

# **Open Source Geospatial:**

## **Exploring the cross-roads of organization, integration, and acceptance of OS Geospatial in the real world**

*Presented at LinuxFest NW 2008 by  
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*Ecotrust ([www.ecotrust.org](http://www.ecotrust.org))*

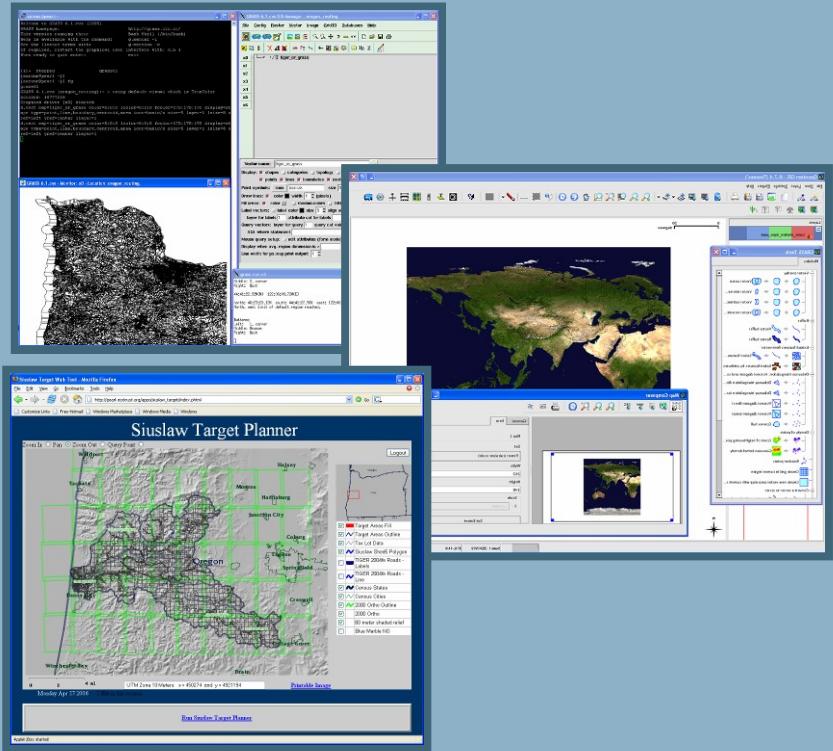
*aaronr@ecotrust.org*

*Z-Pulley Inc. ([www.reprojected.com](http://www.reprojected.com))*

*aaronr@z-pulley.com*

# Who am I?

## B.S. Computer Science

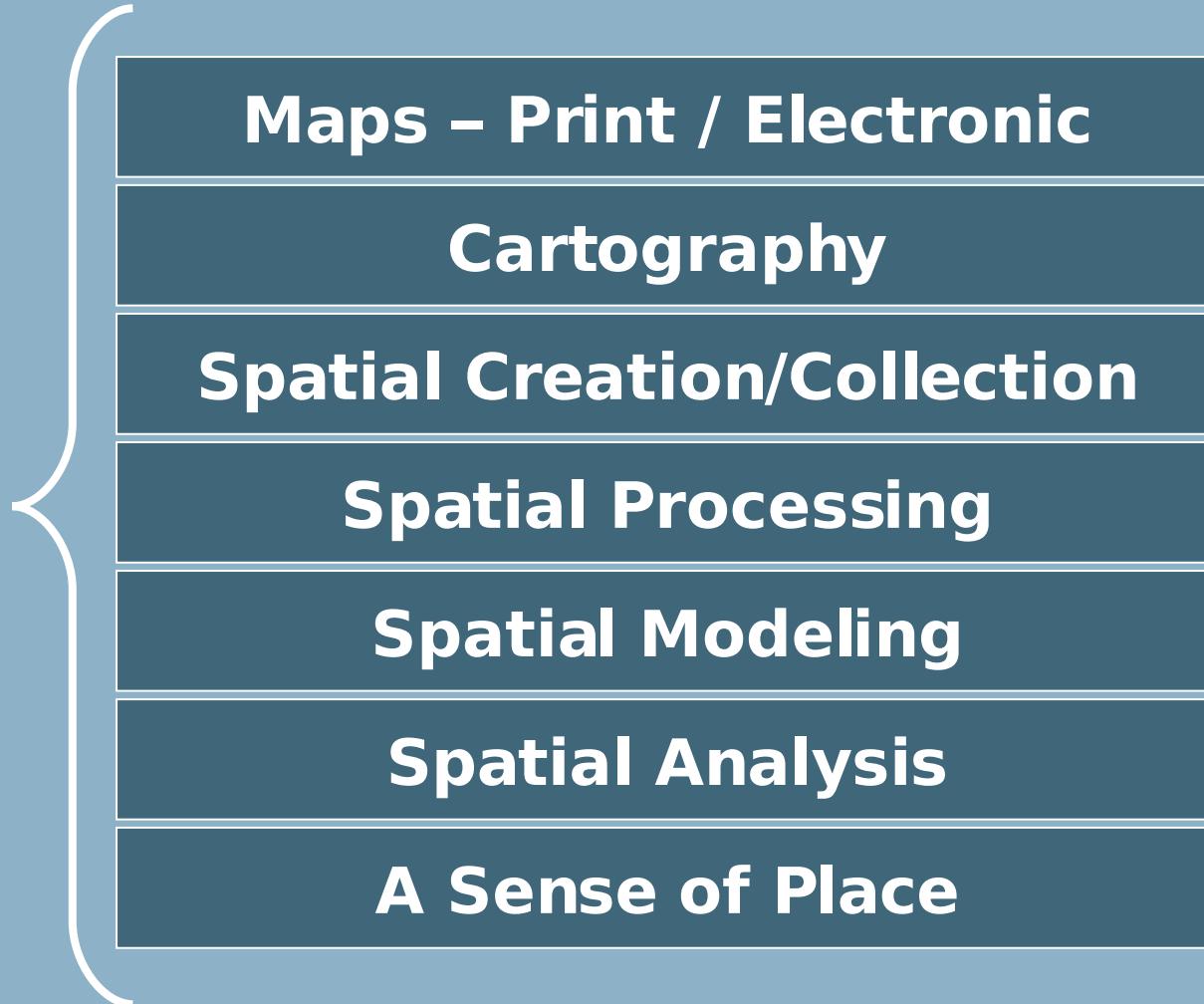


**Open Source User/Developer  
GIS Programmer**

## M.S. Environmental Science



**GIS**



**Geographic Information Systems**

# Open Source Geospatial – What Is It?

**OS GIS Web Apps**  
(Mapserver, MapGuide,  
OpenLayers, etc.)

**OS GIS Desktop Apps**  
(QGIS, GRASS, UDdig  
Jump, OSSIM, etc.)

**OS GIS Base Tools**  
(GDAL, FDO, PostGIS, etc.)

**OS Base Tools**  
(Apache, Compilers, etc.)

**OS Core**  
(Linux)



**Website**

**System Administration**

**Fundraising**

**Education and Curriculum**

**Incubation**

**Public Geospatial Data**

**Promotion and Visibility**

**Projects**



**General Members**

**Charter Members**

**Board of Directors**

- To **provide resources** for foundation projects - eg. infrastructure, funding, legal.
- To promote **freely available geodata** - free software is useless without data.
- To **promote the use** of open source software in the geospatial industry (not just foundation software) - eg. PR, training, outreach.
- To encourage the implementation of **open standards** and standards-based interoperability in foundation projects.
- To ensure a high degree of **quality** in foundation projects in order to build and preserve the foundation "brand".
- To make foundation and related software **more accessible** to end users - eg. binary "stack" builds, cross package documentation.
- To provide support for the use of OSGeo software in **education** via curriculum development, outreach, and support.
- To encourage **communication and cooperation** between OSGeo communities on different language (eg. Java/C/Python) and operating system (eg. Win32, Unix, MacOS) platforms.
- To **support** use and contribution to foundation projects from the worldwide community through **internationalization** of software and community outreach.
- To operate an annual **OSGeo Conference**, possibly in cooperation with related efforts (eg. EOGEO).

# OSGeo – Projects

OSGeo.org | Your Open Source Compass - Mozilla Firefox

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Getting Started Latest Headlines

<http://www.osgeo.org/> Google

 **OSGeo**  
Your Open Source Compass

Welcome to the Open Source Geospatial Foundation Website

The Open Source Geospatial Foundation has been created to support and build the highest-quality open source geospatial software. The foundation's goal is to encourage the use and collaborative development of community-led projects. This website serves as a portal for users and developers to share their ideas and contribute to project development. As the Open Source Geospatial Foundation grows and changes, so will this website. Please check back often and sign up to the [mailing lists](#) to monitor developments. To get involved, check out the [Getting Started](#) page.

**Community Spotlights**

**Steve Lime** Steve Lime is the lead developer of MapServer, a leading web mapping package. At the FOSS4G 2007 conference, Steve was honored with the Sol Katz GFOSS Award for 2007. [Read more...](#)

**Tom Kralidis** Tom Kralidis is a participant at OSGeo.org and an employee of Environment Canada. Tom is primarily a user of MapServer (and underlying packages) and mapbuilder and also supports OGC specifications for open source projects. [Read more...](#)

**News**

2008-04-24 GRASS GIS 6.3.0 Released

2008-04-22 OSGeo Welcomes Twenty Students for Google Summer of Code

2008-04-15 OpenLayers 2.6 Released

2008-04-13 geocamp2008: Call for Presentations/Workshops

2008-04-04 FOSS4G 2008 Registration and Calls for Papers and Workshops

2008-04-03 GeoNetwork opensource Geospatial Catalog v2.2.0 Released

[Submit News](#) [more](#)

**Upcoming events**

- 1Spatial Conference 2008 - 1 Source of Truth (3 days)
- OSGeo UK Chapter Meeting (6 days)
- OSBOOTCAMP 6 - Geospatial Software, Ottawa (37 days)

**Support OSGeo**

[Make A Donation](#) Any Amount

**OSGeo Projects**

Web Mapping  
Mapbender  
MapBuilder  
MapGuide Open Source  
MapServer  
OpenLayers

Desktop Applications  
GRASS GIS  
OSSIM  
Quantum GIS  
gvSIG

Geospatial Libraries  
FDO  
GDAL/OGR  
GEOS  
GeoTools

Metadata Catalog  
GeoNetwork opensource

Other Projects  
Public Geospatial Data  
Education and Curriculum

Done

**Mapbender**  
**Mapbuilder**  
**MapGuide**  
**MapServer**  
**OpenLayers**  
**GRASS**  
**OSSIM**  
**QGIS**  
**FDO**  
**GDAL/OGR**  
**GeoTools**  
**GeoNetwork**

Projects

# OSGeo – Events

URISA - Oregon and Southwest Washington | OSGeo.org - Mozilla Firefox

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http://www.osgeo.org/node/164

 OSGeo  
Your Open Source Compass

You are here: [Home](#) >> URISA - Oregon And Southwest Washington

## URISA - Oregon and Southwest Washington

Submitted by admin on Mon, 2007-01-15 19:29. ::

Start: 2007-04-17 08:30  
End: 2007-04-18 17:00  
Timezone: US/Pacific  
Vancouver, Washington, USA  
See <http://www.orurisa.org/events/qisinact/2007event/index.html> for more details.

[calendar](#)

**News**

- 13 Apr 2007 [degree day 2007 – Call for Papers](#)
- 12 Apr 2007 [OSGeo Welcomes Sixteen Students for Google Summer of Code](#)
- 4 Apr 2007 [FOSS4G 2007 Call for Presentations](#)
- 15 Mar 2007 [OSGeo Accepted for Google Summer of Code](#)

[Submit News](#) [more](#)

  
CAPE TOWN SOUTH AFRICA  
**FOSS4G 2008**  
2008 FREE AND OPEN SOURCE  
SOFTWARE FOR GEOSPATIAL CONFERENCE

  
  
Geo - Information Society of South Africa

# OSGeo – Local Groups

Cascadia Users of Geospatial Open Source | Google Groups - Mozilla Firefox

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Google Groups Recently Visited Groups | Help | Sign in

## Cascadia Users of Geospatial Open Source

Search this group Search Groups

### Home

New since last time: 1 message

Description: CUGOS aims to facilitate general support and regional meetings for people who are interested in Open Source GIS software. This is the official discussion group for CUGOS related questions and activities.

#### Discussions 8 of 115 messages [view all »](#)

[Views on opensource software are changing](#)  
By karsten - Apr 21 - 1 author - 0 replies

[April meeting - Cancelled!](#)  
By jlivni - Apr 14 - 1 author - 0 replies

[precinct work](#)  
By Chad Lupkes - Mar 31 - 4 authors - 6 replies

[Extra special march meeting \(19th\)](#)  
By Michael Gerlek - Mar 17 - 3 authors - 3 replies

[February Meeting: 2/20 at Lizardtech](#)  
By jlivni - Feb 19 - 1 author - 0 replies

[Time domain in GIS?](#)  
By Donna and Chris Barker - Feb 13 - 2 authors - 1 reply

[Google maps project](#)  
By Ken - Feb 6 - 1 author - 0 replies

[GIS Architect job posting at NetMotion Wireless](#)  
By Hal Mueller - Jan 23 - 1 author - 0 replies

#### Discussions

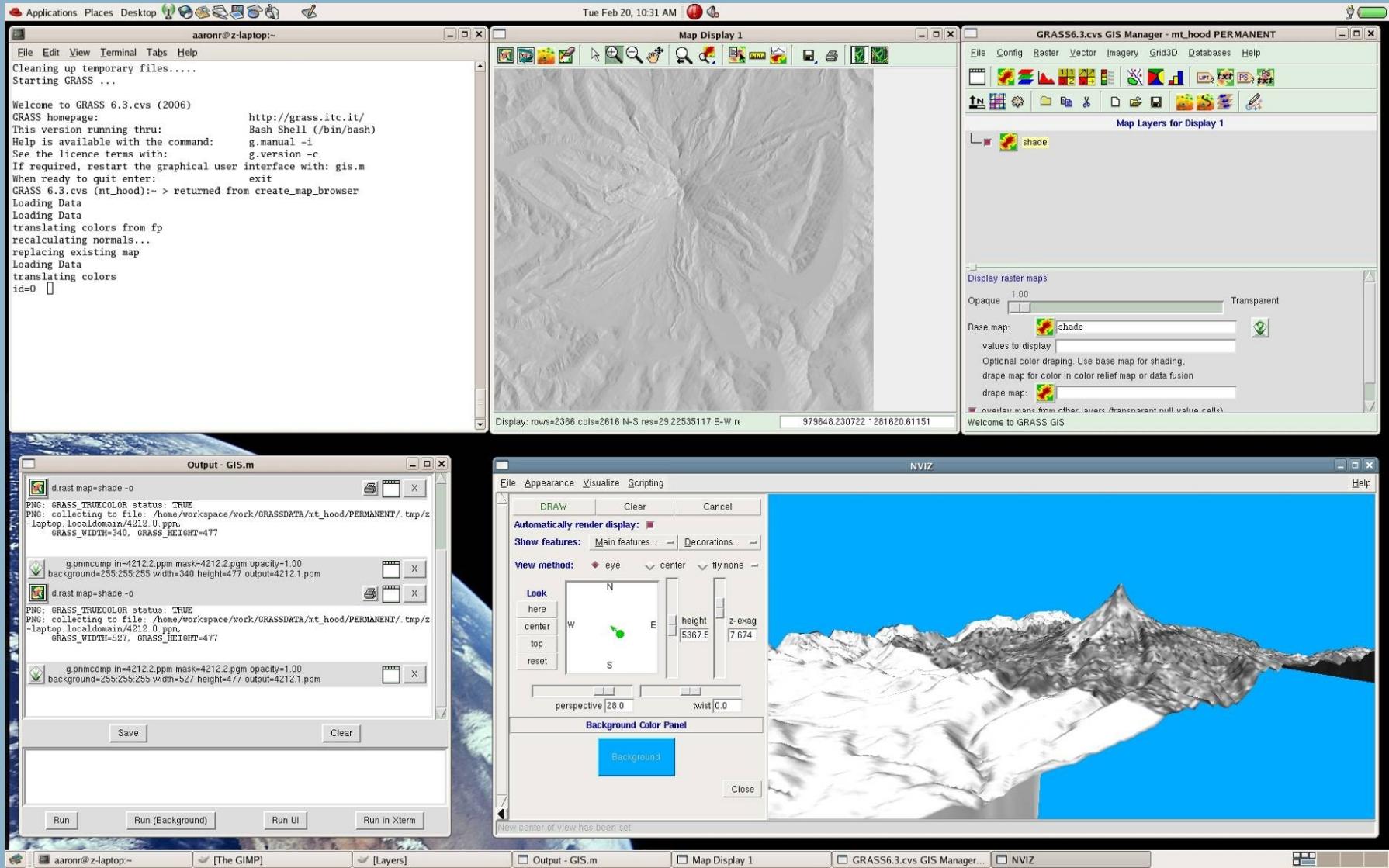
[About this group](#)  
[Apply for group membership](#)

[Group info](#)  
**Members:** 76  
**Activity:** Low activity  
**Language:** English  
**Group categories:** Not categorized  
[More group info »](#)

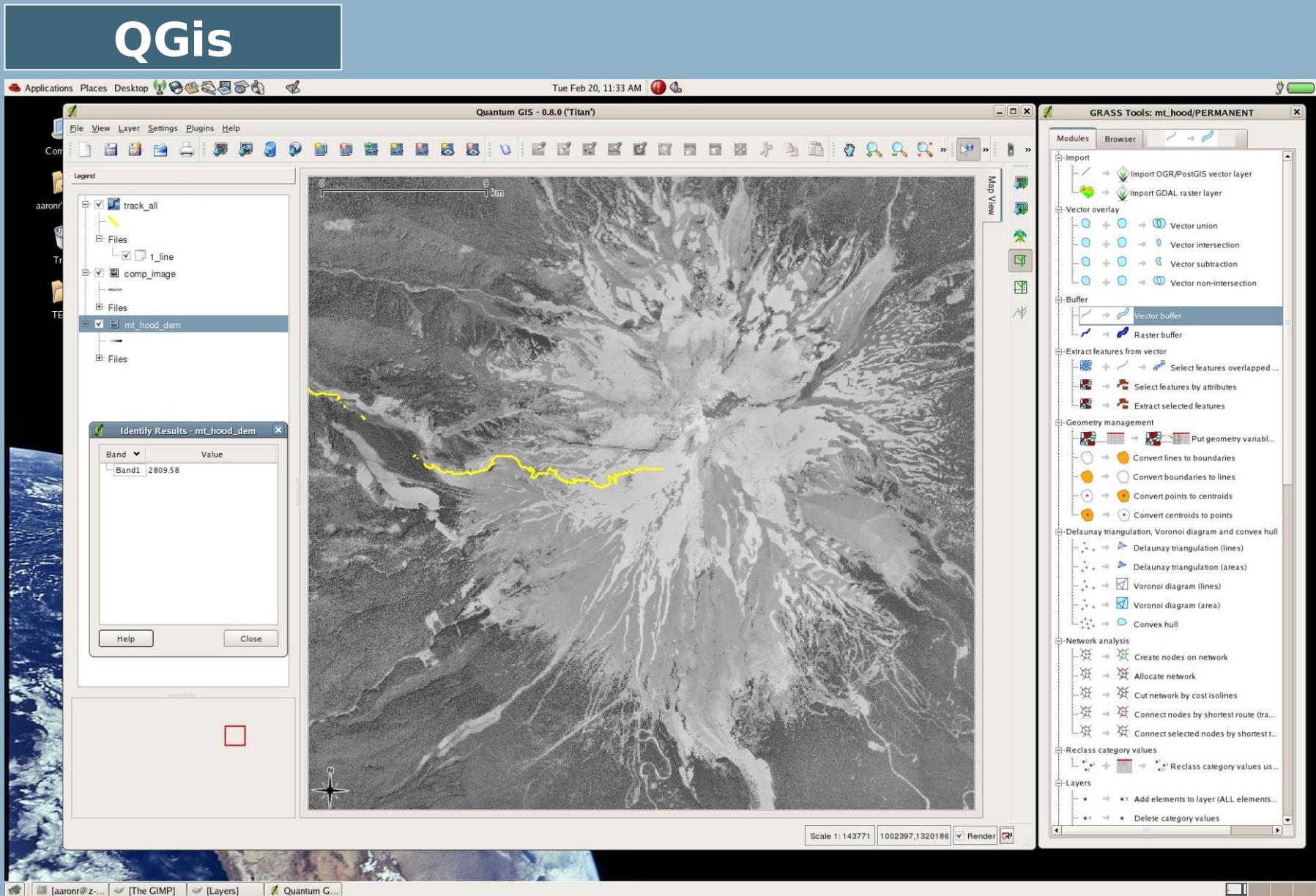
A picture speaks louder  
than words...

# Examples - Desktop

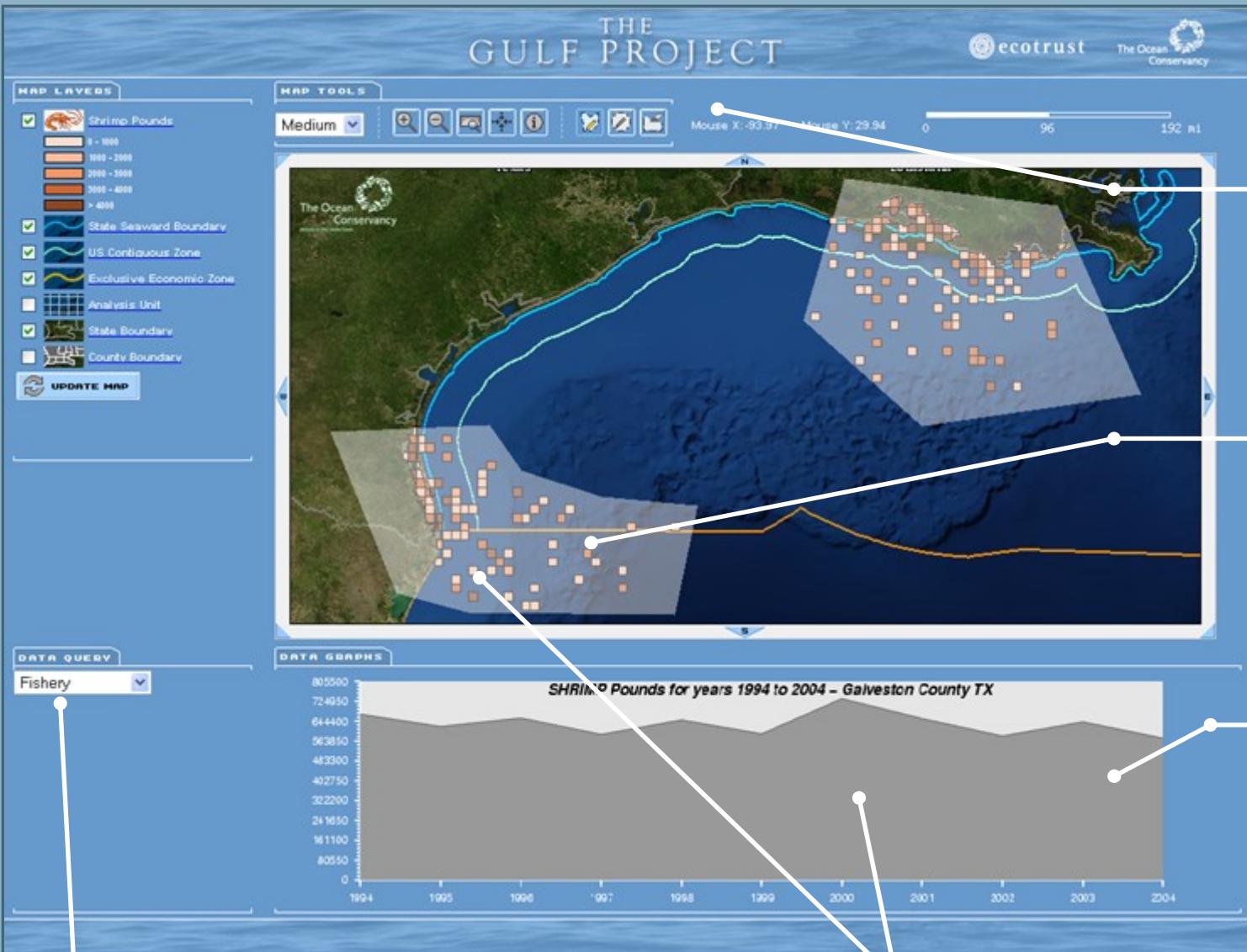
## Grass - Raster Processing



# Examples - Desktop



# Examples - Web-Based



AJAX-User Based Data Filter

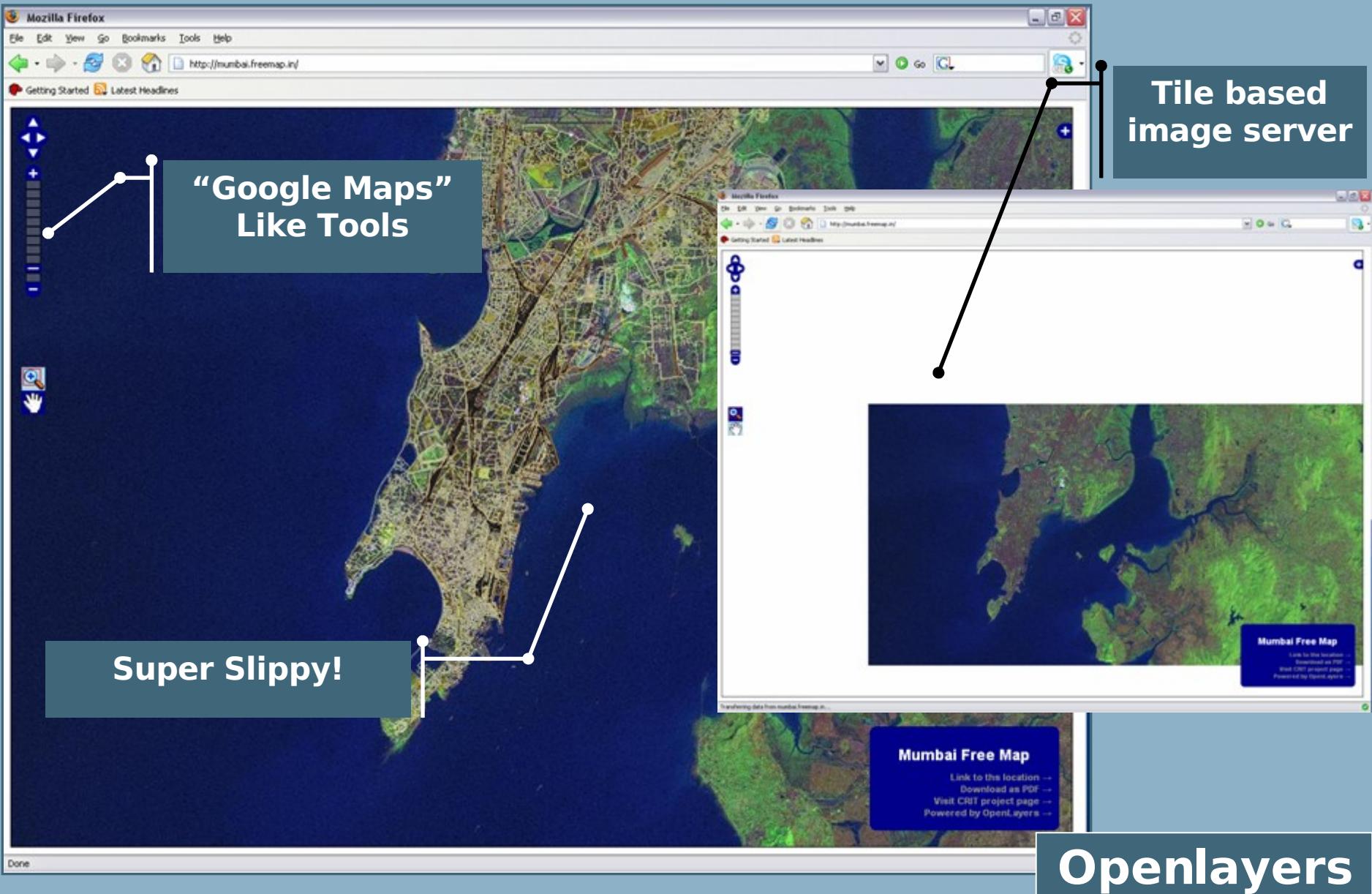
PostGIS Spatial Data

Chameleon  
Mapserver  
framework

Spatially  
constrained  
queries and  
scenarios

GMT  
generated  
graphics

# Examples - Web-Based



“Google Maps” Like Tools

Super Slippy!

Tile based image server

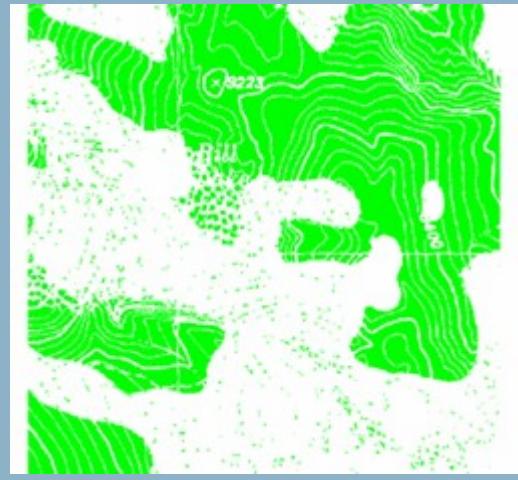
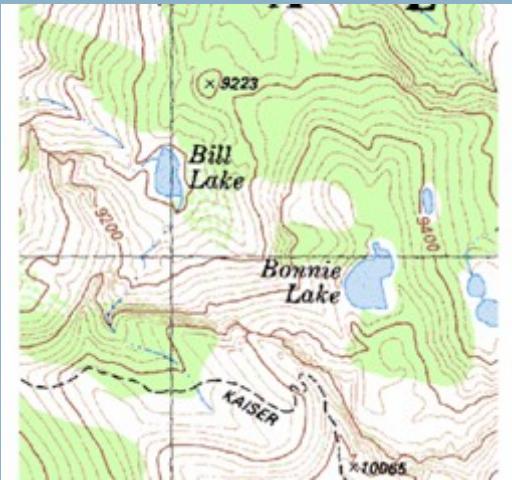
Mumbai Free Map

Link to this location →  
Download as PDF →  
Visit C4IT project page →  
Powered by OpenLayers →

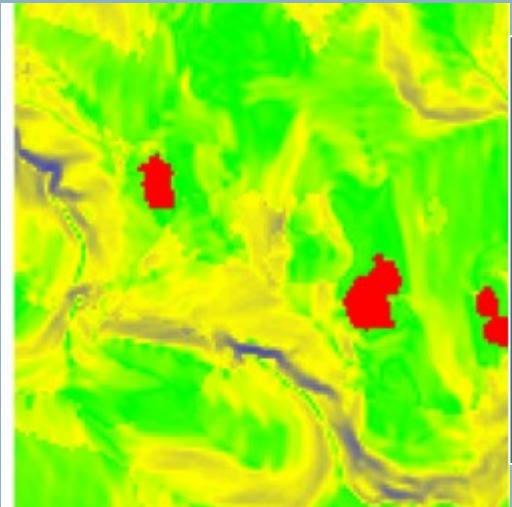
Openlayers

# How is this useful to you?

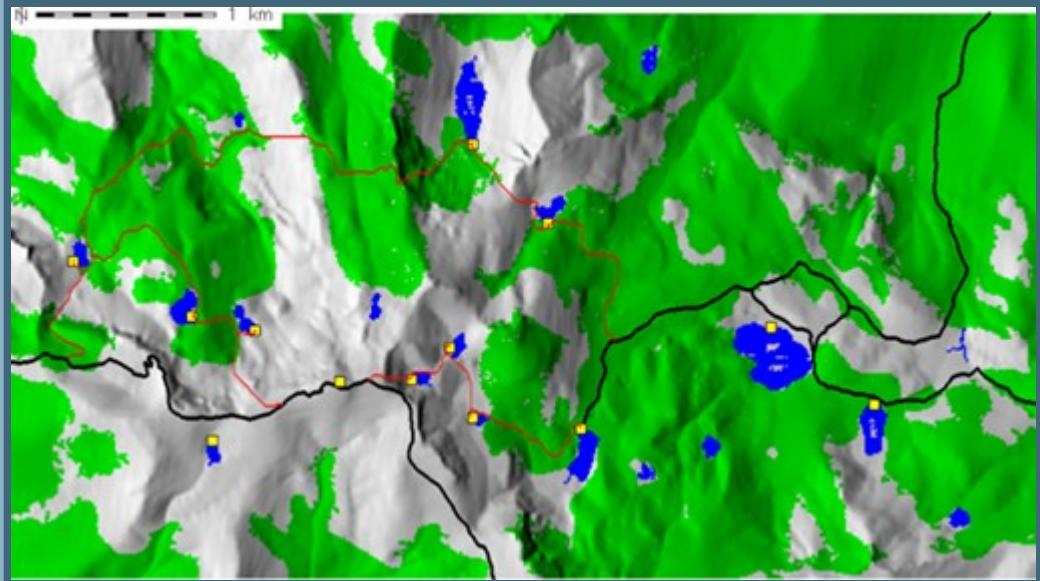
## Navigating Wilderness Areas with GRASS



Classification



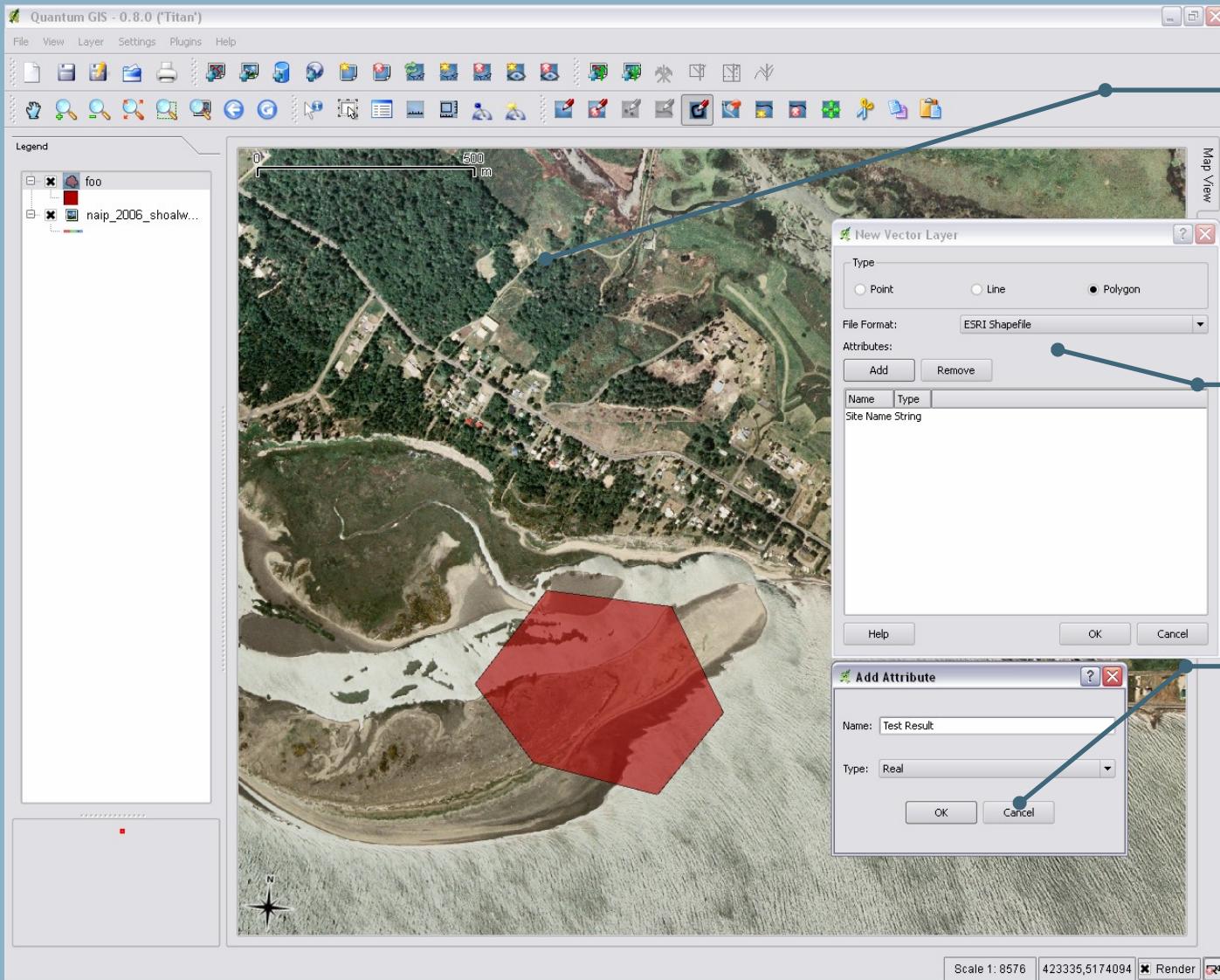
Cost Surface



Thanks to Dylan Beaudette :

<http://casoilresource.lawr.ucdavis.edu/drupal/node/244>

## Digitizing, Modifying, Extracting...



Context Layer Viewing

Create New Shapes

Create New Attributes



## How to get coordinates in UTM to Geo-NAD83?

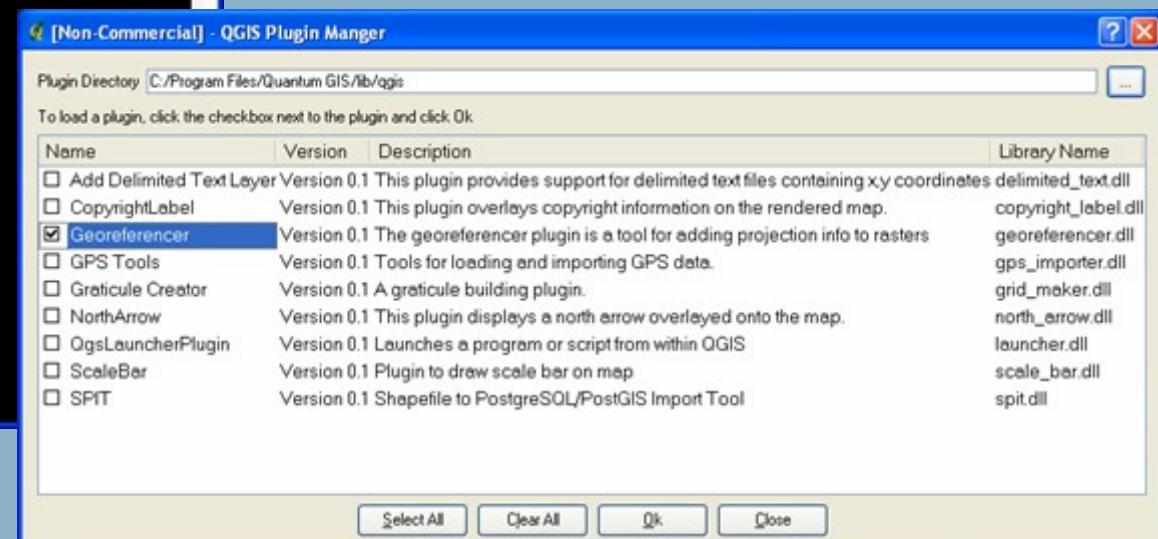
```
aaronr@pearl:~$ GRASS 6.1.cvs (mike_station):~ > r.proj --help

Description:
Re-project a raster map from one location to the current location.

Usage:
r.proj [-ln] input=name location=name [mapset=name] [dbase=name]
[output=name] [method=name] [resolution=value]

Flags:
-l List raster files in input location and exit
-n Do not perform region cropping optimization

Parameters:
  input      Input raster map
  location   Location of input map
  mapset     Mapset of input map
  dbase      Path to GRASS database of input location
  output     Output raster map
  method     Interpolation method to use
            options: nearest,bilinear,cubic
            default: nearest
  resolution Resolution of output map
GRASS 6.1.cvs (mike_station):~ >
```



```
aaronr@pearl:~$ gdalwarp
Usage: gdalwarp [--help-general] [--formats]
  [-s_srs srs_def] [-t_srs srs_def] [-order n] [-et err_threshold]
  [-te xmin ymin xmax ymax] [-tr xres yres] [-ts width height]
  [-wo "NAME=VALUE"] [-ot Byte/Int16/...] [-wt Byte/Int16]
  [-srcnodata value [value...]] [-dstnodata value [value...]] -dstalpha
  [-rn] [-rb] [-rc] [-rcs] [-wm memory_in_mb] [-multi] [-q]
  [-of format] [-co "NAME=VALUE"] * srcfile dstfile
aaronr@pearl ~$
```

# Web enable geo-data....

**topozone**

Aerial Photographs  
World's Premier Library of Aerial & Satellite Imagery and Maps Online!  
[Add to Geospatial](#)

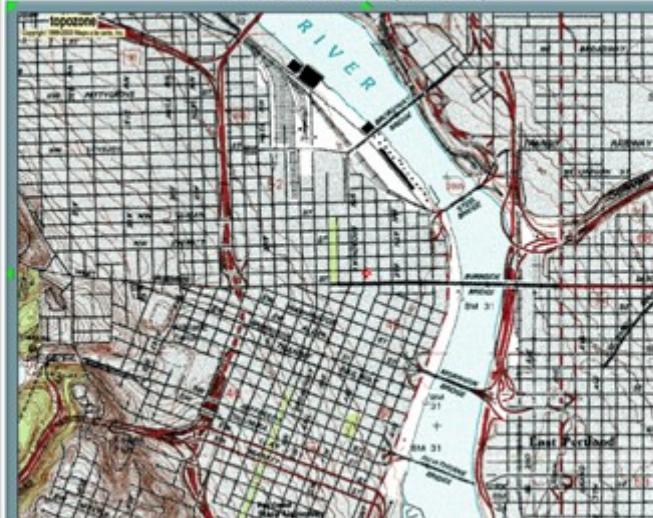
View MAPS | GET DATA | MY TOPOZONE | WEB SERVICES | ABOUT US | HELP!

USGS Topo Maps  
1:24K/1:25K Topo Maps  
1:100K Topo Maps  
1:250K Topo Maps  
Map Size  
Small  
Medium  
Large  
View Scale  
1: 50000   
Coordinate Format  
UTM  
Map Datum  
WGS84  Show target  
Email this topo map  
Bookmark this topo map  
Print this topo map

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TOPO MAPS  
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FAST DELIVERY  
START AT \$0.95

Use Topo Maps Online  
US Map Topo Online in Detail. Try It Free! Unlimited printing.  
[Advertiser on this site](#)

Portland, USGS Portland (OR, WA) Topo Map  
View TopoZone Pro topographic maps, aerial photos, street maps, coordinate and elevation display  
UTM 10 S25206E 504153N (WGS84/NAD83)



OpenID  
File Edit  
Customize  
Home |  
Real-time  
Sea Surface  
Water-level  
Wave Mod  
Salinity  
Hurricane  
Katrina (2005)  
Water Level  
Waves  
Wind & sea  
Rita (2005)  
Site Control  
NOAA (Hu)  
NOAA (Co)  
NOAA (D)  
NOAA (Co)  
NOAA (Co)

## How to select data within a polygon area?

```
[aracicot@boris:~/html/boris.ecotrust.org/gulf_project/core/SCA_Model]
```

```
CREATE VIEW species_SHRIMP_revenue_1572338318_view AS SELECT bk.the_geom, bk.gid, sum(lb.pounds) as total_lbs FROM blk1deg6 as bk, log_books_2004 as lb, permits as p WHERE lb.vesselid=p.vesselid and p.assigned_county='Galveston' and p.assigned_state='TX' and lb.blockid=bk.gid AND (Intersects(bk.the_geom,GeomFromText('POLYGON((-91.62285 30.24335,-93.0228 30.174500000000002,-93.2064 27.8336,-91.5999 26.57135,-89.0754 26.61725,-88.9377 28.6598,-90.0852 30.0368,-91.62285 30.24335))',-1)) OR Intersects(bk.the_geom,GeomFromText('POLYGON((-94.37685 26.06645,-96.39645 27.328699999999998,-97.7964 27.48935,-97.6587000000001 25.1255,-97.58985 23.63375,-95.0883 23.67965,-93.0228 24.4829,-94.37685 26.06645))',-1))) GROUP BY bk.the_geom bk.gid HAVING count(lb.blockid)>0
```

Intersects

Geometry Definition

Distance(geometry, geometry)  
Equals(geometry, geometry)  
Disjoint(geometry, geometry)  
Intersects(geometry, geometry)  
Touches(geometry, geometry)  
Crosses(geometry, geometry)  
Within(geometry A, geometry B)  
Overlaps(geometry, geometry)  
Contains(geometry A, geometry B)  
Intersects(geometry, geometry)  
Relate(geometry, geometry, intersectionPatternMatrix)  
Relate(geometry, geometry)

Centroid(geometry)  
Area(geometry)  
Length(geometry)  
PointOnSurface(geometry)  
Boundary(geometry)  
Buffer(geometry, double, [integer])  
ConvexHull(geometry)  
Intersection(geometry, geometry)  
SymDifference(geometry A, geometry B)  
Difference(geometry A, geometry B)  
GeomUnion(geometry, geometry)  
GeomUnion(geometry set)  
MemGeomUnion(geometry set)

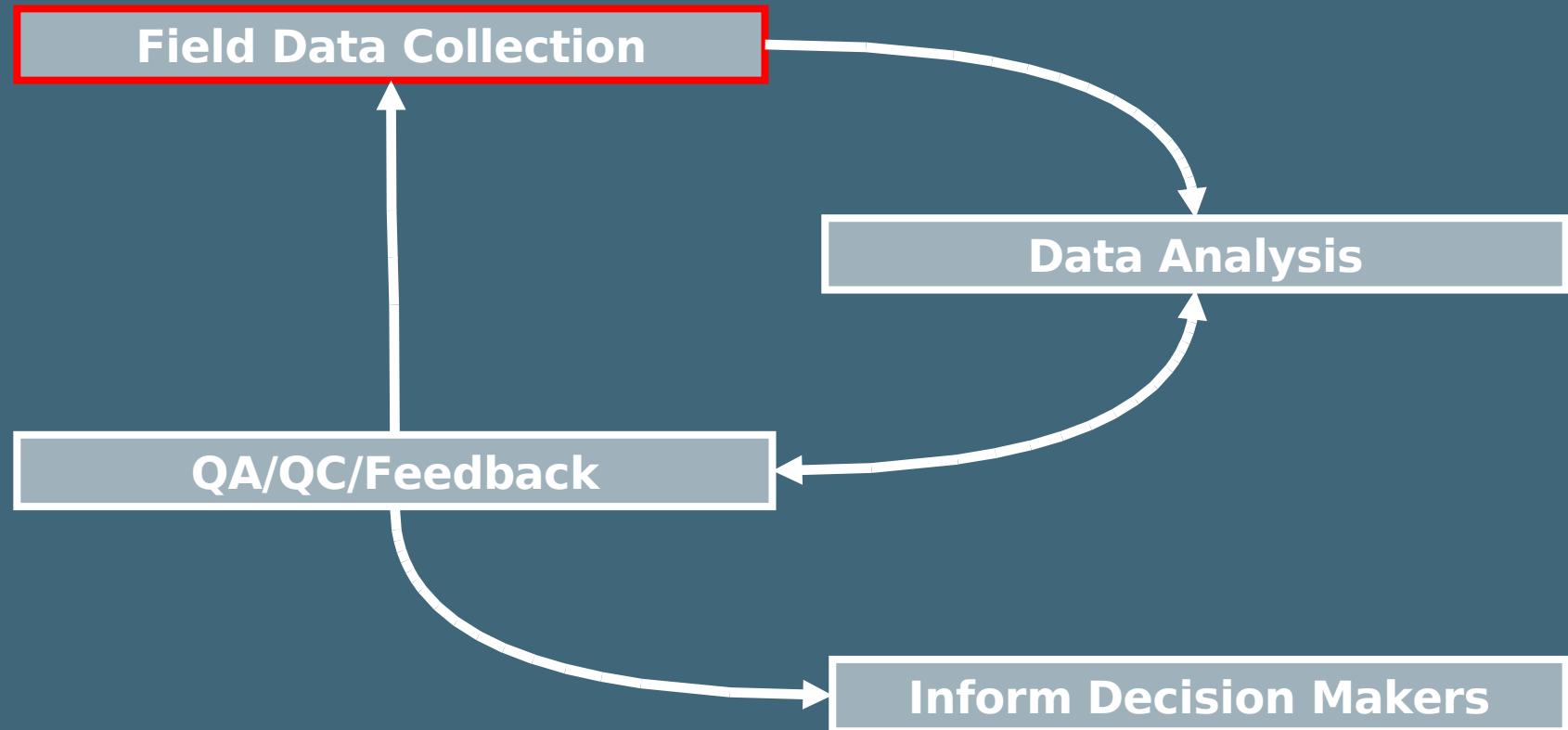


# What am I doing?

# Decision Support Pattern

**Field Work**

**Back at the Office**



# Old Version of Tool

ArcView GIS 3.3

Tycho

File Edit View Theme Graphics Window Help Oceanmap

Critical Economic Areas

Name:  Home Port: Avila

Interviewer Name #1:  Place of Residence:

Interviewer Name #2:  Fishery: Albacore/Purse Seine

Age:  Habitat Types:

Years of Experience:  Hard Bottom

Percent of Income From Fishing:  Hard Outcrop/Pavement

Percent of Income from this Fishery:  Mixed

Federal Vessel ID:  Licenses or Permits Held Pertaining to this Fishery:

State Vessel ID:  Deeper Nearshore Species Permit

Fisherman License ID:  Federal (HMS) Permit Thresher Shark

Interviewer Mood:  Federal Coastal Pelagic Species Permit

Overall Importance:  Done

Oceanmap Version 2

foo4

foo3

foo2

foo

Point Conception/Pigeon Po

State Waters

Coastal Access

Coastline

Land Reference Points

Marine Protected Areas

100 Fathom Line

Map showing coastal areas and marine protected areas.

oceanmap\_milpa\_ecotrust\_CD.apr

New Open Run

Oceanmap.BenthicHab.SHP

Oceanmap.FDS.Done.Click

Oceanmap.FDS.Open

Oceanmap.Fishery.Other.Select

Oceanmap.HomePort.Other.Select

Oceanmap.JustADrawing.Done.Click

Oceanmap.Permits.Other.Select

Oceanmap2.AddBoundingCoords

Oceanmap2.AddCoordsChoice

Oceanmap2.addDDcoords

Oceanmap2.AddDDMS

Oceanmap2.AddTabularData

Oceanmap2.Bathymetry

Oceanmap2.BD.Done.Click

Oceanmap2.BD.Open

Oceanmap2.BH

Oceanmap2.CA.LBLDone.Click

Oceanmap2.CA.Open

Oceanmap2.CEA.LBLDone.Click

Oceanmap2.CEA.Open

oceanmap2.ChartsOff

Oceanmap2.ChartsOn

Oceanmap2.CoastalAccess

Oceanmap2.Convert2Shapefile

Oceanmap2.CoordsHelp

Oceanmap2.DD2DM

Oceanmap2.dd2dms

Oceanmap2.DeleteLabels

Oceanmap2.DissectOverlaps

Oceanmap2.DrawCircle

Oceanmap2.DrawLine

Oceanmap2.DrawPoint

Oceanmap2.DrawPoly

Oceanmap2.DrawRect

Oceanmap2.Fathoms.Apply

Oceanmap2.Fathoms.Click

Oceanmap2.FullExtent

Oceanmap2.Hp.Done.Click

Oceanmap2.HP.Open

Oceanmap2.Labels

Oceanmap2.LatLonRun

Oceanmap2.LatLonTool

Oceanmap2.LaunchCalCoastBrowser

Oceanmap2.LULCChart

Oceanmap2.MakeMap

Oceanmap2.MergeThemes

Oceanmap2.OpenDrawingTools

Oceanmap2.P.Done.Click

Oceanmap2.P.Open

Oceanmap2.PrintMap

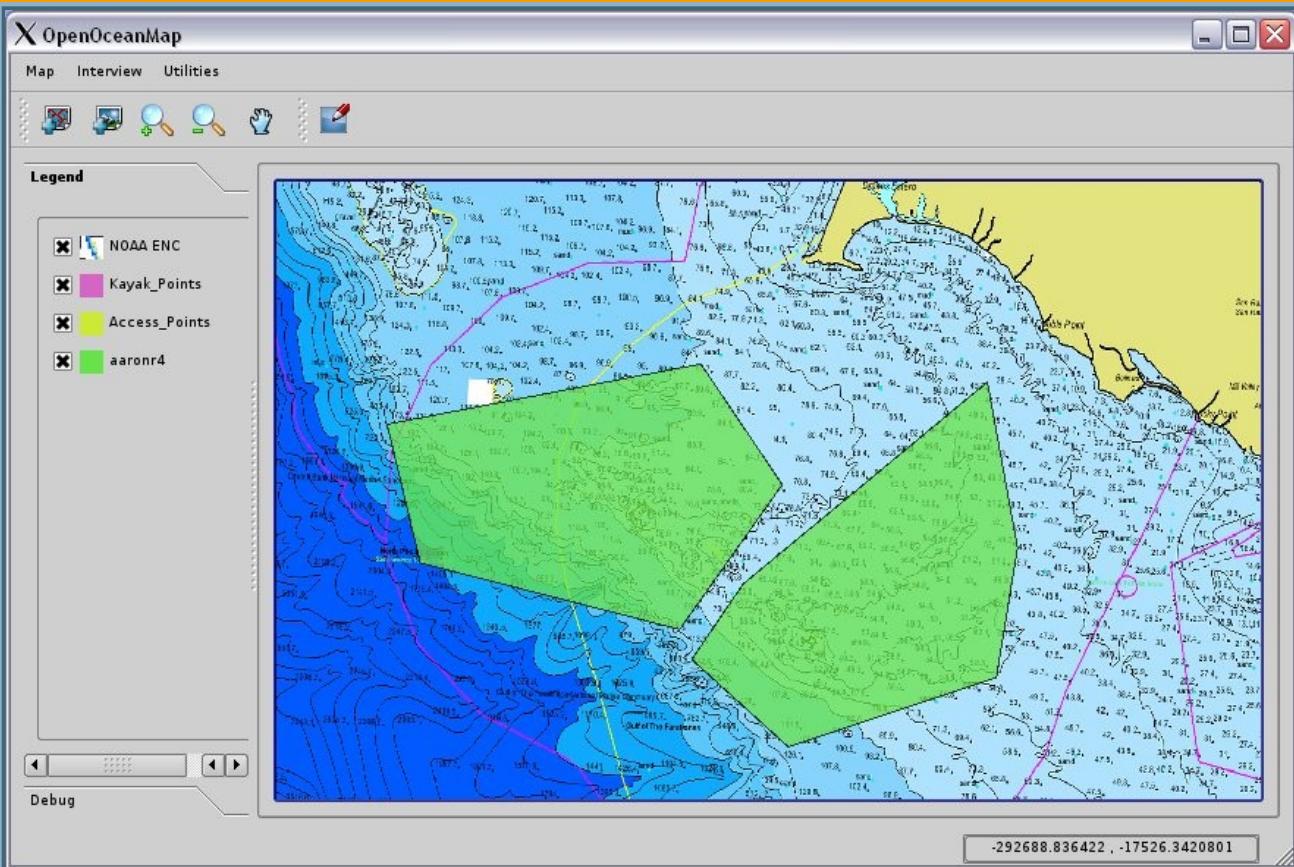
Oceanmap2.PristineAreas.Done

Oceanmap2.PristineAreas.open

Oceanmap2.RelativeImportance

Start | Oceanmap | ArcView GIS 3.3

# New Version of Tool



Information

license :

operating a boat :

of ownership :

length :

Port :

Information

Location : San Francisco County and south, including Pillar Point

trials per trip :

average days fishing per year :

time from home to fishing location :

Rec. fishing user group :

Interviewer

Date of interview (mm/dd/yyyy) :

Interviewer #1

First Name :   
Last Name :

Interviewer #2

First Name :   
Last Name :

# Being Developed in the Open

OpenOcean - Trac - Mozilla Firefox

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Getting Started Latest Headlines

  
Equity  
Ocean Communities Ecology Analysis Network  
Economy

Login | Settings | Help/Guide | About Trac | Register

Wiki Timeline Roadmap Browse Source View Tickets Search

Start Page | Index by Title | Index by Date | Last Change

## Welcome to OpenOcean? - An open implementation of Ocean Communities 3E Analysis Network (OCEAN)

OpenOcean? a suite of tools that enable the integrated ecological and socioeconomic assessment of fishery policy and marine conservation, and their effects on coastal communities — the Ocean Communities "3E" Analytical Network, or OCEAN. The E stands for economy, ecology and equity, the balancing of which in a conservation economy captures Ecotrust's mission. OCEAN comprises databases, analysis and tools that allow scientists, managers, and communities to take an integrated and systemic look at ecosystems and management issues. OCEAN continues to grow, building on both proprietary and third-party, quantitative and qualitative information across a number of scales — both temporal and spatial.

Please visit [Ecotrust](#) to learn more about OCEAN regard to components, versions and milestones.

### Starting Points

- License -- All source code is licensed under the [GPL](#)
- Tickets -- How we keep track of progress on [OpenOcean?](#)
- Source -- Feel free to browse the source code

Download in other formats:  
[Plain Text](#)

Powered by **trac** POWERED By Edgewall Software.

Visit Ecotrust at <http://www.ecotrust.org/>

Done

# Tools Used



PyQGIS

PyQT



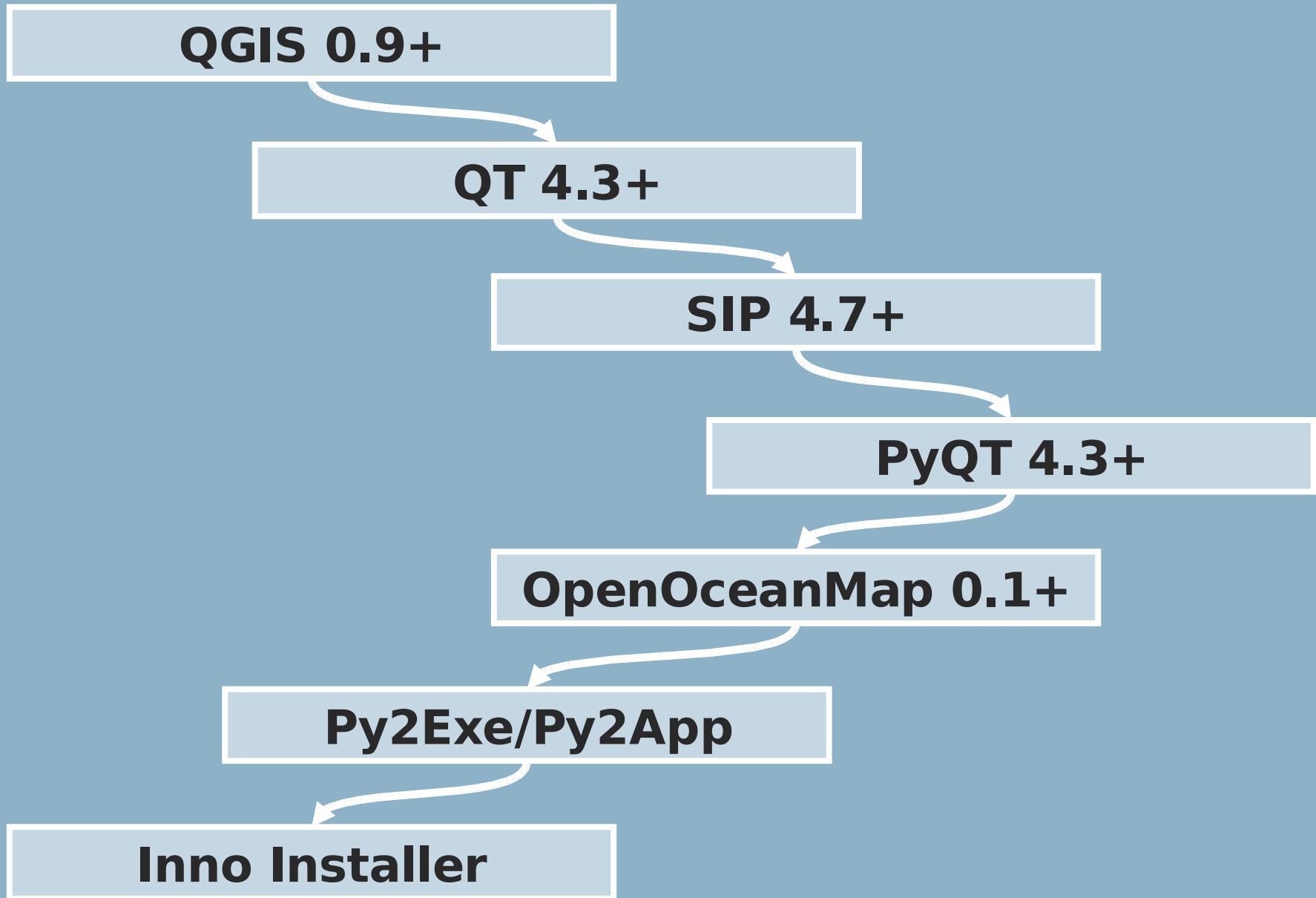
Riverbank



Quantum GIS  
version 0.9  
"GANYMED"



# Requirements to build



**# PyQt4 includes**

```
from PyQt4.QtCore import *
from PyQt4.QtGui import *
```

**# QGIS bindings**

```
from qgis.core import *
from qgis.gui import *
```

```
# Main window used for housing the canvas,  
# toolbars, and dialogs  
  
class MainWindow(QMainWindow, Ui_MainWindow):  
  
    def __init__(self,splash):  
        QMainWindow.__init__(self)  
  
        # required by Qt4 to initialize the UI  
        self.setupUi(self)
```

```
# create map canvas

self.canvas = QgsMapCanvas(self)
self.canvas.setCanvasColor(QColor(255,255,255))
self.canvas.enableAntiAliasing(True)
self.canvas.useQImageToRender(False)
self.canvas.show()
```

```
# create a little toolbar for map tool
self.toolbar = parent.addToolBar("MapTool")
self.toolbar.addAction(parent.mpActionZoomIn)

self.toolZoomIn = QgsMapToolZoom(self.canvas,False)
self.toolZoomIn.setAction(parent.mpActionZoomIn)

# Connect the button signal to a slot
QObject.connect(parent.mpActionZoomIn,
    SIGNAL("triggered()"), self.zoomIn)

# Signal handler for zoom in button
def zoomIn(self):
    self.canvas.setMapTool(self.toolZoomIn)
```

# Embedded Python Interpreter

X OpenOceanMap - Python Console

```
---- OpenOceanMap Python Console ----
Python 2.4.4c1 (#2, Oct 11 2006, 21:51:02)
[GCC 4.1.2 20060928 (prerelease) (Ubuntu 4.1.1-13ubuntu5)] on linux2

-----
Namespace is for QMainWindow
Example use for QString vars: str(canvas.extent().stringRep())
Example use for list of QString vars: map(str,interviewInfo)

>>> str(canvas.extent().stringRep())
'-367150.5281690140836872,-83250.0000000000000000 :
-163849.4718309859163128,65750.0000000000000000'

>>> 2+2
4
```

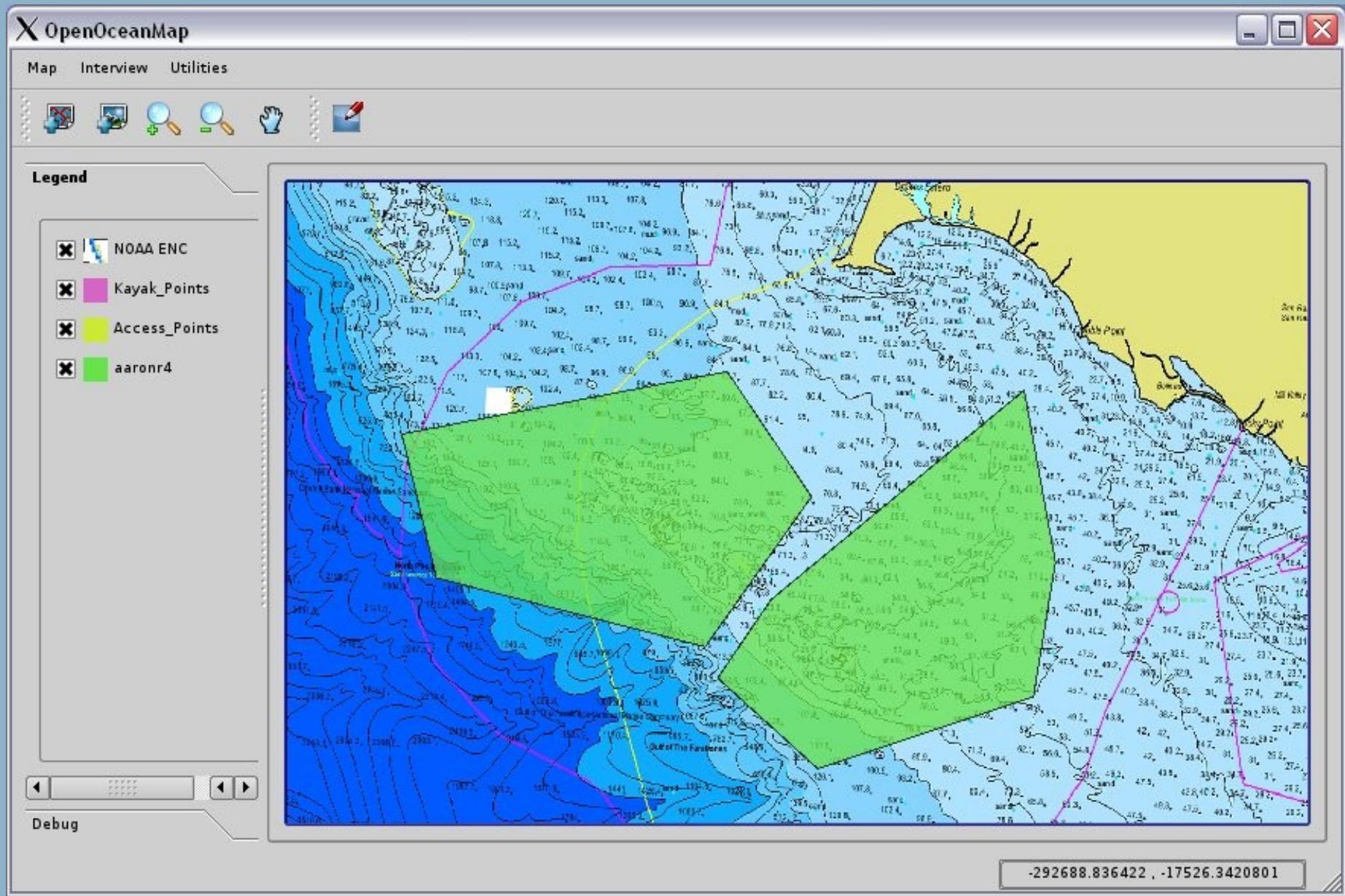
>>> |

Close

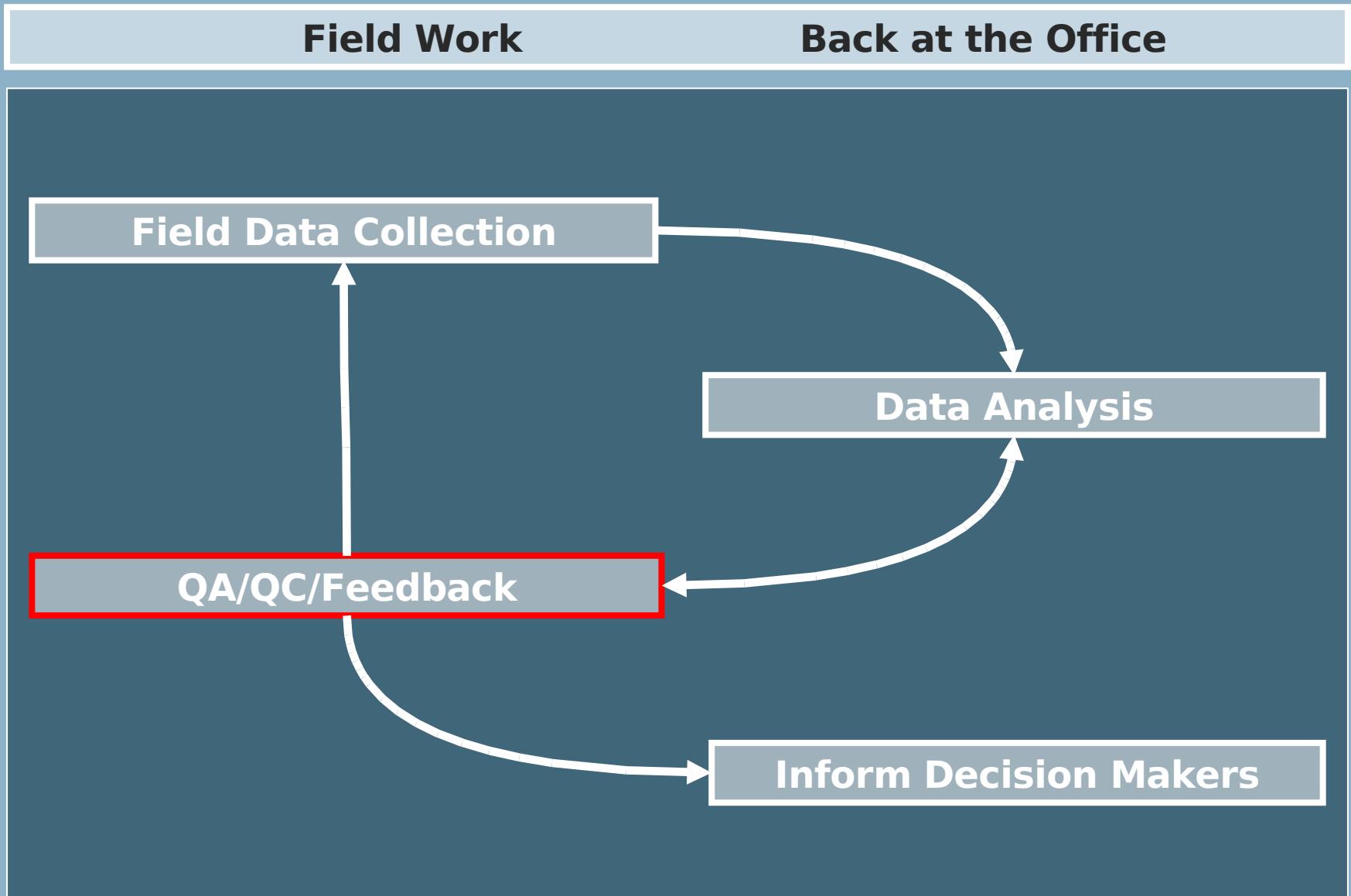
```
C:\openoceanmap>more setup.py
from py2exe.build_exe import py2exe
from distutils.core import setup
opts = {
    "py2exe": {
        "includes": ["sip"],
        "packages": ["qgis","PyQt4"],
        "dist_dir": "bin",
    }
}
setup(options = opts,
      console=[{"script": "openoceanmap.py"}] )
```

```
C:\openoceanmap>python setup.py py2exe
```

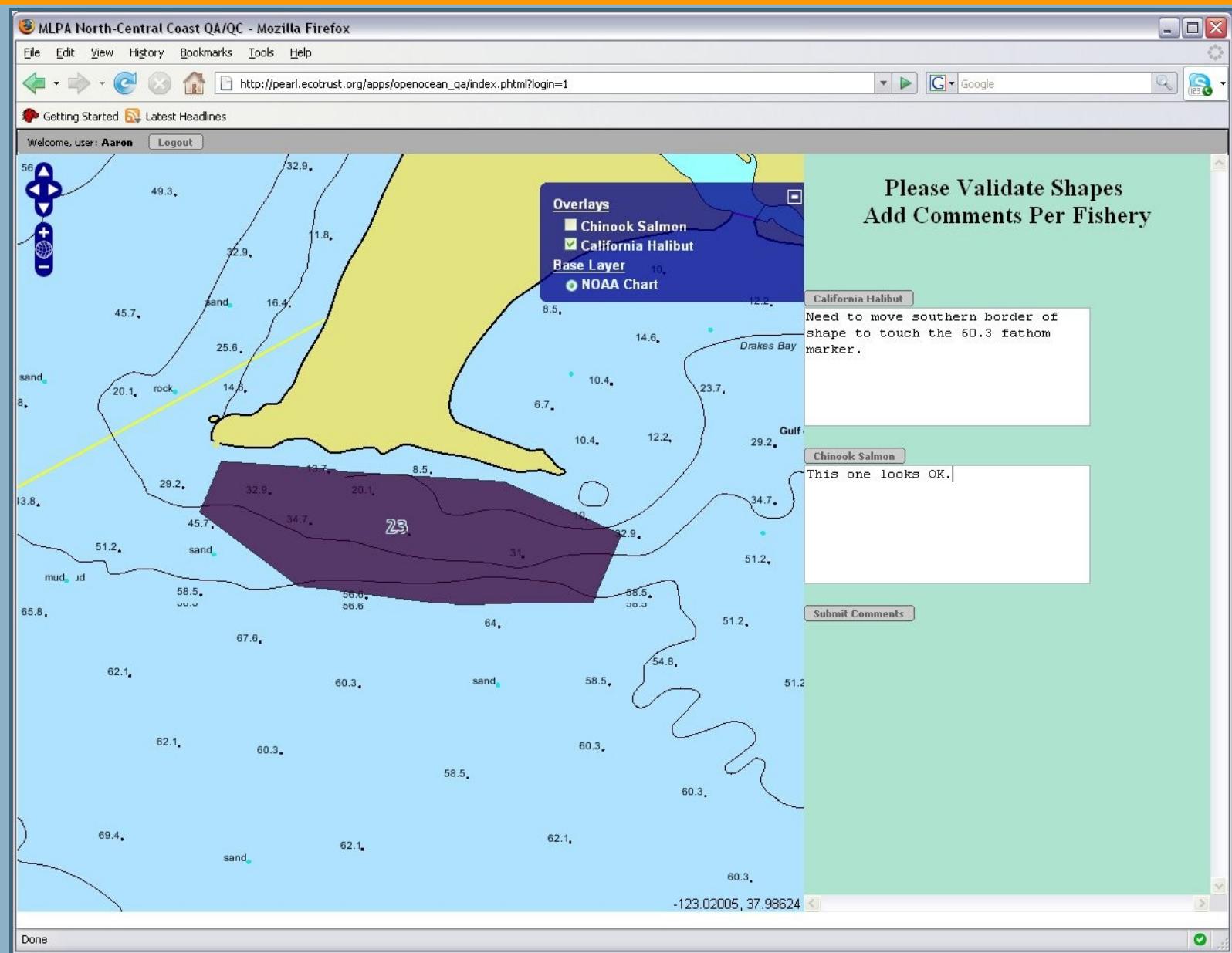
# OpenOceanMap



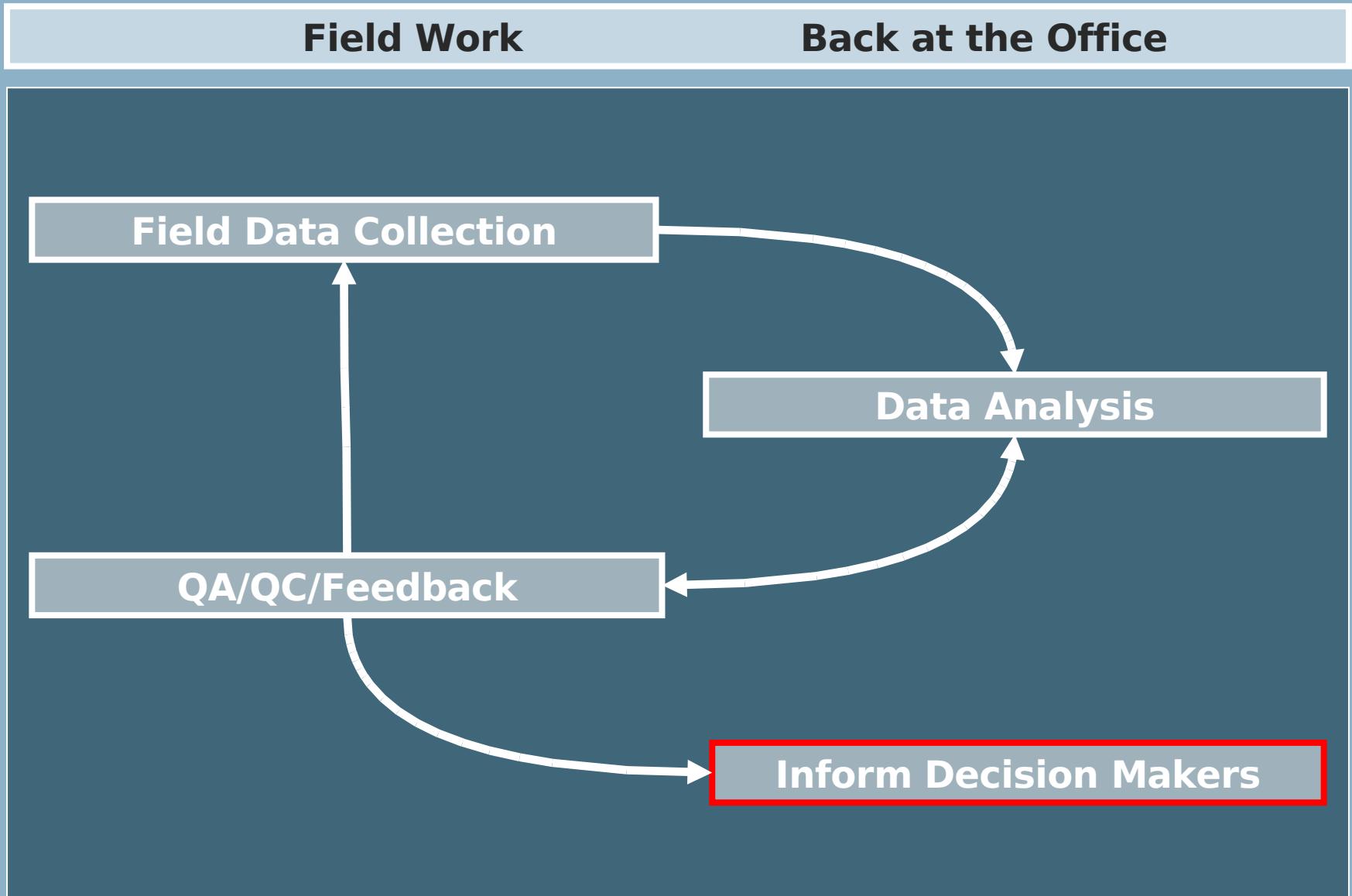
# Other parts of the process...QA/QC



# User Driven QA/QC...



# Other parts of the process...DST's



# Modeling work

CALZONE - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

## CAL-ZONE Decision Support TOOL

Welcome, user: aaron Logout ?

Control - Done!

Marzone - v0\_9\_9\_2

Start

0.002 :: BLM  
-1 :: RANDSEED  
100 :: NUMREPS  
1 :: AVAILABLEZONE  
1000000 :: NUMITNS  
3 :: VERBOSITY

Mon Apr 16 2007 16:04:08 GMT-0700 (Pacific Daylight Time) - CALZONE\_WEB\_DONE

The End

Time passed so far is 3 mins and 38 secs

Best solution is run 75

Time passed so far is 3 mins and 38 secs

Iterative Improvement:Value 2803.0 Cost 167.2 PUs 6389 reserve 6389 Boundary 2635.8 Missing 0 Shortfall 0.00 Penalty 0.0

Best:Value 2803.0 Cost 167.2 PUs 6389 reserve 6389 Boundary 2635.8 Missing 0 Shortfall 0.00 Penalty 0.0

Annealing:Value 2803.0 Cost 167.2 PUs 6389 reserve 6389 Boundary 2635.8 Missing 0 Shortfall 0.00 Penalty 0.0

Output

Intertidal

- Coastal Marsh = 28764.399
- Rocky Intertidal-ns = 127477.863
- Rocky Intertidal-s1 = 387.213
- Sandy or Gravel Beach = 176290.268
- Tidal Flats = 21171.701
- Seagrass Bed - Surfgrass = 130248.357
- Seagrass Bed - Edelgrass = 1740069.803
- Estuary = 6494959.506

Soft Bottom

- 0-30 Meters = 350095658.201001
- 30-100 Meters = 728304457.464001
- 100-200 Meters = 75123409.338001

Map App

Selection Frequency

- 1-10
- 11-20
- 21-30
- 31-40
- 41-50
- 51-60
- 61-70
- 71-80
- 81-90
- 91-100

Overlays

- Counties
- Pref Package
- Calzone Best
- Calzone Sum

Base Layer

- Blue Marble
- Naut Charts
- OL WMS

# Where to go for more info

## Ecotrust

- <http://www.ecotrust.org>

## Reprojected

- <http://www.reprojected.com>

## OSGeo

- <http://www.osgeo.org>

## OSGIS

- Maptools - <http://www.maptools.org>
- FreeGIS - <http://freegis.org/>
- Open Source GIS -  
<http://opensourcegis.org/>

## Standards

- OGC - <http://www.opengeospatial.org/>

## Desktop

- GRASS - <http://grass.itc.it/>
- QGIS - <http://qgis.org/>
- OSSIM - <http://www.ossim.org/>
- UDIG - <http://udig.refractions.net/>
- JUMP – <http://jump-project.org/>
- OpenEV - <http://openev.sourceforge.net/>

## Server/Web

- Mapserver - <http://mapserver.gis.umn.edu/>
- MapBender - <http://www.mapbender.org>
- MapBuilder -  
<http://communitymapbuilder.osgeo.org/>
- MapGuide OS – <http://mapguide.osgeo.org/>
- OpenLayers - <http://www.openlayers.org/>

## Tools

- PostGIS - <http://postgis.refractions.net/>
- Remote Sensing -  
<http://remotesensing.org/>
- GDAL/OGR - <http://gdal.maptools.org/>
- PROJ.4 - <http://proj.maptools.org/>
- R-Statistics - <http://www.r-project.org/>
- GMT - <http://gmt.soest.hawaii.edu/>

## Blogs - Aggregators

- <http://planetosgeo.crschmidt.net/>
- <http://www.planetgs.com/>
- <http://slashgeo.org/>

## Blogs - Individual

- <http://www.osgeo.org/blog>
- <http://zcologia.com/news/>
- <http://openlayers.org/blog>
- <http://blog.qgis.org/>
- <http://mappinghacks.com/>
- <http://hobu.biz/>
- <http://www.reprojected.com/geoblog>

## IRC

- #osgeo, #grass, #mapserver, #openlayers, etc...

## Local User Group

- <http://groups.google.com/group/cugos>