

1. INTEL precompiled version of 3.7
2. Setup
 - a. setenv SMK_HOME and using smoke_install.csh with 3 compressed files
 - b. Critical file: Assigns file
 - i. \$SMK_HOME/subsys/smoke/assigns
3. Test case (nctox)
 - a. 7/11/2005 – 7/11/2005, 12km North Carolana (subdomain of EPA's 12-km)
 - b. toxics processing for stationary area, nonroad mobile, and point sources

```

cd $SMK_HOME/subsys/smoke/assigns
source ASSIGNS.nctox.cmaq.cb05_soa.us12-nc
cd $SCRIPTS/run
./smk_area_nctox.csh
./smk_bg_nctox.csh
./smk_nonroad_nctox.csh
./smk_point_nctox.csh
./smk_rateperdistance_nctox.csh
./smk_ratepervehicle_nctox.csh
./smk_rateperprofile_nctox.csh
./smk_rateperhour_nctox.csh
./smk_mrgall_nctox.csh

cd $LOGS (change to the log file directory for the test case)
grep ERROR *
cd $SCRIPTS/install
./check_smk_install

## RESULT ##
No differences found between your SMOKE report files and the comparison files.
Your installation and example SMOKE run have completed successfully!
YOU DO NOT NEED TO COMPILE SMOKE source codes but USE the
precompiled executables located at $SMK_BIN
##

```

4. 3SDW case
 - a. ge_dat
 - b. inventory" base11b
 - i.
 - c. 7/11/2005 – 7/11/2005, 12km North Carolana (subdomain of EPA's 12-km)

```

cd $SMK_HOME/subsys/smoke/assigns
cp ASSIGNS.nctox.cmaq.cb05_soa.us12-nc
ASSIGNS.nctox.cmaq.cb05_soa.us12-nc_TEST1

## EDIT ASSIGN FILE ##

cp source ASSIGNS.nctox.cmaq.cb05_soa.us12-nc
cd $SCRIPTS/run

```

```

./smk_area_nctox.csh
./smk_bg_nctox.csh
./smk_nonroad_nctox.csh
./smk_point_nctox.csh
./smk_rateperdistance_nctox.csh
./smk_ratepervehicle_nctox.csh
./smk_rateperprofile_nctox.csh
./smk_rateperhour_nctox.csh
./smk_mrgall_nctox.csh

cd $LOGS (change to the log file directory for the test case)
grep ERROR *
cd $SCRIPTS/install
./check_smk_install

```

```
## RESULT ##
```

```

No differences found between your SMOKE report files and the comparison files.
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##

```

5.
 - a. \$SMK_HOME/subsys/smoke/assigns/
6. EPA_2011v6 v2platform
 - a. \$INSTALL_DIR/scripts/platformr
 - i. #set os = `uname -s`uname -r | cut -d"." -f1`_`uname -p`
set os = Linux3_x86_64
7. EPA 2011v6 v3 platform
 - a. same as the platform above..
 - b. ioapi symbolic link: pgf -> ifort (it works..)
 - c. First, tried to use 2011eh inventory.
 - i. use only state data in nonpoint, nonroad, onroad, and point
 - ii. CO 08 COLORADO
UT 49 UTAH
WY 56 WYOMING
 - iii. code edit:
 - 1.
 - iv. nonpt
 1. afdust & afdust_adj
 - a. xportfrac.8vars.beld3.4kmgrid
 - b. setenv SRGDESC
"\${GE_DAT}/gridding/srgdesc_CONUS4_2010_v5_15
may2015_v1.txt"
 - c. afdust_adj
 - i. afdust_ann_report.py
 - ii. 'cmaq_cb6':
'/home/noitul5/MODEL/SMOKEv3.7/smoke3.7/s

cripts/annual_report/parameter_file_cmaq_cb6.t
xt',
mwDefault = 'cmaq_cb6'

2. ag
3. agfire
4. c1c2rail
 - a. Annual_rail
 - i. setenv SRGDESC
"\${GE_DAT}/gridding/srgdesc_CONUS12_2010_v5_16jan2015_v5.txt"
setenv SRGPRO
"\${GE_DAT}/gridding/CONUS12_2010_v5_20141015/USA_100_FILL_NORM.txt"
 - ii. EMISINV_A
 - iii. nhapexclude_2011NElv2_c1c2rail_25sep2014_v0
 - iv. copy
srgdesc_CONUS4_2010_v5_16jan2015_v5.txt
from CONUS4 folder
 - v. run file: smk_ar_annual_emf
5. c3marine
6. nonpt
7. np_oilgas
8. rwc

d. smk_merge_dates : Use "create_merge_dates"

8. DENVER 2017

- a. Environment
 - i. SMOKEv3.7
 - ii. Use default directory tree
 - iii. ge_dat
 1. scc_desc and artpnt are related to each other. (used from v3platform)
 - a. changed location (INV -> GE_DAT)
 2. costcy
 - a. costcy_for_2007platform_08dec2015_nf_v15.txt from v3platform (population warnings?)
 - iv. INVTABLE
 1. original: invtable_hapcap_cb05soa.txt
 - a. Might be
:Alpine_EMIS/denver_2017_Colorado_smoke_onroad/
smokev3_6/data/ge_dat/ge_dat_pmnaaqs07/invtable_hapcap_cb05soa_25may2011_v13.txt (can be found in nei2005 inventory)
 - b. compared with MOVES2014.27aug2015_v2.txt
 - i. only have VMT
 - ii. lots of missing data

- c. invtable_2011v2_platform_integrate_15may2015_v3.txt from v3platform was used. This file was used for area emission in v3platform
 - v. SMKINVEN
 - 1. No population data
 - a. This warning can be disapperred Using costcy.txt in SMOKE v3.7 default file, but another warnings were showw..
 - i. ARNING: Applying default time zone 5 to country/state/county code: XXXXXXXX...
 - b. In this case, costcy file from v3 flatfrom was used
 - i. costcy_for_2007platform_08dec2015_nf_v15.txt
 - 2. Speciation: put those fine into \$ge_data/speciation/
 - a.
 - b.
- b. Area Inventory
 - i. inside Colorado (SRCABBR arCO)
 - 1. Speciation
 - a. First try
 - i. Gspro_cmaq_cb6_2011ek_cb6v2_v6_11g_16dec2014.txt
 - ii. Gsref_2011ek_cb6v2_v6_11g_nf.txt
 - iii. turn off GSREF and GSPRO in ASSIGNS file
 - iv. user SARPC files from v3platform
 - v. VOC (inventory) -> TOG (profile) : need for GSCNV file
 - vi. PM10 (inventory) -> TOG (profile) : need for GSCNV file
 - b. Second try
 - i. CB5 from EPA v6.2 platform
 - ii. Cannot use spatial surrogate file
 - 1. Xorig and yorig should have N x (xcell,ycell) differences from COLOR4 setting
 - a. Original 4km : -973.D3, -313500.000,
 - b. Modified 4km: -972.D3, -312.D3
 - c. Shifted 1km to the east and 1.5km to the north
 - iii. Temporal
 - 1. setenv ATPRO_MONTHLY
"\${GE_DAT}/temporal/amptpro_general_2011platform_tpro_monthly_20nov2015_v2"
 - 2. setenv ATPRO_WEEKLY
"\${GE_DAT}/temporal/amptpro_general

_2011platform_tpro_weekly_13nov2014
_v1"

3. setenv ATREF
"\${GE_DAT}/temporal/ampref_general_2011platform_tref_08dec2015_nf_v11"
4.
: use EPA v6.3 file
5. Missing problem
6. 700 : not used in Alpine_emis
7. file:

iv.

2. setenv WRITE_ANN_ZERO Y <- remove warning in
spcmat

- ii. (run_area_04k.camx.2017.CO.bat)
Area (nonpt) sources inside the 4K domain, but outside Colorado
(run_area_04k.camx.2017.noda.bat)
Oil and Gas Area Sources inside the CO non-attainment area
(run_areaOG_04k.2017.CONAAonly.bat)
Oil and Gas Area Sources outside the CO non-attainment area
(run_areaOG_04k.camx.2017_COnoNAA.bat)

Nonroad inside CO (run_nonroad_04k.camx.2017.CO.bat)
Nonroad outside CO (run_nonroad_04k.camx.2017.noda.bat)

Point sources without CEM data inside CO
(run_pntNOCEM_04k.camx.2017.CO.bat)
Point sources without CEM data outside CO
(run_pnt_04k.camx.2017.noda.bat)
Oil and Gas Point Sources inside the CO non-attainment area
(run_pntOG_04k.camx.2017.CONAA.bat)
Oil and Gas Point Sources outside the CO non-attainment area
(run_pntOG_04k.camx.2017.COnonNAA.bat)

CEM source are split into 3 sections:

CEM Sources using the 2011 activity data as 2017
(run_COcem04k.camx.cb6.2017as2011.bat)

CEM Sources using the 2017 activity data as 2017
(run_COcem04k.camx.cb6.2017as2017.bat)

Special case processing for Cherokee Units 5,6 to utilized hourly
projection data (run_hourly_cherokee56.bat)

Note that there are no CEM sources in the 4K grid outside of CO.

The SMOKE-MOVES processing was completed by ENVIRON, those
files will be made available separately.

Other data streams are processed outside of SMOKE:

Biogenics
Lightning NOx
Fires

9. SPTOOL v3.1

a. postgresql

i. <http://blogger.pe.kr/503>

ii.

```
yum install postgresql-server perl-CPAN perl-YAML.noarch
service postgresql initdb
service postgresql start
passwd postgres (not clear if this is required)
su postgres
psql -U postgres
```

```
=# CREATE USER <user name here> WITH CREATEDB;
=# \q
```

! user name is the linux account

Finally, run the script sptool_reqd_checks.sh again

If PgPP is not worked correctly,

```
perl -MCPAN -e shell
cpan> install DBI
cpan> install Text::CSV
cpan> install DBD::PgPP
```

iii. run script

```
# root account,

service postgresql start
# In user account,
source Assigns.sptool
# If there is another task,
dropdb sptoolv3_1 ;or
change the name of SPTOOL_DB (!! must lowercasel)
psql -l ; to show existing PostgreSQL databases
```

iv. Input files

1. mechanism

- can contain any kind of mechanism definitions
- format: mechanism name, speci_id (unique species identifier), aqm_poll (emission name in AQM), moles_per_mole

2. nrog = 2, nvol = 1 except SAPRC16

10. GSPRO, GSREF, GSCNV

a. 2011eh_cb05

i. Annual cases

1. GSPRO

a. In U.S. case, all sector uses

gspro_cmaq_cb05_soa_2011eh_cb05_v6_11g_11dec
2014.txt except beis

b. gspro_combo can be used for ????

2. GSREF

a. All cases use gsref_2011eh_v6_11g_05jan2015.txt
except othpt and othar (might be due to not in U.S.)

3. GSCNV: All cases use gscnv_2011eh_v6_11g_05jan2015.txt

ii. There is another versions related to "toxic". If there is no separated
toxic emissions, it might not be necessary.

iii.

1.

iv.

1. gscnv_2011eh_v6_11g_05jan2015.txt

2.

11.

12. acom-sojint5500:/home/noitul5/Desktop> find ~/DATA/FRAPPE/EMISSION/ -name

'*ref*.txt' | xargs grep '2310021450'

/home/noitul5/DATA/FRAPPE/EMISSION/denver2017/smoke/ge_dat/gref.oag.3SAQ
S.denverupdate.txt:00000;2310021450;686 ! Added for CDPHE emissions

/home/noitul5/DATA/FRAPPE/EMISSION/denver2017/smoke/ge_dat/gsref.oag.3SA
QS.denverupdate.txt:### Added 2310021450 (DJVNT)

/home/noitul5/DATA/FRAPPE/EMISSION/denver2017/smoke/ge_dat/gsref.oag.3SA
QS.denverupdate.txt:2310021450;"DJVNT";"VOC";,;,,;

agts_l.npOGCO2014.20140709.4.ECMWF4km.FRAPPE_D02.ncf: ADDING CL2 : it's OK for
CMAQ

mgts_l.RPD_CO.20140709.4.ECMWF4km.FRAPPE_D02.ncf: ADDING PMC

mgts_l.RPD_CO.20140709.4.ECMWF4km.FRAPPE_D02.ncf: ADDING N2O_INV

mgts_l.RPD_CO.20140709.4.ECMWF4km.FRAPPE_D02.ncf: ADDING CO2_INV

mgts_l.RPD_CO.20140709.4.ECMWF4km.FRAPPE_D02.ncf: ADDING CH4_INV

pgts_l.ptOGCO2014.20140709.4.ECMWF4km.FRAPPE_D02.ncf: ADDING ECH4 -> CH4

pgts_l.ptOGCO2014.20140709.4.ECMWF4km.FRAPPE_D02.ncf: ADDING ISP->ISOP

pgts_l.ptOGCO2014.20140709.4.ECMWF4km.FRAPPE_D02.ncf: ADDING TOLA->TOL

pgts_l.ptOGCO2014.20140709.4.ECMWF4km.FRAPPE_D02.ncf: ADDING TRP->TERP

pgts_l.ptOGCO2014.20140709.4.ECMWF4km.FRAPPE_D02.ncf: ADDING XYLA->XYL

pgts_l.ptOGCO2014.20140709.4.ECMWF4km.FRAPPE_D02.ncf: ADDING

FPRM->PMFINE

Modify: 5674,

Remove: 92000

30190022 VOC remove

pgts_I.ptOGCO2014.20140709.4.ECMWF4km.FRAPPE_D02.ncf: ADDING POA
->POC(0.83) and PNCOM(0.17)

Current EMISSION information

1. Location

- a. D01: /glade/scratch/noitul5/run_FRAPPE_D01/output/cmaq_cb06
- b. D02: /glade/scratch/noitul5/run_FRAPPE_D02/output/cmaq_cb06
- c. ONROAD EMISSION:
 - i. D01:
/glade/p/work/noitul5/FRAPPE_BACKUP/EMISSION/cmaq_cb06/NE
W_VERSION/D01/SECTOR
 - ii. D02:
/glade/p/work/noitul5/FRAPPE_BACKUP/EMISSION/cmaq_cb06/NE
W_VERSION/D02/SECTOR

2. Sector emissions

- a. TAG "2017" : 2017 projection emissions in EPA 2011 v6.3
- b. POINT SOURCES
 - i. TAG "ptgts3d" : Elevated point emissions with WRF 2014 simulation
 - ii. EGU sector
 1. 2014 emissions based on 2014 Continuous Emissions Monitoring System (CEMS) data: ptgts3d_I.ptCEM2014
 - iii. Point source oil and gas sector
 1. 2014 CDPHE emission inside CO: ptgts3d_I.ptOG2014CO
 2. 2017 EPA emission outside CO: ptgts3d_I.ptOG2017woCO
 - iv. Non-IPM (Integrated Planning Model) sector:
ptgts3d_I.ptNONIPM2017
 1. point sources that are not in the EGU or O&G sectors
- c. NONPOINT SOURCES
 - i. Area fugitive dust sector : agts_s.npAFDUST2017
 - ii. Agricultural ammonia sector : agts_I.npAG2017
 - iii. Nonpoint source oil and gas sector
 1. agts_I.npOG2014CO : Inside CO Emission from CDPHE 2014 emission with EPA 2011 O&G spatial surrogate
 2. agts_I.npOG2017woCO : Outside CO based on EPA 2017
 - iv. Residential wood combustion sector : agts_I.npRWC2017
 - v. Other nonpoint sources sector : agts_I.npNP2017
 1. Stationary nonpoint sources that were not subdivided into the other sectors were assigned
 2. stationary source fuel combustion, including industrial, commercial, and residential
 3. chemical manufacturing
 4. industrial processes such as commercial cooking, metal production, mineral processes, petroleum refining, wood

products, fabricated metals, and refrigeration; solvent utilization for surface coatings such as architectural coatings, auto refinishing, traffic marking, textile production, furniture finishing, and coating of paper, plastic, metal, appliances, and motor vehicles; solvent utilization for degreasing of furniture, metals, auto repair, electronics, and manufacturing

5. solvent utilization for dry cleaning, graphic arts, plastics, industrial processes, personal care products, household products, adhesives and sealants
6. solvent utilization for asphalt application and roofing, and pesticide application; storage and transport of petroleum for uses such as portable gas cans, bulk terminals, gasoline service stations, aviation, and marine vessels
7. storage and transport of chemicals
8. waste disposal, treatment, and recovery via incineration, open burning, landfills, and composting
9. agricultural burning and orchard heating
10. miscellaneous area sources such as cremation, hospitals, lamp breakage, and automotive repair shops.

d. ONROAD SOURCES

- i. 2017 emission from Alpine geophysics : egts_I.mobile

e. NONROAD MOBILE SOURCES

- i. Category 1, Category 2, Category 3 Commercial Marine Vessels (cmv)
 1. Not included in D02 emissions (no marine!)
- ii. Railroad sources: agts_I.npRAIL2017
- iii. Nonroad mobile equipment sources: agts_I.npNR2017