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Metadata for bark beetle grids (spatial resolution: 1 km2) converted from aerial survey data Date: 10 July 2020
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Preliminary notes:

Please notify me by email if you want to use this data set

- there may be nuances or interpretation that I can help you with
- I would like to be able to contact you in case updates occur

CAUTION: Test correct file reading by comparing your figure (or map) to the PNG files in this directory or to the FEM figures.

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Reference:
Hicke, J. A., B. Xu, A. J. H. Meddens, and J. M. Egan, Characterizing recent bark beetle-caused tree mortality in the western United States from aerial surveys, accepted by Forest Ecology and Management.

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Contents:

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-- MA_FHPR1-R4.zip                  <-> Mortality Area from FHP(R1-R4) method
-- NKT_FHPR1-R4.zip                 <-> Number of Killed Trees from FHP(R1-R4) method
-- flown_grids_geotiff.zip          <-> annual grids of flown/not flown areas by
                                        surveyors
-- ids_dca_code.csv                 <-> codes, explanations for Damage Causal Agents
                                        (bark beetles)
-- ids_host_code.csv                <-> codes, explanations for host tree species
-- idl.produce.cumulative.files.txt <-> IDL code file illustrating reading, plotting
-- *.png                            <-> maps for you to compare against (for
                                        debugging?)
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Compressed using zip function on MacOS.

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Data:

Data is percent mortality (or mortality in ha) of a 1-km2 of forest canopy mortality within the grid cell, not the percent mortality of the forested area within that grid cell) (i.e., if a grid cell has a value of 40 and 40% of that grid cell is forested, then 100% of the forest area within the grid cell is killed).

Note: No data = -9999

Note: If aerial surveys report no damage for a damage causal agent (dca)/host combination in a given year, then that dca/host combination for that year (i.e., that data file) is not included in the data set.

**** NOTE ***** ENVI binary files are written such that first row in binary file is northernmost (topmost) row in map (image)

ENVI binary file information (www.harrisgeospatial.com/docs/ENVIImageFiles.html):

> ENVI binary files use a generalized raster data format that consists of two parts:

1. binary file - flat binary file
2. header file (.hdr) - small text (ASCII) file containing the metadata associated with the binary file (https://www.harrisgeospatial.com/docs/enviheaderfiles.html). This file can contain multiple following fields followed by equal sign and a variable. Here the header files contain:

- ENVI [first line; file type indicator]
- description [text description; ignored]
- samples [number of columns]
- lines [number of rows]
- bands [number of bands (here, number of years)
- header offset [number of bytes to skip in binary file]
- file type [file type]
- data type [here: 4 - 4-byte float]
- interleave [here: bsq, band sequential (X[col,row,band])
- byte order [here: 0 - little-endian byte order, format used on PC/Intel machines
- map info [map projection information]
- projection info [map projection information]

File name extensions:
none: binary data file
.hdr: associated ENVI header file
(i.e., there is a pair of files for each DCA/host/year)

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Naming convention of individual aerial survey grid products:

1_2_3_4_5_6_capped
place_year_typeofgrid_method_(bark beetle/host)_capped

1: us (only value)
2: yyyy (year)
3: NKT (number of killed trees) or MA (mortality area)
4: method described in Hicke et al., FEM; FHPR1-R4 (this is the only value)
5&6: bark beetle and host (see ids_dca_code.csv and ids_host_code.csv for code explanations)

- NOTE: when equal to "cumu", indicates that the file is the cumulative MA or NKT for all bark beetle/host combinations

Example names:
us_2009_NKT_FHPR1-R4_pe_wwp_capped
us_2009_NKT_FHPR1-R4_pe_wwp_capped.hdr

Exception: us_MA_FHPR1-R4_cumu is the map (grid) of cumulative MA (or NKT) across all years and bark beetle/host combinations

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Projection information:

US_ALBERS (1a-c):
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x dimension (pixels) 1886
y dimension (pixels) 2216
Spatial resolution (m) 1000.000
Upper left x -2375000.0000
Upper left y 3190000.0000
Projected Coordinate System: NAD_1983_Albers
Projection: Albers
False_Easting: 0.0000000000
False_Northing: 0.0000000000
Central_Meridian: -96.00000000

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Standard_Parallel_1:              29.500000000
Standard_Parallel_2:              45.500000000
Latitude_Of_Origin:         23.000000000
Linear Unit:                Meter
Geographic Coordinate System:     GCS_North_American_1983
Datum:                      D_North_American_1983
Prime Meridian:                   Greenwich
Angular Unit:               Degree
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