



Treading Into Open Source GIS

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

David Howes, Ph.D. - David Howes, LLC
dhowes.com

Jason Pardy - NewfoundGEO Consulting
newfoundgeo.com

Matt Stevenson - CORE GIS
coregis.net

Who Are We?

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

David Howes LLC

Geographic Information Systems Development Services

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

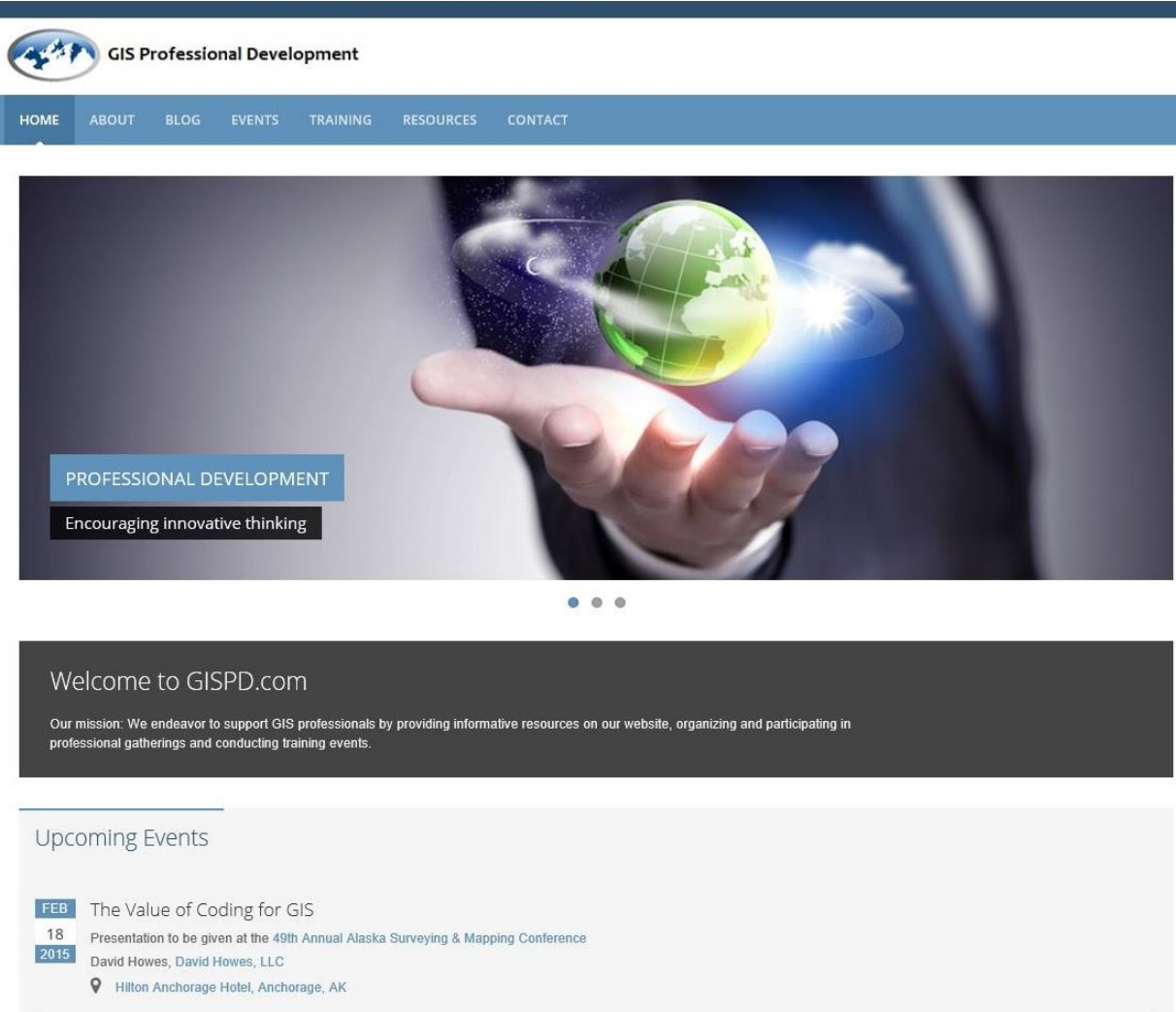


NewfoundGEO Consulting

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



Background



The screenshot shows the homepage of GISPD.com. At the top left is a logo with a globe and the text "GIS Professional Development". Below it is a navigation menu with links for HOME, ABOUT, BLOG, EVENTS, TRAINING, RESOURCES, and CONTACT. The main content area features a large image of a hand holding a glowing globe with a grid pattern. Below the image is a blue box with the text "PROFESSIONAL DEVELOPMENT" and a black box with the text "Encouraging innovative thinking". Below this is a dark grey box with the text "Welcome to GISPD.com" and a mission statement: "Our mission: We endeavor to support GIS professionals by providing informative resources on our website, organizing and participating in professional gatherings and conducting training events." Below the mission statement is a section titled "Upcoming Events" with a list of events. The first event is "The Value of Coding for GIS" on February 18, 2015, presented at the 49th Annual Alaska Surveying & Mapping Conference, organized by David Howes, David Howes, LLC, at the Hilton Anchorage Hotel, Anchorage, AK.



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

The Summit - The Washington URISA Newsletter

Autumn 2014

GISPD.com Blog

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

El Workbook for Sample Name April 15, 2003 Account #: 1234-00665 Page 1 Overview

The Blue Bar = Your Tendencies. 'S' = How You See Yourself. 'O' = How You Think Others See You. 'V' shows Variability.

| Tendency | How You See Yourself | How You Think Others See You | Variability |
|--------------------------------------|--------------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------------|
| Energy Tendency 1.1 | High-Energy | Moderate Energy | High-Energy |
| Stress Tendency 3.1 | Relaxed Calm | Stressed from not being stressed | Stressed from stimulation/response |
| Optimism Tendency 4.1 | Witty, sees problems & some good | Pragmatic, Can see problems | Care-Free Very positive |
| Self-Esteem Tendency 7 | Flexible but vain | Moderate esteem | Self-Assured Proud Likes self |
| Work Ethic Tendency 6.1 | Laziness, Hanging or playing | Working Moderate work | Work-Focused |
| Detail Tendency 5.1 | Spontaneous & intuitive | Moderate-Detail Spontaneous | Careful Precise Professional Follows |
| Change Tendency 2.1 | Consistent Likes routines & repetition | Flexible Prefers sameness | Change-Resistant Change-Open Wants new places, things, ideas |
| Courage Tendency 8.1 | Safe Likes safety & comfort | Cautious Some courage Likes taking control | Brave Pugged Trusts Others Very rugged Trusts |
| Direction Tendency 9.1 | Confidence Values guidance & procedures | Respects Prefers advice | Respects Sees, Can share decisions Self-Directed Provides |
| Assertive Tendency 8.1 | Compliant Cooperative | Assertive Witty | Assertive Tells, sells, defends Careful Tells, sells, defends |
| Tolerance Tendency 3.1 | Intolerance of abuse | Easy Some patience | Patience Shows no anger Forgiving Patient Very Tolerant |
| Conscientious Tendency 3.1 | Self-Preoccupied Takes care of one's needs | Careful Moderate caring | Helpful Listens, Also takes care of self Assertive Listens, Helps |
| Sociability Tendency 2.1 | Solitary Enjoys being alone | Reserved Likes to work with others | Social Talkative, Wants people nearby Outgoing Wants people nearby Very talkative |

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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



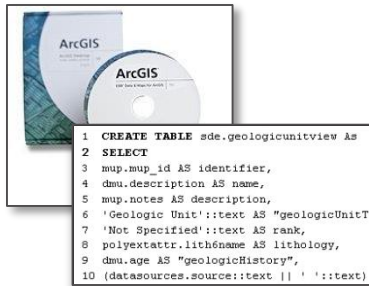
Thousands of people focusing on solving a problem vs. waiting for the next release cycle



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



GISPD.com

GIS Professional Development

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

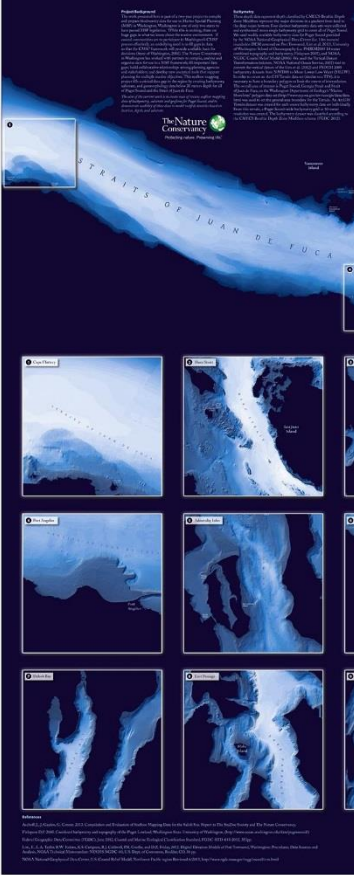


Why “Treading”?

- 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

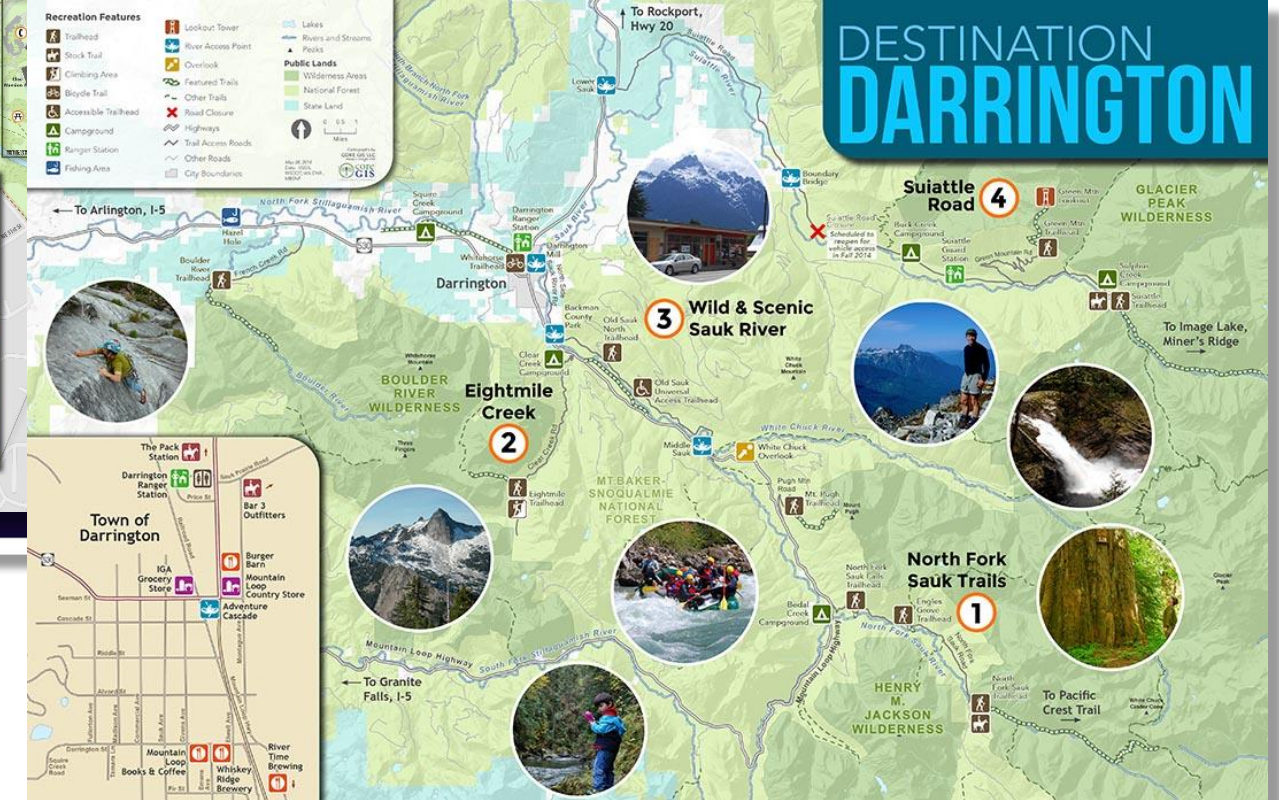


Bathymetry of Puget Sound



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

Welcome to Marymoor Park



DESTINATION DARRINGTON

```
.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.eyJ1IjoieY29yZS1naXMiLCJhIjoiaUxqQS1zQSJ9.mDT5nb81_dWIHbn0TebcQ';
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

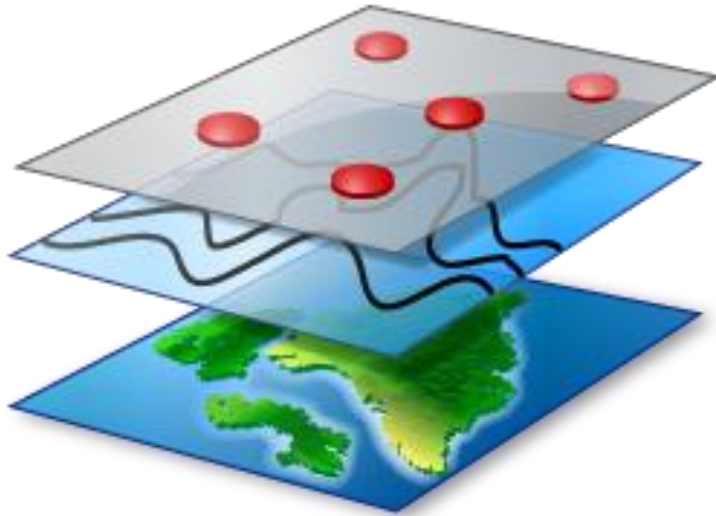
The screenshot displays the Voyager v1.9 Beta web application interface. At the top left is the "Voyager" logo with "v1.9 Beta" underneath. To the right of the logo is a search bar with a magnifying glass icon. In the top right corner, there are links for "Welcome admin", "Logout", "Help", and "Manage". Below the logo and search bar is a navigation bar with "Home", "Sort: Relevance", "View: Grid", and "Tools" dropdown menus. A status bar indicates "Showing 120 of 492" with navigation arrows. The main content area is titled "Explore" and shows "Format type: File" and "Format keyword: GeoPDF". It features a large grid of 120 map thumbnails. On the right side, there is a "Refine Your Search" sidebar with the following sections:

- Mime**: PDF (492)
- Format type**: File (492)
- Format keyword**: GeoPDF (492)
- Keywords**:
 - 001 (184)
 - 002 (154)
 - 003 (63)
 - 004 (17)
 - 006 (5)
 - 005 (4)
 - Geographic Names Information System (1)
 - Hydrography (1)
 - Imagery and Base Maps (1)

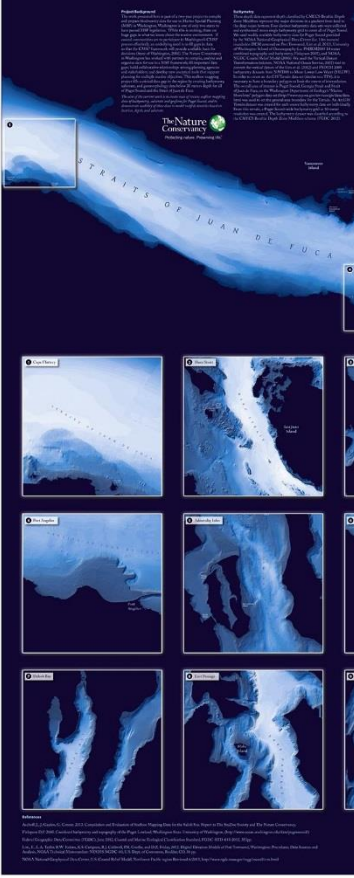
Why “Treading”?

- Ex-Esri
- Clients need it
- Curiosity

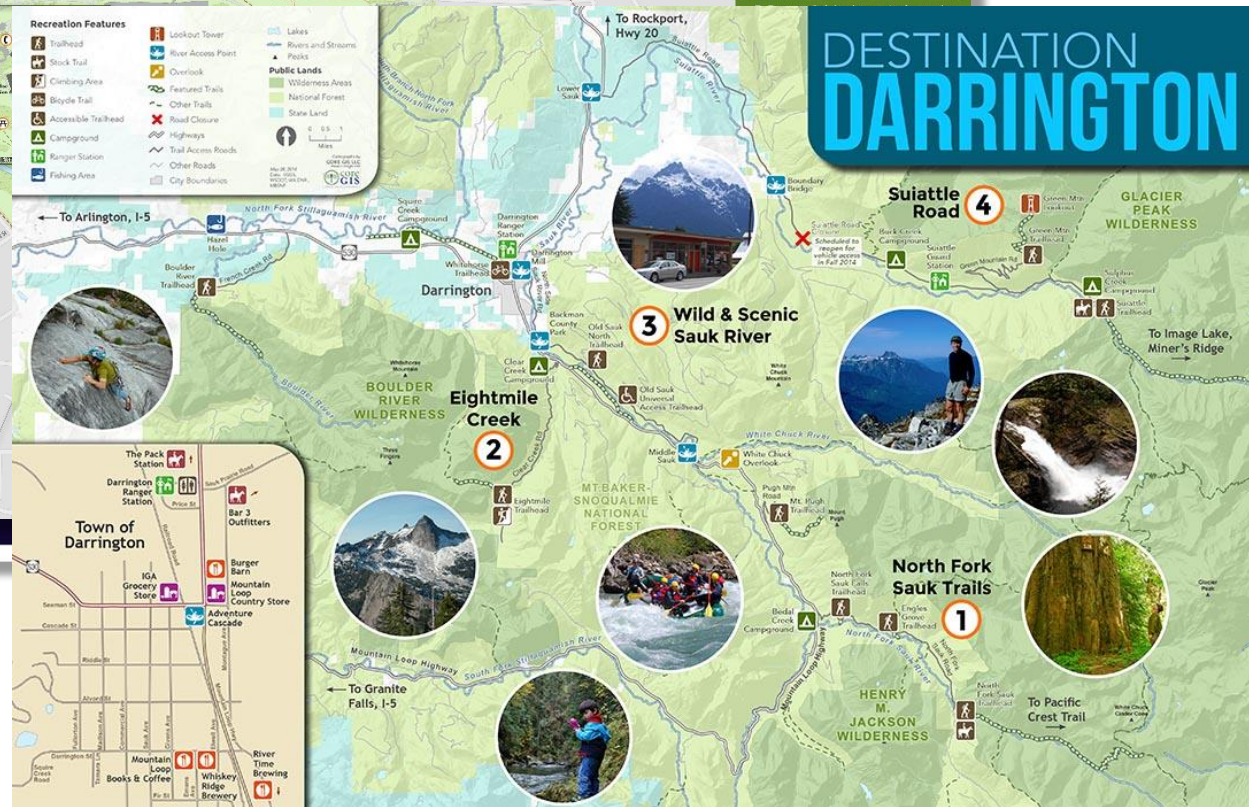
When a geoprocessing expert thinks about GIS, they tend to think about this...



Bathymetry of Puget Sound



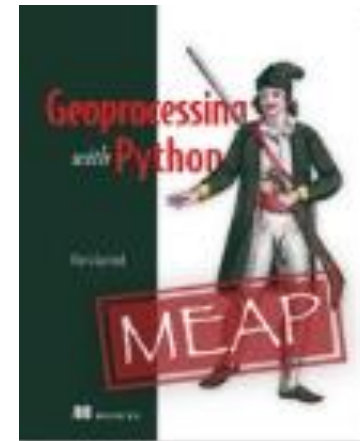
Welcome to Marymoor Park



...not this

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)

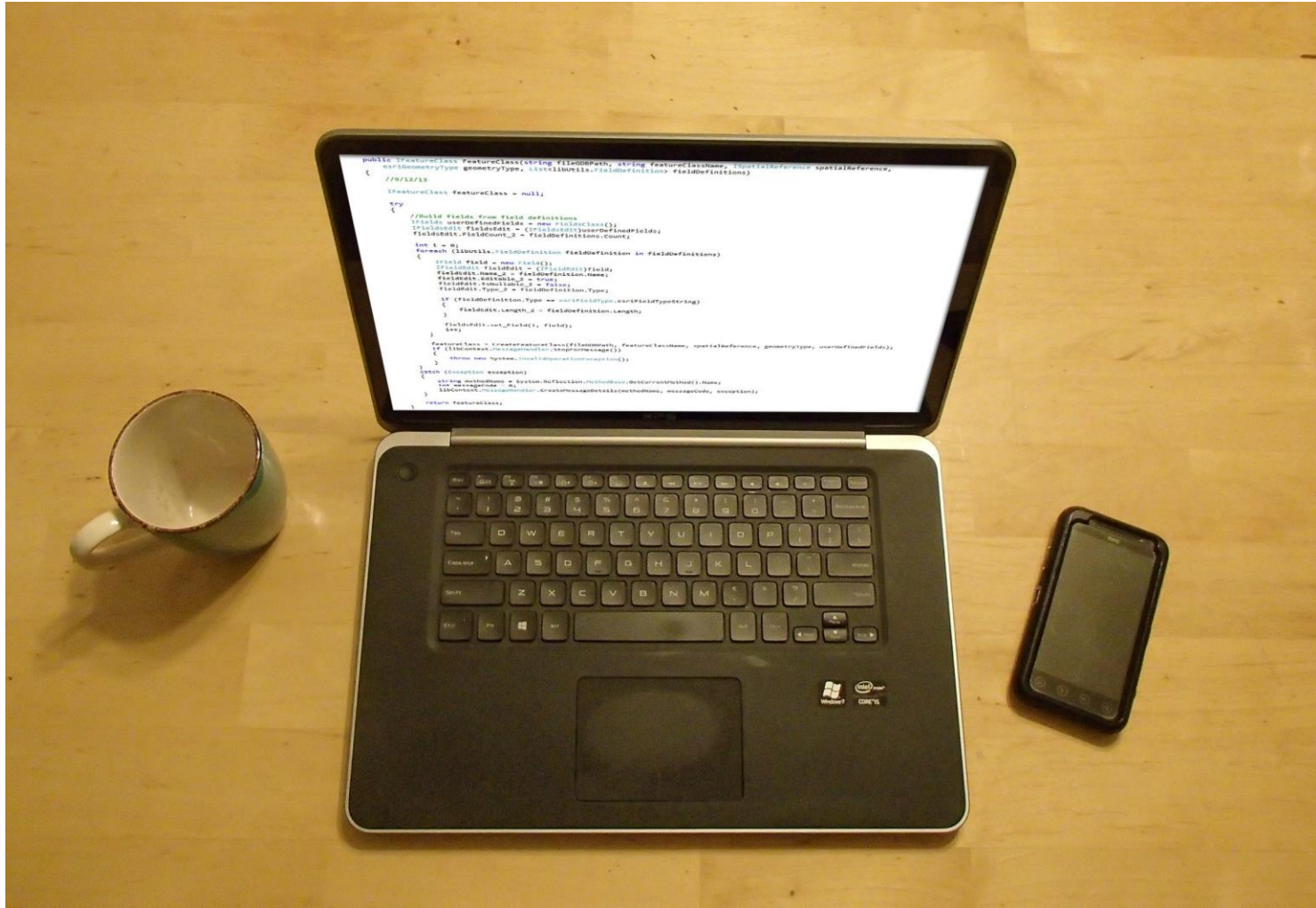
Overall Impression

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




```

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++;
        }

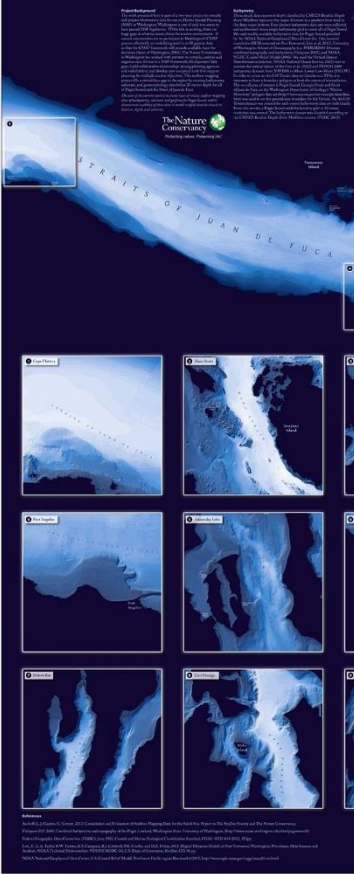
        featureClass = CreateFeatureClass(fileGDBPath, featureClassName, spatialReference, geometryType, userDefinedFields);
        if (libContext.MessageHandler.StopForMessage())
        {
            throw new System.InvalidOperationException();
        }
    }
    catch (Exception exception)
    {
     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

    return featureClass;
}

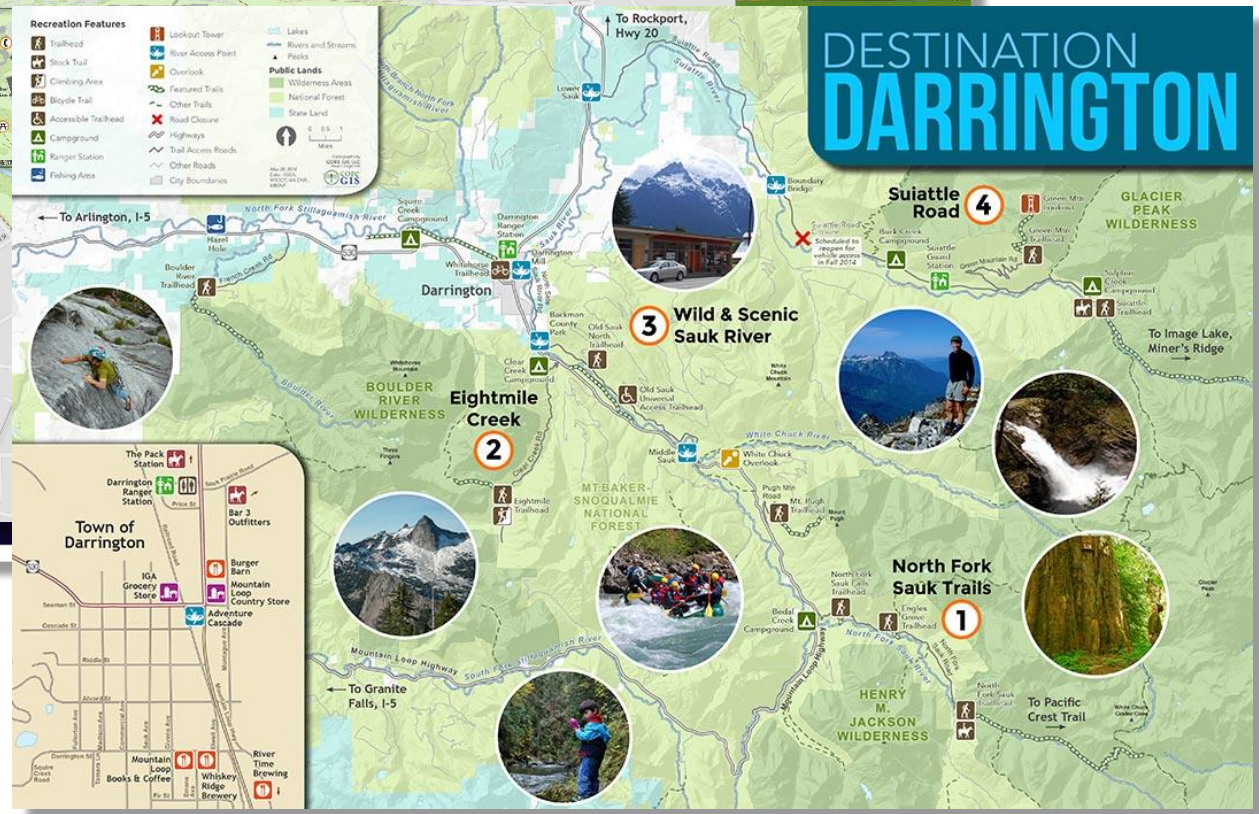
```

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

Bathymetry of Puget Sound



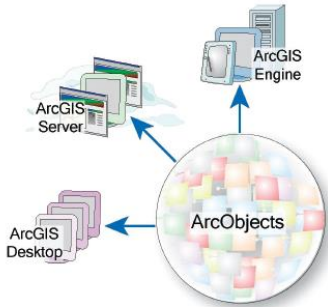
Welcome to Marymoor Park



...not this

Likelihood of Success?

Command-line background



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

```
terminal
[user@host] ~/project> test00b -v --color --regex='test[0-3]' tests/suites.py
test0 (suites.CaseDigits.test0) ... FAIL
test1 (suites.CaseDigits.test1) ... ok
test2 (suites.CaseDigits.test2) ... ok
test3 (suites.CaseDigits.test3) ... ok
-----
FAIL: test0 (suites.CaseDigits.test0)
-----
Traceback (most recent call last):
  File "tests/suites.py", line 32, in test0
    def test0(self): self.assertEqual("0" + "0", "01")
AssertionError: '00' != '01'
-----
Ran 4 tests in 0.010s
FAILED (failures=1)
[user@host] ~/project>
```

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'



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



Adherence to standards

Getting Used to the OS Community

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



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

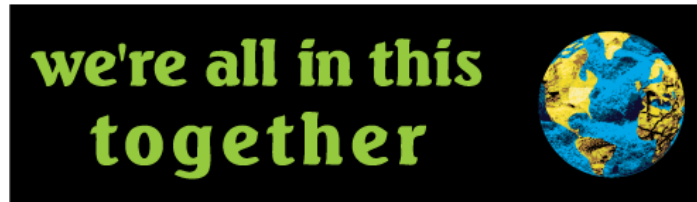
- Many options can be great
- Too many options can be paralyzing
- Perceived lack of support

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 <http://gispd.com/events>



Thanks for Coming

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

