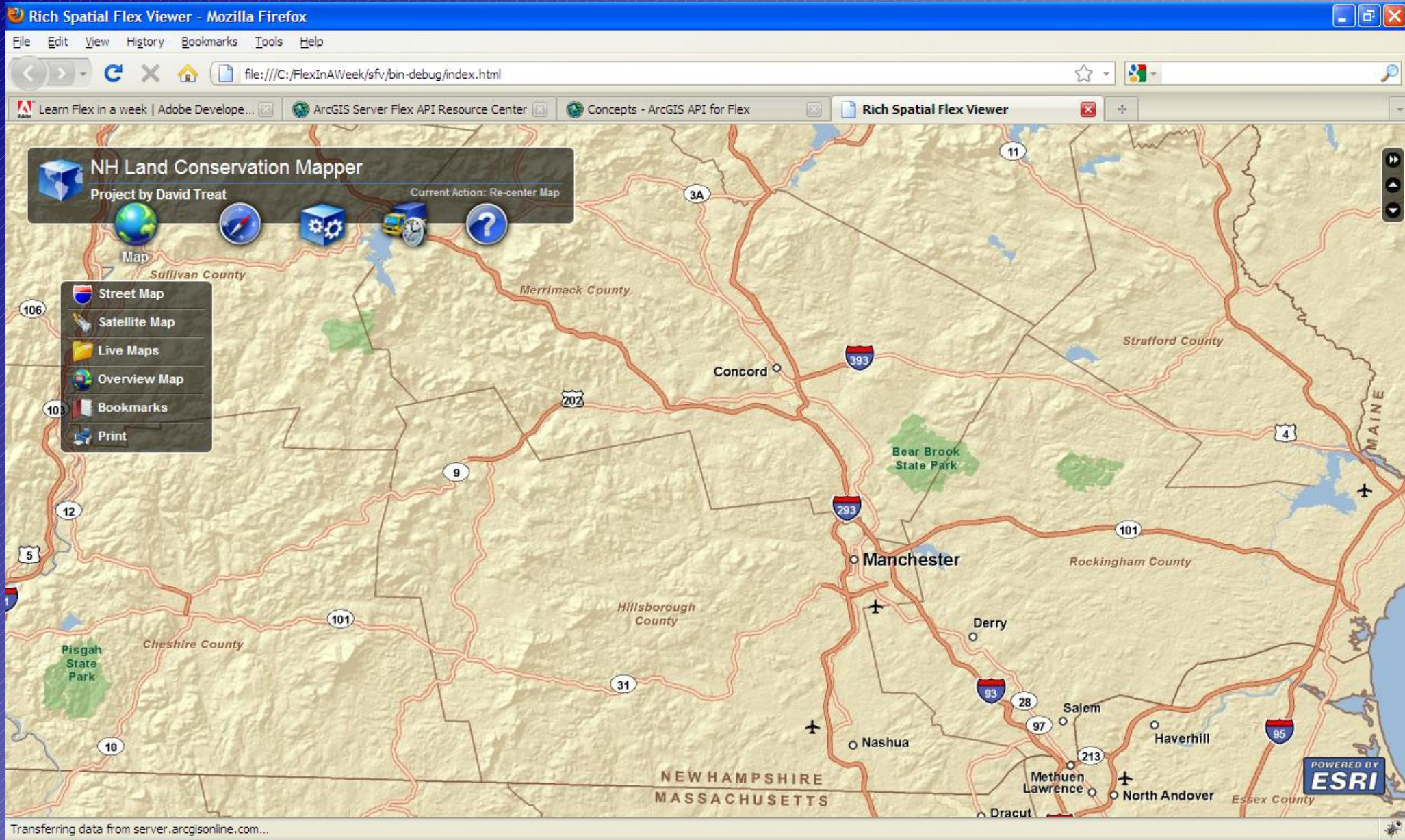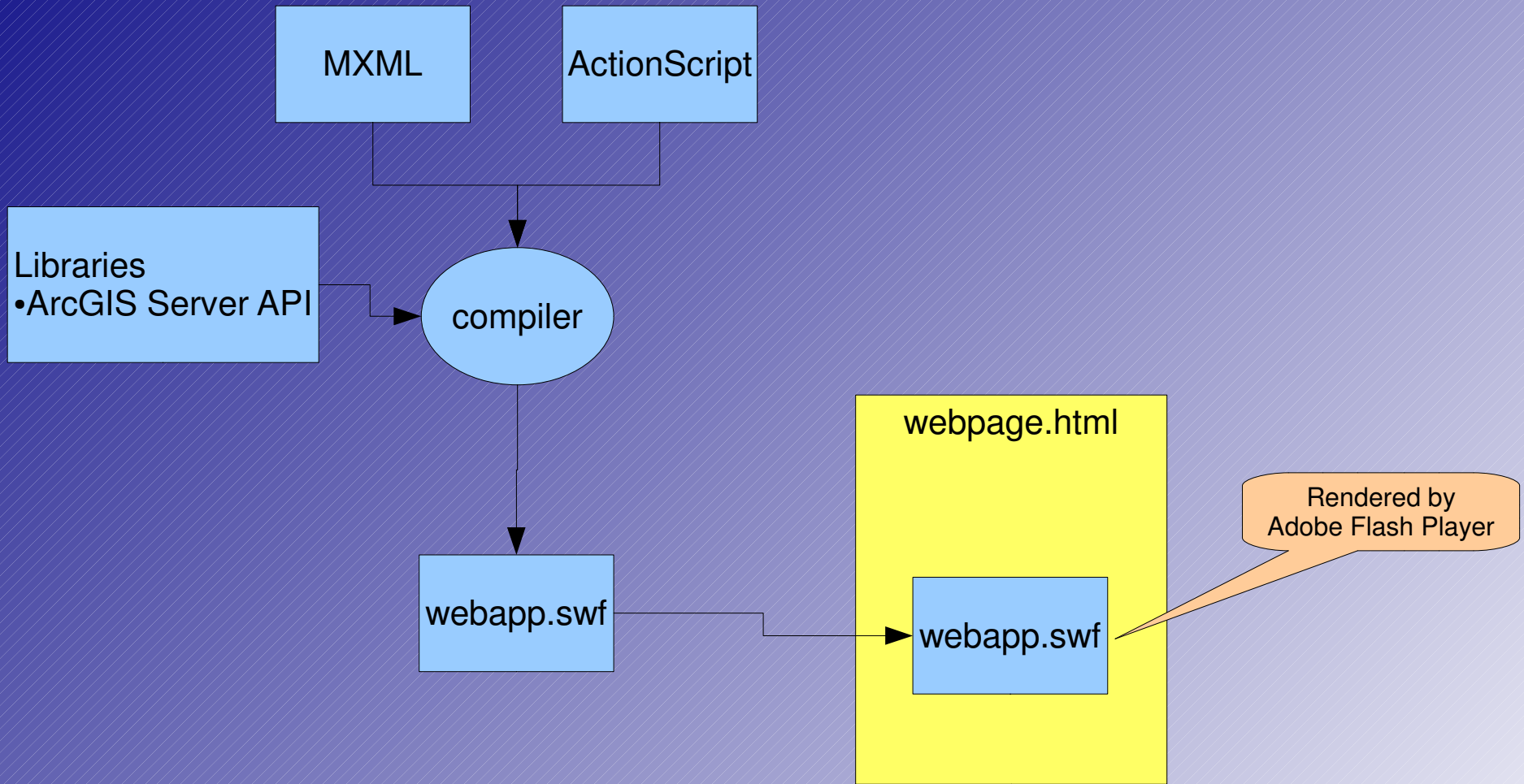
Map Services

- Use ArcGIS Online for basemaps

- Publish four map services to ArcGIS Server

  - Land Conservation and Natural Resources

  - Wildlife Action Plan

  - The Land Conservation Plan for New Hampshire's Coastal Watersheds

  - Draft Land Conservation Parcels Layer (user entries)

    - Publish as a Feature Service

Design and Methods

Map Example: WAP Habitat Tiers

Design and Methods
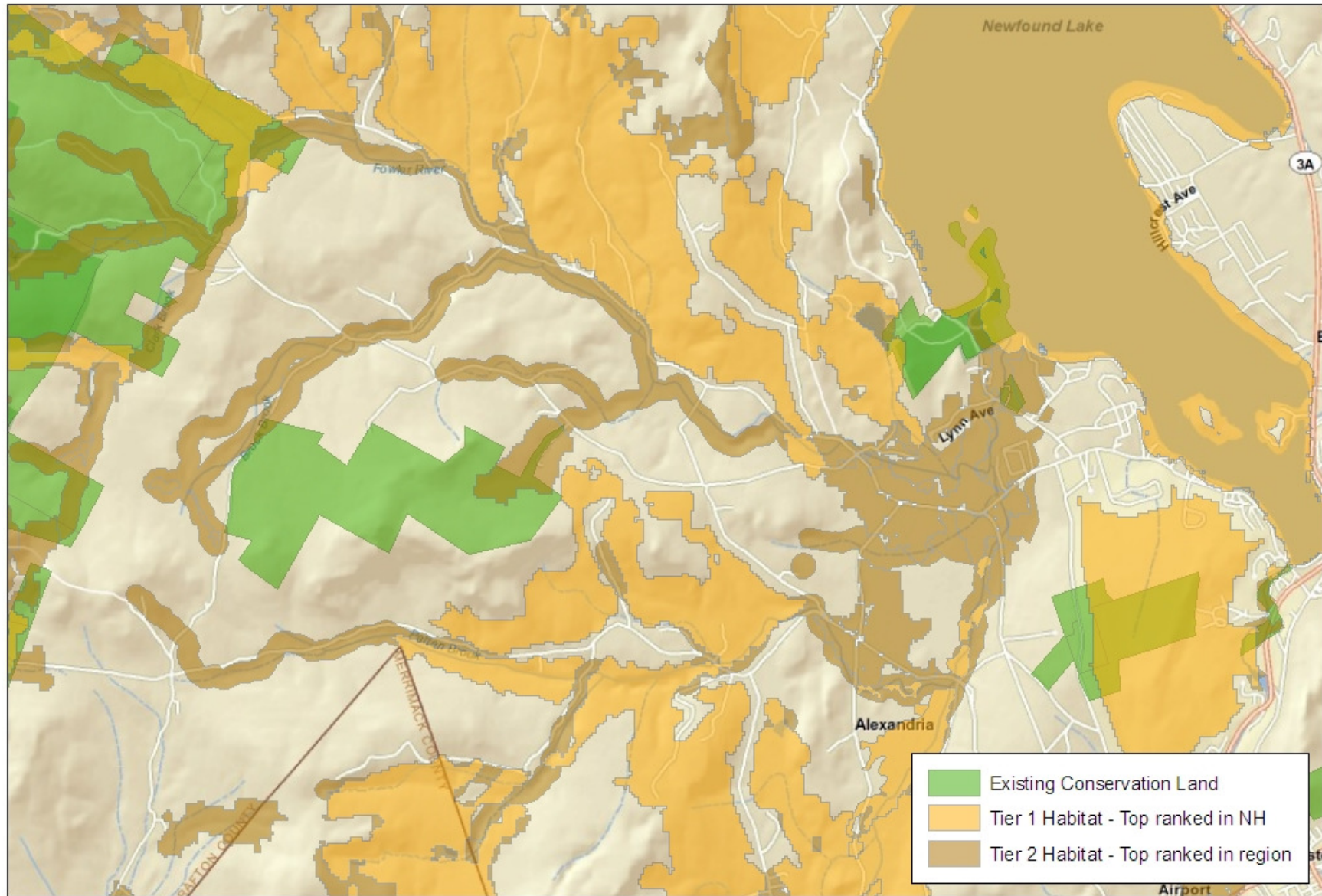
Geoprocessing Services

- Publish one Geoprocessing Service to ArcGIS Server: Land Conservation Assessment Tool

  - Intersect drawn parcel with various layers

  - Extract quantities of interest and return to client

- Custom Python scripts may be necessary as part of geoprocessing model

Design and Methods

Land Conservation Assessment Prototype

| Natural Resource Assessment			
	Acres	Hectares	Pct of Total
Total Parcel	100.0	40.5	100%
Lakes & Ponds	0.3	0.1	0.3%
Riparian	0.1	0.0	0.1%
Wetlands	2.0	0.8	2.0%
Flood Storage	2.2	0.9	2.2%
Water Supply	1.3	0.5	1.3%
Productive Soils	17.3	7.0	17.3%
Tier 1 Habitat	5.4	2.2	5.4%
Tier 2 Habitat	19.7	8.0	19.7%
Supporting Landscape	33.0	13.3	33.0%
Alpine Habitat	0.0	-	0.0%
Appalachian Oak-Pine Forests	48.5	19.6	48.5%
Cliffs		-	0.0%
Coastal Islands	0.0	-	0.0%
Dunes	0.0	-	0.0%
Floodplain Forest	0.0	-	0.0%
Grassland	0.4	0.1	0.4%
Hemlock-Hardwood-Pine Forests	33.3	13.5	33.3%
High-Elevation Spruce-Fir Forests	0.0	-	0.0%
Lowland Spruce-Fir Forests	15.1	6.1	15.1%
Marsh and Shrub Wetlands	2.0	0.8	2.0%
Northern Hardwood Conifer Forests	0.0	-	0.0%
Peatlands	0.0	-	0.0%
Pine Barrens	0.0	-	0.0%
Rocky Ridges and Talus Slopes	0.0	-	0.0%
Salt Marshes	0.0	-	0.0%
Shrublands	0.4	0.2	0.4%

Design and Methods

Challenges

- Learning Curve

  - Adobe "Flex in a Week"

  - ESRI ArcGIS Server Training Seminars

  - ESRI ArcGIS Server Flex API Examples

  - ESRI Python Seminars

  - python.org Python Tutorial

- ArcGIS Server

  - PSU for project development

  - GRANIT for production environment

Wrap Up

Timeline
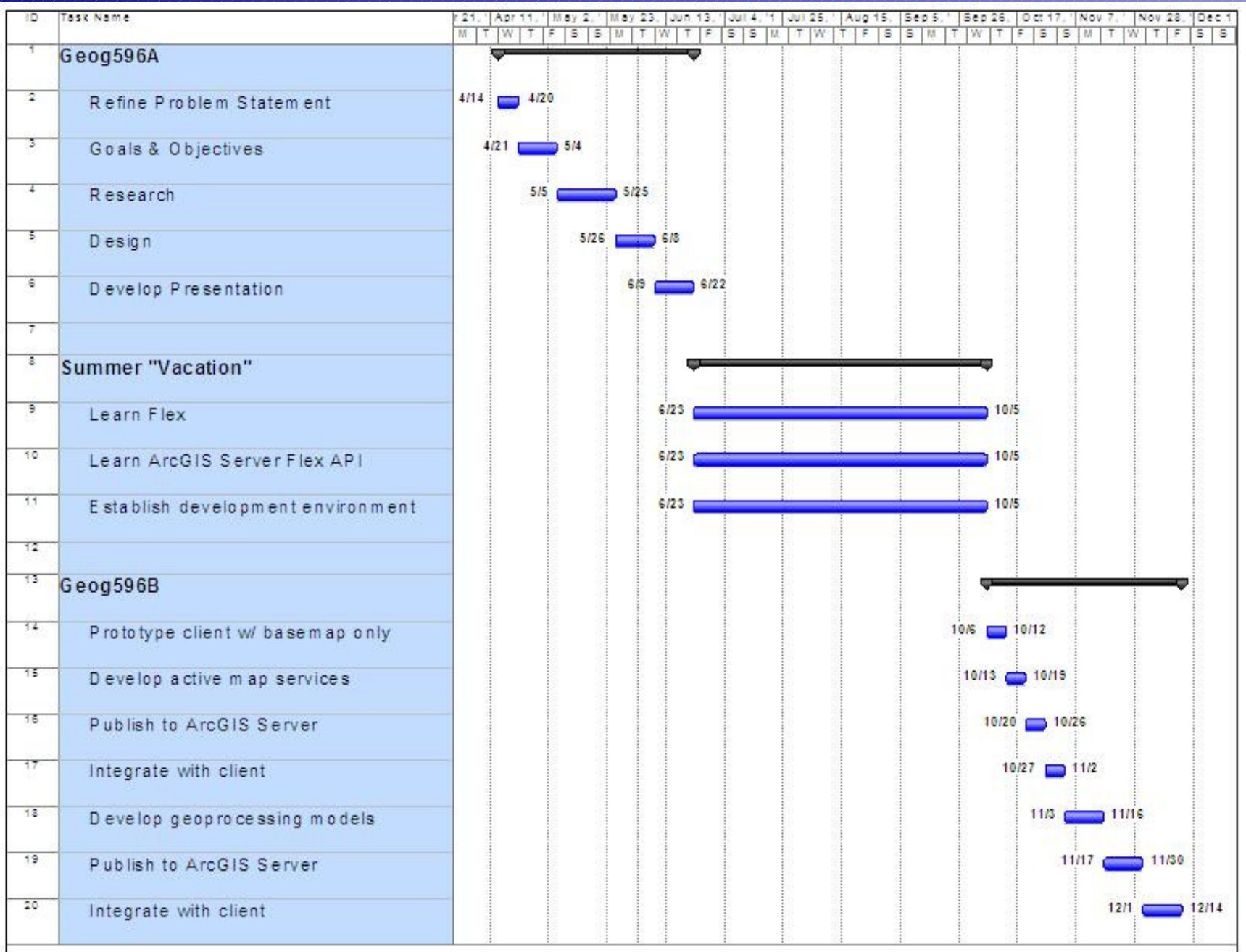
Next Steps

- Continue Flex training

- Familiarize myself with PSU ArcGIS Server environment

- Consider client and map service designs

- Confirm project presentation venue

  - Northeast Arc User's Group
    November 7-10, 2010
    Newport, Rhode Island

Wrap Up

Questions?

ESRI ArcGIS Server

Author map document in ArcGIS

Author Geoprocessing Model in ArcGIS

Publish to server

ArcGIS Server

Map Service url

Geoprocessing Service url

Feature Service url

Web Client

MXML and/or ActionScript

Access map service using **Map** object

Access Geoprocessing Service using **Geoprocessor** object

Access Feature Service using **Editor** component