What is PostGIS?

- PostGIS is a GPL'd Open Source Project founded by Refractions Research in 2001.
- It was developed by Refractions as a cost effective solution to managing spatial data; specifically for work they were doing with Canadian British Ministry. It has since then been enhanced and adopted by many companies. Gory history here: http://www.refractions.net/products/postgis/history/
- PostGIS is a PostgreSQL module that adds Open GIS Consortium (OGC) Simple Features for SQL (SFS) compliant geometry data types and functions to PostgreSQL.
- It is a cost effective alternative to Oracle Spatial, IBM DBII Spatial and Informix Spatial Data Blade, and Microsoft SQL Server 2008. It shares many of the same characteristics as these other OGC SFS compliant products.
- Used to analyze patterns in location based data, road routing, and as a mapping back-end

Who uses it?

- Government Agencies – Property and Building Management, Project Management, Environmental protection, Emergency Response, Air Traffic Control, Road Traffic Control, Shipping Control, Foreclosure Prevention/Targeting
- Research agencies, Non-Profits – Soil Management, Ecology
- Universities – growing use in teaching spatial concepts to GIS and Urban Planning course students
- Private and other Corporations as a backend to support their product/ business process –
    - Fleet Management
    - Sales
    - Political Districting
    - Developing communities around Location Based awareness
    - Crowd sourcing
   - Modeling and Simulation

Spatial SQL Art
You can make art


```
INSERT INTO mypois(poi_name, poi_geom)
WITH RECURSIVE
x(i)
AS (
    VALUES(0)
UNION ALL
    SELECT i + 1 FROM x WHERE i < 101
),
Z(Ix, Iy, Cx, Cy, X, Y, I)
AS (
    SELECT Ix, Iy, X::float, Y::float, X::float, Y::float, 0
    FROM
        (SELECT -2.2 + 0.031 * i, i FROM x) AS xgen(x,ix)
    CROSS JOIN
        (SELECT -1.5 + 0.031 * i, i FROM x) AS ygen(y,iy)
    UNION ALL
    SELECT Ix, Iy, Cx, Cy, X * X - Y * Y + Cx AS X, Y * X * 2 + Cy, I + 1
    FROM Z
    WHERE X * X + Y * Y < 16.0
    AND I < 27
),
Zt (Ix, Iy, I) AS (
    SELECT Ix, Iy, MAX(I) AS I
    FROM Z
    GROUP BY Iy, Ix
    ORDER BY Iy, Ix
)
SELECT 'mandlebrot ' || CAST(Iy As text), ST_MakeLine(ST_MakePoint(Ix,I))
        As poi_geom
FROM Zt
GROUP BY Iy
ORDER BY Iy;
```
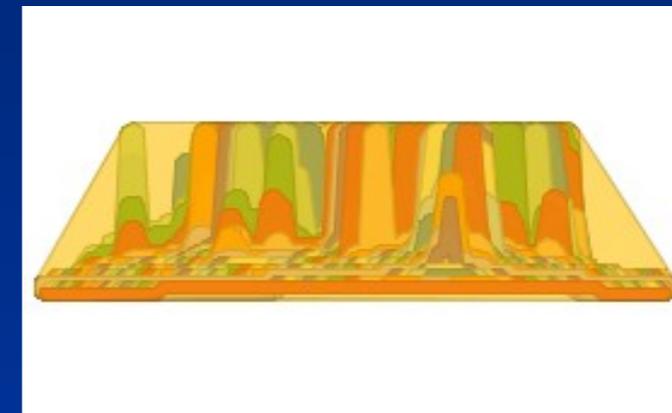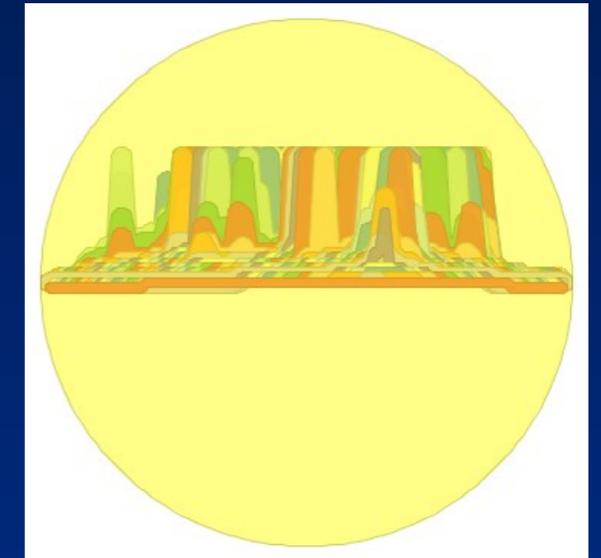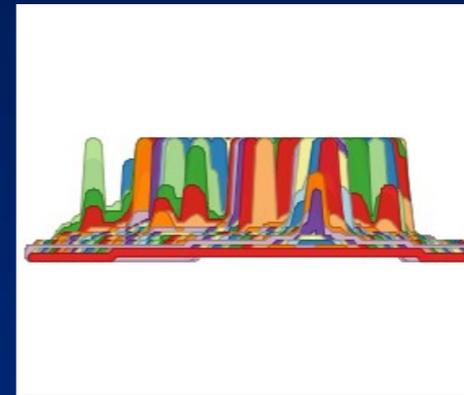
OpenJump Queries:
Buffered

```
SELECT poi_name, ST_AsBinary(ST_Buffer(poi_geom,
ST_YMin(poi_geom)))
FROM mypois
WHERE poi_name LIKE 'mandlebrot%';
```

MBC

```
SELECT ST_AsBinary(ST_MinimumBoundingCircle(
ST_Collect(
    ST_Buffer(poi_geom, ST_YMin(poi_geom))
  )
 )
)
FROM mypois
WHERE poi_name LIKE 'mandlebrot%';
```

Convex Hull:

```
SELECT ST_AsBinary(
    ST_ConvexHull(
        ST_Collect(
        ST_Buffer(poi_geom,
            ST_YMin(poi_geom))
        )
            )
)
FROM mypois
WHERE poi_name LIKE 'mandlebrot%';
```

Management Changes

- In the past the full responsibility of management and funding was by Refractions, all servers, newsgroups, code repository etc.

- PostGIS is now undergoing Open Source Geospatial Foundation (OSGEO) incubation process

- Recent changes – subversion repository/Wiki/Bug Tracker now hosted by OSGEO – http://trac.osgeo.org/postgis

- We have currently a de facto Project Steering Committee (PSC)
  - Project Owner – Jeff Lounsbury (Refractions Research - Canada) – http://www.refractions.net
  - Mark Cave-Ayland (Sirius Corporation – UK) -- http://www.siriusit.co.uk
  - Kevin Neufeld (Refractions Research – Canada) - http://www.refractions.net
  - Regina Obe (Paragon Corporation – US) – http://www.paragoncorporation.com
  - Paul Ramsey (OpenGeo – Canada/US) – http://www.opengeo.org
    - Paul in a former life used to be President of Refractions Research
    - He is also a co-founder of the PostGIS project.

Dependency/Complimentary

- **PostGIS relies on the following OSGEO projects in addition to PostgreSQL**
  - GEOS – Geometry Open Source – spearheaded by Refractions Research, now an incubation project of OSGEO - this provides relational operators and advanced geometry functions – buffer, union etc. Lots of developers with Paul Ramsey, Sandro Santilli, Mateusz Loskot as current major committers
  - Proj4 – Provides Projection Support – managed primarily by Frank Wamerdam – also an OSGEO project

- **Complimentary High Visibility**
  - **WKT RASTER** – http://trac.osgeo.org/postgis/wiki/WKTRaster
    - in alpha state – adds RASTER support to PostGIS. This is a subproject currently funded by University of Laval Quebec, Canada, CadCorp Sys, and Tyler Erickson. It is managed by Pierre Racine (ULaval) and currently has Mateusz Loskot (Cadcorp), Sandro Santilli (Private contractor) as developers.
  - **PgRouting** – project of Orkney http://www.orkney.co.jp/ - provides routing capability such as driving distance cost based analysis along a path
  - **Tiger Geocoder** – Stephen Frost is here I believe and is working on upgrading the Tiger Geocoder for new Census Shape/DBF format. This is used by many people for address matching using US Census data.

PostGIS 1.3.5/.6

- PostGIS 1.3.6 – first version to compile cleanly against PostgreSQL 8.4
- PostGIS 1.3.5 /.6
  - Curved Support doesn't crash so much
  - Great improvements in speed with common intersects/contains/ etc. operators
  - If you are using GEOS 3.1+ even more improvements on intersects as it uses the new prepared geometry functionality in GEOS 3.1+

PostGIS 1.4 – not out yet

- Should be out sometime early June – but you can play with it.
- Cleanup of Code base and reduction of a lot of duplicate code
- More functions – ST_IsValidReason, locate along Z index functions, Minimum Bounding Circle
- Improved speed of aggregates – ST_Union (if you use GEOS 3.1 will use the new cascaded union functionality – its fast)
  - All aggregates even if you are not using 8.4 will enjoy the luxury of the new array_agg logic added in PostgreSQL 8.4 to improve aggregation of many many geometries in the 30,000s and more.
- Shp2Pgsql Gui – WxWidgets based – a gui companion to the shp2pgsql commandline tool
- Even more fixes and enhancements for Curved Support. Crashes even less than 1.3.5+ when faced with curves. Yeh!
- Enhancements to output functions – ST_AsGML, ST_AsKML, ST_AsGeoJSON to support newer versions, more reliable precision arg.
- Way better user documentation than 1.3+ series. http://postgis.refractions.net/documentation/manual-svn/
- We even have Doxygen based developer documentation built almost daily with GraphViz graphs.
  - http://postgis.refractions.net/documentation/postgis-doxygen/
  - http://postgis.refractions.net/documentation/raster-doxygen/

- SHAMELESS PLUG: We have an upcoming book **PostGIS in Action – http://www.manning.com/obe**
  - This will target PostgreSQL 8.4/PostGIS 1.3/1.4 (first chapter is a free download)
  - You can purchase now and read the chapters as they unfold
  - Hard copy expected January 2010

PostGIS 2.0+ Goals

- Should be out around February to April 2010
- Geodetic Support – spatial index with geodetic support and subset of PostGIS functions that will be Geodetic aware.
- More work on improving stability and extending Curved Geometry Support
- WKT Raster integrated
- Ability to import GML/KML and possibly other XML based formats
- 3D enhancements – CityGML, Collada export, 3D GIST Index
- Use of PostgreSQL Typemods to make geometry_columns a view
- More transformation support /import so PostGIS is SRText import aware