Treading Into Open Source GIS

49th Annual Alaska Surveying & Mapping Conference
February 18th , 2015

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  dhowes.com

Jason Pardy - NewfoundGEO Consulting
  newfoundgeo.com

Matt Stevenson - CORE GIS
  coregis.net

GISPD.com

GIS Professional Development

Who Are We?

- David Howes, Ph.D.
  - David Howes, LLC
  - GIS tools, processes and supporting infrastructure
  - http://dhowes.com

- Jason Pardy
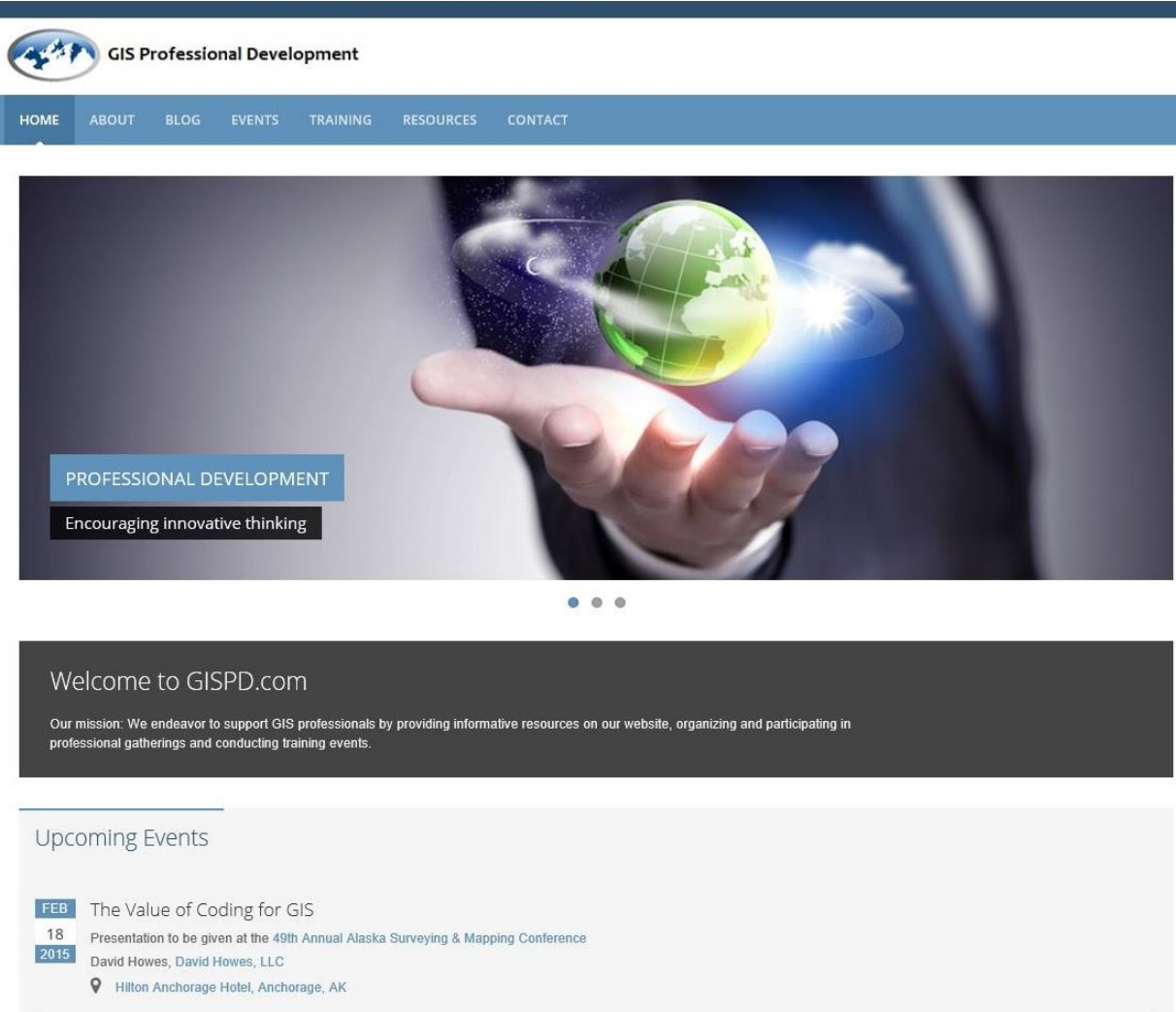 - NewfoundGEO Consulting, Voyager Search
  - GIS development
  - http://voyagersearch.com

- Matt Stevenson
  - CORE GIS
  - Cartography, spatial analysis, conservation planning, urban planning, and GIS project management
  - http://coregis.net

Background

Venturing Into Open Source GIS: A Global Conference Comes To Our Doorstep

The Summit - The Washington URISA Newsletter

Autumn 2014

GISPD.com Blog

GISPD.com GIS Professional Development

Who Are You?

GIS professionals with

- Existing familiarity with proprietary GIS

- Interest in adopting or requirement to adopt OS GIS

- Willingness to investigate alternative approaches

What We're Trying To Do

Support communication, decision-making and innovation by

- Exploring and understanding the individual, organizational and cultural facets related to open source GIS and proprietary GIS

- Relating our findings and experiences with respect to each world

Why It's Worth Doing This

- The more people using open source (OS) GIS, the better it is for all who use OS GIS

- Learning OS capabilities makes you a better proprietary GIS user

- Each domain can learn from the other's strengths and weaknesses

Approach

- Observations

- Matt's perspectives

  Web-based cartography

- Jason's perspectives

  Geoprocessing & data inventory

- David perspectives

  GIS development & professional development

- Perceived reality

Worthy Questions

What are the best characteristics of each group?

Why would you switch in one direction or the other?

How well do the groups persuade each other of the relative benefits of their capabilities?

Value of Conversation: Communication

Promote healthy coexistence and collaboration

OS world may learn from the proprietary world's marketing strategies

Proprietary world can learn from the OS culture of collaboration, agility and growth

Value of Conversation: Decision-Making

Understand the implications of moving to or introducing OS vs. proprietary

Assess the likelihood of success when adopting technology within one world or the other or both

Can we consider an OS or proprietary aptitude test?

Value of Conversation: Innovation

Increased understanding of the intended audience should, in theory, lead to better products

Growing need for focused and low-cost solutions that can be put in place relatively quickly

Thousands of people focusing on solving a problem vs. waiting for the next release cycle

Individual Considerations

Rebellion against the wizard syndrome
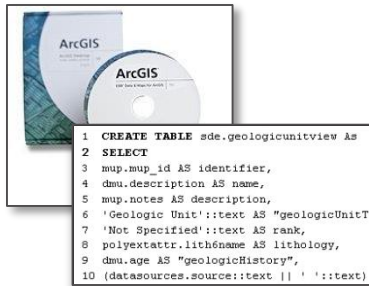
Technological preference - pop in a disk and go vs. plug away for a month to get something working?

Desire for freedom and growth

Organizational Considerations

What's the relationship between IT and GIS?

Do you have the financial certainty sufficient to support investment in proprietary technology?

Is the organization open to a sharing culture?

Cultural Considerations

Maybe you just don't like dealing with corporations (anti-establishment)?

Macs vs. Windows machines (which way does your slash lean?)


```
C:\>cd Temp

C:\Temp>cd "Another Dir"

C:\Temp\Another Dir>
```

```
David@Bajada /cygdrive/c/Temp
$ mkdir "Another Dir"

David@Bajada /cygdrive/c/Temp
$ cd Another\ Dir/

David@Bajada /cygdrive/c/Temp/Another Dir
$ |
```

Some people want complete control over their machines and everything on them

Confidence vs Control

"Either you have to have full confidence in a software platform or you have to have full control"

Ben Sainsbury, Oregon Metro, FOSS4G 2014

Increasing Maturity of OS

Australian Federal government chief technology officer John Sheridan, in 2013:

"When people asked me why we were not using more open source I would say, imagine fronting Senate estimates to explain why your system failed and having to say:

'I was just relying on help by posting to the bulletin board on the internet and nobody came back to me fast enough.'

Now the development of companies that provide support to those open-source solutions changes what we can do."

Open-Source Platform Gains Popularity in Government - The Sydney Morning Herald September 24, 2013

http://www.smh.com.au/it-pro/government-it/opensource-platform-gains-popularity-in-government-20130924-hv1sj.html

From Andrew Dennison, FOSS4G 2014, http://vimeo.com/107478903
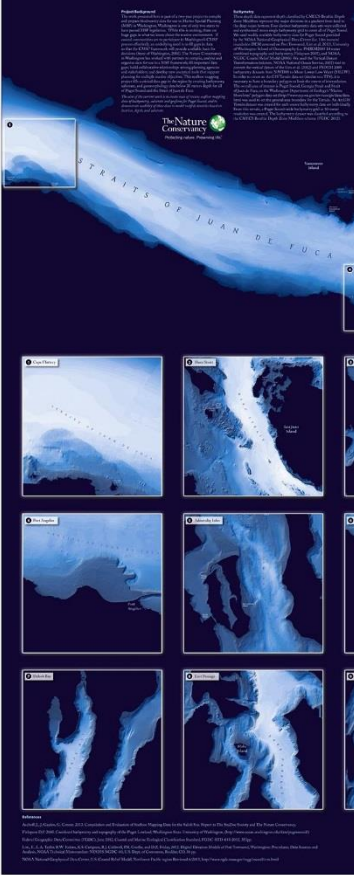
Service Providers

Matt's Perspectives

Why "Treading"?

- Cartography, spatial analysis

- Esri
  - Strong background
  - ArcGIS Online can't deliver
  - ArcGIS Server is too expensive

- Now using open source map/app development tools
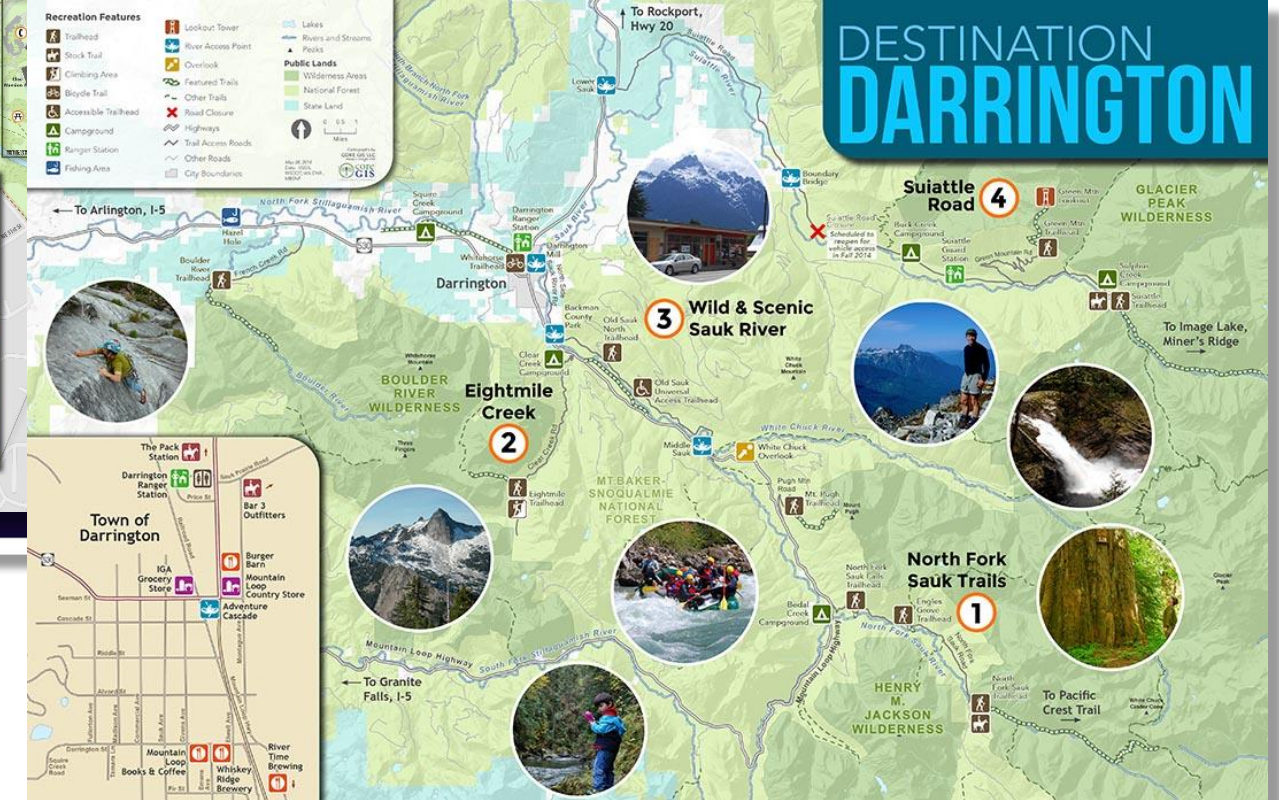 - MapBox
  - TileMill
  - QGIS

When a cartographer thinks about GIS, they tend to think about this...

```css
.leaflet-top .leaflet-control-zoom {
  top:20px;
  }
</style>

<div id='map'></div>
<input id='range' class='range' type='range' min='0' max='1.0' step='any' />

<script>
L.mapbox.accessToken = 'pk.eyJ1IjoiY29yZS1naXMiLCJhIjoiaUxxqQS1zQSJ9.mDT5nb81_dWIHzbnOTebcQ';
var map = L.mapbox.map('map');
L.mapbox.tileLayer('examples.map-i87786ca').addTo(map);

var overlay = L.mapbox.tileLayer('examples.map-i875mjb7').addTo(map);
var range = document.getElementById('range');

function clip() {
  var nw = map.containerPointToLayerPoint([0, 0]),
      se = map.containerPointToLayerPoint(map.getSize()),
      clipX = nw.x + (se.x - nw.x) * range.value;

  overlay.getContainer().style.clip = 'rect(' + [nw.y, clipX, se.y, nw.x].join('px,') + 'px)';
}

range['oninput' in range ? 'oninput' : 'onchange'] = clip;
map.on('move', clip);
map.setView([49.434,-123.272], 7);

clip();
</script>
```

The Cartography Perspective

- Cartographers tend to be visual thinkers, not a developer

- When cartographers think of maps, they think about telling a story

- When they think of code, they feel removed from the story

Complexity Concern

OS is complicated!

Wait, proprietary software is too...
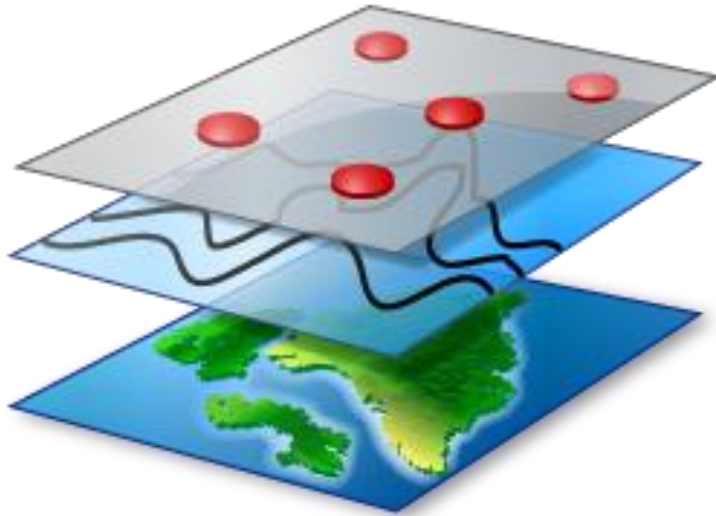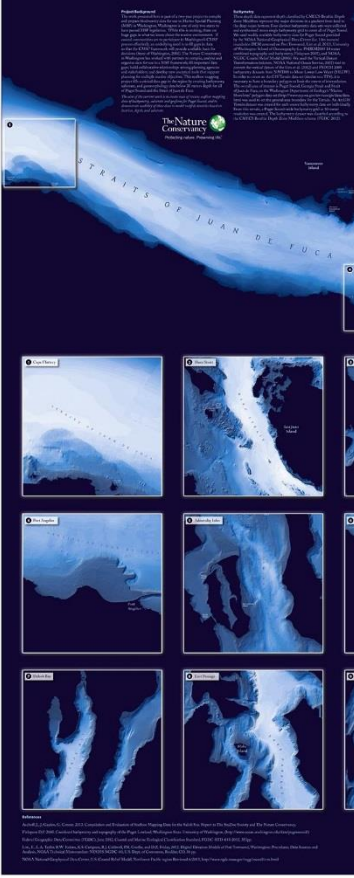
Jason's Perspectives

Why "Treading"?

- Ex-Esri

- Clients need it

- Curiosity

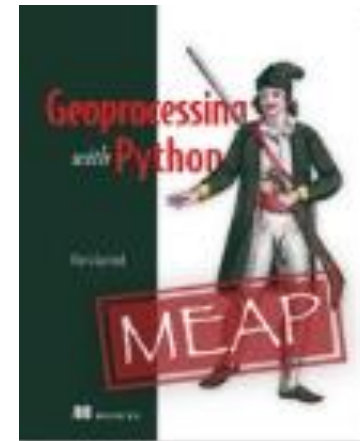When a geoprocessing expert thinks about GIS, they tend to think about this…

...not this

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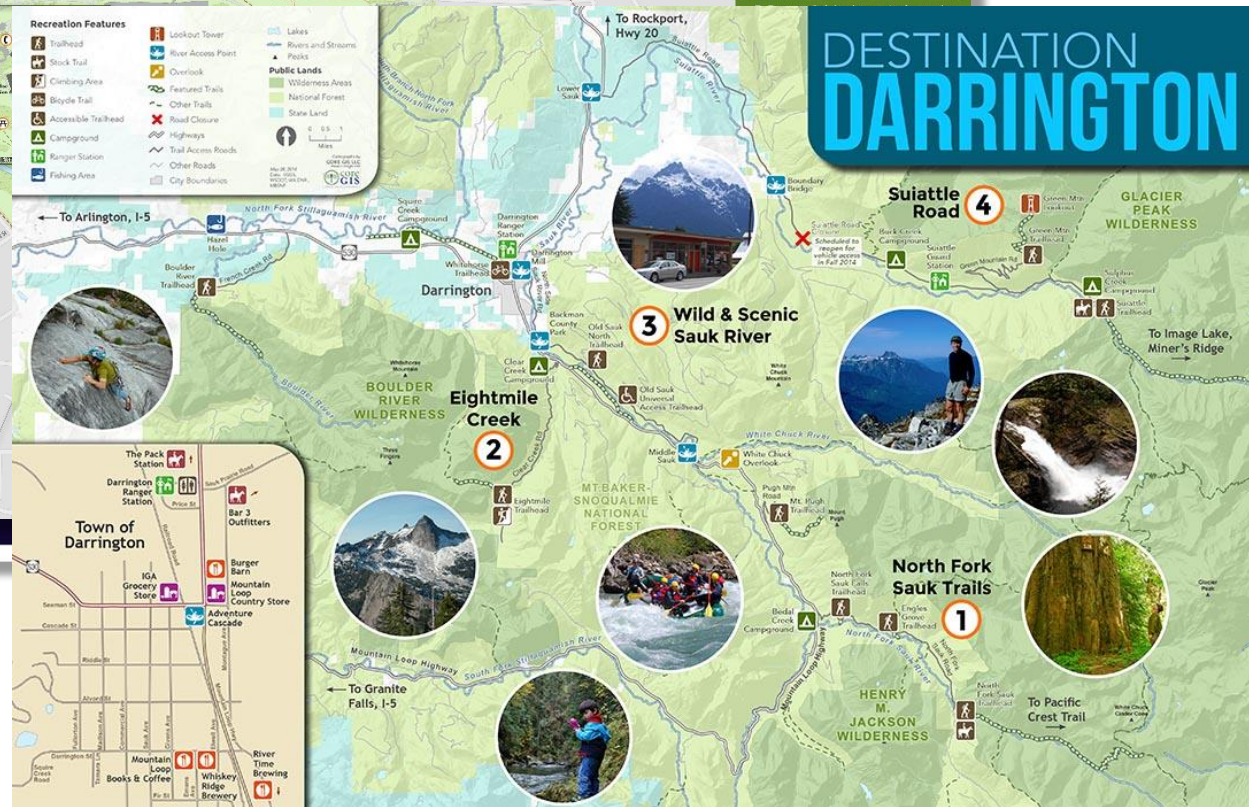
Python Geoprocessing

- Long time OS user (Python)

- Many libraries available
  - GDAL
  - pyproj
  - Shapely

- Strong and active community

Heartache and Brain Damage of OS GIS

Desktop

- Quantum GIS
- gvSIG
- Udig
- GRASS
- JOSM (OpenStreetMap editor)

Server

- GeoExt (WebGIS framework)
- MapFish (WebGIS framework)
- GeoServer (WebGIS server)
- MapServer (WebGIS server)
- PostgreSQL, PostGIS (geo-database)
- Magento* (Webshop framework)
- SilverStripe* (content management system)

Libraries and Tools

- OpenLayers (WebGIS framework)
- ExtJS*, jQuery* (JavaScript library)
- pgRouting (routing module for PostgreSQL/PostGIS)
- GeoTools (Java GIS toolkit)
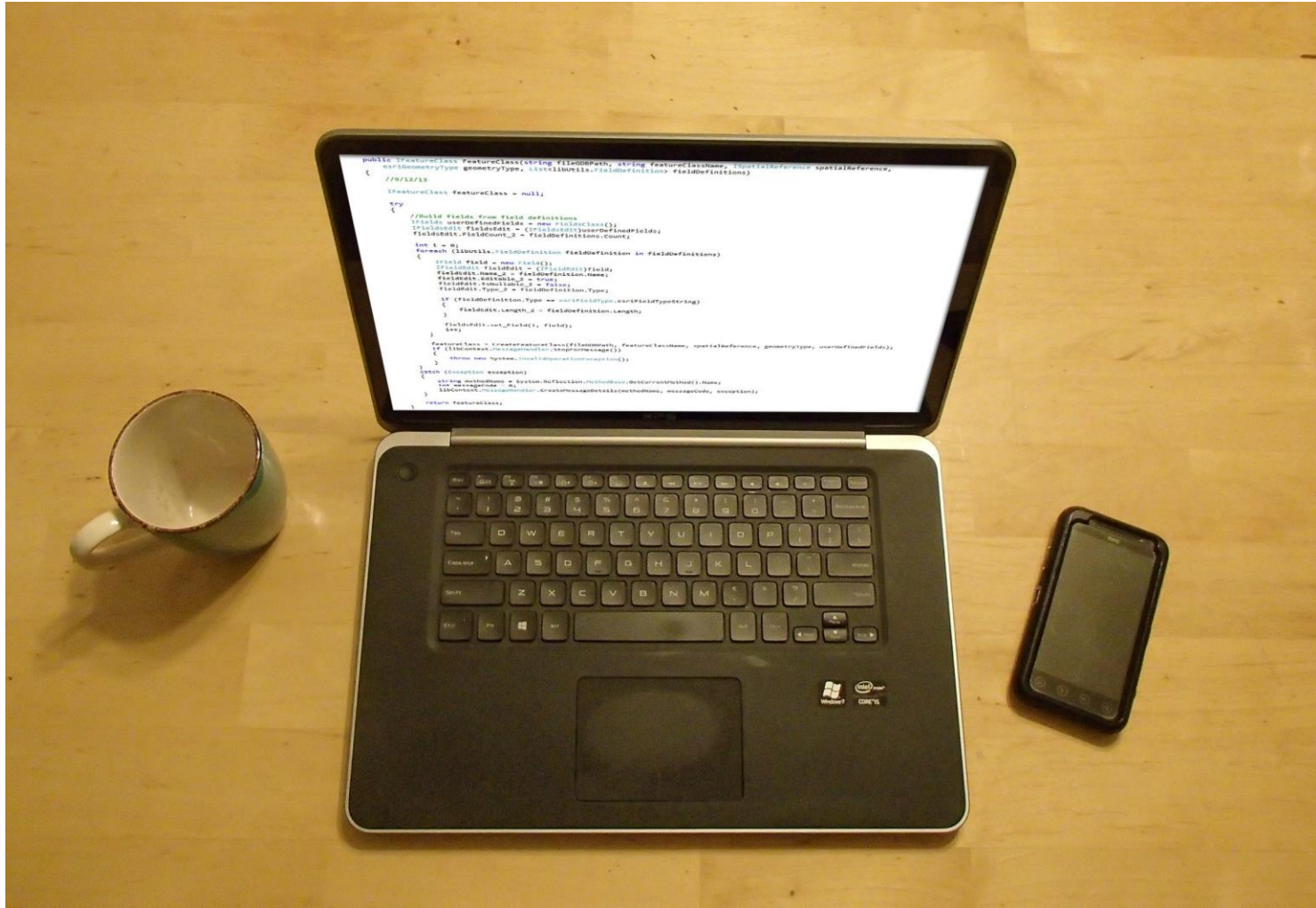- GDAL/OGR (Geospatial Data Abstraction library)

Overall Impression

You need to understand GIS

- Spatial analysis

- Projections

- Coding

David's Perspectives

Why "Treading"?

- Explore best possibilities for solving client needs

- Increase depth of understanding

- Learn about community/professional development

```csharp
public IFeatureClass FeatureClass(string fileGDBPath, string featureClassName, ISpatialReference spatialReference,
    esriGeometryType geometryType, List<libUtils.FieldDefinition> fieldDefinitions)
{
    //9/12/13

    IFeatureClass featureClass = null;

    try
    {
        //Build fields from field definitions
        IFields userDefinedFields = new FieldsClass();
        IFieldsEdit fieldsEdit = (IFieldsEdit)userDefinedFields;
        fieldsEdit.FieldCount_2 = fieldDefinitions.Count;

        int i = 0;
        foreach (libUtils.FieldDefinition fieldDefinition in fieldDefinitions)
        {
            IField field = new Field();
            IFieldEdit fieldEdit = (IFieldEdit)field;
            fieldEdit.Name_2 = fieldDefinition.Name;
            fieldEdit.Editable_2 = true;
            fieldEdit.IsNullable_2 = false;
            fieldEdit.Type_2 = fieldDefinition.Type;

            if (fieldDefinition.Type == esriFieldType.esriFieldTypeString)
            {
                fieldEdit.Length_2 = fieldDefinition.Length;
            }

            fieldsEdit.set_Field(i, field);
            i++;
        }

        featureClass = CreateFeatureClass(fileGDBPath, featureClassName, spatialReference, geometryType, userDefinedFields);
        if (libContext.MessageHandler.StopForMessage())
        {
            throw new System.InvalidOperationException();
        }
    }
    catch (Exception exception)
    {
        string methodName = System.Reflection.MethodBase.GetCurrentMethod().Name;
        int messageCode = 0;
        libContext.MessageHandler.CreateMessageDetails(methodName, messageCode, exception);
    }

    return featureClass;
}
```
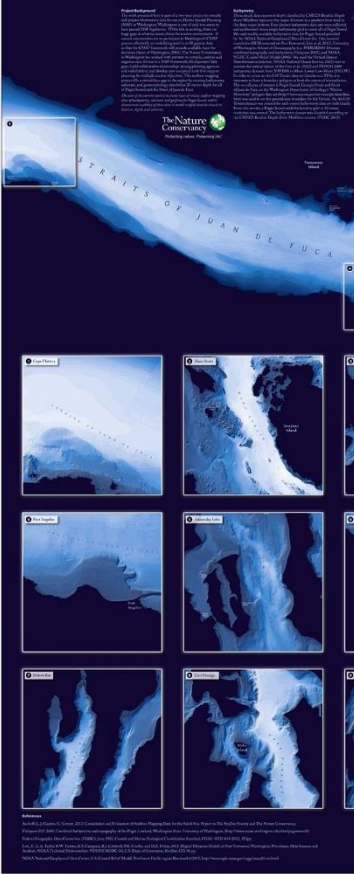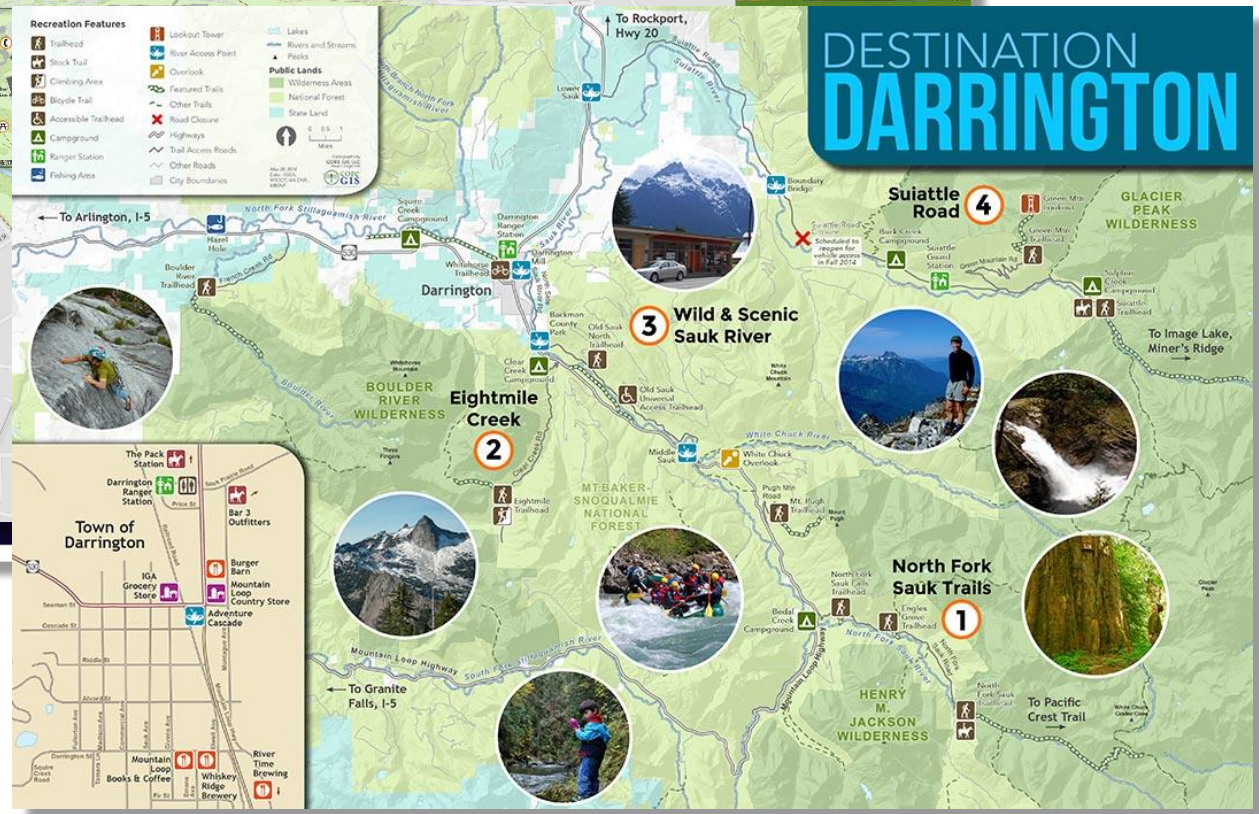
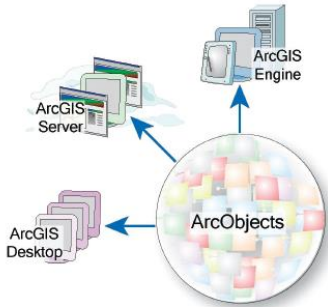When a developer thinks about GIS, they tend to think about this…

...not this

Likelihood of Success?

Command-line background

If you can work with ArcObjects,
well, you know...

OS GIS is not a trivial undertaking

- Need to be able to program
- Many steep learning curves
- Well worth the effort

Appealing Characteristics of OS

Develop a greater understanding of what's happening 'under the hood'

Adherence to standards

- No lock-in
- Easier integration
- A-la-carte approach

Getting Used to the OS Community

Initial pain - need to learn how to deal with responses on forums, chatrooms etc.

RTFM

Strong egos and trolls – you need to have a thick skin

Help others in whatever ways you can

The Nature of a FOSS4G Project

FOSS4G 2014 Day 2 Keynote - Sarah Novotny, NGINX:

Source Code

+

License

+

Humility, Respect & Trust

=

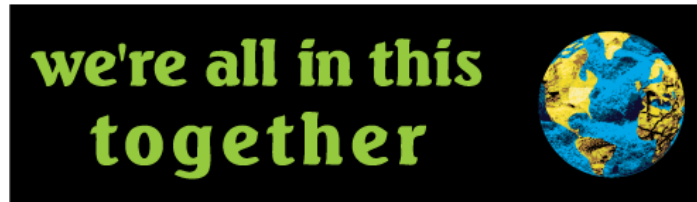FOSS4G project

Perceived Reality

OS

- Many options can be great
- Too many options can be paralyzing
- Perceived lack of support

Proprietary

- Expensive
- Lack of responsiveness
- Lock-in

A Happier Perspective

OS

- Freedom
- Free (as in a puppy)
- Strong community

Proprietary

- Support
- Heritage
- Ubiquity

Questions?

Slides available at

GISPD.com

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Thanks for Coming

Slides available at http://gispd.com/events