

OPENING THE DOOR TO OPEN SOURCE



Presented by
**David Howes &
Matt Stevenson**
*Northwest GIS Conference
October 15, 2014*

Who are We?

David Howes, Ph.D.

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

David Howes LLC

Geographic Information Systems Development Services

Matt Stevenson

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



gispd.com



GIS Professional Development

[HOME](#) [ABOUT](#) [BLOG](#) [EVENTS](#) [TRAINING](#) [RESOURCES](#) [CONTACT](#)



PROFESSIONAL DEVELOPMENT

Encouraging innovative thinking

Welcome to GISPD.com

Our mission is to support GIS professionals by providing informative resources on our website, organizing and participating in professional gatherings and conducting training events.

Events

OCT 15 2014 Opening the Door to Open Source GIS
Session at the 2014 Northwest GIS Conference
David Howes, David Howes, LLC & Matt Stevenson, CORE GIS
📍 Lynnwood Convention Center, Lynnwood, WA

OCT 15 2014 Extending ArcGIS for Desktop: Python and .NET Add-ins in a Nutshell
Presentation at the 2014 Northwest GIS Conference
David Howes, David Howes, LLC & Jason Pardy, NewfoundGEO Consulting
📍 Lynnwood Convention Center, Lynnwood, WA

[All events >](#)

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

The Summit

The Washington
URISA
Newsletter

Autumn 2014

Opening the Door to Open Source



Objectives

Explore and understand the individual, organizational and cultural facets related to open source GIS and proprietary GIS

Relate our findings and experiences with respect to each world

Promote consideration of the sorts of wider issues that can impact our effectiveness as GIS professionals in ways that are often profound and far-reaching

Above all else, help GIS professionals help each other.



Agenda

- Introduction
- Observations
- Matt's perspectives
- David's perspectives
- Audience engagement
- Closing thoughts



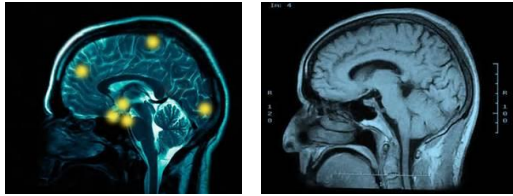
Observations



Opening the Door to Open Source



Typical Questions



Is it reasonable to characterize people as proprietary or open source?

Is there value in asking the question? If yes to both,

- What makes an open source person?
- What makes a proprietary person?

Should we coexist, conquer or merge?



Typical Questions

What are the best characteristics of each group?



Why would you switch in one direction or the other?



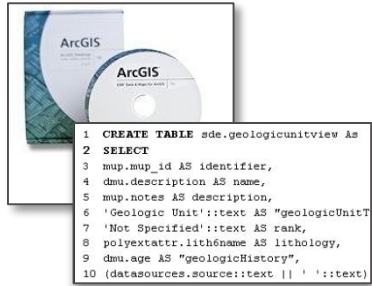
How well do the groups persuade each other of the relative benefits of their capabilities?



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



I want to learn GIS, reading books and academic papers and articles about geospatial data, map projections, server-side technologies, databases, different geospatial standards and protocols and their implementations in available range of server and client software, perform analysis of my data and use cases, preferably involving other GIS specialists and do a lot of other research so that I can make sensible decisions about the required technology stack, adjust it to the needs of my application and finally **make a**  **map** (maybe in a couple years)

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



“I will share pretty much everything with you because we are all
in this together and we are building something

SUPER AWESOME AND FUN!”



“I have developed a superior product and if you *pay me lots of money* I will help you leverage your data and create strategic synergies between your enterprise database solutions and customer-centric blah blah blah”



The Vibe - Which is Which?



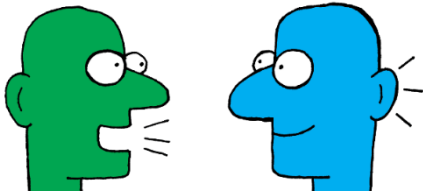
Opening the Door to Open Source



The Value of the Conversation?



It can support decision-making, particularly regarding effort and expenditure



It aids communication



It can help drive technological innovation



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?

E! Workbook for Sample Name April 15, 2003 Account #: 1234-00653					Page 1 Overview
The Star "You" Your Tendencies "X" How You See Yourself "V" How You Think Others See You "X" How Others View You "X"					Workability
Energy Tendency 4.51	Non-Comed Energy for relaxed settings	Moderate-Peace Moderate-Peace	Fast-Peace Fast-Peace, busy	Work-Case Work-Case (Very active)	
Stress Tendency 3.76	Relaxed Calm	Anxious In his but not overly stressed	Anxious From situations/temper	Stressful From situations/temper	
Optimism Tendency 4.23 Ours Say Others See	Very Can see problems	Seeing Less prob- lems & more good	Positive Cheerful, Can see problems	Care Free very positive	
Self Esteem Tendency 3.94 Ours Say Others See	Thrills Not vain	Moderate esteem	Self-Secure	Protect Likes self	
Work Ethic Tendency 4.84 Ours Say Others See	Laziness Working or playing	Working Moderate work	Hard-Working Hard-Working	Work-Focused	
Detail Tendency 3.9 Ours Say Others See	Disorganized Intuitive	Moderate-Peace Spontaneous	Careful Precise, logical	Perfectionist Perfectionist	
Change Tendency 3.8 Ours Say Others See	Consistent Likes routines & repetition	Flexible Flexible sometimes	Change-OK	Change-Resistant Wants new places, things, etc.	
Courage Tendency 3.5 Ours Say Others See	Safe Likes safety & comfort	Cautious More comfort than risk-taking	Safe Regrets, Ties comfort over pressure	Advent Very rugged, Ties brave over comfort	
Direction Tendency 3.9 Ours Say Others See	Confusing Values guidance & procedures	Inspired In inspiring others advice	Advised Loves, Can share decisions	Self-Directed Decides Self-Directed Decisions	
Assertive Tendency 4.82 Ours Say Others See	Compliant Cooperative	Assertive Boldly	Assertive Yells, tells, brags easily	Assertive Yells, tells, brags easily	
Tolerance Tendency 4.71 Ours Say Others See	Intolerant of stress	Safe More patience	Patience How to anger, Forgiving	Passive Very tolerant	
Considerate Tendency 3.88 Ours Say Others See	Self-Regard Takes care of own needs	Own Moderate caring	Helpful Listens, Also takes care of self	Assertive Listens, Helps	
Sociable Tendency 3.8 Ours Say Others See	Solitary Solitary being alone	Attracted Likes to work with others	Social Talkative, Needs people easily	Outgoing Needs people easily, Very solitary	

© Copyright 2003 Software Management Systems Research, Inc.



Communication



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



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



Don't always say it's so easy, although things are getting easier



Technological 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



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



FOSS4G Attendance

Computer scientists vs. geo experts

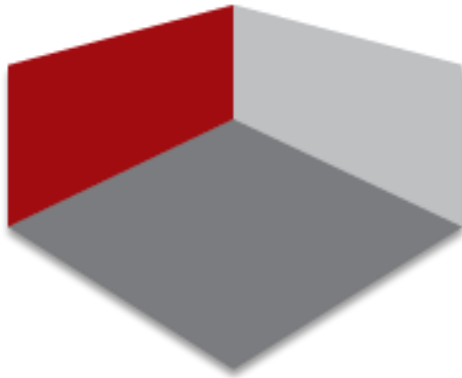
Techniques vs. practical applications

Truly international participation

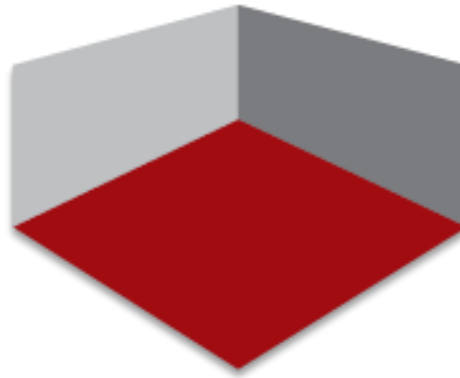


Descriptive Dimensions

Extent of Adoption



OS/Proprietary Balance



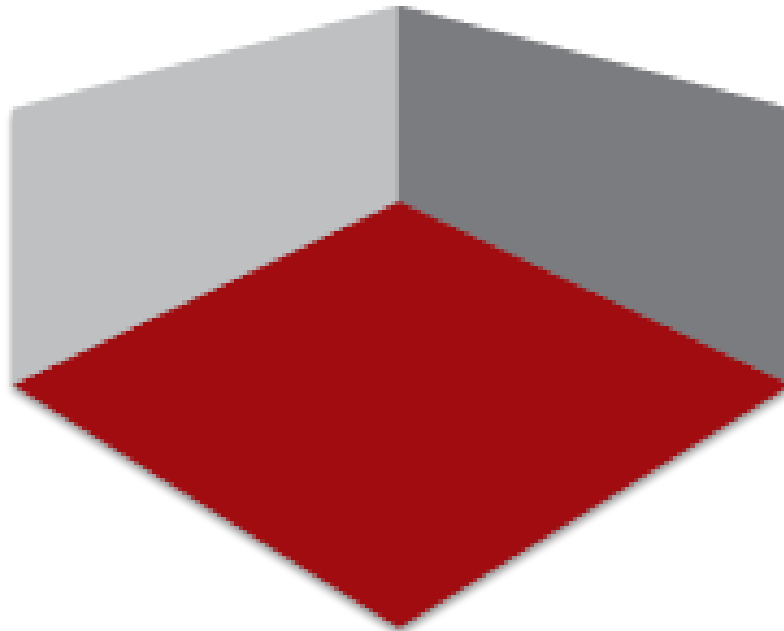
Setup/Installation



Dimensions - OS/Proprietary Balance

How much time do you spend in each world?

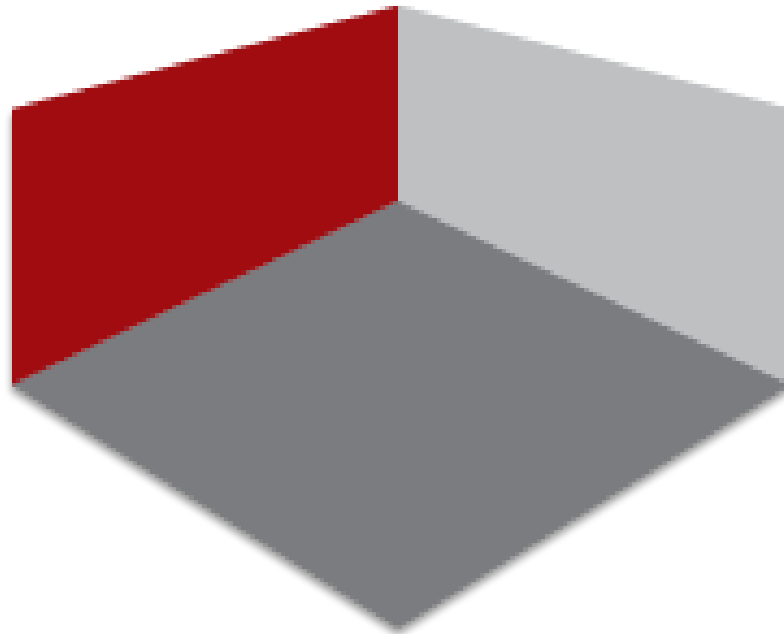
- Proprietary – do you worship Jack?
- OS – do you want to stick it to the man?



Dimensions - Extent of Adoption

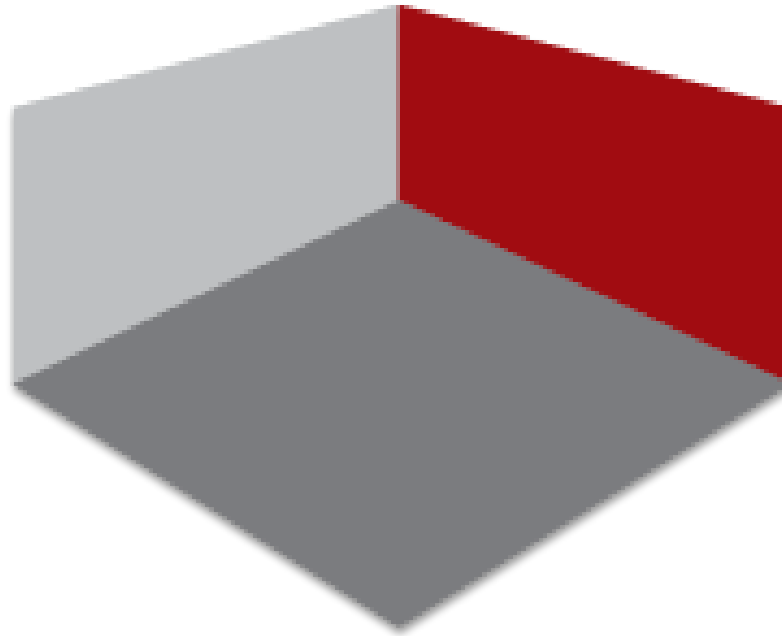
How many different flavors of software do you use?

- Proprietary - I only need two EXEs...
- OS - I use more libraries than you!



Dimensions - Setup/Installation

- How involved are you in the nitty gritty aspects of getting things working?
 - Proprietary - what's the installation investiture?
 - OS - what's your geek quotient?



Use Scenarios

Matt

- Use OS web apps for cartography and user interactivity
- Don't have to be concerned with local installation, functionality just has to work and be affordable



David

- Focus on desktop geoprocessing
- Need to deal with installation issues, getting things working locally

David Howes LLC

Geographic Information Systems Development Services



Matt's Perspectives

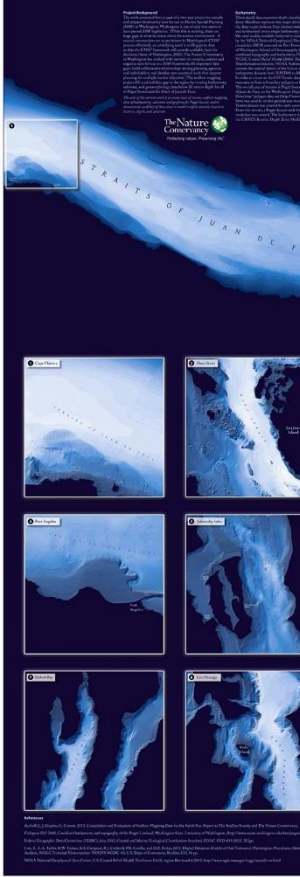


Matt's Perspectives

- I am a visual thinker, not a developer (not to suggest for a moment that those two traits are mutually exclusive)
- When I think of maps, I see pictures
- When I think of code, I get headaches
- OS is too complicated! Wait, proprietary software is too...
- But Esri is too expensive!
- Time to start hiking up the learning curve



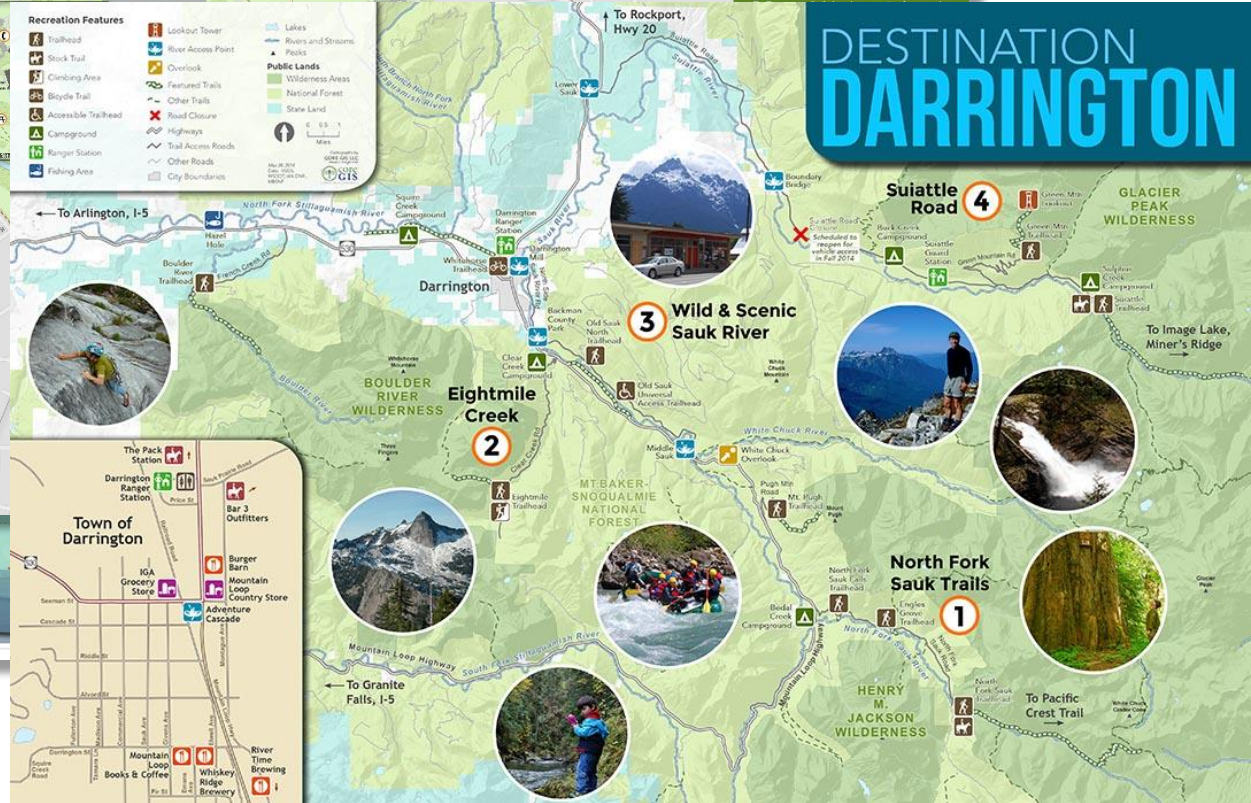
Bathymetry of Puget Sound



Greater Everglades Region Building Resilient Habitats in Florida



Welcome to MARYMOOR PARK



Opening the Door to Open Source

...not this!

```
.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_dWlHbnOTebcQ';
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>
```



Heartache and Brain Damage of OS

Desktop Applications

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

Server Applications

- 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)



But proprietary software is complicated too

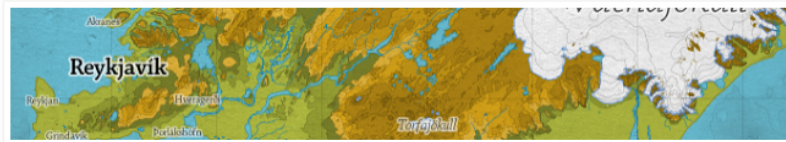


Opening the Door to Open Source

The Great Breakthrough!

Browser Cartography: Some Safehouses for ESRI Refugees

Wednes
day,
May 30,
2012



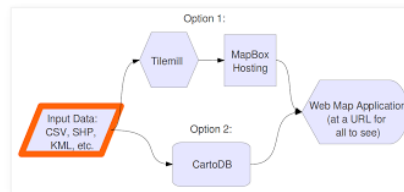
"Island" by Konstantin Kafer

A Primer for Getting Started With Open-Source Web Maps

Now that you know [why I care](#) about telling compelling stories with widely-distributed maps, let's look at a few of the many tools that are out there to help the process. I confess to narrow experience here; I use [MapBox](#) and [CartoDB](#) for the majority of my projects, and there are plenty of alternatives to those. But as a starting point I think that these open-source web map design platforms are perfect - they minimize the amount of code required, they use the [best graphic rendering engine in the field](#), and they are extremely cheap (or free) to use, even in an enterprise or high-traffic environment. I'm avoiding ESRI's "ArcWhatever Online for Server" options because of a.) [the high price tag](#), and b.) the [actual user-facing sites](#) are only as robust as the javascript or flash developer who builds them. My preferred options give you a lot more to work with out of the box, for free.

I am not going to walk you step-by-step through the process below - I'll point you to resources that will - but rather I mean to sketch the structure that can get your map applications up and running. If you're stumbling and need some help, drop me a line through the [GeoSprocket contact page](#) or on [Twitter](#)

Step 1: Data



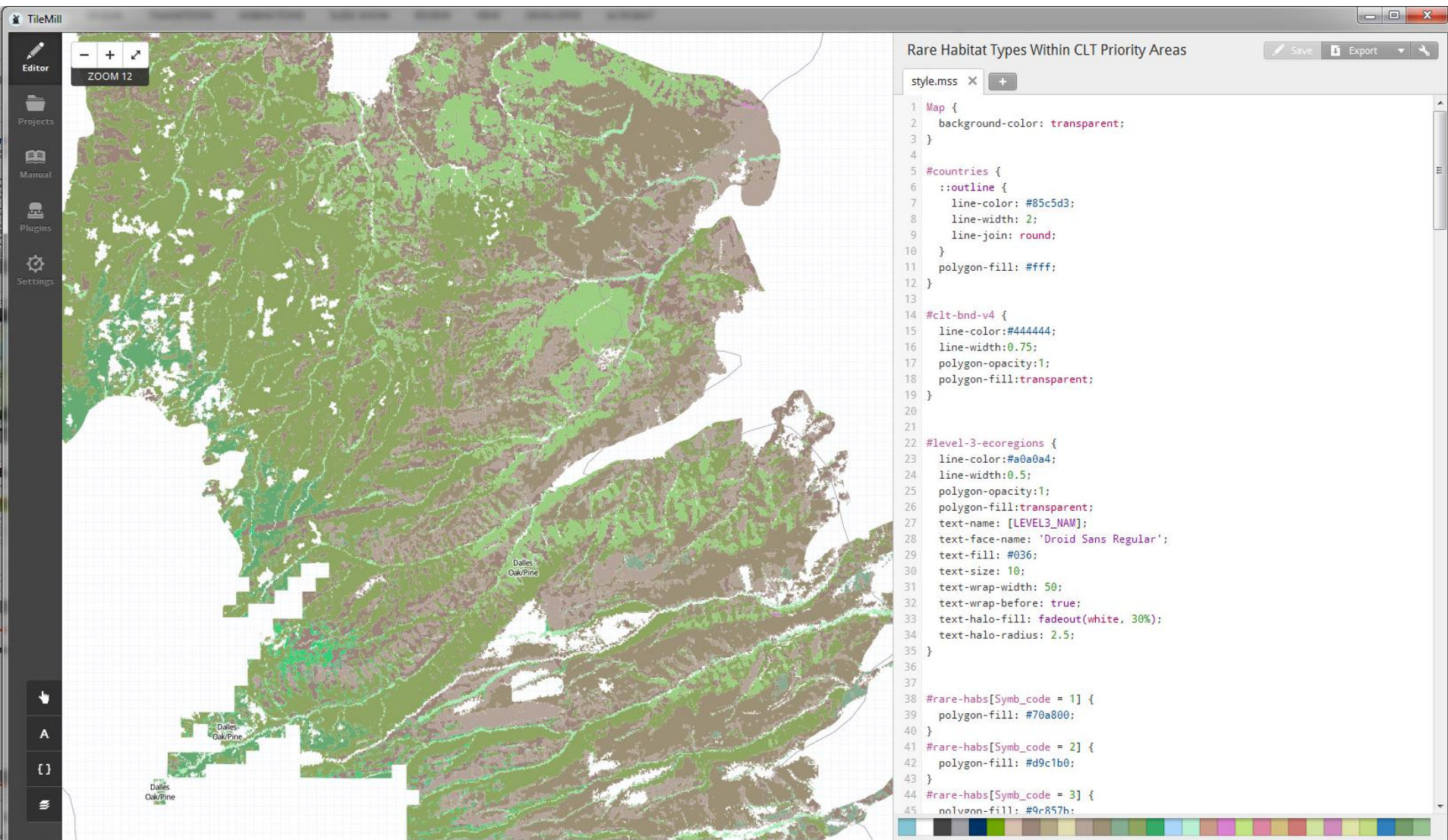
Data in this context can mean a lot of different things. The tools we're using aren't picky, so this includes:

- Shapefiles (but this will need to be in a compressed folder)
- Spreadsheets (CSV, XLS, DBF, you name it)
- KML or KMZ
- GPX or in many cases raw text from various GPS units

geosprocket.blogspot.com



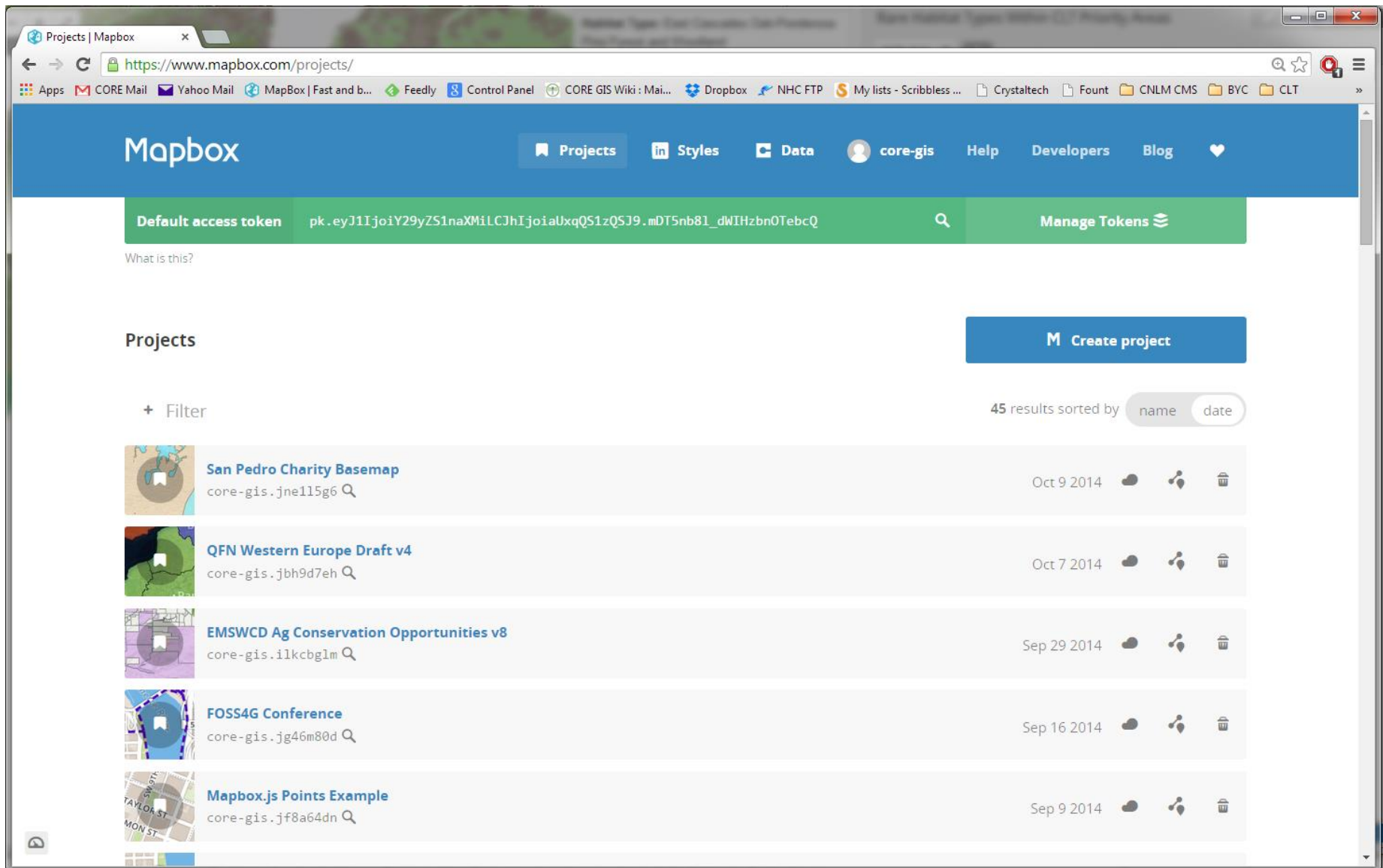
Combining the visual with a bit of code



The screenshot displays the TileMill application interface. On the left is a vertical sidebar with icons for Editor, Projects, Manual, Plugins, and Settings. The main area shows a map of a region with various habitat types, including 'Dalles Oak/Pine'. The map is styled with a green and brown color scheme. On the right is a code editor window titled 'Rare Habitat Types Within CLT Priority Areas' with a 'style.mss' file. The code defines map styles for countries, CLT priority areas, and rare habitat types. A color palette is visible at the bottom of the code editor.

```
1 Map {
2   background-color: transparent;
3 }
4
5 #countries {
6   ::outline {
7     line-color: #85c5d3;
8     line-width: 2;
9     line-join: round;
10  }
11  polygon-fill: #fff;
12 }
13
14 #clt-bnd-v4 {
15   line-color: #444444;
16   line-width: 0.75;
17   polygon-opacity: 1;
18   polygon-fill: transparent;
19 }
20
21
22 #level-3-ecoregions {
23   line-color: #a0a0a4;
24   line-width: 0.5;
25   polygon-opacity: 1;
26   polygon-fill: transparent;
27   text-name: [LEVEL3_NAM];
28   text-face-name: 'Droid Sans Regular';
29   text-fill: #036;
30   text-size: 10;
31   text-wrap-width: 50;
32   text-wrap-before: true;
33   text-halo-fill: fadeout(white, 30%);
34   text-halo-radius: 2.5;
35 }
36
37
38 #rare-habs[Symb_code = 1] {
39   polygon-fill: #70a800;
40 }
41
42 #rare-habs[Symb_code = 2] {
43   polygon-fill: #d9c1b0;
44 }
45
46 #rare-habs[Symb_code = 3] {
47   polygon-fill: #9c857b;
48 }
```

Opening the Door to Open Source



Opening the Door to Open Source



How I Use FOSS4G

TileMill → Mapbox

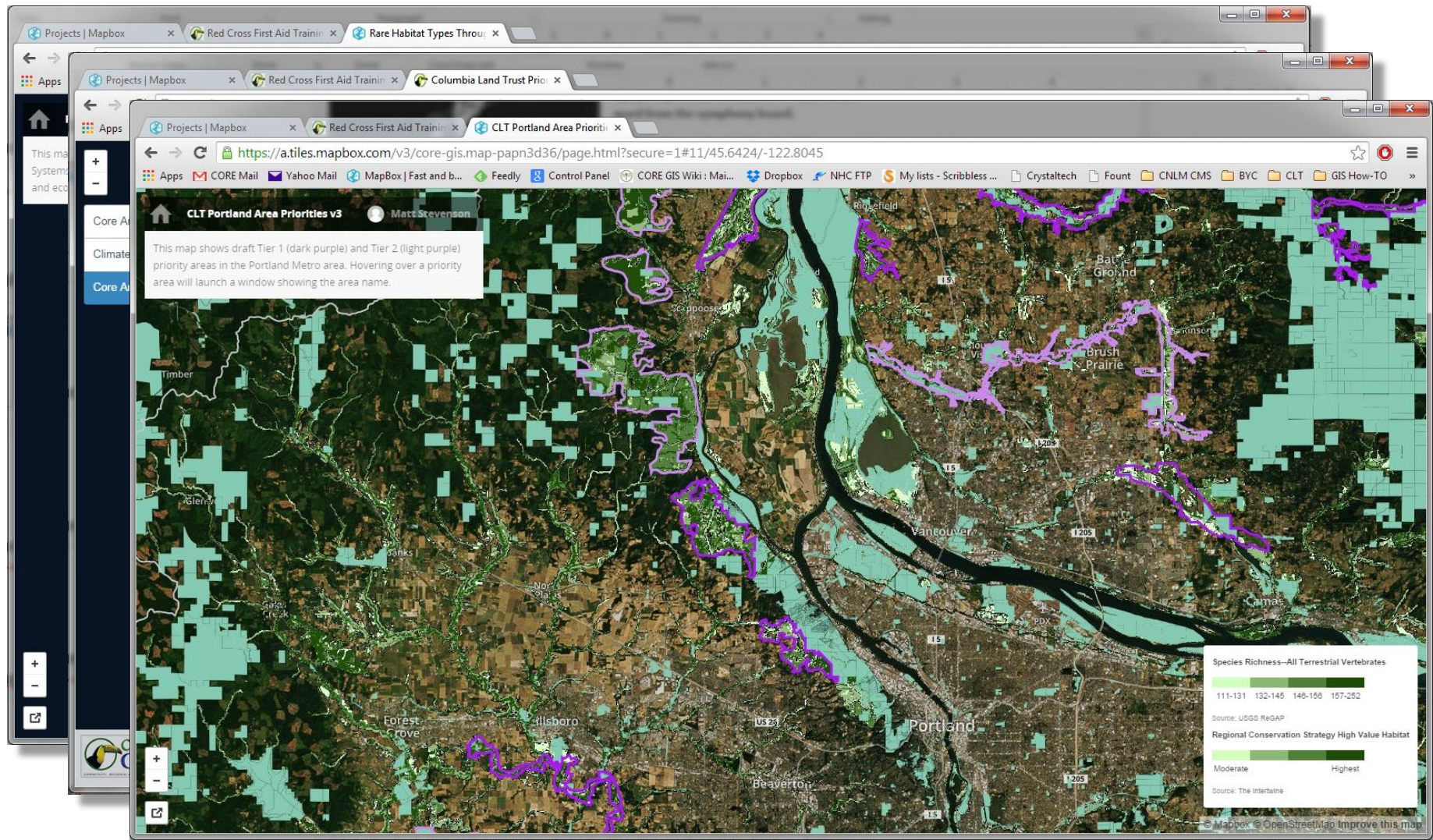
Tilemill → Mapbox + Mapbox.js +
HTML/CSS

Tilemill → Mapbox + Leaflet.js + HTML/CSS

Leaflet.js/Mapbox.js + HTML/CSS



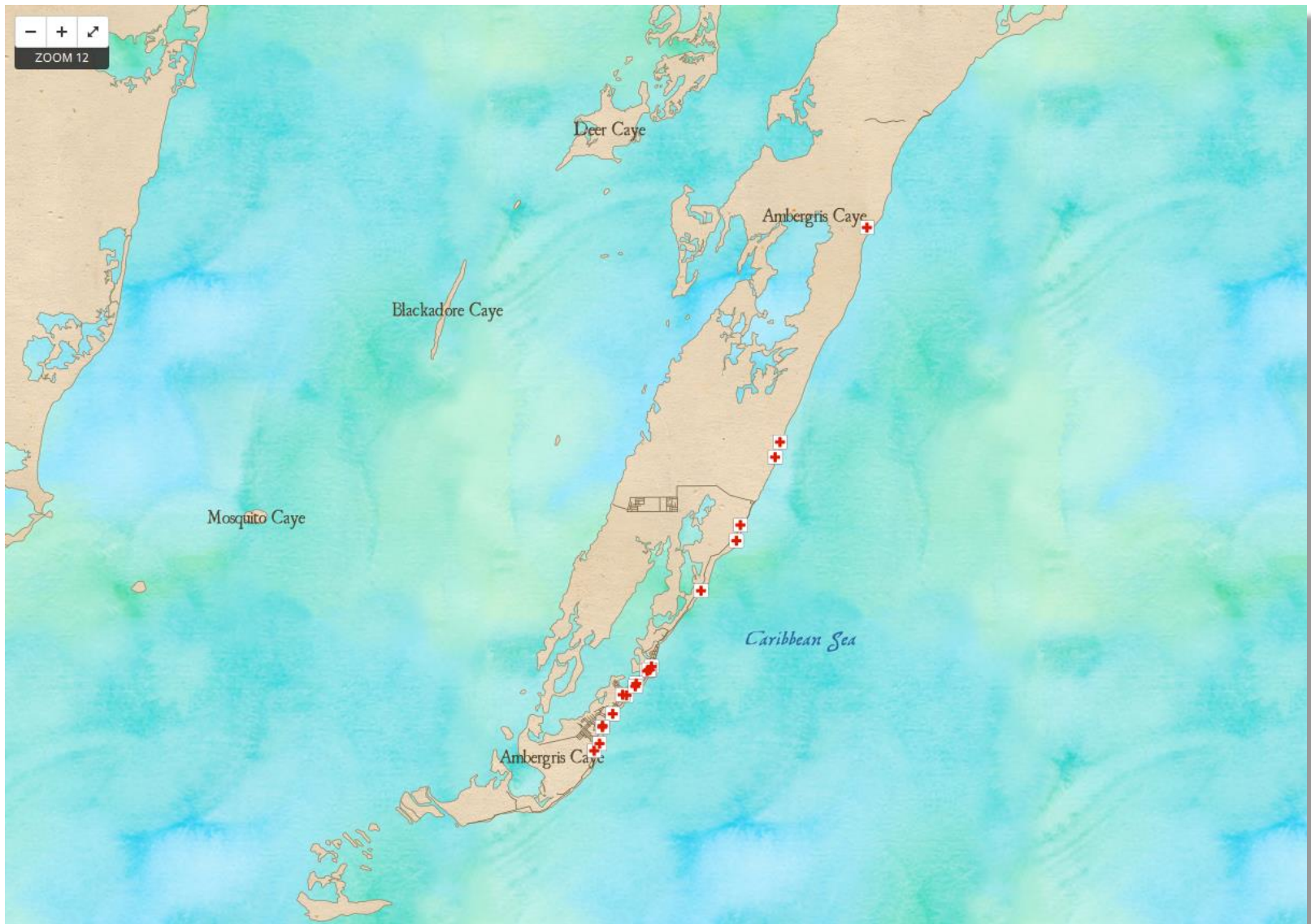
Examples: Columbia Land Trust



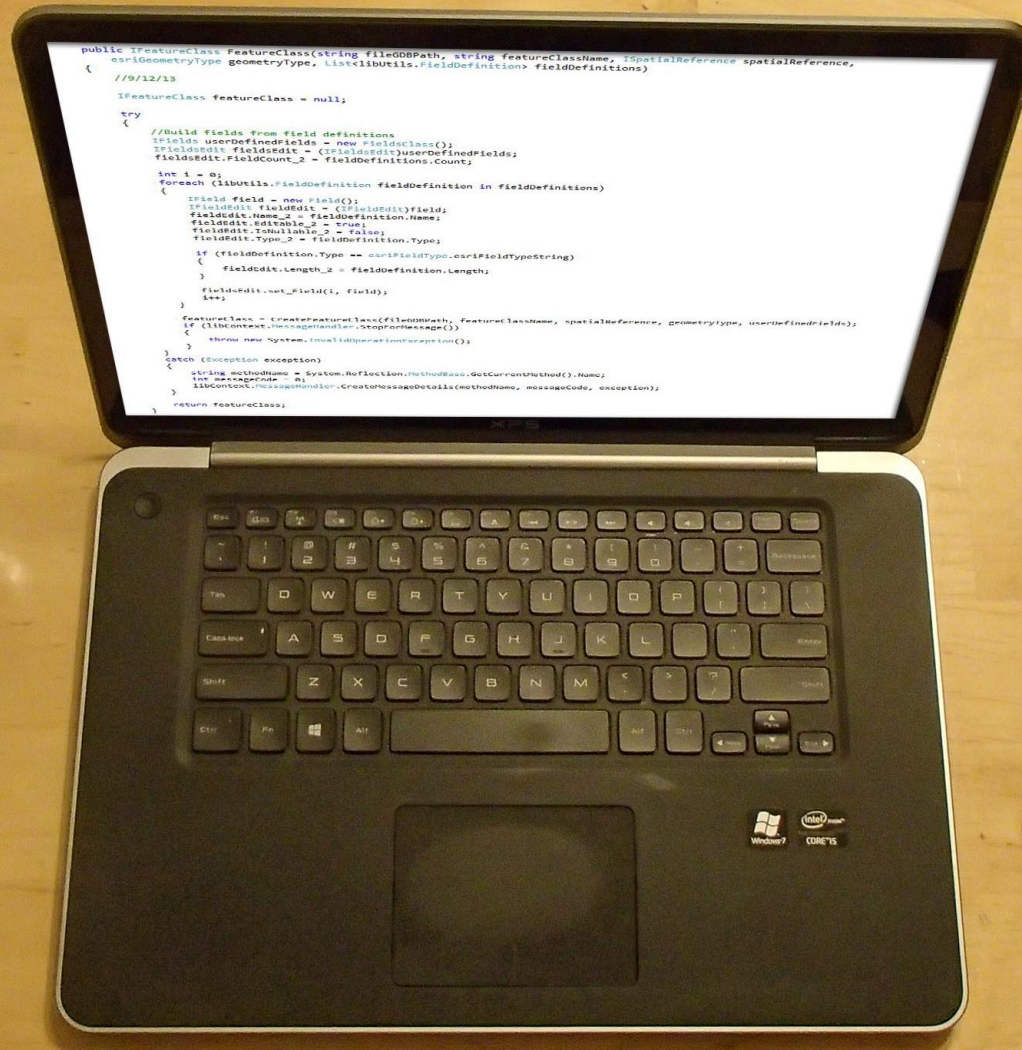
Opening the Door to Open Source



Examples: Belize Red Cross



David's Perspectives



```

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 I think of
GIS, I think of
this



Bathymetry of Puget Sound



...not this!

Greater Everglades Region
Building Resilient Habitats in Florida

The Greater Everglades Resilient Habitats Campaign covers an expansive region from mangrove shorelines of the Everglades National Park to the pine...

Welcome to
MARYMOOR PARK

DESTINATION DARRINGTON

Recreation Features:

- Trailhead
- Lookout Tower
- River Access Point
- Overlook
- Climbing Area
- Featured Trails
- Other Trails
- Bicycle Trail
- Road Closure
- Accessible Trailhead
- Highways
- Campground
- Trail Access Roads
- Ranger Station
- Other Roads
- Fishing Area
- City Boundaries

Public Lands:

- Wilderness Areas
- National Forest
- State Land

Willowmoor Farm:

- Trailhead
- Lookout Tower
- River Access Point
- Overlook
- Climbing Area
- Featured Trails
- Other Trails
- Bicycle Trail
- Road Closure
- Accessible Trailhead
- Highways
- Campground
- Trail Access Roads
- Ranger Station
- Other Roads
- Fishing Area
- City Boundaries

Town of Darrington:

- The Pack Station
- IGA Grocery Store
- Burger Barn
- Mountain Loop Country Store
- Adventure Cascade
- Mountain Loop Books & Coffee
- Whiskey Ridge Brewery
- River Time Brewing

Wild & Scenic Sauk River

Eightmile Creek

North Fork Sauk Trails

Henry M. Jackson Wilderness

Glacier Peak Wilderness

To Rockport, Hwy 20

To Arlington, I-5

To Granite Falls, I-5

To Image Lake, Miner's Ridge

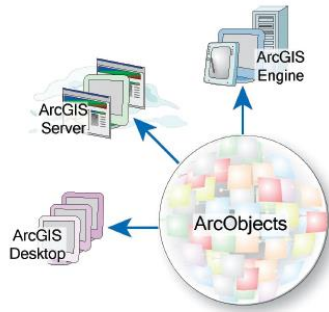
To Pacific Crest Trail

Opening the Door to Open Source

Likelihood of Success?

Command-line background

```
terminal
[user@host] ~/project> testob -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>
```



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
- OS experts appear to constantly seek to challenge themselves



Personal Development



Enabling factor for
OS = freedom

Personal growth



Become less stubborn, be open to criticism



Getting Used to the OS Community

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



Strong egos and trolls – 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



Appealing Characteristics of OS



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

Adherence to standards



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



Confidence vs Control



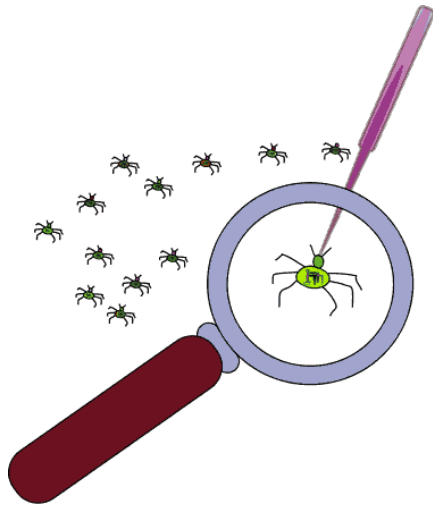
“Either you have to have full confidence in a software platform or you have to have full control”



Ben Sainsbury, Oregon Metro
FOSS4G 2014



Participation and Contribution

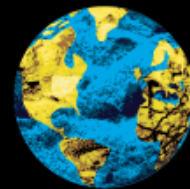


Debugging: Why should I fix something when I'm paying for the software?

I made something great, it's free and please help me make it better



**we're all in this
together**



Lessons So Far



OS experts often tend to suggest that things are really easy

- Sometimes they are
- Generally, they're not
- Need to adjust the marketing message

Library shock

- Many options can be great
- Too many options can be paralyzing
- Geekdom doesn't always sell well



Audience Engagement

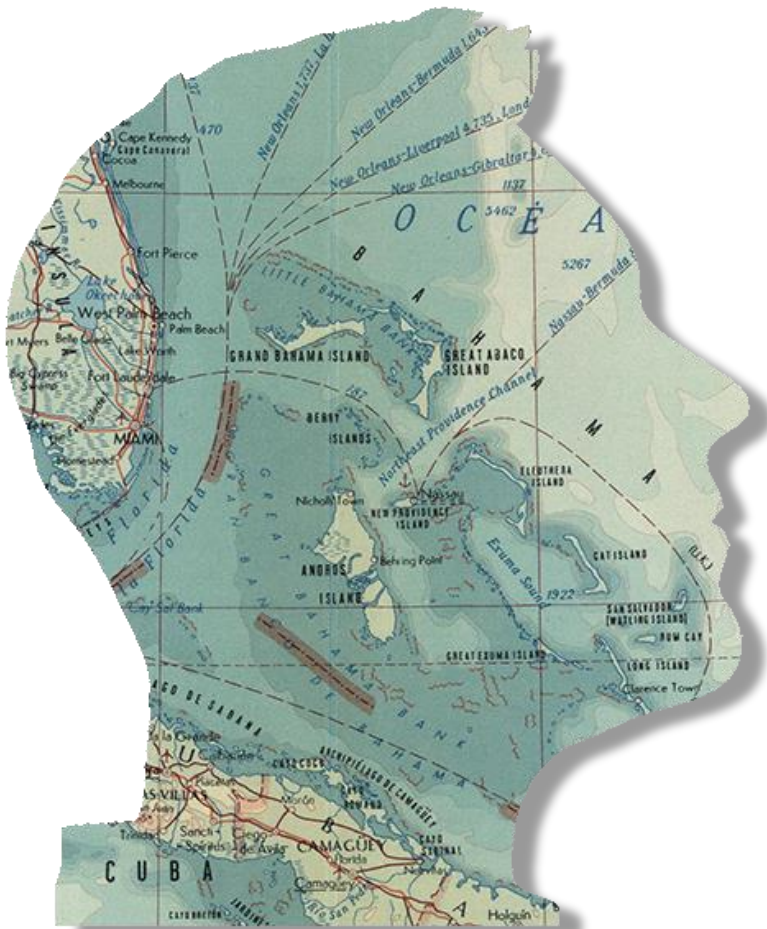


Guidelines

- Who are you?
- Where are you from?
- Why are you interested in proprietary GIS or OS GIS or both?



Closing Thoughts



Opening the Door to Open Source



Ending Option I - Wedding



Ending Option 2 – Civil War



Opening the Door to Open Source





Thanks for coming!

