

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

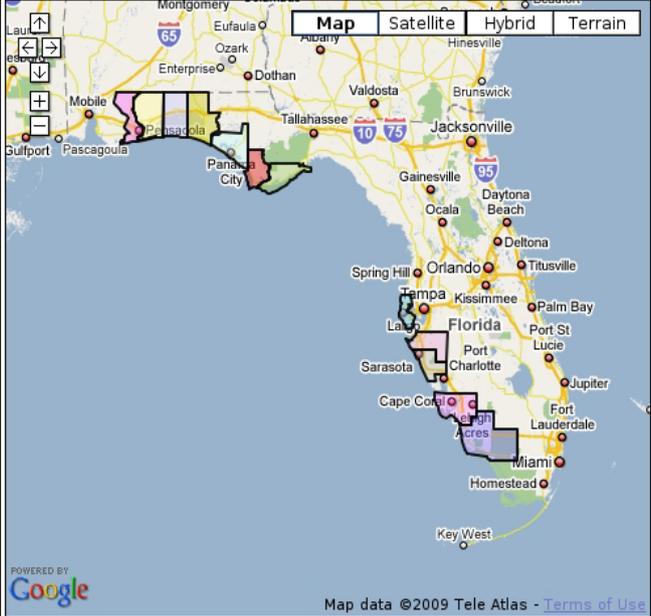
Beach Conditions Reports for the Gulf Coast of Florida^(TM)



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Map Satellite Hybrid Terrain



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

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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/

Most Visited Getting Started Latest Headlines

Beach Conditions Reports for the Gulf Coast of FloridaTM



Home

Escambia

Santa Rosa

Okaloosa

Walton

Bay

Gulf

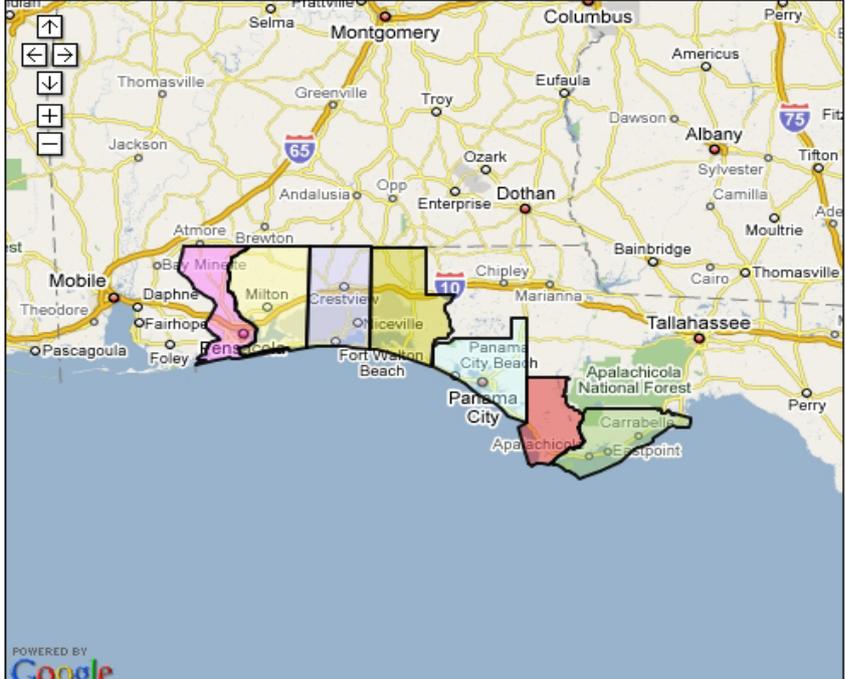
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Done

Lido Key Infobox

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

File Edit View History Bookmarks Tools Help

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

Most Visited Getting Started Latest Headlines

Sarasota County



Home

Sarasota

Manatee

Pinellas

Lee

Collier

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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



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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

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

File Edit View History Bookmarks Tools Help

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

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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:

Choose an action: Subscribe Unsubscribe Unsubscribe all

Forgot Password Delete Account

email address:

password:

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Done

Sample Email

Subject	Sender	Date
• addEmail.php ALERT	• beachconditions@m...	• 09:01 AM
• Beach Conditions Report: Escambia C...	• 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

Subject: Beach Conditions Report: Sarasota County
From: beachconditions@mote.org
Date: 10:30 AM
To: rdc@mote.org

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

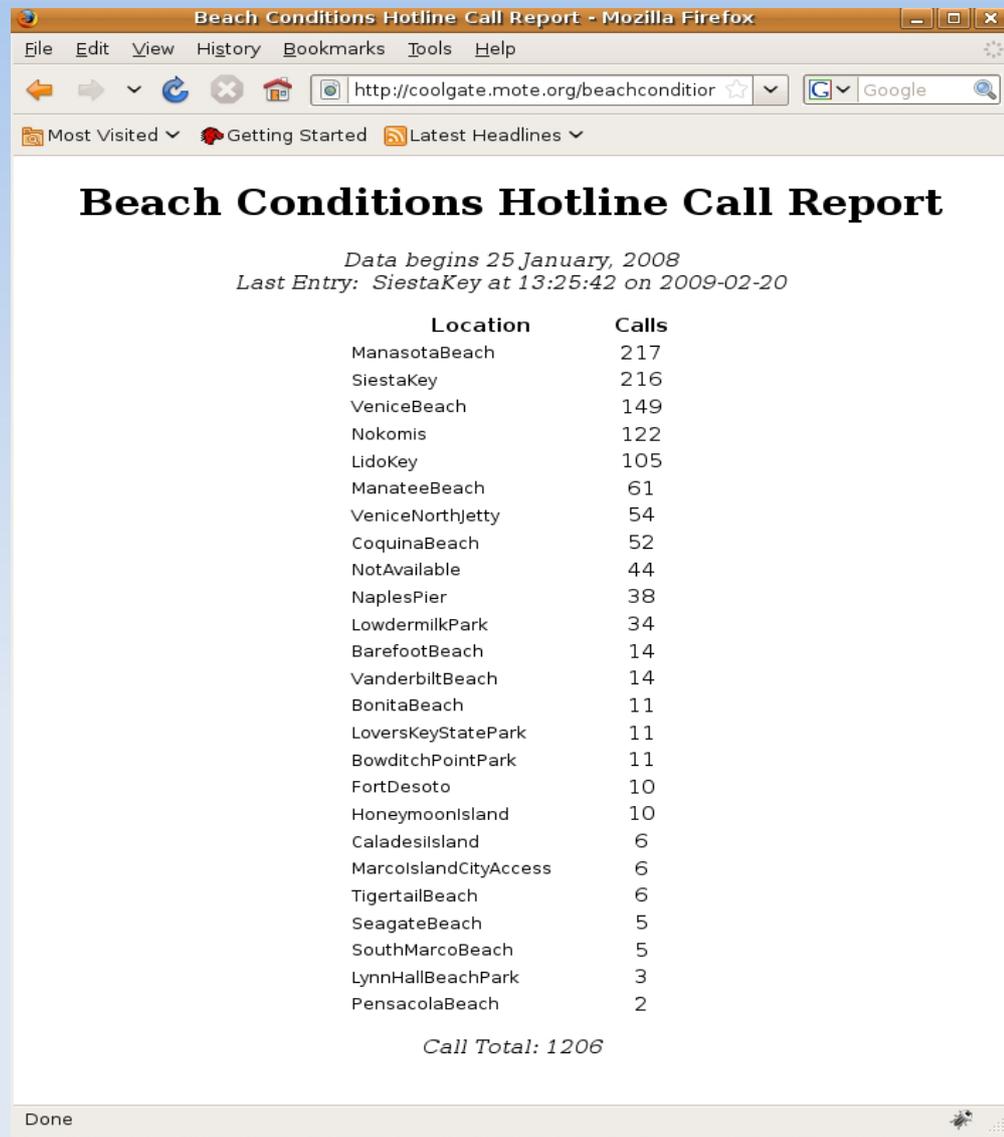
Voice Hotline Architecture

- 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

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
MarcoIslandCityAccess	6
TigertailBeach	6
SeagateBeach	5
SouthMarcoBeach	5
LynnHallBeachPark	3
PensacolaBeach	2

Call Total: 1206

Submission Form (what the Lifeguards see)

Sarasota County Submission Form - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://coolgate.mote.org/beachconditio

Most Visited Getting Started Latest Headlines

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

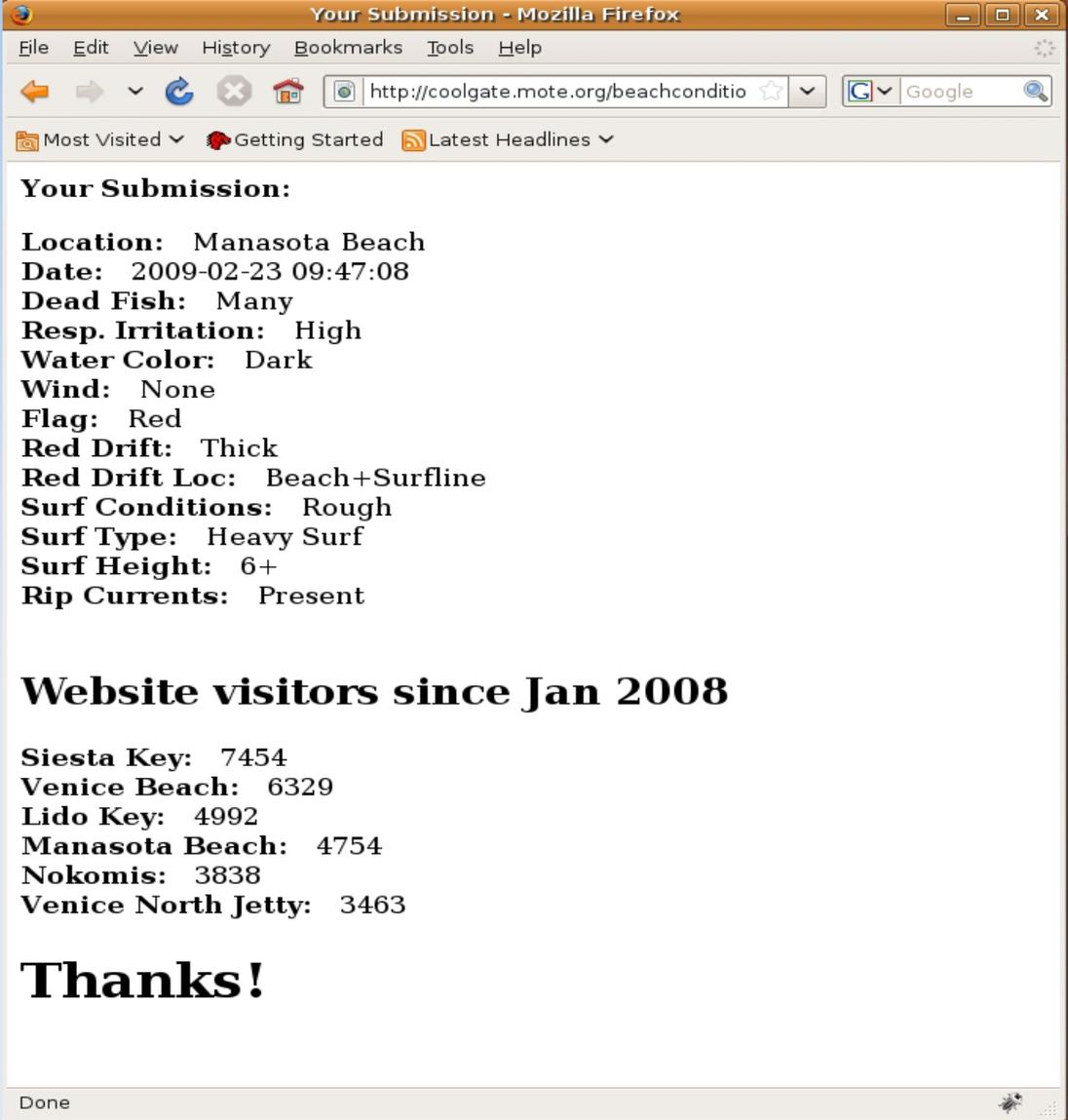
Location

None In Surfline On Beach Beach+Surfline

reset submit

Done

Submission validation



The screenshot shows a Mozilla Firefox browser window with the title "Your Submission - Mozilla Firefox". The address bar displays the URL "http://coolgate.mote.org/beachconditio". The page content is as follows:

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+Surflines
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

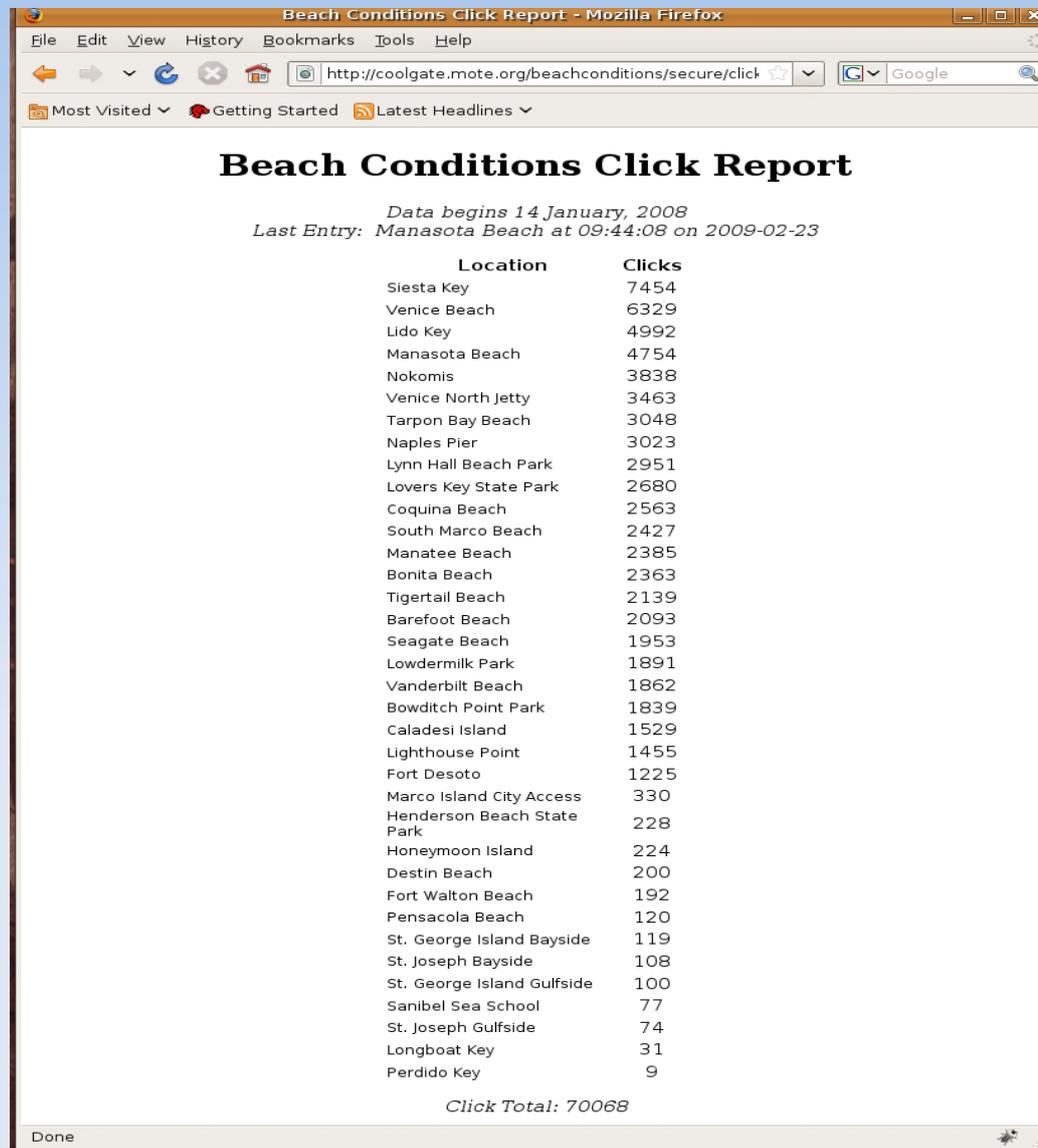
Thanks!

Done

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



The screenshot shows a Mozilla Firefox browser window with the title 'Beach Conditions Click Report - Mozilla Firefox'. The address bar contains the URL 'http://coolgate.mote.org/beachconditions/secure/click'. The page content includes a title 'Beach Conditions Click Report', a note that data begins on 14 January 2008, and the last entry being Manasota Beach at 09:44:08 on 2009-02-23. A table lists 30 beach locations and their corresponding click counts, totaling 70068 clicks.

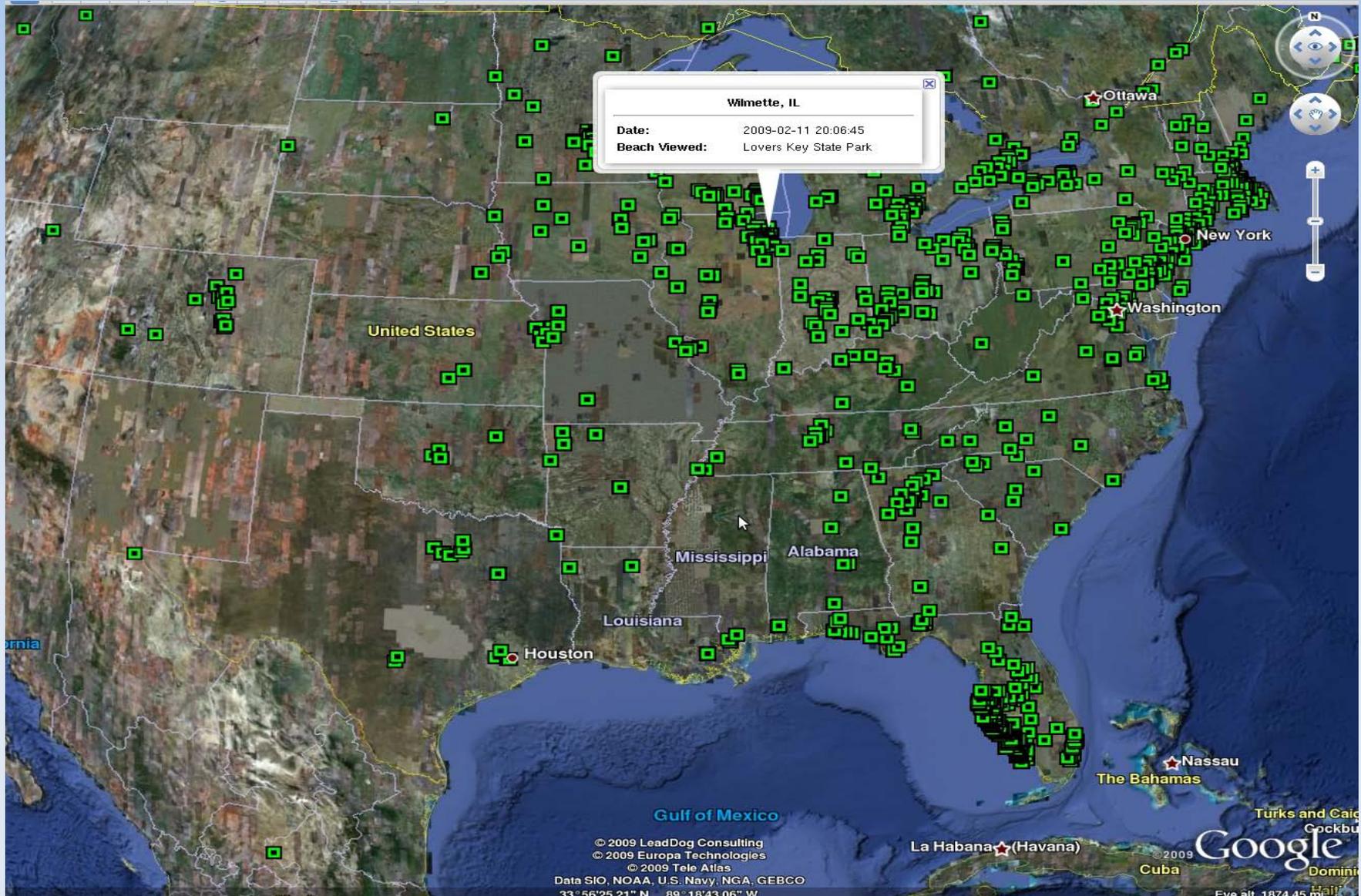
Location	Clicks
Siesta Key	7454
Venice Beach	6329
Lido Key	4992
Manasota Beach	4754
Nokomis	3838
Venice North Jetty	3463
Tarpon Bay Beach	3048
Naples Pier	3023
Lynn Hall Beach Park	2951
Lovers Key State Park	2680
Coquina Beach	2563
South Marco Beach	2427
Manatee Beach	2385
Bonita Beach	2363
Tigertail 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

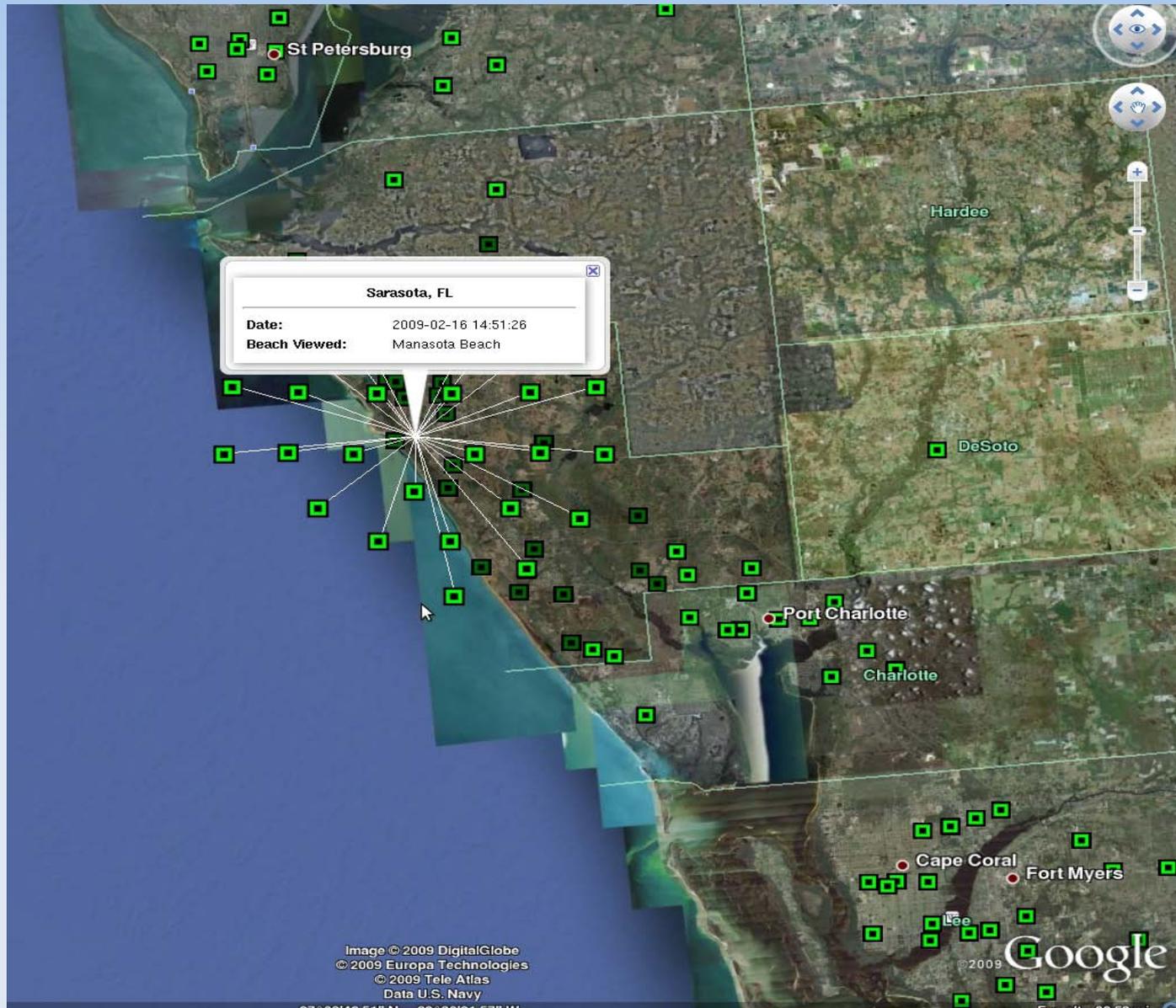
Where do our users live?

- IP addresses collected since December 2008
- Python application georeferences IP
- Uses GeoIP 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 .htmlaccess
- 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