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Vector-Based Data Services for NASA Earth Science

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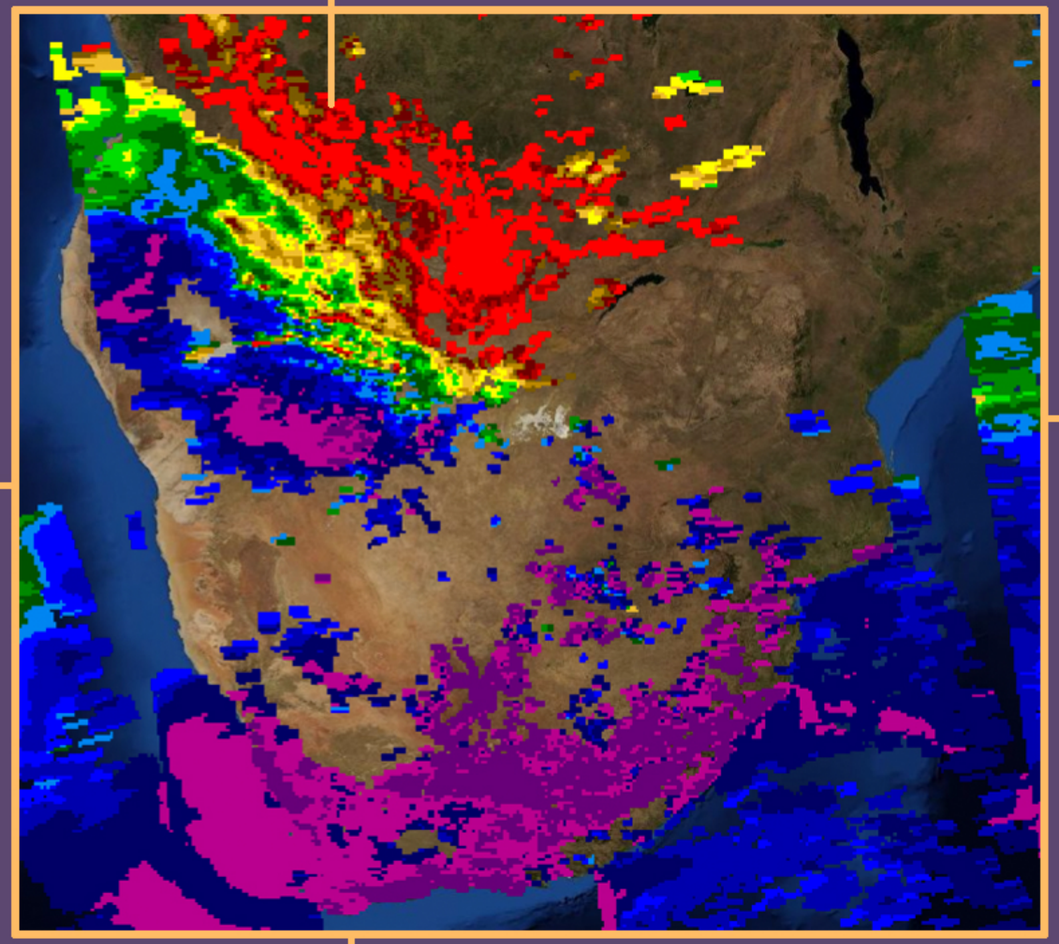
Raster

Data limited to RGBA (or 32-bit data) values per pixel



Loads quickly and supported everywhere

Image formats like JPEG and PNG

Fixed amount of data per tile (256x256 px)

Vector

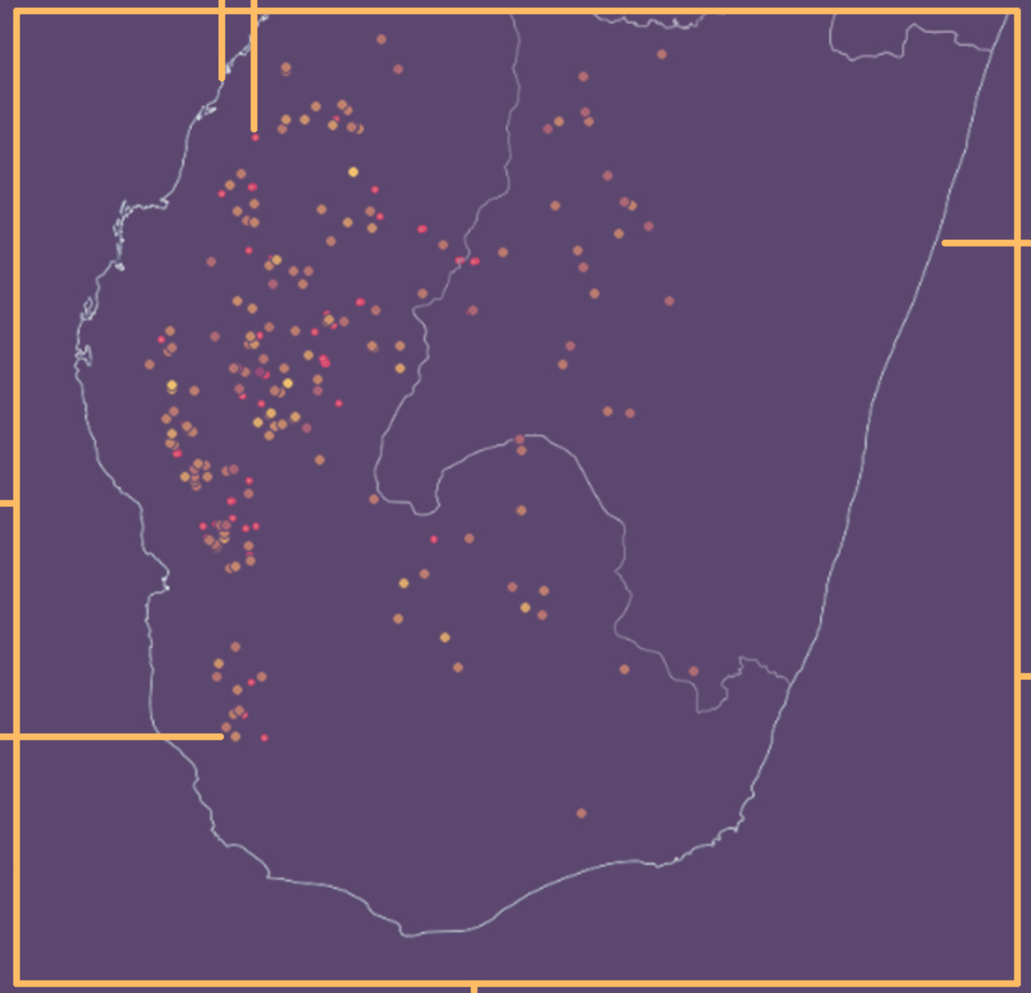
Features defined as geometry with points, lines, and arcs

Features can be styled/analyzed by client

Data formats like GeoJSON and MVT

More rendering overhead required

Can contain actual data like coordinates and measurements



No fixed data limit

Supported Vector Formats

Output:

- GeoJSON
- Mapbox Vector Tiles
- Rasters
- KML

Input:

- GeoJSON
- Esri Shapefile

Not currently supported:

- TopoJSON

Supported Access Protocols

WMS (raster images)

WMTS (MVT tiles)

WFS (GeoJSON data)

Widely-used format for geospatial data

Can contain entire dataset or client can specify server-side filtering (bounding box, etc.)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}
```


OnEarth/Mapserver can serve on-the-fly via WFS

Can be used in Leaflet and OpenLayers

GeoJSON

Features defined in tile coordinates

Tiles defined as square grids

OnEarth pre-generates tile pyramids and serves them from disk

File in compressed binary format (gzip/protobuf)

Features can contain attribute data

Tiles align to GIBS tile matrix sets

MVT

(Mapbox Vector Tile)

Demo with OpenLayers

OnEarth vector tools

Apache Server (mod_onearth, mod_oems)

MVT via WMTS
GeoJSON via WFS
Rasterized images via WMS/Mapserver
KML via WMS

Data preparation (oe_vectorgen)

Pre-render MVT tile pyramids
Configure vector layers for use with OnEarth

Available for download at: github.com/nasa-gibs/onearth

OnEarth raster tools

Apache Server (mod_onearth, mod_oems)

Images (JPEG/PNG) via WMS
Tiled imagery via WMTS and TWMS
Optimized for fast tile request handling

Data preparation (oe_vectorgen)

Generate tile pyramids and pre-packaged imagery in MRF format
Configure image layers for use with Apache OnEarth

Available for download at: github.com/nasa-gibs/onearth

Community Input/Questions

What kinds of vector formats do you use?

What features are most important to you?