

Check Please!

What your Postgres database wishes you would monitor



OmniTI / Presentation

Who am I?

- Lead Database Operations at OmniTI
 - Database Consulting / Management
- Postgres?
 - TB+ OLAP/DSS
 - multiple 1000+ tps OLTP
 - custom built, private label
 - long time user (6.5-9.x)
 - community member
 - major contributor

Check Yourself!

- Basic Tuning Is Job #1
 - shared buffers, effective cache size, checkpoints
- Resources
 - http://wiki.postgresql.org/wiki/Tuning_Your_PostgreSQL_Server
 - <http://www.slideshare.net/xzilla/the-essential-postgresqlconf-presentation>

Before You Wreck Yourself!

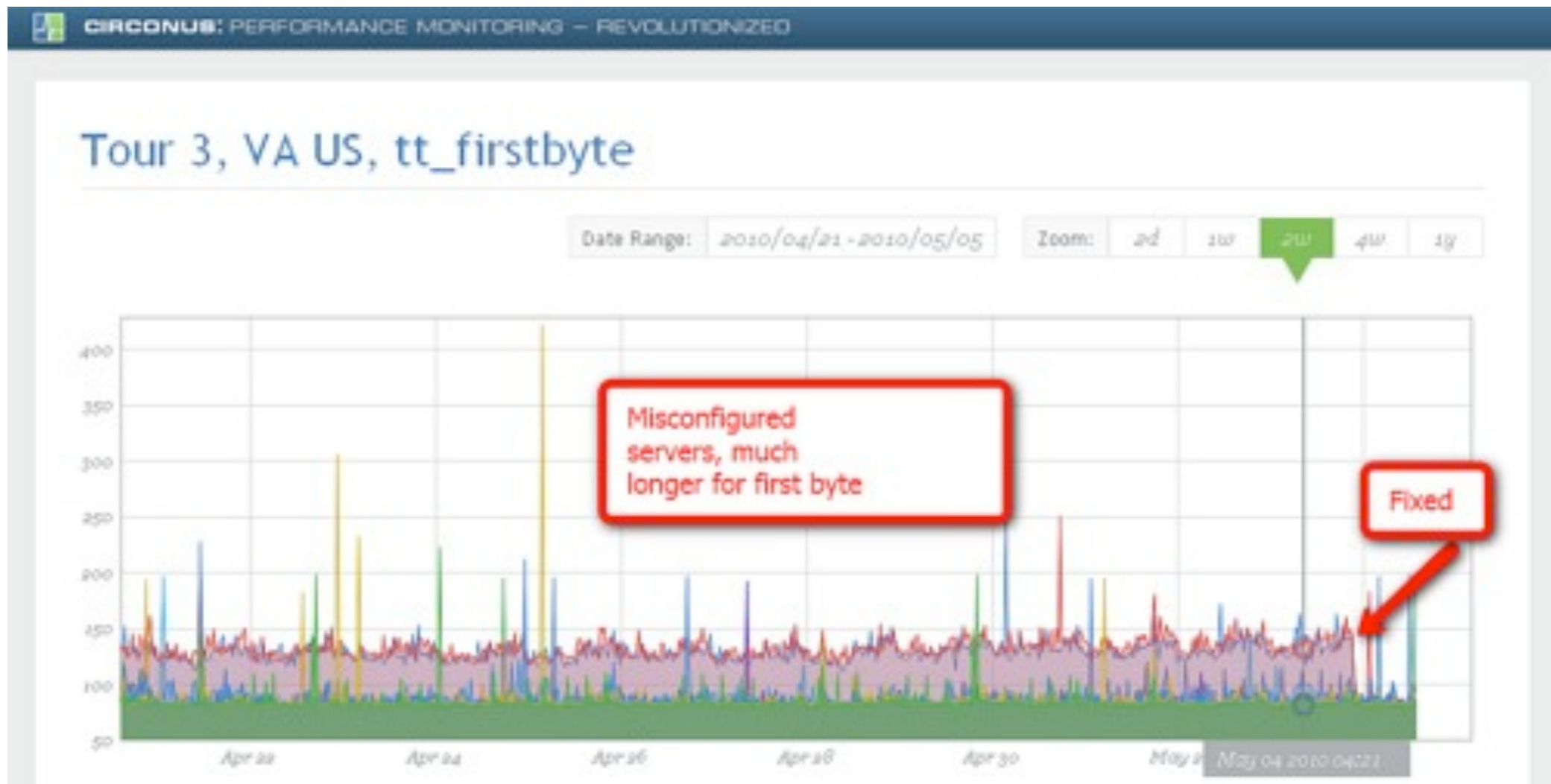


Before You Wreck Yourself!

- **Monitoring**
 - If a server crashes in the woods
 - Pain is a great motivator

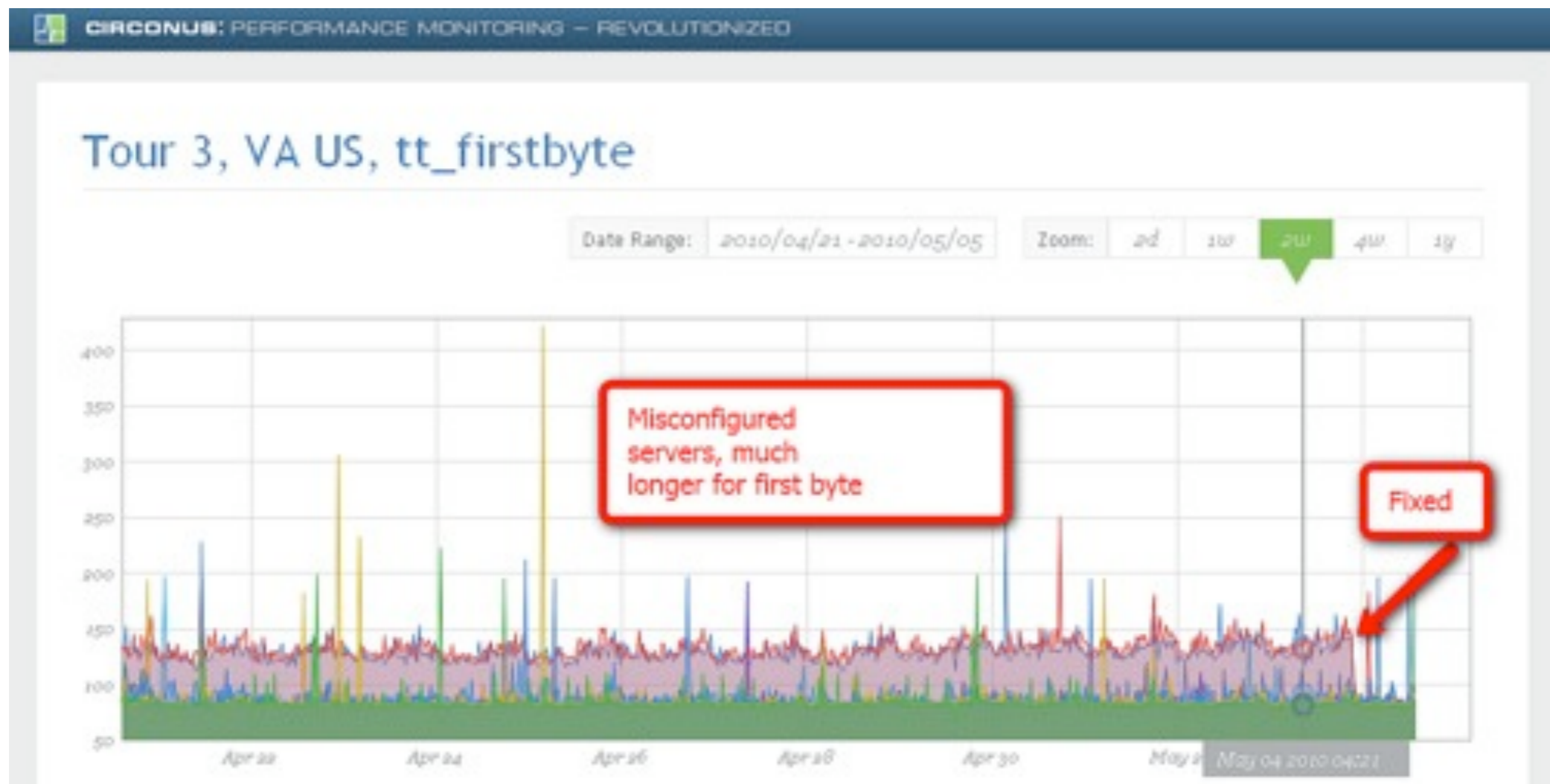


Before You Wreck Yourself!



Before You Wreck Yourself!

- **Trending**
 - Knowing what things look like when they're good helps determine when things are bad
 - You can often tell where you're going by looking at where you came from



Tools?

- Tools cannot replace experience and discipline
 - But they can help you maintain that discipline
- Popular tools
 - nagios / munin
 - cacti / mrtg
 - circonus.com / reconnoiter
 - { check_postgres }

Connections

- Hard limit on allowed connections
- **Game Over**
- Large numbers of concurrent users
- Internet facing systems



- Paul RJ Muller, beached whale

Disk Space

- Data, clog, xlogs, log files
- **Game Over**
- (planning)
- Everybody



- Squiggle, Overloaded?

WAL Files

- pg_xlog directory, transaction logs
- maintain database consistency
- excessive disk space
- excessive recovery time
- heavy write transactions
- pg start/stop backup (buggy systems)



- Jazzmasterson, Workspace 3.0 - Noguchi File

Size Matters

- more data == more disk space
- only grow if you should
- large tables, i/o issues
- unbounded growth?
- fast paced development
- everyone else (eventually)



- elmada, Size Matters

Bloating

- mvcc leaves dead rows
- unused space in tables, indexes
- i/o issues
- disk space (eventually)
- heavy updates, data churn
- untuned systems



- Joe Alterio, burpalurpa

Transactions

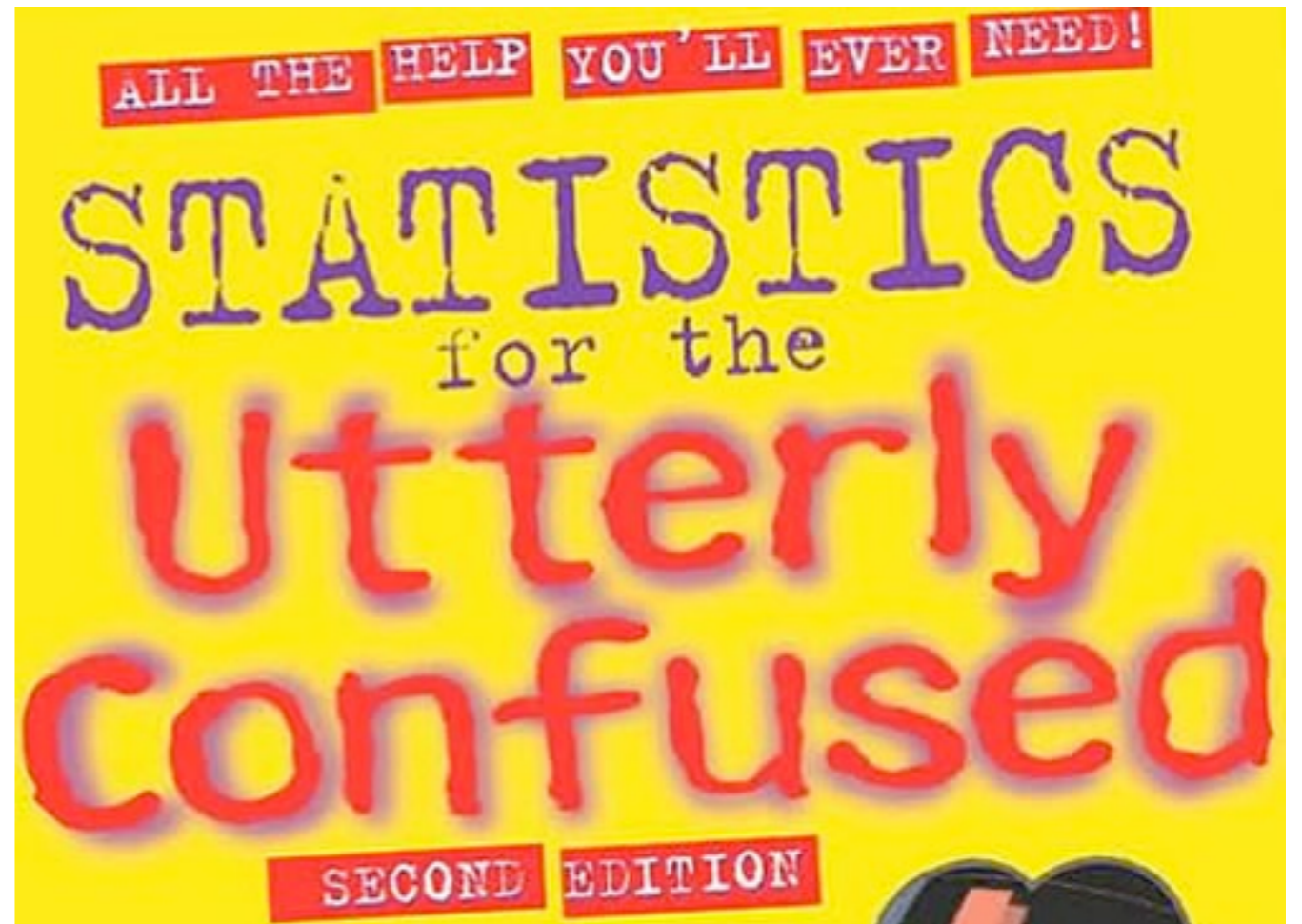
- every statement is in a transaction
- select/insert/update/deletes
- underlying effects
- load spikes
- OLTP Systems
- Logging/Internet Facing Systems



- laurieofindy , Walmart on Black Friday 2009

All Stats

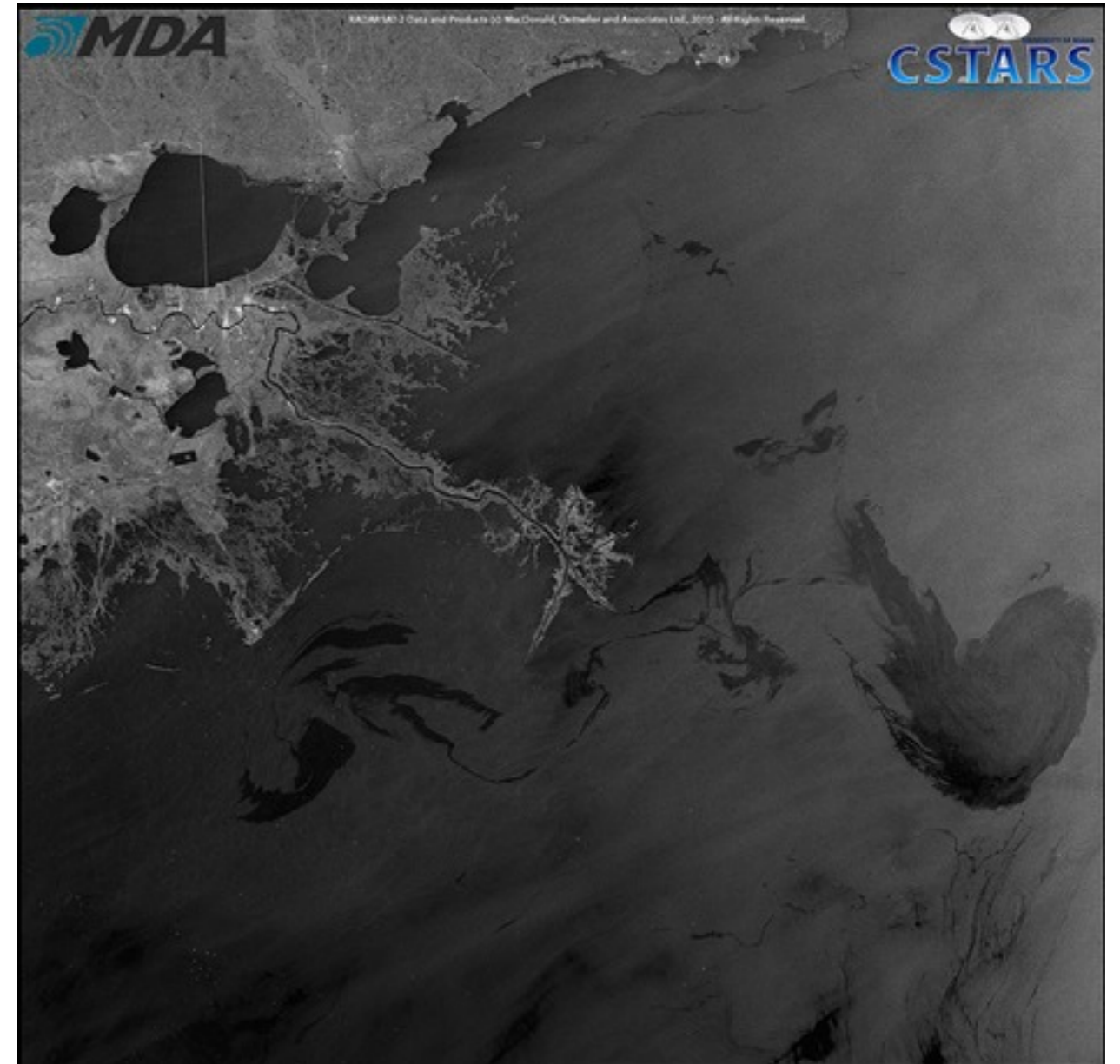
- pg_stat tables
- tables, indexes... scans, tuples
- underlying effects
- load spikes
- OLTP Systems
- Logging/Internet Facing Systems



- Inju, Statistics for the Utterly Confused

Free Space Map

- Tracks unused space
- Keeps vacuum effective
- **Table / Index Bloat**
- Medium to Large Systems
- High Update / Data Churn DB



- SkyTruth, Deepwater Horizon Oil Spill - RADARSAT-2, May 8, 2010

Autovacuum Max Freeze Age

- Ensures all tables get vacuumed
- Prevents XID wrap-around
- Heavy I/O
- Locking Issues
- High TPS / OLTP
- pg_dump



- Joe Marinaro, Good Morning!

Long Running Queries

- postgres can't freeze query plans
- pg_stat_activity
- Can cause issues for vacuum
- Uh, response time obligations
- active data collection
- developers write queries ;-)



- _Tawcan, Spiral Out..keep going

Idle Transactions

- BEGIN; zzz...
- pg_stat_activity
- Can cause issues for vacuum
- Connections holding memory
- pretty much everyone



- psd, Canadian Cashpoints, Bah!

Sequence limits

- sequences limited to 2 billion
- non-transactional

- Can break inserts



- Heavy insert (update?) systems

- gavinzac, Rise and Fall in Donegal

Wrap-around

- Postgres must vacuum every table within 2 Billion transactions
- Catastrophic data loss
- pretty much everyone



- Jurvetson, Wrapped Around the Axle

Settings

- postgresql.conf doesn't always reflect reality
- temporary changes can lead to long term trouble
- pretty much everyone



- denovich, P9220453.jpg

Thanks!

- **PGCon**
- **PGCommunity**
- **OmniTI**
- **Want more?**
 - **xzilla@users.sourceforge.net, <http://www.xzilla.net>**
 - **[@robtreat2](#)**
 - **robert@omniti.com, <http://www.omniti.com/is/hiring>**