Importing high-resolution datasets into Geogrid

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Introduction

The modifications to Geogrid presented here allow it to read GeoTIFF encoded data directly. The metadata embedded in the GeoTIFF file provides geolocation and storage details. This information is extracted automatically and provided to Geogrid at runtime. The modifications are patched from the current WPS version 3.3 and are designed to produce output compatible with the standard release.

Current source code for this project is provided at `http://github.com/jbeezley/wrf-fire`. Additional usage information and updated documentation are available at `http://www.openwfm.org`.

Acknowledgement

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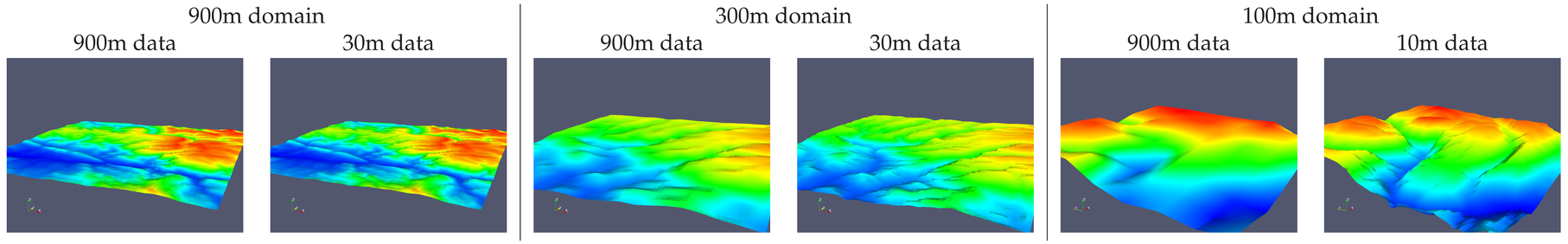
High resolution topography (USGS) with no smoothing



GEOGRID.TBL

```
name=HGT_M
priority = 1
dest_type = continuous
interp_option =
default:average_gcell(4.0)
rel_path=default:./topo_30s
```

```
name=ZSF
priority = 1
dest_type = continuous
interp_option =
default:average_gcell(4.0)
rel_path=default:./topo_30s
abs_path=ned30:./ned_30
abs_path=ned10:./ned_10
```

topo_30s/index

```
projection = regular_ll
dx = 0.00833333
dy = 0.00833333
known_x = 1.0
known_y = 1.0
known_lat = -89.99583
known_lon = -179.99583
wordsize = 2
tile_x = 1200
tile_y = 1200
tile_bdr=3
units="meters"
description="Topography"
```

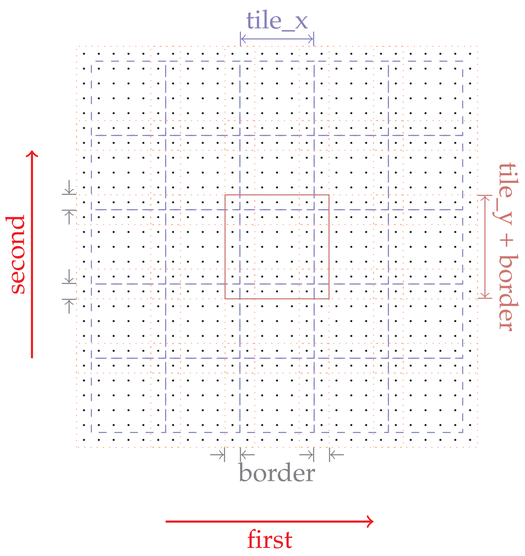
ned_30/index

```
geotiff = ned_30.tif
description="Topography"
units = "meters"
tile_x = 200
tile_y = 200
tile_bdr = 3
```

ned_10/index

```
geotiff = ned_10.tif
description="Topography"
units = "meters"
tile_x = 200
tile_y = 200
tile_bdr = 3
```

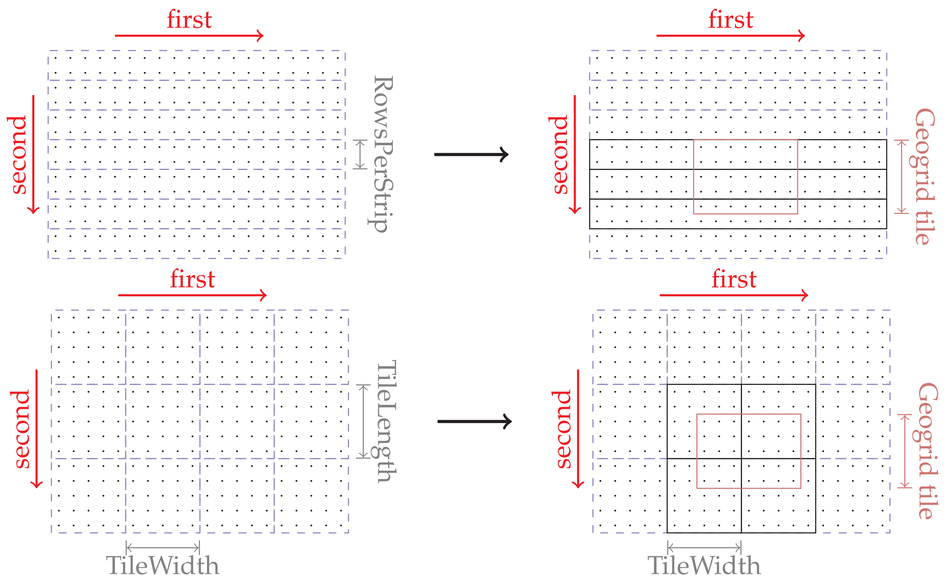
Geogrid binary format




```
datadir
    | index
    | 00001-00005.00001-00005
    | 00001-00005.00006-00010
    | 00001-00005.00011-00015
    | 00001-00005.00016-00020
    | 00001-00005.00021-00025
    | 00006-00010.00001-00005
    | 00006-00010.00006-00010
    | 00006-00010.00011-00015
    | 00006-00010.00016-00020
    | 00006-00010.00021-00025
    | 00011-00015.00001-00005
    | 00011-00015.00006-00010
    | 00011-00015.00011-00015
    | 00011-00015.00016-00020
    | 00011-00015.00021-00025
    | 00016-00020.00001-00005
    | 00016-00020.00006-00010
    | 00016-00020.00011-00015
    | 00016-00020.00016-00020
    | 00016-00020.00021-00025
    | 00021-00025.00001-00005
    | ...
```

The Geogrid binary format consists of a text file called `index` that contains metadata and number of binary files containing tiles of data. Each tile of data has a specified border region where tiles overlap. All data is stored in rows from bottom to top.

GeoTIFF to Geogrid interface



The TIFF format has several different storage conventions. The code currently supports tiled and stripped formats with row-wise top to bottom storage order. The interface requests a tile using Geogrid indexing conventions. A stub layer determines the GeoTIFF tiles necessary to fill that tile and assembles the data in the correct storage order. Available metadata from the GeoTIFF file is given to `source_data_module` automatically, which the user can over-ride in `index`.