



Use of U.S. DoD visual information does not imply or constitute DoD endorsement



L3HARRIS AUTO-TEST SUITE

A PostGIS Success Story for STL PostGIS Day 2019

November 14, 2019

BEN WOOLF | MapMerger Product Manager; Geospatial Analyst
ZANE KULLMAN | Geospatial Developer

Large-Scale Data



- L3Harris was a prime contractor for two-thirds of the world during the Foundation Geospatial Content Management (FGCM) contract
- L3Harris is now prime contractor for the other third of the world for Janus Project 7
- Auto-Test Suite (ATS) has been used successfully to automate QC processes and corrective tasks for all of these AOIs:



Large-Scale Data Problems



So. Much. Data.

FGCM Region A = 204.5 GB

FGCM Region C = 144.1 GB

Janus Region 215 = 289 GB

Extremely Common/Prevalent Problems Solved with PostGIS

- Line/Area Feature Merge Failures
- Change Detection
- Scale/Matching Scale
- Metrics
- Portrayal Tables
- Finding Gaps & Slivers
- Line-Line Over/Undershoots
- Creating Metadata Surfaces
- Missing Volumetric Attribution
- Validations/Corrections of Geometry

Large-Scale Data Solutions



- **~67,000 function calls for geoprocessing in L3Harris Janus code repository**
 - PostGIS functions address many repetitive tasks, freeing up analysts to create, analyze, and QC data
 - Processes that take seconds to complete with ST geometry take milliseconds with PG
- **Feature Analysis Matching Engine (FAME)**
 - Finds geometric differences between two datasets using vertex and line matching with variable tolerances (angle, distance, and general proximity)
 - Develop pinpoints for enrichment, bidding, analysis, prescriptive data management

Large-Scale Data Solutions



- Metrics
 - Multithreaded searching by tile, mosaics of databases
 - PostgreSQL, PostGIS, Multi-threaded geo-analysis
- Line Feature Merge Failure Fix
 - Fully-automated solution addresses nearly 100% of LFMF with impressive accuracy
 - Features not addressed by automation are written to a pinpoint table
 - Saved hundreds of hours on recent contract
- Area-Area Gaps & Slivers Detection
 - Indexing with PostGIS decreased search time and improved the number of true-positive calls generated for analyst review
- Cost Benefits
 - Free & open source

Large-Scale Data Solutions – QA Tool



- ~47,000,000 features in the largest Region A AOI
 - Traditional QC Checks: **~138hr**
 - **Harris Attribute and Topology Checks (HATCH): 21hr**
- ~31,000,000 features in the second-largest Region A AOI
 - Traditional QC Checks: **~168hr**
 - **Harris Attribute and Topology Checks (HATCH): 20hr**
- ~8,500,000 features in the largest Region C AOI
 - Traditional QC Checks: **~156hr**
 - **Harris Attribute and Topology Checks (HATCH): 16hr**



Questions/Comments