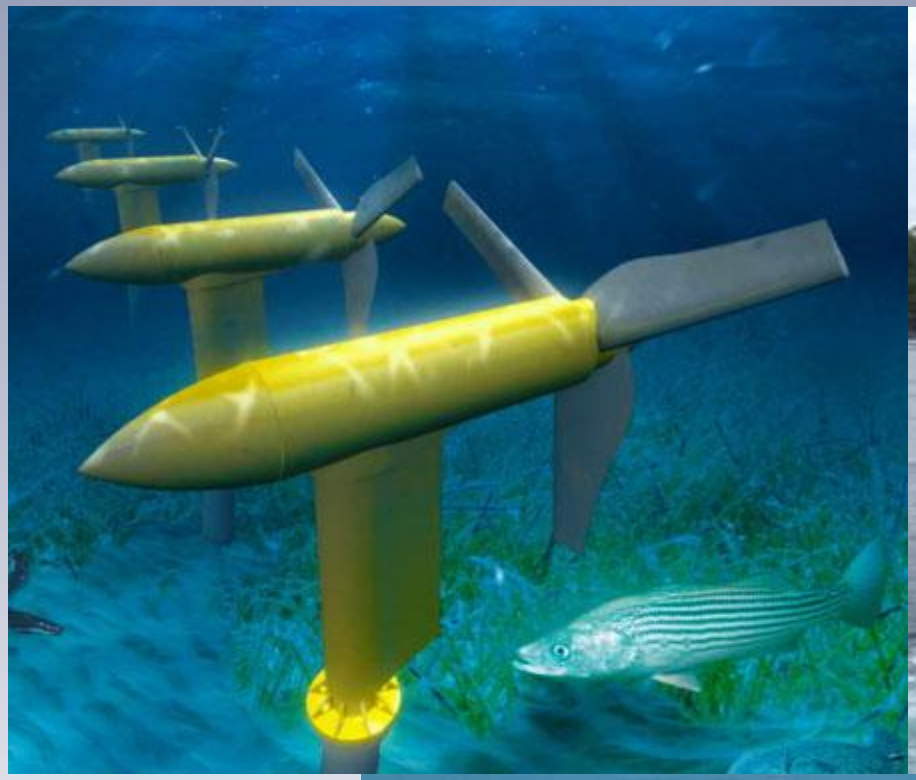
TISEC

OPEN SOURCE, WEB-BASED, SPATIAL DECISION SUPPORT TOOL FOR TIDAL POWER SITING IN WASHINGTON STATE

Tidal In-Stream Energy Conversion



Web-Based Tool and Why

- Cross Platform Support
- Multi-User
- No special software to install… just a browser
- Offload real work to server
- No worrying about versions of data/software
- Integrated GIS capabilities
- Potential for wide range of users…
  - public<->modelers
- Utilizing Open Source Software
  - Reduce Cost
  - Increase transportability

Common Workflows Fit Well With OS GIS Tools

- Data Collection
- Model Integration
- Web-Based DST's

Reduced Expense for Tight Budgets

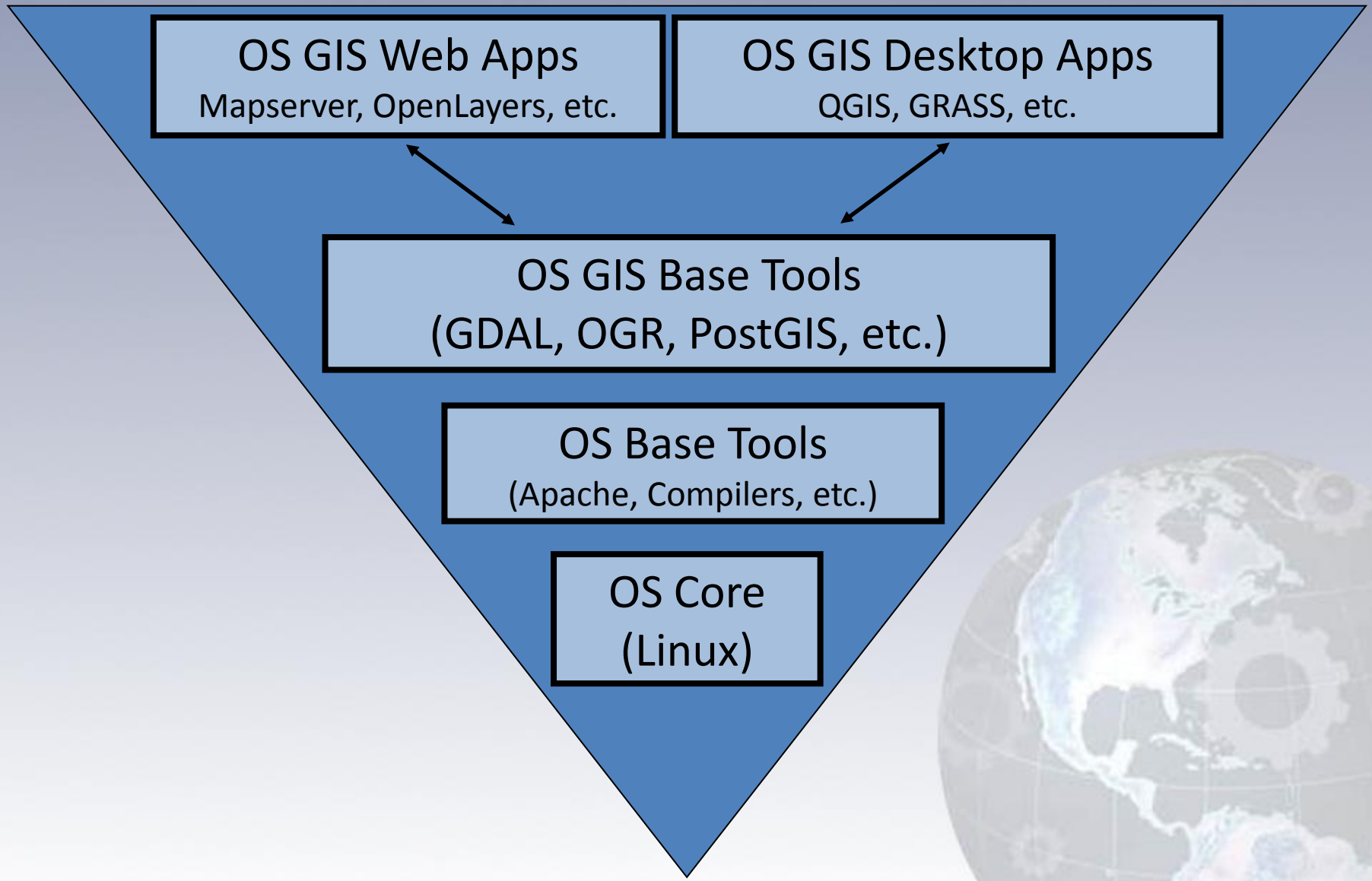
- Software Expense
- Contracting/ Development
- Deployment and Hosting

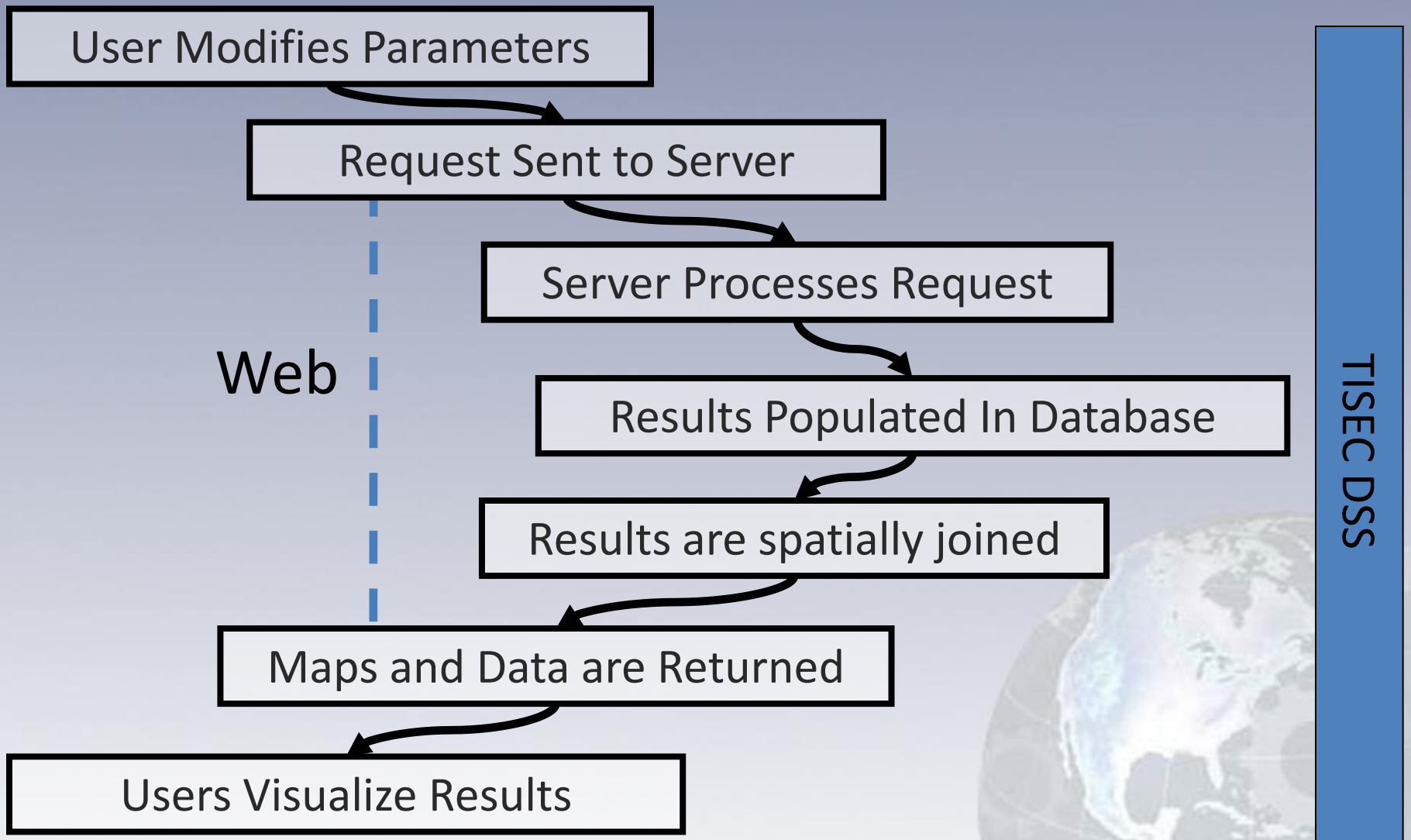
Standards Based – Transparent Development

- Standards Focused
- Open Development
- Community Building

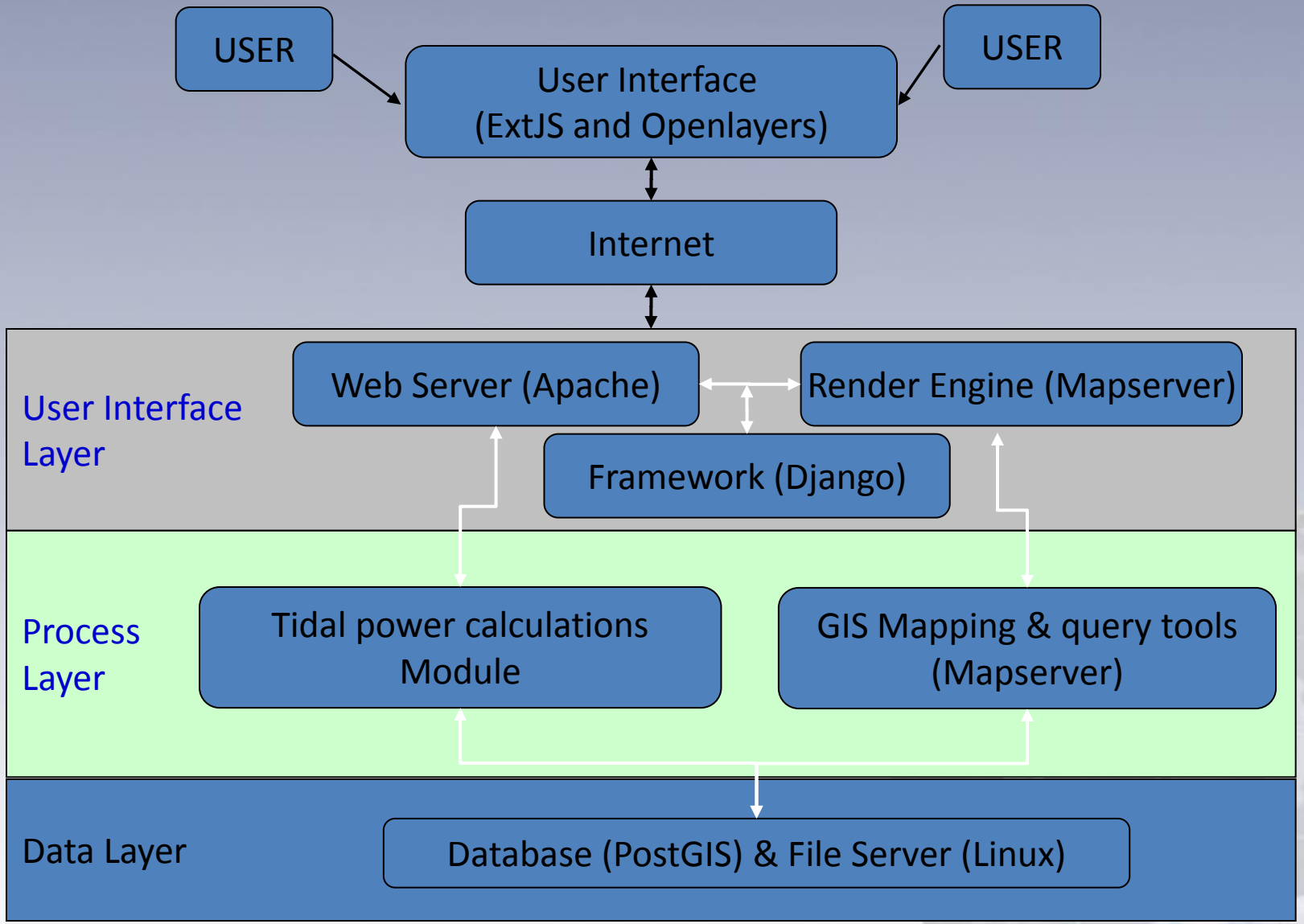
Flexibility

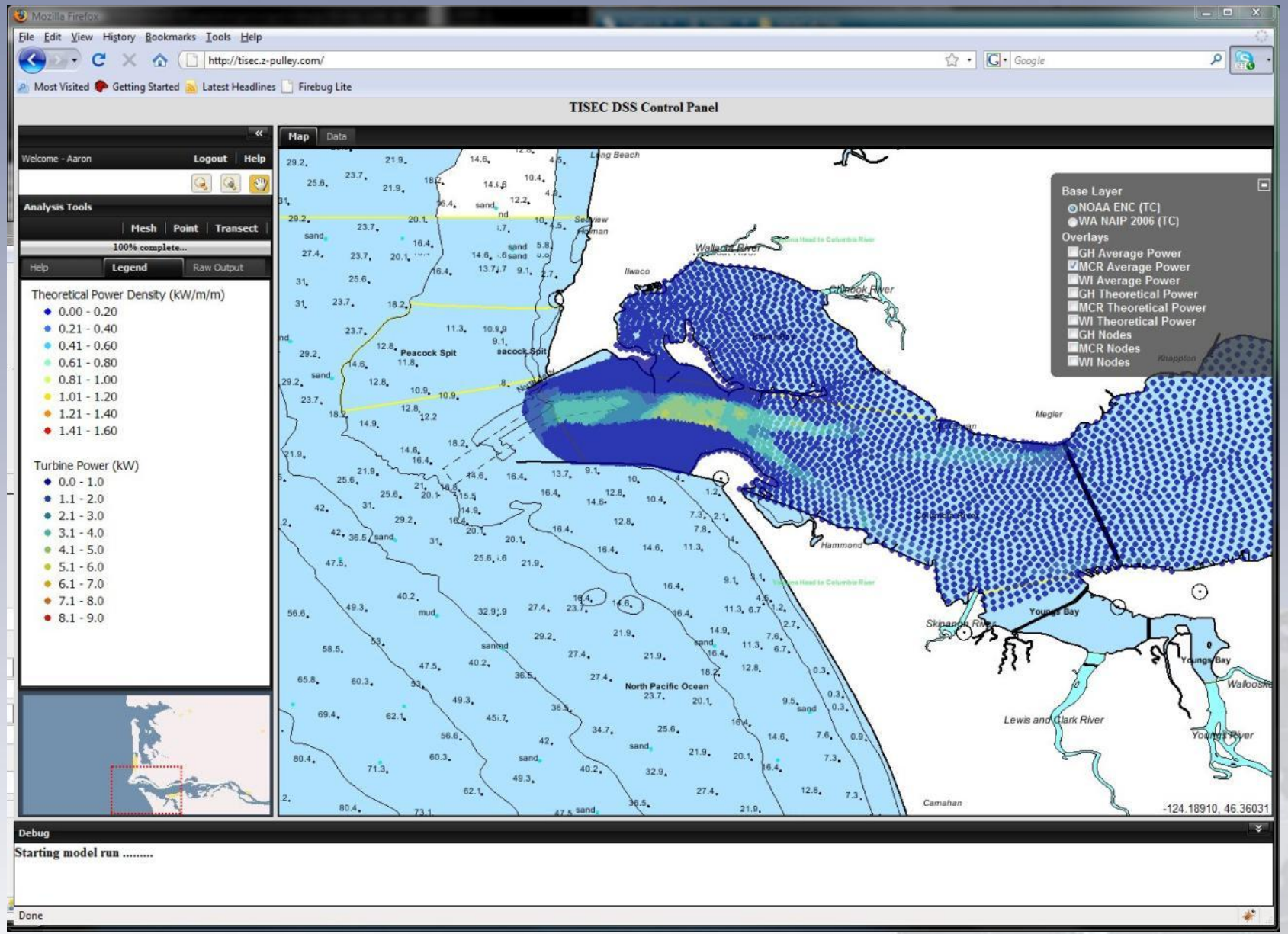
Explaining the Geo Stack




User Modifies Parameters
Request Sent to Server
Server Processes Request
Web
Results Populated In Database
Results are spatially joined
Maps and Data are Returned
Users Visualize Results
TISEC DSS

Architecture

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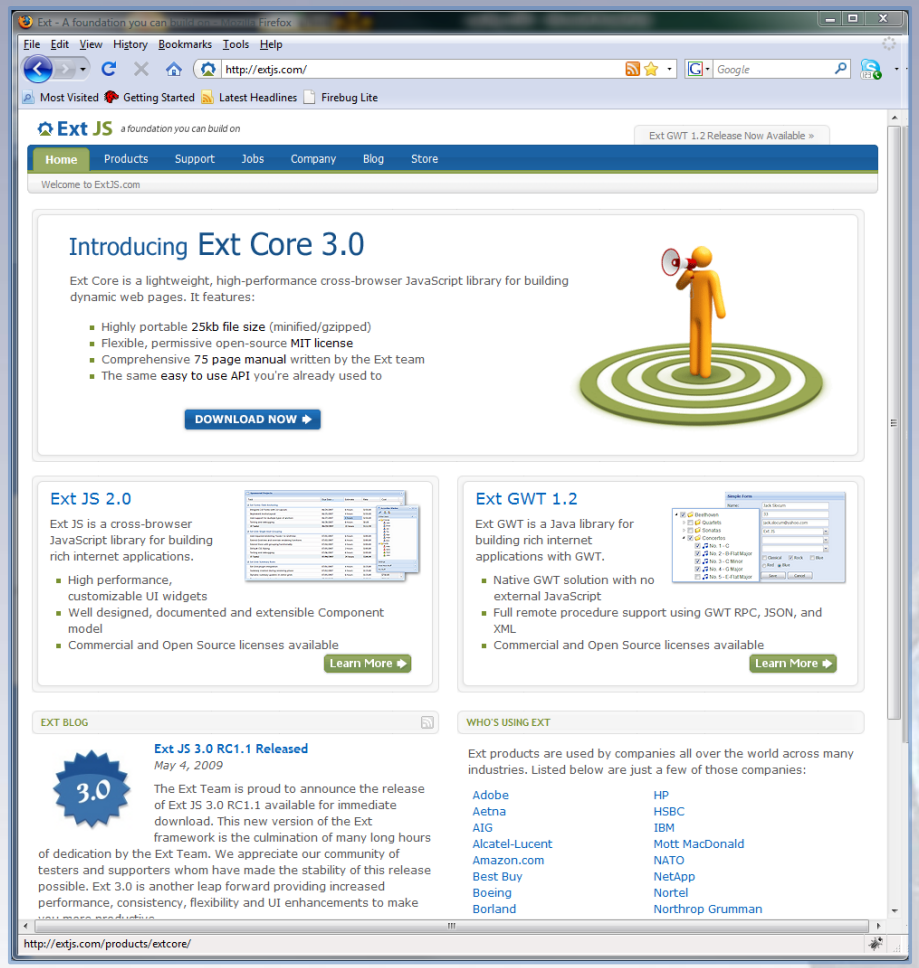
TISEC DSS Control Panel
Welcome - Aaron
Logout | Help
Analysis Tools
Mesh | Point | Transect
100% complete...
Help | Legend | Raw Output
Theoretical Power Density (kW/m/m)
0.00 - 0.20
0.21 - 0.40
0.41 - 0.60
0.61 - 0.80
0.81 - 1.00
1.01 - 1.20
1.21 - 1.40
1.41 - 1.60
Turbine Power (kW)
0.0 - 1.0
1.1 - 2.0
2.1 - 3.0
3.1 - 4.0
4.1 - 5.0
5.1 - 6.0
6.1 - 7.0
7.1 - 8.0
8.1 - 9.0
Map Data
Base Layer
NOAA ENC (TC)
WA NAIP 2006 (TC)
Overlays
GH Average Power
MCR Average Power
WI Average Power
GH Theoretical Power
MCR Theoretical Power
WI Theoretical Power
GH Nodes
MCR Nodes
WI Nodes
Long Beach
Ilwaco
Peacock Spit
North Pacific Ocean
Hammond
Megler
Youngs Bay
Lewis and Clark River
Camahan
-124.18910, 46.36031
Debug
Starting model run .....
Done

ExtJS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Ext JS a foundation you can build on
Ext GWT 1.2 Release Now Available »
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Introducing Ext Core 3.0
Ext Core is a lightweight, high-performance cross-browser JavaScript library for building dynamic web pages. It features:
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Flexible, permissive open-source MIT license
Comprehensive 75 page manual written by the Ext team
The same easy to use API you're already used to
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Native GWT solution with no external JavaScript
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EXT BLOG
Ext JS 3.0 RC1.1 Released
May 4, 2009
The Ext Team is proud to announce the release of Ext JS 3.0 RC1.1 available for immediate download. This new version of the Ext framework is the culmination of many long hours of dedication by the Ext Team. We appreciate our community of testers and supporters whom have made the stability of this release possible. Ext 3.0 is another leap forward providing increased performance, consistency, flexibility and UI enhancements to make
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IBM
Mott MacDonald
NATO
NetApp
Nortel
Northrop Grumman
http://extjs.com/products/extcore/

Django

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django
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The Web framework for perfectionists with deadlines.
Django makes it easier to build better Web apps more quickly and with less code.
Meet Django
Django is a high-level Python Web framework that encourages rapid development and clean, pragmatic design.
Developed four years ago by a fast-moving online-news operation, Django was designed to handle two challenges: the intensive deadlines of a newsroom and the stringent requirements of the experienced Web developers who wrote it. It lets you build high-performing, elegant Web applications quickly.
Django focuses on automating as much as possible and adhering to the DRY principle.
Dive in by reading the overview →
When you're ready to code, read the installation guide and tutorial.
The Django framework
Object-relational mapper
Define your data models entirely in Python. You get a rich, dynamic database-access API for free — but you can still write SQL if needed.
Automatic admin interface
Save yourself the tedious work of creating interfaces for people to add and update content. Django does that automatically, and it's production-ready.
Elegant URL design
Design pretty, cruft-free URLs with no framework-specific limitations. Be as flexible as you like.
Template system
Use Django's powerful, extensible and designer-friendly template language to separate design, content and Python code.
Download
Latest release: 1.0.2
Open source, BSD license
Documentation
Installation guide
Tutorial
Using Django
Reference
More...
Sites that use Django
lawrence.com
An internationally renowned local-entertainment site with events, stories, bands, drink specials and more.
washingtonpost.com
The Washington Post's growing selection of innovative Web database applications.
EveryBlock
A news feed for your block.
LJWorld.com
An industry-leading newspaper site.
Tabblo
An innovative photo-sharing site, with a narrative twist.
Toronto Life
Toronto's city magazine.
See more sites...
Weblog
Django 1.1 beta released
by Jacob Kaplan-Moss on Mar. 23, 2009
Tonight the Django team has issued Django 1.1 beta 1, a preview package for the upcoming Django 1.1 release.
Read more
Django 1.1 alpha 1 released
by James Bennett on Feb. 23, 2009
Tonight the Django team has issued Django 1.1 alpha 1, a preview/testing package for the upcoming Django 1.1 release.
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PyCon 2009
by Jacob Kaplan-Moss on Feb. 20, 2009
It's almost spring, and you know what that means: PyCon is here! Early-bird registration ends soon, so take advantage of the low prices and register now!
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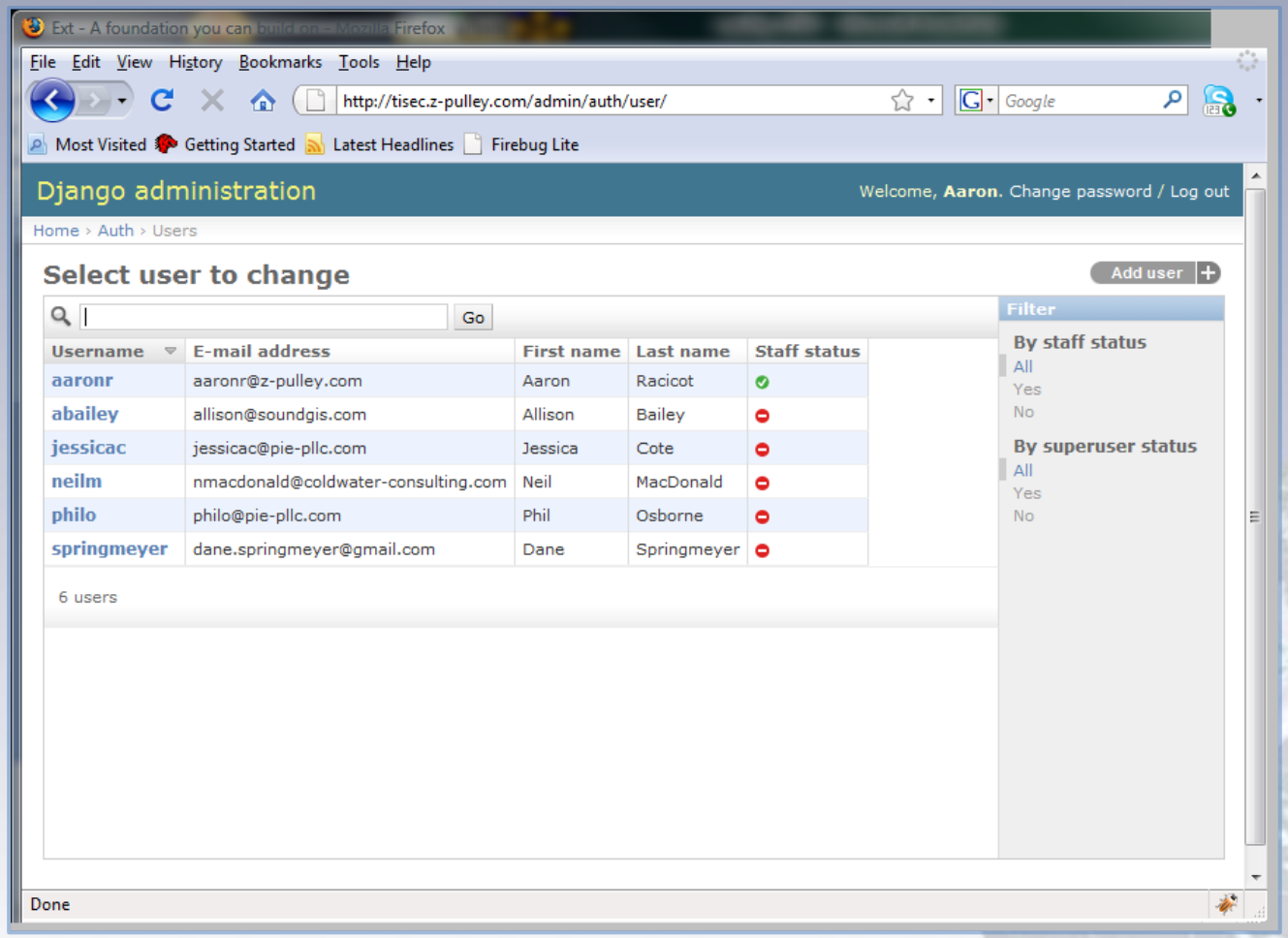
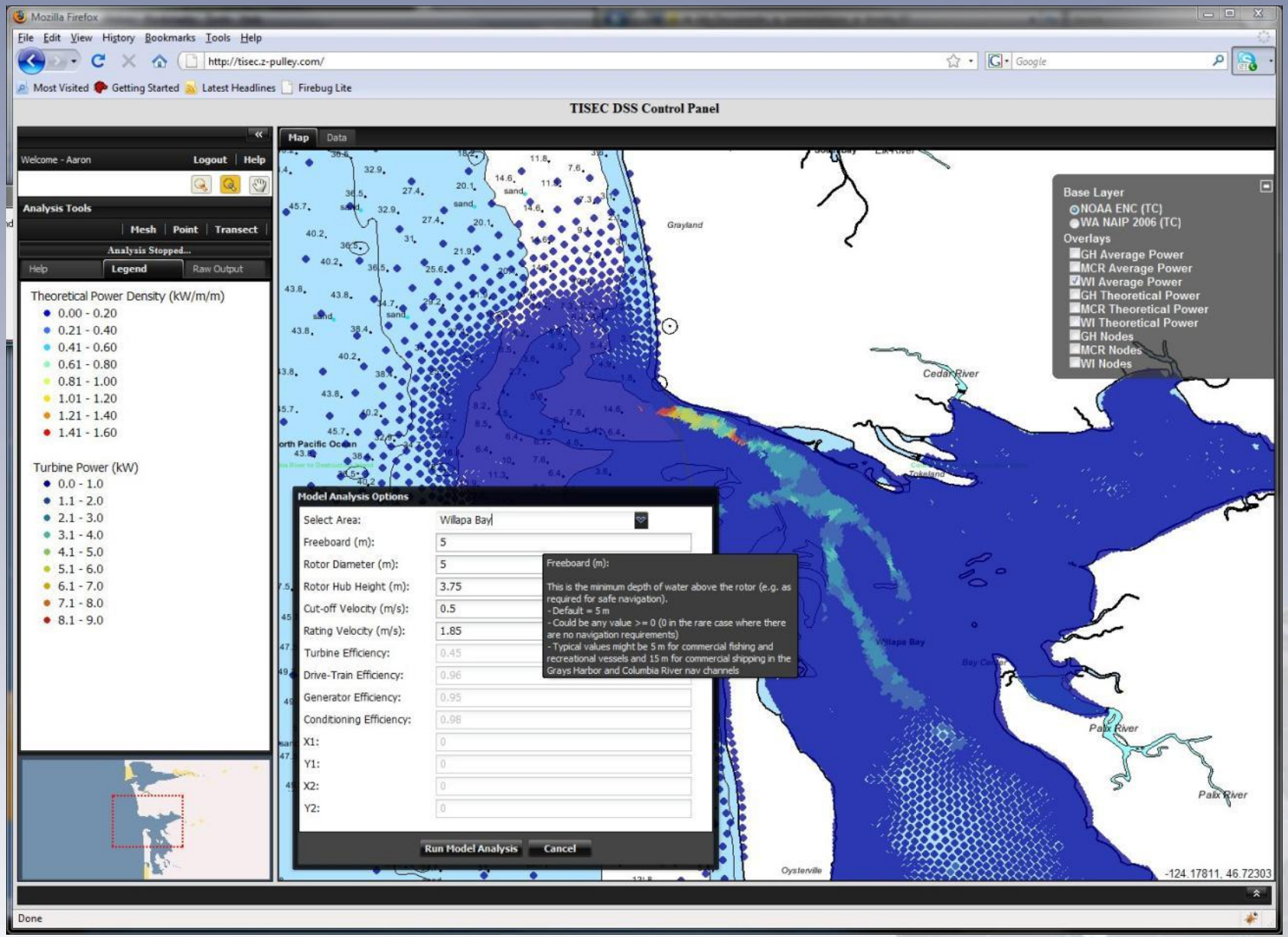
EuroDjangoCon 2009
by Jacob Kaplan-Moss on Feb. 11, 2009
EuroDjangoCon 2009 is a go!
Read more
Done

Admin Interface

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Mesh | Point | Transect
Analysis Stopped...
Help | Legend | Raw Output
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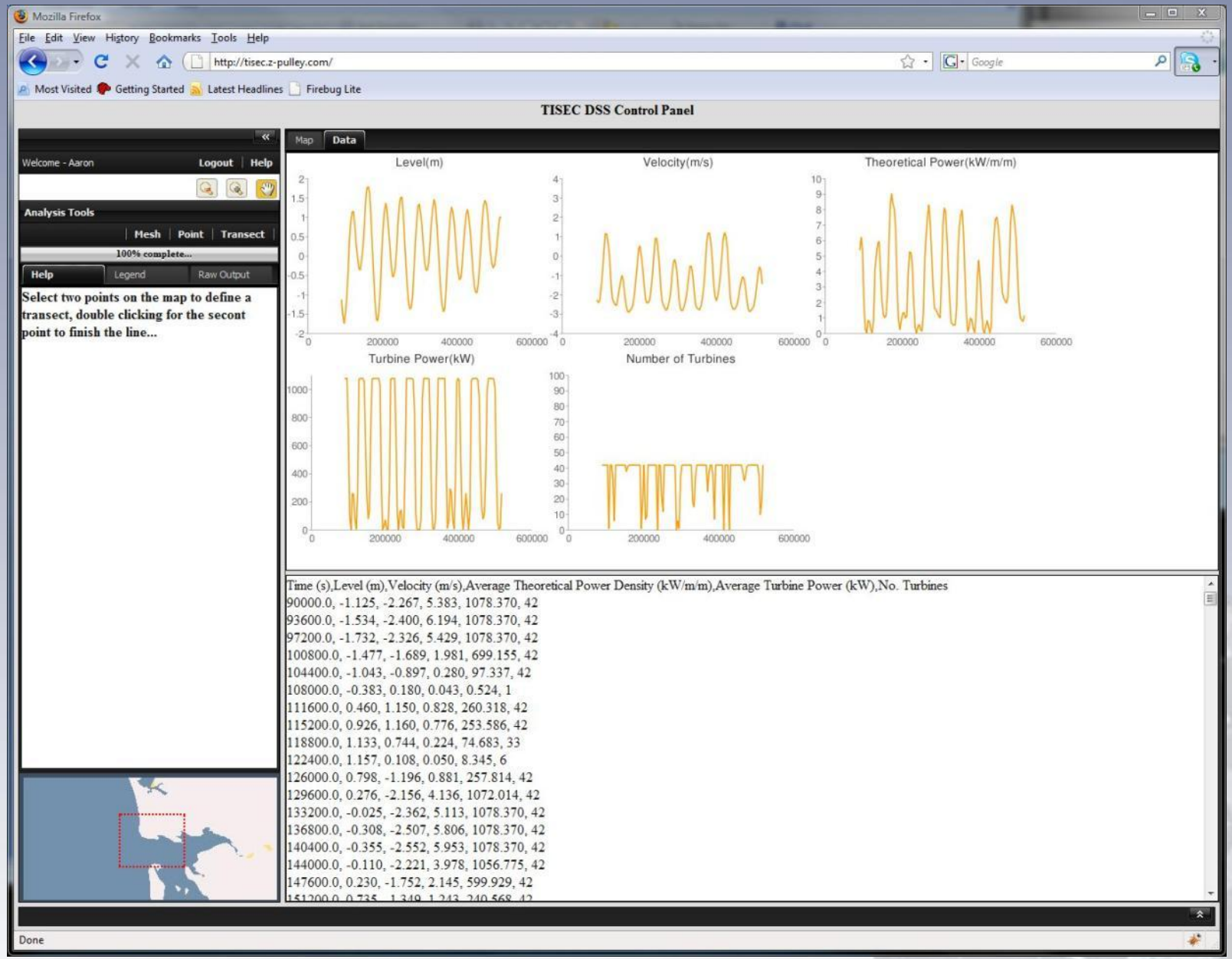
MCR Average Power
WI Average Power
GH Theoretical Power
MCR Theoretical Power
WI Theoretical Power
GH Nodes
MCR Nodes
WI Nodes
Grayland
Cedar River
Tokeland
Willapa Bay
Palix River
Oysterville
Model Analysis Options
Select Area: Willapa Bay
Freeboard (m): 5
Rotor Diameter (m): 5
Rotor Hub Height (m): 3.75
Cut-off Velocity (m/s): 0.5
Rating Velocity (m/s): 1.85
Turbine Efficiency: 0.45
Drive-Train Efficiency: 0.96
Generator Efficiency: 0.95
Conditioning Efficiency: 0.98
X1: 0
Y1: 0
X2: 0
Y2: 0
Run Model Analysis
Cancel
Freeboard (m):
This is the minimum depth of water above the rotor (e.g. as required for safe navigation).
- Default = 5 m
- Could be any value >= 0 (0 in the rare case where there are no navigation requirements)
- Typical values might be 5 m for commercial fishing and recreational vessels and 15 m for commercial shipping in the Grays Harbor and Columbia River nav channels
-124.17811, 46.72303
Done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100% complete...
Help
Legend
Raw Output
Select two points on the map to define a transect, double clicking for the secont point to finish the line...
Map
Data
Level(m)
Velocity(m/s)
Theoretical Power(kW/m/m)
Turbine Power(kW)
Number of Turbines
Time (s),Level (m),Velocity (m/s),Average Theoretical Power Density (kW/m/m),Average Turbine Power (kW),No. Turbines
90000.0, -1.125, -2.267, 5.383, 1078.370, 42
93600.0, -1.534, -2.400, 6.194, 1078.370, 42
97200.0, -1.732, -2.326, 5.429, 1078.370, 42
100800.0, -1.477, -1.689, 1.981, 699.155, 42
104400.0, -1.043, -0.897, 0.280, 97.337, 42
108000.0, -0.383, 0.180, 0.043, 0.524, 1
111600.0, 0.460, 1.150, 0.828, 260.318, 42
115200.0, 0.926, 1.160, 0.776, 253.586, 42
118800.0, 1.133, 0.744, 0.224, 74.683, 33
122400.0, 1.157, 0.108, 0.050, 8.345, 6
126000.0, 0.798, -1.196, 0.881, 257.814, 42
129600.0, 0.276, -2.156, 4.136, 1072.014, 42
133200.0, -0.025, -2.362, 5.113, 1078.370, 42
136800.0, -0.308, -2.507, 5.806, 1078.370, 42
140400.0, -0.355, -2.552, 5.953, 1078.370, 42
144000.0, -0.110, -2.221, 3.978, 1056.775, 42
147600.0, 0.230, -1.752, 2.145, 599.929, 42
Done

Project References

Project Standards:

- **OGC - http://www.opengeospatial.org**
- **W3C - http://www.w3.org/**

UI Framework:

- **ExtJS - http://extjs.com/**

User/Data Management Tools:

- **Django - http://www.djangoproject.com/**

Data Visualization Tools:

- **OpenLayers - http://www.openlayers.org**

Map Engine / Rendering Tools:

- **TileCache - http://www.tilecache.org**
- **FeatureServer – http://www.featureserver.org**
- **Mapserver - http://mapserver.gis.umn.edu**

Data Management Tools:

- **Metadata – http://geology.usgs.gov/tools/metadata/standard/metadata.html**
- **PostGIS - http://postgis.refractions.net**
- **GDAL/OGR - http://gdal.maptools.org**

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