Geocorrection for Airborne Platforms (GCAP) , Web Coverage Processing Service (WCPS) and Atmospheric Correction Status

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HysplRI Symposium
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EO-1 Cloud Computing Functionality

Technologists
NASA Investigators
Disaster Responders

Matsu Cloud

http server

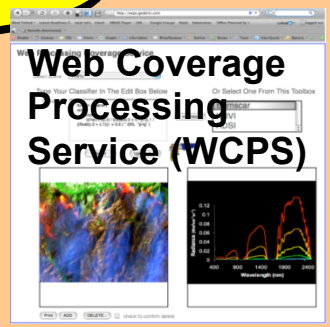
Level 1R and Level 1G Processing for ALI & Hyperion

Co-registration with Landsat GLS

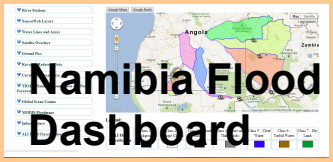
Starlight 100 Gigabit Ethernet Exchange

Hyperion and ALI Level 0 Processed data from GSFC, building 3 server

Web Coverage Processing Service (WCPS)



Atmospheric Correction for ALI & Hyperion

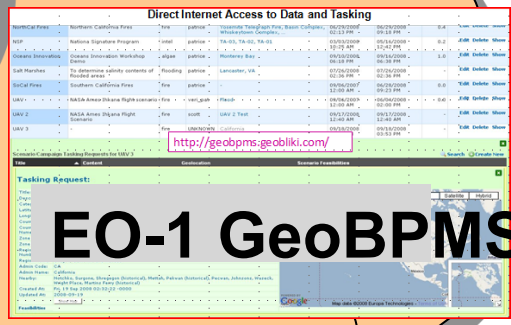


Namibia Flood Dashboard

Multi year data product archive

Matsu Cloud
- Eucalyptus/Open Stack-based Elastic Cloud SW
- 300+ core processors
- 500+ Tbytes of storage
- 10 Gbps connection to GSFC
  - being upgraded to 100 Gbps (Part of OCC)
- Hadoop Tiling/MapReduce/Accumulo
- Supplied by Open Cloud Consortium
- Open Science Data Cloud Virtual Machines & HTTP server to VM's

Joyent Cloud

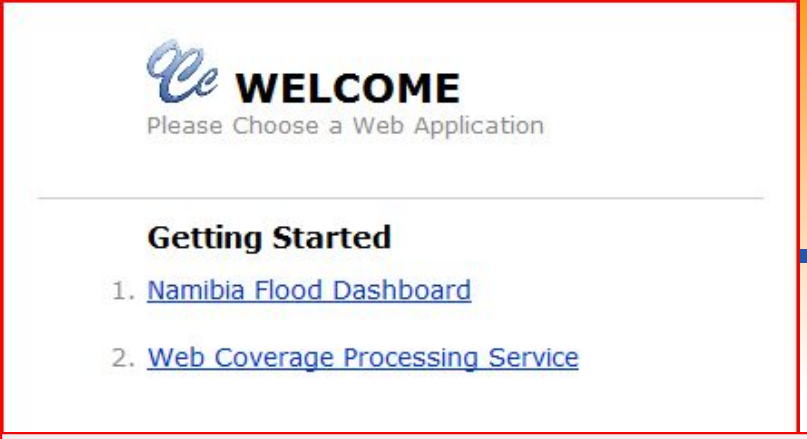


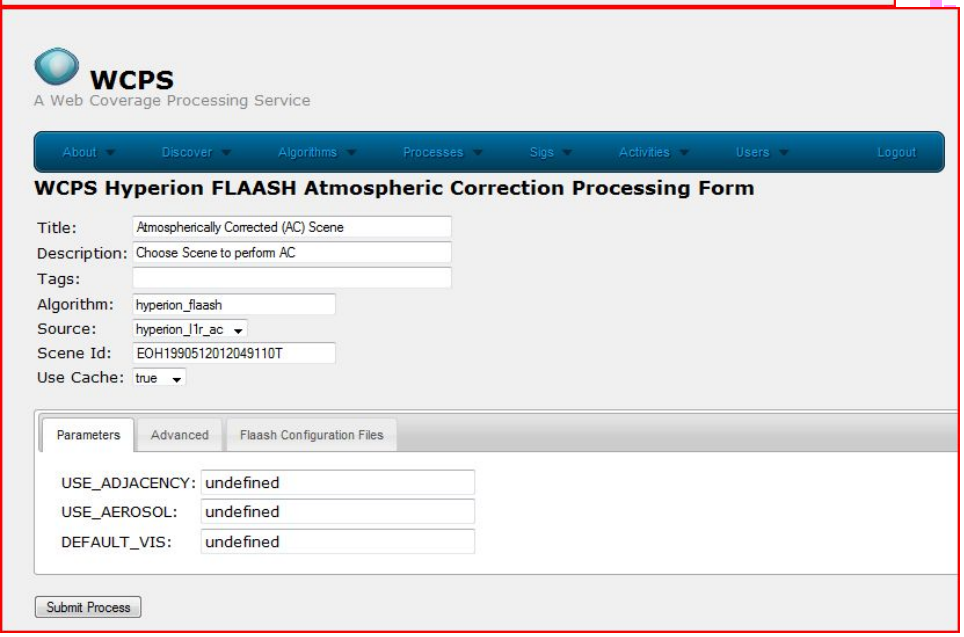
EO-1 GeoBPMS

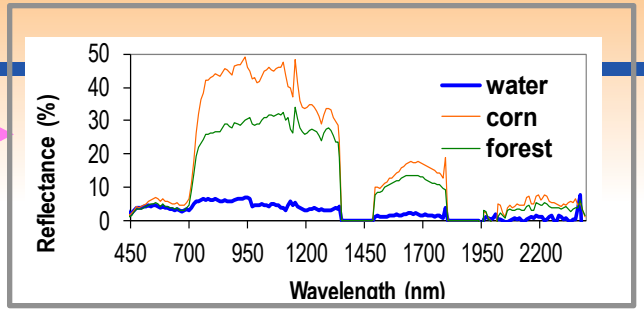
EO-1 GeoBliki

Joyent Cloud
- Ruby on Rails
- 3 processors
- 3 Tbytes of storage

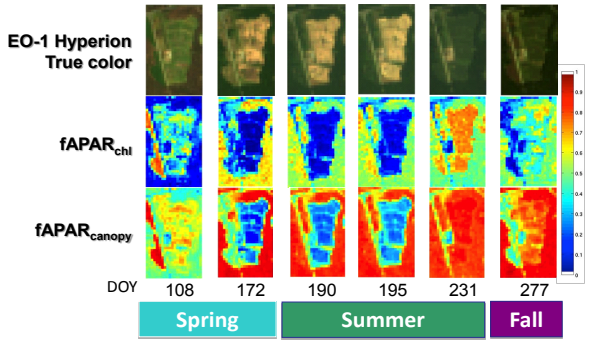
Web Coverage Processing Service
Atmospheric Correction Status





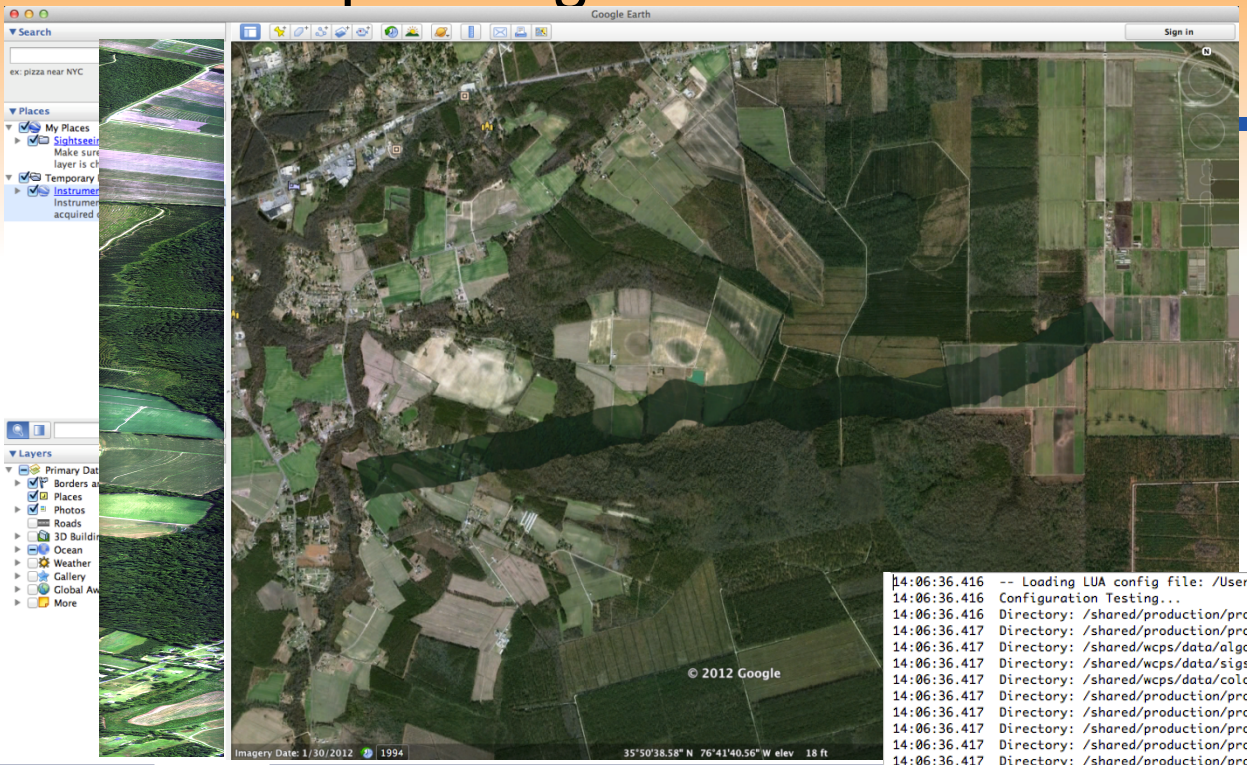


Selected scene with applied algorithms including atmospheric correction



EO-1 Product Prototypes: **albedo, water content, derivatives, fAPAR, chlorophyll, N …..**

Geo-Correction for Airborne Platforms (GCAP) Operating on G-LiHT Airborne Data



Headwall imaging spectrometer

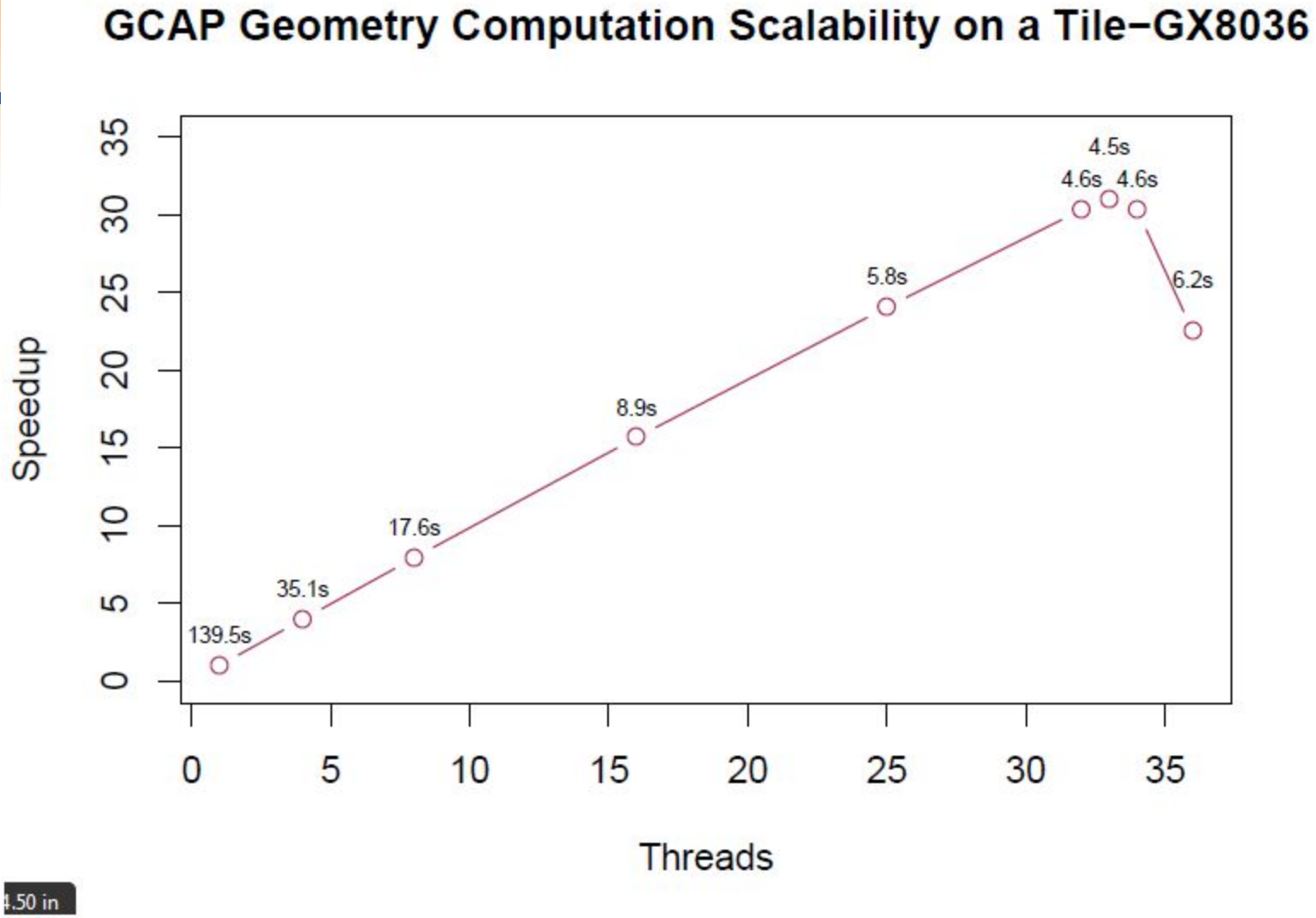
```
<terminated> gcap [C/C++ Application] /Users/imvuong/Documents/code/gcap/src/.libs/gcap (10/15/12 2:05 PM)
config.c:32: INPUT_FILENAME = /Users/imvuong/Documents/code/gcap/data/input/Parker-Track1.bin
config.c:32: IMU_POSITION_FILE = /Users/imvuong/Documents/code/gcap/data/input/110728_132454.pos
config.c:32: INSTR_TIMESTAMP_FILE = /Users/imvuong/Documents/code/gcap/data/input/Parker-Track1.asc
config.c:32: BAND = 40 80 160
config.c:32: OUTPUT_DIR = /shared/production/proddata/gliht_l1g/Parker-Track1/
config.c:57: ROLL_OFFSET = 0.000000
config.c:57: PITCH_OFFSET = 0.000000
config.c:57: ALTITUDE_OFFSET = 0.000000
config.c:57: HEADING_OFFSET = 0.000000
config.c:57: INSTR_TIMESTAMP_OFFSET = -0.460000
config.c:57: INSTR_VIEW_ANGLE = 53.000000
main.c:213: Input image size: 1004x5465x402.
gcap.c:166: UL: 35.851659867857456732,-76.730605800650906190
gcap.c:167: UR: 35.851659867857456732,-76.658554548188419631
gcap.c:168: LL: 35.836418930876448030,-76.730605800650906190
gcap.c:169: LR: 35.836418930876448030,-76.658554548188419631
main.c:218: Output image size: 6494x1695x402.
main.c:234: Writing file: /shared/production/proddata/gliht_l1g/Parker-Track1/Parker-Track1-B040.tif.
main.c:234: Writing file: /shared/production/proddata/gliht_l1g/Parker-Track1/Parker-Track1-B080.tif.
main.c:234: Writing file: /shared/production/proddata/gliht_l1g/Parker-Track1/Parker-Track1-B160.tif.
main.c:143: UL: 35.851659867857456732,-76.730605800650906190
main.c:144: UR: 35.851659867857456732,-76.658554548188419631
main.c:145: LL: 35.836418930876448030,-76.730605800650906190
main.c:146: LR: 35.836418930876448030,-76.658554548188419631
main.c:148: Writing file: /shared/production/proddata/gliht_l1g/Parker-Track1/Parker-Track1.meta.
```

Run GCAP

```
14:06:36.416  -- Loading LUA config file: /Users/imvuong/Documents/code/wcps/data/wcps.frodo.lua
14:06:36.416  Configuration Testing...
14:06:36.416  Directory: /shared/production/proddata exists
14:06:36.417  Directory: /shared/production/proddata/wcps exists
14:06:36.417  Directory: /shared/wcps/data/algos exists
14:06:36.417  Directory: /shared/wcps/data/sigs exists
14:06:36.417  Directory: /shared/wcps/data/colormaps exists
14:06:36.417  Directory: /shared/production/proddata/ams_l1g exists
14:06:36.417  Directory: /shared/production/proddata/ams_l2 exists
14:06:36.417  Directory: /shared/production/proddata/gliht_l1g exists
14:06:36.417  Directory: /shared/production/proddata/gliht_l2 exists
14:06:36.417  Directory: /shared/production/proddata/ali_l1g exists
14:06:36.417  Directory: /shared/production/proddata/ali_l1g_ac exists
14:06:36.417  Directory: /shared/production/proddata/ali_l2 exists
14:06:36.417  Directory: /shared/production/proddata/hyperion_l1r exists
14:06:36.417  Directory: /shared/production/proddata/hyperion_l1r_ac exists
14:06:36.417  Directory: /shared/production/proddata/hyperion_l1g exists
14:06:36.418  Directory: /shared/production/proddata/hyperion_l1g_ac exists
14:06:36.418  Directory: /shared/production/proddata/hyperion_l2 exists
14:06:36.418  wcps init  1
14:06:36.418  WCPS Execute vis_composite gliht_l1g Parker-Track1 0 1 NA  init 1
14:06:36.418  WCPS Execute vis_composite gliht_l1g Parker-Track1 0 1 NA
14:06:36.418  WCPS Execute algo:vis_composite inst:gliht data:l1g scene:Parker-Track1 cache:0 userid:1 sig:NA...
14:06:36.418  Execute file: /shared/wcps/data/algos/gliht_l1g/vis_composite.lua
14:06:36.419  Creating Atom file /shared/production/proddata/gliht_l2/gliht_l1g/Parker-Track1/vis_composite.atom...
14:06:36.419  get band for instrument: gliht data: l1g
14:06:36.420  get band 160 - file /shared/production/proddata/gliht_l1g/Parker-Track1/Parker-Track1-B160.tif
 min:0.000000 mean:30.582403 stdev:76.606514 max:3142.000000  zeroes:8943407 positive:2063923
14:06:36.492  get band for instrument: gliht data: l1g
14:06:36.492  get band 80 - file /shared/production/proddata/gliht_l1g/Parker-Track1/Parker-Track1-B080.tif
 min:0.000000 mean:59.534584 stdev:135.201553 max:4063.000000  zeroes:8943407 positive:2063923
14:06:36.549  get band for instrument: gliht data: l1g
14:06:36.549  get band 40 - file /shared/production/proddata/gliht_l1g/Parker-Track1/Parker-Track1-B040.tif
 min:0.000000 mean:35.607391 stdev:84.499809 max:3577.000000  zeroes:8943407 positive:2063923
14:06:37.165  write_file:/shared/production/proddata/gliht_l2/gliht_l1g/Parker-Track1/vis_composite.png
14:06:39.119  Making kmz
14:06:39.120  Creating doc file: /shared/production/proddata/gliht_l2/gliht_l1g/Parker-Track1/doc.kml
14:06:39.129  Output filesize: 4174419 and tiling is set to 1
14:06:39.307  Making thumnail
14:06:39.660  Making atom entry
14:06:39.661  closed Atom file /shared/production/proddata/gliht_l2/gliht_l1g/Parker-Track1/vis_composite.atom
execute result:0
14:06:39.682  Done.
```

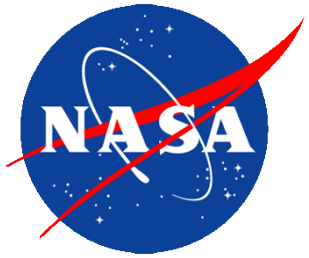
Run WCPS

Developing IPM software



Note that performance falls when adding tiles 34 and 35 to assist in processing of GCAP . This is because the Tilera operating system resides in two of the tiles and when those tiles assist in the actual calculation, the total performance goes down.

Performance Metrics


NASA