

# **Beach Conditions Reports for the Gulf Coast of Florida**

***Constructing a collaborative tool for the dissemination of  
real-time environmental conditions using open-source software***

***<http://coolgate.mote.org/GeoTools2009/>***

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# What is FOSS?

- Free and Open Source Software
- Liberally licensed
- Users can study, change and improve
- Everyone has access to the source code
- Can be modified and redistributed
- Often based on open standards

# Examples of FOSS

- Linux (CentOS, OpenSuSE, Ubuntu)
- Thunderbird email client
- Firefox web browser
- FireBug Javascript/CSS debugger
- OpenOffice Suite
- MySQL database
- GRASS/Quantum GIS
- R Project (statistical computing)

# What is NOT FOSS?

- Microsoft Windows/Office
- Oracle Database
- ArcGIS
- Adobe Flash (free, but not FOSS)
- Google Earth (entry level free, but not FOSS)

# Why We Chose FOSS

- Small group w/1 IT person
- No funding for expensive commercial s/w
- Math/Oceanography libraries plentiful
- Able to leverage others work (see bullet 1)
- Google Earth/Maps free for basic usage
- BUT ---

# But Google isn't FOSS!!!

- It is free, but it's not open source
- We subscribe to the 'IIWUI!' principle:
  - If it works, use it!
- Google handled the 'heavy lifting' for viz
- Our target audience already use Gmaps
- Don't be hardcore about using FOSS
- Use what works best for you

# Why Beach Conditions Reports?

- 2005 Red Tide bloom was devastating
- Huge demand from public for better info
- Reports lagged reality by days or weeks
- Bloom impact could be localized:
  - One beach great, the other nasty
- Potential impact on local economies:
  - Shellfish
  - Tourism

# What was needed

- 365 days/year coverage, esp weekends
- Not reliant on single individual or instrument
- Local knowledge of conditions essential
- Beach reporter interface must be 'no brainer'
- Submission should be made on the beach
- User interface must be simple for public
- Data must be archived

# BCRS Version 1

- Google Maps user interface
- Blackberries issued to County Lifeguards
- Started with one county: Sarasota
- Twice-daily reporting at 10am and 3pm
- Bare-bones 'proof of concept' version
- It was very well received so...
- Voice-synthesized telephone interface added and...

# BCRS Version 2

- Added 4 counties:
  - Manatee, Pinellas, Lee and Collier
- Adding new counties necessitated total redo:
  - Version 1 was 'make it work'
  - Rebuilt system to allow for modular growth
  - Flexibility of FOSS paramount to our success
  - New version 'Web 2/AJAX' powered
  - No change to Beach Reporters interface
  - 6 Panhandle Counties added in Sept. 2008

# BCRS Version 2

**Beach Conditions Reports for the Gulf Coast of Florida™**

Map | Satellite | Hybrid | Terrain

This site powered by

Home

Panhandle

Southwest

About Us

Contact Us

Glossary/Help

Email

[Get Email Updates](#)

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Google

Map data ©2009 Tele Atlas - [Terms of Use](#)

**General Information**

This service provides beach condition reports from select beaches in the Southwest coast of Florida and the Florida Panhandle.

The reports are subjective (no measurements taken, just an estimate) and designed to indicate to the beachgoer which beach may be more preferable to visit at a particular time.

Done

# Panhandle Counties

Beach Conditions Reports for the Gulf Coast of Florida - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://coolgate.mote.org/beachconditions/ Google

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## Beach Conditions Reports for the Gulf Coast of Florida™



Home

Escambia

Santa Rosa

Okaloosa

Walton

Bay

Gulf

Franklin

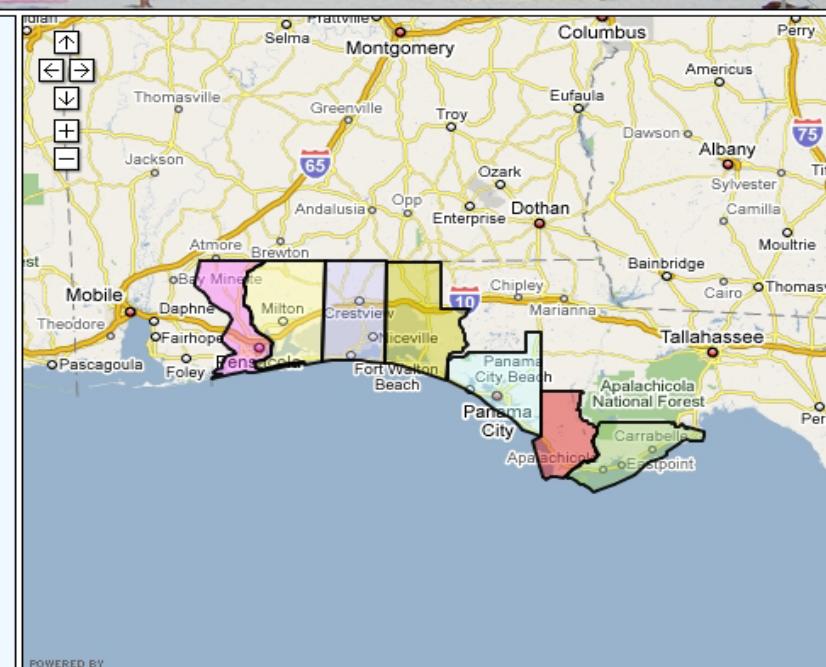
Contact Us

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Email

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This site powered by

- SPIN 98.1
- Alltel wireless
- Google Maps
- php
- MySQL
- CentOS
- python powered

Done

# Southwest Counties

Beach Conditions Reports for the Gulf Coast of Florida - Mozilla Firefox

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http://coolgate.mote.org/beachconditions/ Google

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## Beach Conditions Reports for the Gulf Coast of Florida™

The website displays a map of the Florida peninsula with a focus on the southwest coastal areas. Major cities like Tampa, St. Petersburg, Clearwater, and Fort Myers are labeled. The map is overlaid with various colored regions, likely indicating different beach monitoring areas or conditions. A sidebar on the left provides links to local county pages (Sarasota, Manatee, Pinellas, Lee, Collier) and contact information. The right sidebar lists the site's technical stack, including MySQL, PHP, CentOS, and Python.

Home

Sarasota  
Manatee  
Pinellas  
Lee  
Collier

Contact Us  
Glossary/Help

Email

[Get Email Updates](#)

POWERED BY

This site powered by:

- elltel wireless
- Google Maps
- php
- MySQL
- CentOS
- python

Done

# Lido Key Infobox

Beach Conditions Reports for the Gulf Coast of Florida - Mozilla Firefox

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http://coolgate.mote.org/beachconditions/ Google

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## Sarasota County

### Lido Key

Last Report:	02/22/2009 2:37pm
Water Color:	Clear
Wind Direction:	W
Surf Conditions:	Calm
Dead Fish:	None
Respiratory Irritation:	None
Beach Flag:	Green
Red Drift Algae:	None
Red Drift Location:	None
Surf Type:	Calm
Surf Height:	0-1
Rip Currents:	Absent

Map showing Sarasota Bay, Longboat Key, Lido Key, and Verna. Routes 45, 301, 75, 41, and 17 are indicated. A green dot marks Lido Key.

Map data ©2009 Tele Atlas - [Terms of Use](#)

### Sarasota County Links

Links to Red Tide Cell Count/Bloom status reports:

[Mote Marine Laboratory](#) [Our Gulf Environment](#) [Florida Fish and Wildlife Research Institute](#) [NOAA HAB Bulletin](#)  
[Florida Department of Agriculture and Consumer Services, Division of Aquaculture](#)

For impacts at the beach:

UV: [Sunwise](#) Weather, tides, air and water temperatures: [Weather Underground](#)  
[Weekly bacterial conditions](#) [Florida Healthy Beaches Program](#)

Done

This site powered by:

- Redshift
- calltel wireless
- Google Maps
- php
- MySQL
- CentOS
- python powered

# BCRS Architecture

- Primarily Javascript
  - Most code embedded in bcrs.html file
  - County outline polygons in separate file
- PHP on the server for database connectivity
- Python for report generation
- MySQL database
- Dynamic, but most data embedded right now
- XMLHttpRequest used for click counts & email

# Architecture cont...

- Javascript:
  - Subscription form handling
  - Email address validation via regex
- PHP:
  - MySQL database submission
  - Email delivery
- Python:
  - Report Generation
  - Georeferencing

# BCRS Emails

Beach Conditions Reports for the Gulf Coast of Florida - Mozilla Firefox

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## Beach Conditions Reports for the Gulf Coast of Florida™



Manage your Beach Conditions Reports email subscription

Reports are selectable by county only, not individual beaches  
Passwords are required to prevent unauthorized usage.  
Reports are mailed twice daily at 10:30am and 3:30pm

Select a county: Sarasota

Choose an action:  Subscribe  Unsubscribe  Unsubscribe all  
 Forgot Password  Delete Account

email address: \_\_\_\_\_  
password: \_\_\_\_\_

submit

This site powered by

alltel wireless

Google Maps

php

MySQL

CentOS

python powered

Get Email Updates

Done

# Sample Email

Subject	Sender	Date
• addEmail.php ALERT	beachconditions@m...	09:01 AM
• Beach Conditions Report: Escambia Co...	beachconditions@m...	10:30 AM
• Beach Conditions Report: Okaloosa Co...	beachconditions@m...	10:30 AM
• Beach Conditions Report: Sarasota Co...	beachconditions@m...	10:30 AM
• Beach Conditions Report: Lee County	beachconditions@m...	10:30 AM
<b>Subject: Beach Conditions Report: Sarasota County</b>		
<b>From:</b> <a href="mailto:beachconditions@mote.org">beachconditions@mote.org</a>		
<b>Date:</b> 10:30 AM		
<b>To:</b> <a href="mailto:rdc@mote.org">rdc@mote.org</a>		
<hr/> ----- Location: Lido Key Last Report: 02/22/2009 at 02:37pm Dead Fish: None Water Color: Clear Respiratory Irritation: None Surf: Calm Wind Direction: W Beach Flag: Green Red Drift Algae: None Surf Type: Calm Surf Height: 0-1 Rip Current: Absent ----- ----- Location: Manasota Beach Last Report: 02/22/2009 at 03:34pm Dead Fish: None Water Color: Moderate Respiratory Irritation: None Surf: Calm Wind Direction: N Beach Flag: Green Red Drift Algae: None Surf Type: Wind Chop Surf Height: 0-1 Rip Current: Absent ----- ----- Location: Nokomis Last Report: 02/22/2009 at 09:58am Dead Fish: None Water Color: Clear Respiratory Irritation: None Surf: Calm Wind Direction: E Beach Flag: Green Red Drift Algae: None Surf Type: Calm Surf Height: 0-1 Rip Current: Absent -----		

# BCRS Voice Hotline

- Originally for public w/no access to computer
- Rapidly became favorite of surfers, beachgoers
- Users dial 1-941-beaches (1 line at present)
- Most counties/beaches available
- Usage heaviest during wind/surf events

# Voice Hotline Architecture

- Composed of 5 applications:
  - maxtrix\_cepstral.tcl:
    - Written in tcl
    - Uses mysqltcl connector
    - Retrieves reports from db and builds text files
    - Execs cepstral voice synth to convert text to WAV
  - convert\_1.01.sh:
    - Written in bash shell
    - Converts WAV files to pvf using wavtopvf
    - Converts PVF files to RMD using pvftormd

# Voice architecture cont...

- Vgetty:
  - Extends voice capabilities to mgetty
  - Written by Marc Eberhard in 2003
  - Documentation very poor
  - But it's FOSS!
- matrix\_ivr.tcl:
  - Primary application for hotline
  - Written in tcl
  - Takes 'handoff' from vgetty and plays voice files
- Cepstral voice synthesizer
  - Commercial application (FOSS versions just didn't cut it)

# Hotline Usage Stats

Beach Conditions Hotline Call Report - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://coolgate.mote.org/beachcondition

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## Beach Conditions Hotline Call Report

Data begins 25 January, 2008  
Last Entry: SiestaKey at 13:25:42 on 2009-02-20

Location	Calls
ManasotaBeach	217
SiestaKey	216
VeniceBeach	149
Nokomis	122
LidoKey	105
ManateeBeach	61
VeniceNorthJetty	54
CoquinaBeach	52
NotAvailable	44
NaplesPier	38
LowdermilkPark	34
BarefootBeach	14
VanderbiltBeach	14
BonitaBeach	11
LoversKeyStatePark	11
BowditchPointPark	11
FortDesoto	10
HoneymoonIsland	10
CaladesiIsland	6
MarcosIslandCityAccess	6
TigertailBeach	6
SeagateBeach	5
SouthMarcoBeach	5
LynnHallBeachPark	3
PensacolaBeach	2

Call Total: 1206

Done

# Submission Form (what the Lifeguards see)

Sarasota County Submission Form - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://coolgate.mote.org/beachconditio Google

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## Sarasota County Submission Form

**Locations:**

Lido  Siesta  Nokomis  
 N Jetty  Venice  Manasota

**Dead Fish:**

None  Some  Many

**Respiratory Irritation:**

None  Slight  Mod  High

**Water Color:**

Clear  Mod  Dark

**Wind From The:**

N  E  S  W  None

**Surf Conditions:**

Calm  Mod  Rough

**Surf Type**

Calm  Light Chop  Ground Swell  Shore Break  Wind Chop  Heavy Surf

**Surf Height**

0-1  1-2  2-3  3-4  4-5  5-6  6+

**Rip Currents**

Absent  Present

**Beach Flag:**

Green  Yellow  Red  
 Double Red  Purple  Yellow+Purple  N/A

**Red Drift Algae:**

**Quantity**

None  Some  Thick

**Location**

None  In Surfline  On Beach  Beach+Surfline

reset submit

# Submission validation

Your Submission - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://coolgate.mote.org/beachconditio Google

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**Your Submission:**

**Location:** Manasota Beach  
**Date:** 2009-02-23 09:47:08  
**Dead Fish:** Many  
**Resp. Irritation:** High  
**Water Color:** Dark  
**Wind:** None  
**Flag:** Red  
**Red Drift:** Thick  
**Red Drift Loc:** Beach+Surfline  
**Surf Conditions:** Rough  
**Surf Type:** Heavy Surf  
**Surf Height:** 6+  
**Rip Currents:** Present

**Website visitors since Jan 2008**

**Siesta Key:** 7454  
**Venice Beach:** 6329  
**Lido Key:** 4992  
**Manasota Beach:** 4754  
**Nokomis:** 3838  
**Venice North Jetty:** 3463

**Thanks!**

# The Click Report

- Standard web usage tools didn't capture usage
- Clicking on many beaches == 1 page hit
- We wanted accurate count of beaches visited
- Used XMLHttpRequest and php on server
- Beach, Date and Time logged in DB

# Click Stats

Beach Conditions Click Report - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://coolgate.mote.org/beachconditions/secure/click

Most Visited Getting Started Latest Headlines

## Beach Conditions Click Report

Data begins 14 January, 2008  
Last Entry: Manasota Beach at 09:44:08 on 2009-02-23

Location	Clicks
Siesta Key	7454
Venice Beach	6329
Lido Key	4992
Manasota Beach	4754
Nokomis	3838
Venice North Jetty	3463
Tarpon Bay Beach	3048
Naples Pier	3023
Lynn Hall Beach Park	2951
Lovers Key State Park	2680
Coquina Beach	2563
South Marco Beach	2427
Manatee Beach	2385
Bonita Beach	2363
Tigertail Beach	2139
Barefoot Beach	2093
Seagate Beach	1953
Lowdermilk Park	1891
Vanderbilt Beach	1862
Bowditch Point Park	1839
Caladesi Island	1529
Lighthouse Point	1455
Fort Desoto	1225
Marco Island City Access	330
Henderson Beach State Park	228
Honeymoon Island	224
Destin Beach	200
Fort Walton Beach	192
Pensacola Beach	120
St. George Island Bayside	119
St. Joseph Bayside	108
St. George Island Gulfside	100
Sanibel Sea School	77
St. Joseph Gulfside	74
Longboat Key	31
Perdido Key	9

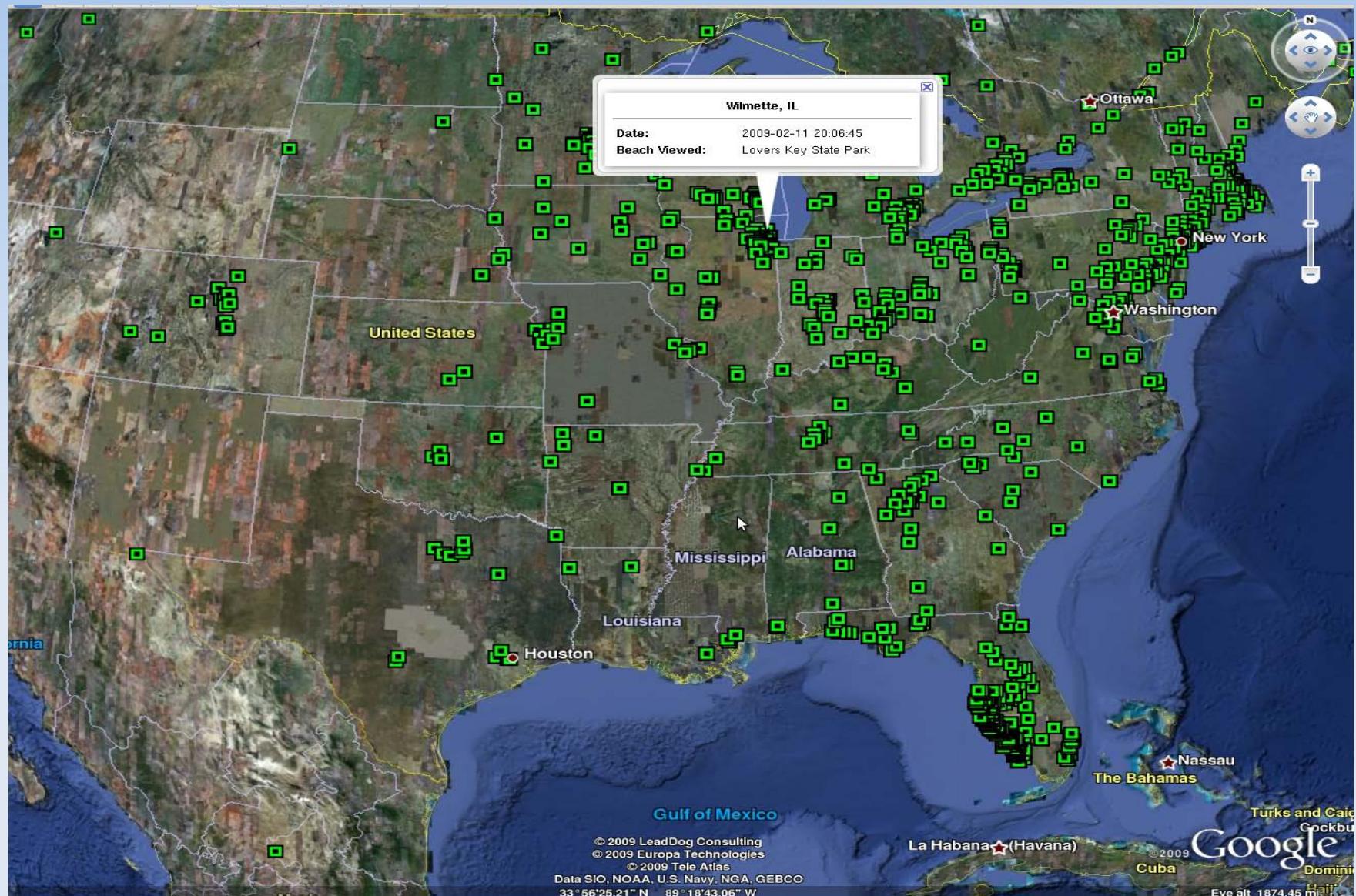
Click Total: 70068

Done

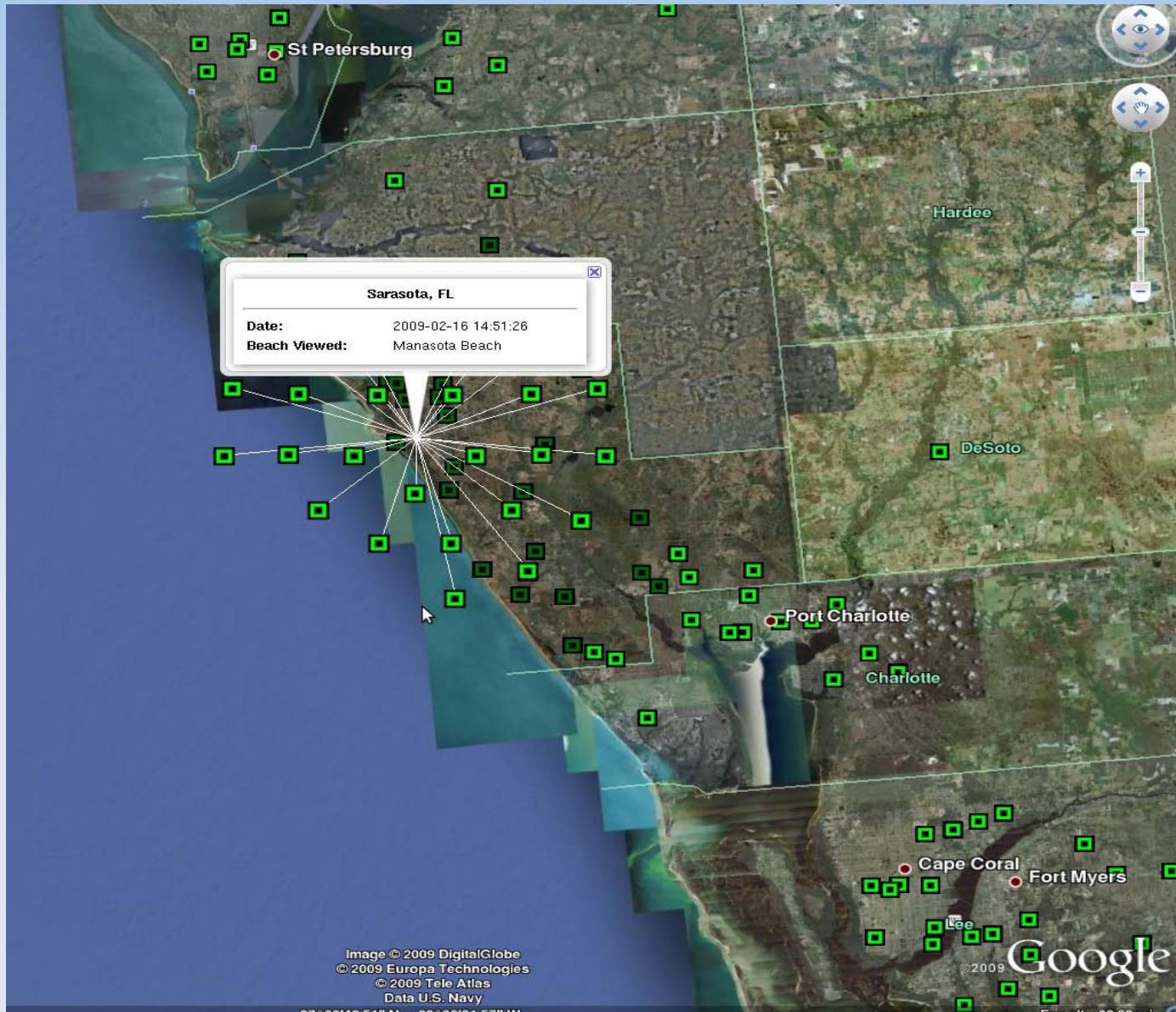
# Where do our users live?

- IP addresses collected since December 2008
- Python application georeferences IP
- Uses GeolP python library from MaxMind
- Uses free 'City' database from MaxMind
- Generates Google Earth KML file
- Gave us some surprising results...

# Snowbird Clusters



# ...and Local Users



# What's Next

- Fully AJAX-ize application
- Use javascript toolkit: dojo or yui
- Support Google Earth browser plug-in
- Store GIS data (polygons) as BLOBS in DB
- Add reporting/charting module for managers
- Authenticate via LDAP instead of .htaccess
- XML output for IOOS/GCOOS
- Migrate voice line to Asterisk (FOSS PBX)

# Thanks To

FL DOH

FL FWRI

START

CDC

NOAA

Sarasota DOH

City of Naples Beach Patrol

Florida State Parks Services

Collier County Parks and Recreation

Santa Rosa Island Authority

Okaloosa County Public Safety

Destin Fire Control District

Sarasota County Beach Patrol

Manatee County Marine Rescue Division