NEI_2011_radm

1.0

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2.1 File List

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Functions/Subroutines

- subroutine check (status)

  Verifies no error in netcdf function call.
- subroutine lee_nml (IX, JX, KX)

  Reads dimensions from namelist file.

Variables

- integer zlev

  Emission Layer.
- integer hh

  Start hour in binary emissions file.
- integer nradm

  Number of chemical species in netcdf emissions file.
- integer, parameter nh =24

  Number of hours in a day.
- integer, parameter radm =32

  Number of chemical species in RADM mechanism.
- integer, parameter ndims =6

  Number dimensions to be stored in netcdf output file.
- real, dimension(:,:,:,:), allocatable emiss3d

  emissions by nx,ny,level,nh,radm
- real, dimension(:,:,:), allocatable xlat

  Latitude coordinates by nx,ny,nh from wrfinput file.
- real, dimension(:,:,:), allocatable xlon

  Longitude coordinates by nx,ny,nh from wrfinput file.
- integer grid_id

  Domain ID from wrfinput file and used in output file.

- integer julyr

  julian year global attribure from wrfinput file and used in output file.
- integer julday

  julian day global attribure from wrfinput file and used in output file.
- integer mapproj

  Map projection ID global attribure from wrfinput file and used in output file.
- integer iswater

  Water ID global attribure from wrfinput file and used in output file.
- integer islake

  Lake ID global attribure from wrfinput file and used in output file.
- integer isice

  Ice ID global attribure from wrfinput file and used in output file.
- integer isurban

  Urban ID global attribure from wrfinput file and used in output file.
- integer isoilwater

  Water-soil ID global attribure from wrfinput file and used in output file.
- real cenlat

  Projection central latitude.
- real cenlon

  Projection central longitude.
- real dx

  Grid size (m) in W-E direction.
- real dy

  Grid size (m) in S-N direction.
- real trulat1

  Standard parallel 1.
- real trulat2

  Standard parallel 2.
- real moadcenlat

  Mother of all domains center latitude.
- real stdlon

  Standard longitude.
- real pollat

  Pole latitude.
- real pollon

  Pole longitude.
- real gmt

  Time zone.
- real num_land_cat

  Land cover categories number.
- character(len=10) cday

  Day of the week.
- character(len=9), dimension(:), allocatable ename1

  Emissions name in binary file.
- character(len=10), dimension(:), allocatable ename

  Emissions name in output netcdf file.
- character(len=19) mminlu

  Source of land use data.
- character(len=19) cmap_proj_char

  Projection description.
- character(len=38) title

Title from wrfinput file.

- character(len=19), dimension(ndims) sdim =(/"Time ", "DateStrLen ","west_east ","south_north ","bottom_top ","emissions_zdim_stag"/)

  Dimension description array.

- character(len=19), dimension(radm) cname =(/'Sulfur Dioxide ', 'Nitrogen oxide ','Aldehydes ','HCHO ','Acetic Acid ', 'Ammonia ','Butanes ','Pentanes ','Alkane ', 'Ethane ','Carbon Monoxide ','Alkanes ','Terminal Alkenes', 'Alkenes ','Toluene ','Xylene ','Acetone ', 'Cresol ','Isoprene ','Methane ','PM25I ', 'PM25J ','SulfatesI ','SulfatesJ ','Nitrates ', 'NitratesJ ','OrganicI ','OrganicJ ','Elemental Carb I', 'Elemental Carb J','PM_10 ','Nitrogen Dioxide'/)

  Chemical mechanism variable emissions description.

- character(len=19) current_date

  Date in wrfiput file.

- character(len=19) mecha

  mechanism name

3.1.1 Detailed Description

Emissions Inventorie Variables.

Author

Jose Agustin Garcia Reynoso

Date

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3.1.2 Function/Subroutine Documentation

3.1.2.1 check()

```
subroutine var_nei::check (
             integer, intent(in) status )
```

Verifies no error in netcdf function call.

Parameters

status	NetCDF functions return a non-zero status codes on error.

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Definition at line 144 of file module_var_nei.F90.

3.1.2.2 lee_nml()

```
subroutine var_nei::lee_nml (
             integer, intent(out) IX,
             integer, intent(out) JX,
             integer, intent(out) KX )
```

Reads dimensions from namelist file.

Obtains from domain.nml file dimension of domain dimensions.

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Parameters

IX	number of cell grid in W-E direction
JX	number of cell grid in S-N direction
KX	number of cell grid in vertical direction

Definition at line 168 of file module_var_nei.F90.

3.1.3 Variable Documentation

3.1.3.1 cday

```
character(len=10) var_nei::cday
```

Day of the week.

Definition at line 70 of file module_var_nei.F90.

3.1.3.2 cenlat

```
real var_nei::cenlat
```

Projection central latitude.

Definition at line 46 of file module_var_nei.F90.

3.1.3.3 cenlon

```
real var_nei::cenlon
```

Projection central longitude.

Definition at line 48 of file module_var_nei.F90.

3.1.3.4 cmap_proj_char

```
character(len=19) var_nei::cmap_proj_char
```

Projection description.

Definition at line 78 of file module_var_nei.F90.

3.1.3.5 cname

```
character(len= 19), dimension(radm) var_nei::cname =(/'Sulfur Dioxide ', 'Nitrogen oxide ','Aldehydes
','HCHO ','Acetic Acid ', 'Ammonia ','Butanes ','Pentanes ','Alkane ', 'Ethane ','Carbon Monoxide
','Alkanes ','Terminal Alkenes', 'Alkenes ','Toluene ','Xylene ','Acetone ', 'Cresol ','Isoprene
','Methane ','PM25I ', 'PM25J ','SulfatesI ','SulfatesJ ','Nitrates ', 'NitratesJ ','OrganicI
','OrganicJ ','Elemental Carb I', 'Elemental Carb J','PM_10 ','Nitrogen Dioxide'/)
```

Chemical mechanism variable emissions description.

Definition at line 86 of file module_var_nei.F90.

3.1.3.6 current_date

```
character (len=19) var_nei::current_date
```

Date in wrfiput file.

Definition at line 96 of file module_var_nei.F90.

3.1.3.7 dx

```
real var_nei::dx
```

Grid size (m) in W-E direction.

Definition at line 50 of file module_var_nei.F90.

3.1.3.8 dy

```
real var_nei::dy
```

Grid size (m) in S-N direction.

Definition at line 52 of file module_var_nei.F90.

3.1.3.9 emiss3d

```
real, dimension(:,:,:,:,:), allocatable var_nei::emiss3d
```

emissions by nx,ny,level,nh,radm

Definition at line 22 of file module_var_nei.F90.

3.1.3.10 ename

```
character (len=10), dimension(:), allocatable var_nei::ename
```

Emissions name in output netcdf file.

Definition at line 74 of file module_var_nei.F90.

3.1.3.11 ename1

```
character (len= 9), dimension(:), allocatable var_nei::ename1
```

Emissions name in binary file.

Definition at line 72 of file module_var_nei.F90.

3.1.3.12 gmt

```
real var_nei::gmt
```

Time zone.

Definition at line 66 of file module_var_nei.F90.

3.1.3.13 grid_id

```
integer var_nei::grid_id
```

Domain ID from wrfinput file and used in output file.

Definition at line 28 of file module_var_nei.F90.

3.1.3.14 hh

```
integer var_nei::hh
```

Start hour in binary emissions file.

Definition at line 12 of file module_var_nei.F90.

3.1.3.15 isice

```
integer var_nei::isice
```

Ice ID global attribure from wrfinput file and used in output file.

Definition at line 40 of file module_var_nei.F90.

3.1.3.16 islake

```
integer var_nei::islake
```

Lake ID global attribure from wrfinput file and used in output file.

Definition at line 38 of file module_var_nei.F90.

3.1.3.17 isoilwater

```
integer var_nei::isoilwater
```

Water-soil ID global attribure from wrfinput file and used in output file.

Definition at line 44 of file module_var_nei.F90.

3.1.3.18 isurban

```
integer var_nei::isurban
```

Urban ID global attribure from wrfinput file and used in output file.

Definition at line 42 of file module_var_nei.F90.

3.1.3.19 iswater

```
integer var_nei::iswater
```

Water ID global attribure from wrfinput file and used in output file.

Definition at line 36 of file module_var_nei.F90.

3.1.3.20 julday

```
integer var_nei::julday
```

julian day global attribure from wrfinput file and used in output file.

Definition at line 32 of file module_var_nei.F90.

3.1.3.21 julyr

```
integer var_nei::julyr
```

julian year global attribure from wrfinput file and used in output file.

Definition at line 30 of file module_var_nei.F90.

3.1.3.22 mapproj

```
integer var_nei::mapproj
```

Map projection ID global attribure from wrfinput file and used in output file.

Definition at line 34 of file module_var_nei.F90.

3.1.3.23 mecha

```
character (len=19) var_nei::mecha
```

mechanism name

Definition at line 98 of file module_var_nei.F90.

3.1.3.24 mminlu

```
character(len=19) var_nei::mminlu
```

Source of land use data.

Definition at line 76 of file module_var_nei.F90.

3.1.3.25 moadcenlat

```
real var_nei::moadcenlat
```

Mother of all domains center latitude.

Definition at line 58 of file module_var_nei.F90.

3.1.3.26 ndims

```
integer, parameter var_nei::ndims =6
```

Number dimensions to be stored in netcdf output file.

Definition at line 20 of file module_var_nei.F90.

3.1.3.27 nh

```
integer, parameter var_nei::nh =24
```

Number of hours in a day.

Definition at line 16 of file module_var_nei.F90.

3.1.3.28 nradm

```
integer var_nei::nradm
```

Number of chemical species in netcdf emissions file.

Definition at line 14 of file module_var_nei.F90.

3.1.3.29 num_land_cat

```
real var_nei::num_land_cat
```

Land cover categories number.

Definition at line 68 of file module_var_nei.F90.

3.1.3.30 pollat

```
real var_nei::pollat
```

Pole latitude.

Definition at line 62 of file module_var_nei.F90.

3.1.3.31 pollon

```
real var_nei::pollon
```

Pole longitude.

Definition at line 64 of file module_var_nei.F90.

3.1.3.32 radm

```
integer, parameter var_nei::radm =32
```

Number of chemical species in RADM mechanism.

Definition at line 18 of file module_var_nei.F90.

3.1.3.33 sdim

```
character (len=19), dimension(ndims) var_nei::sdim =(/"Time ", "DateStrLen ","west_east ","south↩
_north ","bottom_top ","emissions_zdim_stag"/)
```

Dimension description array.

Definition at line 82 of file module_var_nei.F90.

3.1.3.34 stdlon

```
real var_nei::stdlon
```

Standard longitude.

Definition at line 60 of file module_var_nei.F90.

3.1.3.35 title

```
character(len=38) var_nei::title
```

Title from wrfinput file.

Definition at line 80 of file module_var_nei.F90.

3.1.3.36 trulat1

```
real var_nei::trulat1
```

Standard parallel 1.

Definition at line 54 of file module_var_nei.F90.

3.1.3.37 trulat2

```
real var_nei::trulat2
```

Standard parallel 2.

Definition at line 56 of file module_var_nei.F90.

3.1.3.38 xlat

```
real, dimension(:,:,:), allocatable var_nei::xlat
```

Latitude coordinates by nx,ny,nh from wrfinput file.

Definition at line 24 of file module_var_nei.F90.

3.1.3.39 xlon

```
real, dimension(:,:,:), allocatable var_nei::xlon
```

Longitude coordinates by nx,ny,nh from wrfinput file.

Definition at line 26 of file module_var_nei.F90.

3.1.3.40 zlev

```
integer var_nei::zlev
```

Emission Layer.

Definition at line 10 of file module_var_nei.F90.

Chapter 4

File Documentation

4.1 /Users/agustin/proyectos/NEI_2011_radm/source/convierte.F90 File Reference

Functions/Subroutines

- program nei_2011

  Reads binary files from NEI 2011 and converts into netcdf.

4.1.1 Function/Subroutine Documentation

4.1.1.1 nei_2011()

```
program nei_2011
```

Reads binary files from NEI 2011 and converts into netcdf.

using wrfinput to set dates, attributes and dimensions for RADM2 mechanism this is made in two steps: 1) Set hh=0 to indicate thet binary file starting at 00Z will be read reads wrfiput file obtaining time, attibutes and dimensions. stores 00z emissions data in netcdf format 2) Set hh=12 to read 12Z binary file uses previous wrfinput information and stores 12z emissions data in netcdf format

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Definition at line 17 of file convierte.F90.

4.2 /Users/agustin/proyectos/NEI_2011_radm/source/guarda.F90 File Reference

Functions/Subroutines

- subroutine guarda_emisiones

  Stores emissions in radm categories in netcdf format.
- subroutine crea_attr (ncid, ifl, dimids, svar, cname, cunits, id_var)

  Creates attributes for each variable in the netcdf file.

4.2.1 Function/Subroutine Documentation

4.2.1.1 crea_attr()

```
subroutine guarda_emisiones::crea_attr (
             integer, intent(in) ncid,
             integer, intent(in) ifl,
             integer, dimension(:), intent(in) dimids,
             character(len=*), intent(in) svar,
             character(len=*), intent(in) cname,
             character(len=*), intent(in) cunits,
             integer, intent(out) id_var )
```

Creates attributes for each variable in the netcdf file.

Author

Jose Agustin Garcia Reynoso

Date

07/13/2020

Version

2.2

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Parameters

ncid	netcdf file ID
ifl	type of variable 0 for ratio, 1 for emissions 2 for number
dimids	ID dimensons array
svar	short variable name
cname	description variable name
cunits	units of the variable
id_var	variable ID

Definition at line 208 of file guarda.F90.

4.2.1.2 guarda_emisiones()

```
subroutine guarda_emisiones
```

Stores emissions in radm categories in netcdf format.

Author

Jose Agustin Garcia Reynoso

Date

26/04/2018

Version

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Definition at line 21 of file guarda.F90.

4.3 /Users/agustin/proyectos/NEI_2011_radm/source/lee_NEI.F90 File Reference

Functions/Subroutines

- subroutine lee_nei

  Reads binary emissions file with radm categories.

4.3.1 Function/Subroutine Documentation

4.3.1.1 lee_nei()

```
subroutine lee_nei
```

Reads binary emissions file with radm categories.

uses a global variable hh to read 00z or 12z.

Author

Jose Agustin Garcia Reynoso

Date

25/04/2018

Version

1.0

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Definition at line 14 of file lee_NEI.F90.

4.4 /Users/agustin/proyectos/NEI_2011_radm/source/lee_wrfinput.F90 File Reference

Functions/Subroutines

- subroutine lee_wrfinput

4.4.1 Function/Subroutine Documentation

4.4.1.1 lee_wrfinput()

```
subroutine lee_wrfinput
```

Definition at line 11 of file lee_wrfinput.F90.

4.5 /Users/agustin/proyectos/NEI_2011_radm/source/module_var_↩ nei.F90 File Reference

Modules

- module var_nei

  Emissions Inventorie Variables.

Functions/Subroutines

- subroutine var_nei::check (status)

  Verifies no error in netcdf function call.
- subroutine var_nei::lee_nml (IX, JX, KX)

  Reads dimensions from namelist file.

Variables

- integer var_nei::zlev

  Emission Layer.
- integer var_nei::hh

  Start hour in binary emissions file.
- integer var_nei::nradm

  Number of chemical species in netcdf emissions file.
- integer, parameter var_nei::nh =24

  Number of hours in a day.
- integer, parameter var_nei::radm =32

  Number of chemical species in RADM mechanism.
- integer, parameter var_nei::ndims =6

  Number dimensions to be stored in netcdf output file.
- real, dimension(:,:,:,:,:), allocatable var_nei::emiss3d

  emissions by nx,ny,level,nh,radm
- real, dimension(:,:,:), allocatable var_nei::xlat

  Latitude coordinates by nx,ny,nh from wrfinput file.
- real, dimension(:,:,:), allocatable var_nei::xlon

  Longitude coordinates by nx,ny,nh from wrfinput file.
- integer var_nei::grid_id

  Domain ID from wrfinput file and used in output file.
- integer var_nei::julyr

  julian year global attribure from wrfinput file and used in output file.
- integer var_nei::julday

  julian day global attribure from wrfinput file and used in output file.
- integer var_nei::mapproj

  Map projection ID global attribure from wrfinput file and used in output file.
- integer var_nei::iswater

  Water ID global attribure from wrfinput file and used in output file.
- integer var_nei::islake

  Lake ID global attribure from wrfinput file and used in output file.
- integer var_nei::isice

  Ice ID global attribure from wrfinput file and used in output file.

- integer var_nei::isurban

  Urban ID global attribure from wrfinput file and used in output file.
- integer var_nei::isoilwater

  Water-soil ID global attribure from wrfinput file and used in output file.
- real var_nei::cenlat

  Projection central latitude.
- real var_nei::cenlon

  Projection central longitude.
- real var_nei::dx

  Grid size (m) in W-E direction.
- real var_nei::dy

  Grid size (m) in S-N direction.
- real var_nei::trulat1

  Standard parallel 1.
- real var_nei::trulat2

  Standard parallel 2.
- real var_nei::moadcenlat

  Mother of all domains center latitude.
- real var_nei::stdlon

  Standard longitude.
- real var_nei::pollat

  Pole latitude.
- real var_nei::pollon

  Pole longitude.
- real var_nei::gmt

  Time zone.
- real var_nei::num_land_cat

  Land cover categories number.
- character(len=10) var_nei::cday

  Day of the week.
- character(len=9), dimension(:), allocatable var_nei::ename1

  Emissions name in binary file.
- character(len=10), dimension(:), allocatable var_nei::ename

  Emissions name in output netcdf file.
- character(len=19) var_nei::mminlu

  Source of land use data.
- character(len=19) var_nei::cmap_proj_char

  Projection description.
- character(len=38) var_nei::title

  Title from wrfinput file.
- character(len=19), dimension(ndims) var_nei::sdim =(/"Time ", "DateStrLen ","west_east ","south_north ","bottom_top ","emissions_zdim_stag"/)

  Dimension description array.
- character(len=19), dimension(radm) var_nei::cname =(/'Sulfur Dioxide ', 'Nitrogen oxide ','Aldehydes ','HCHO ','Acetic Acid ', 'Ammonia ','Butanes ','Pentanes ','Alkane ', 'Ethane ','Carbon Monoxide ','Alkanes ','Terminal Alkenes', 'Alkenes ','Toluene ','Xylene ','Acetone ', 'Cresol ','Isoprene ','Methane ','PM25I ', 'PM25J ','SulfatesI ','SulfatesJ ','Nitrates ', 'NitratesJ ','OrganicI ','OrganicJ ','Elemental Carb I', 'Elemental Carb J','PM_10 ','Nitrogen Dioxide'/)

  Chemical mechanism variable emissions description.
- character(len=19) var_nei::current_date

  Date in wrfiput file.
- character(len=19) var_nei::mecha

  mechanism name

4.6 /Users/agustin/proyectos/NEI_2011_radm/source/testsuite/t_check.F90 File Reference

Functions/Subroutines

- program test_check

4.6.1 Function/Subroutine Documentation

4.6.1.1 test_check()

```
program test_check
```

Definition at line 2 of file t_check.F90.

4.7 /Users/agustin/proyectos/NEI_2011_radm/source/testsuite/test_nml.F90 File Reference

Functions/Subroutines

- program nml_read

  Program to obtain the domain's dimensions.

4.7.1 Function/Subroutine Documentation

4.7.1.1 nml_read()

```
program nml_read
```

Program to obtain the domain's dimensions.

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Definition at line 7 of file test_nml.F90.

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