AERMAP Briefing for the 8th Conference on Air Quality Modeling

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Purpose of AERMAP

- Calculate elevations for sources and receptors
- Adjust coordinates so all under one Datum
- Calculate critical hill height values for receptors
- Output formatted for input to AERMOD control file

Example AERMAP Output File

```
** AERMAP - VERSION 02222
**  Using Durham NW DEM data file
**
** A total of   9  7.5-minute DEM files were used
** DOMAINXY  683500.0 3990500.0 17 686500.0 3993500.0 17
** ANCHORXY  0.0      0.0     685000.0 3992000.0 17 1
** Terrain heights were extracted by default

RE ELEVUNIT METERS
   GRIDPOLR POL1 STA
            POL1 ORIG   0.0   0.0
            POL1 DIST   100.   200.   300.   500.   1000.
            POL1 GDIR   36     10.    10.
   GRIDPOLR POL1     ELEV    1       132.86       137.55       142.49       148.89       136.50
   GRIDPOLR POL1     ELEV    2       133.60       138.86       143.26       147.71       136.12
   GRIDPOLR POL1     ELEV    3       135.15       139.78       140.59       145.54       133.69
     :
     :
     :
   GRIDPOLR POL1     ELEV   34       134.09       136.88       139.40       144.84       136.00
   GRIDPOLR POL1     ELEV   35       133.34       134.83       136.01       145.46       134.55
   GRIDPOLR POL1     ELEV   36       133.00       135.23       138.18       149.23       130.67
   GRIDPOLR POL1     HILL    1  132.86  137.55  142.49  148.89  136.50
   GRIDPOLR POL1     HILL    2  133.60  138.86  143.26  147.71  136.12
   GRIDPOLR POL1     HILL    3  135.15  139.78  140.59  145.54  133.69
     :
     :
     :
   GRIDPOLR POL1     HILL   34  135.00  151.00  151.00  144.84  136.00
   GRIDPOLR POL1     HILL   35  133.34  149.00  151.00  145.46  134.55
   GRIDPOLR POL1     HILL   36  133.00  135.23  138.18  149.23  130.67
   GRIDPOLR POL1 END
```

Introduction to Modifications

- Treatment of Critical Hill Height Receptors
- Use with SDTS File Format
- Use with Mixed DEM Datums
- Ability to Read 7 Digit Northing Coordinates

Introduction to Modifications – continued

- Better Error Checking
- Use of XYZ Terrain Data for Input
- Use of Various Nodes Spacings
- Status of Aermap
- Allocatable Arrays
- Testing

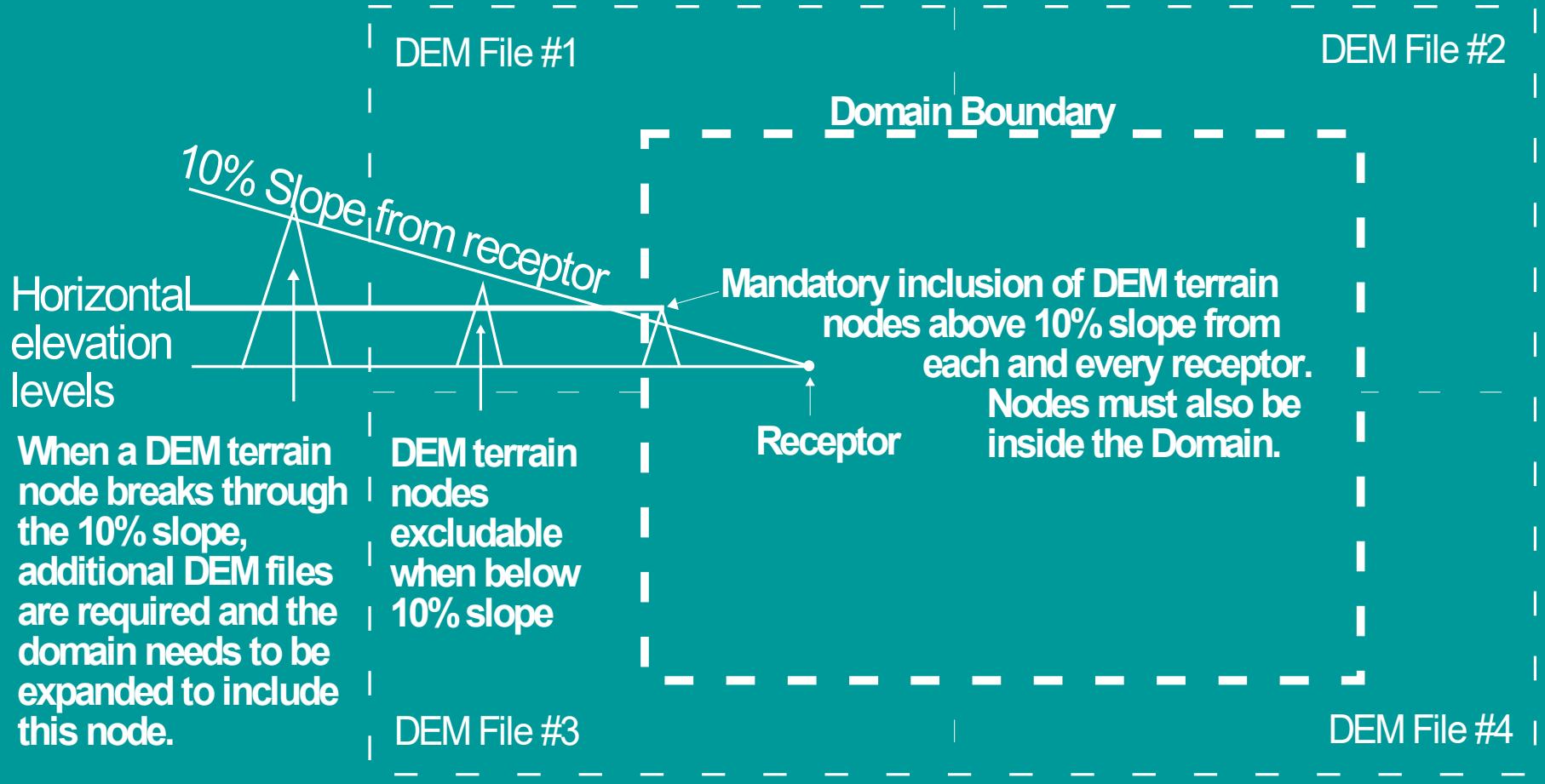
Treatment of Critical Hill Height Receptors

- Public comment:

  Critical Hill Heights could vary based on domain size which did affect the results
- Response:

  Search for terrain that breaks through a 10% slope from a receptor.

Treatment of Critical Hill Height Receptors



Incorporate SDST File Format

Public Comment: Provide ability to read SDTS formats

Response:

- SDTS - Spatial Data Transfer Standard
  Available on several internet sites for “free”.
  May find some download restrictions
- SDTS files are preprocessed and reconstituted into the old “native” DEM file format using the SDTS2DEM program
- Batch file system being included with AERMAP package.
  Important to read instructions and comments

Use with Mixed DEM Datums

Public Comment: Want to use AERMAP with two different datums

Response:

- Can process 7.5-minute files with:
  North American Datum 1927,
  North American Datum 1983,
  Old Hawiian Datum, and
  Puerto Rico and Virgin Island Datum

  Can process 1-Degree files with:
  World Geodetic System 1972, and
  World Geodetic System 1984 Datums

- Need to add a Datum code at end of the ANCHOR keyword

Ability to Read 7-digit Northing Coordinates

Public Comment: AERMAP was not able to fully process the 7-digit Northing Coordinate

Response:

- Done by using Double Precision variables and double to single and single to double precision functions.

Better Error Checking

Public Comment: There was a need sighted for better error checking of the raw data

Response:

- Additional error checks were added to AERMAP
- DEM files were scrutinized for problems and better READ algorithms were developed
- Additional debug statements were added
- An additional debug strategy is being reviewed

Need to Process XYZ Terrain Data

Public Comment: There is a need to be able to read user-prepared XYZ in a user-specified format

- Response:

- A draft method has been developed where the user copies a DEM file and fills in the appropriate field with their own data.

- The X and Y values must be evenly spaced

- The values can be in UTM or Arc-seconds

- The user needs to understand the USGS “Blue Book” format – copy in AERMAP User’s Guide

- A draft XYZ Terrain User’s Guide has been prepared

Use of Variable Node Spacings

Emailed Comment: The USGS SDTS files have node spacings of 10 meters that cause AERMAP to crash

Response:

- The X, Y, and Z spacing values and units which are found in the DEM file header are now read and utilized in AERMAP.
- These values are used instead of the previously fixed values.

Status of AERMAP

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- Allocatable Arrays
- Testing