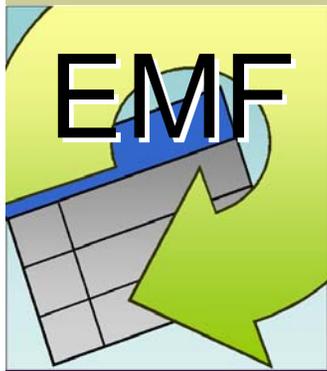


Using SMOKE from the Emissions Modeling Framework

2008 Emission Inventory Conference
June 4, 2008 - Portland, Oregon



Marc Houyoux, [US EPA](#)

Rich Mason, [US EPA](#)

Chris Allen and Allan Beidler,
[Computer Sciences Corporation](#)

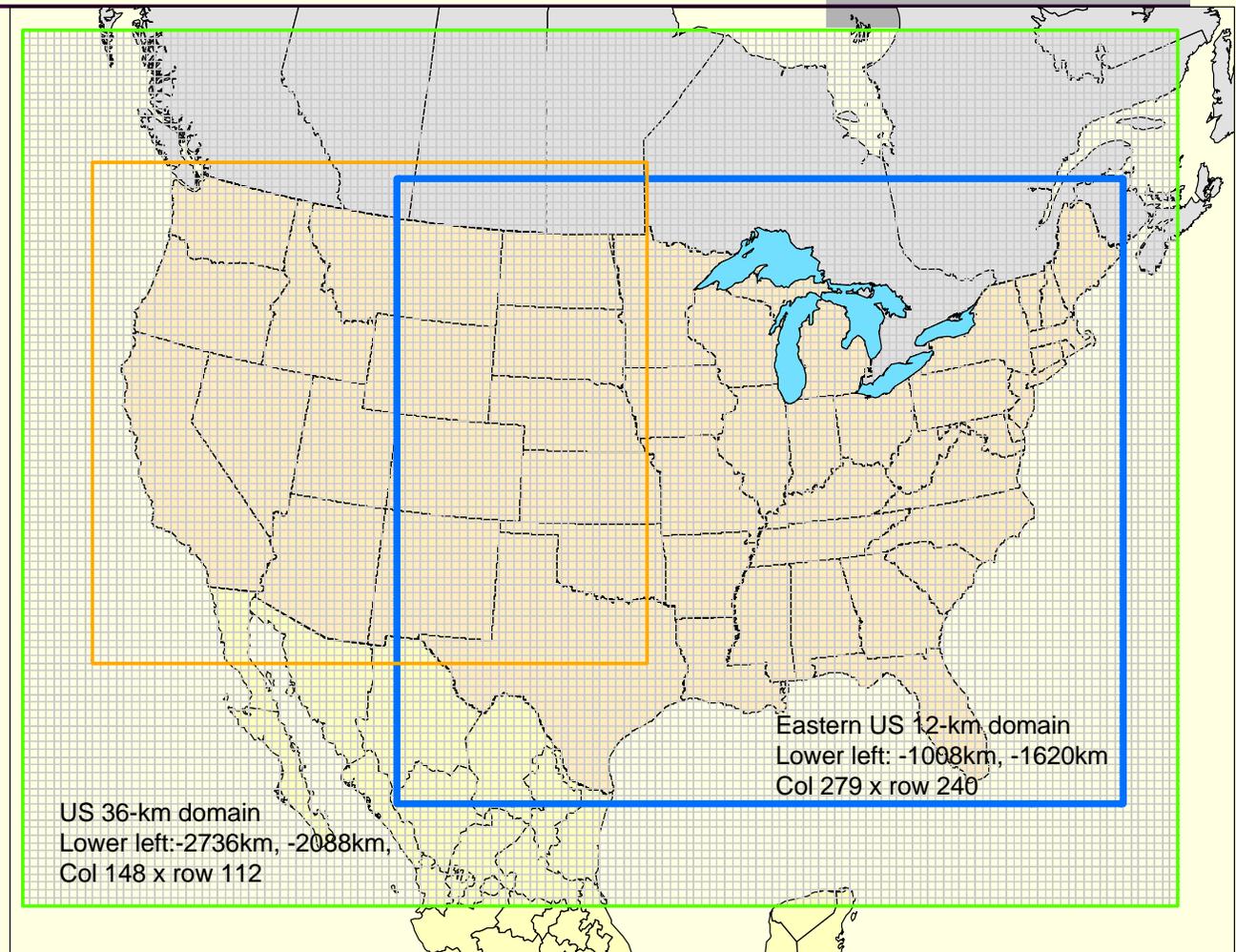
Alexis Zubrow,
[UNC Institute for the Environment](#)

Overview

- Emissions modeling cases
- EMF overview
- Setup and use of SMOKE from the EMF
- Processing results
 - Benefits of EMF for using SMOKE
 - Timing
 - Data sizes

Emissions modeling cases

- CMAQ evaluation
- 2002, 2003, & 2004 annual
- 2006 summer
- 36-km national
12-km eastern
- CB05-SOA
with HONO &
chlorine
- CMAQ 4.7 beta
with “inline”
point and
biogenics



What is the EMF?

■ Software application for emissions modelers and those who access related data

■ Many users to get to a central source of data: inputs to and outputs from emissions modeling

■ Shares emissions modeling information within an organization, not over the internet

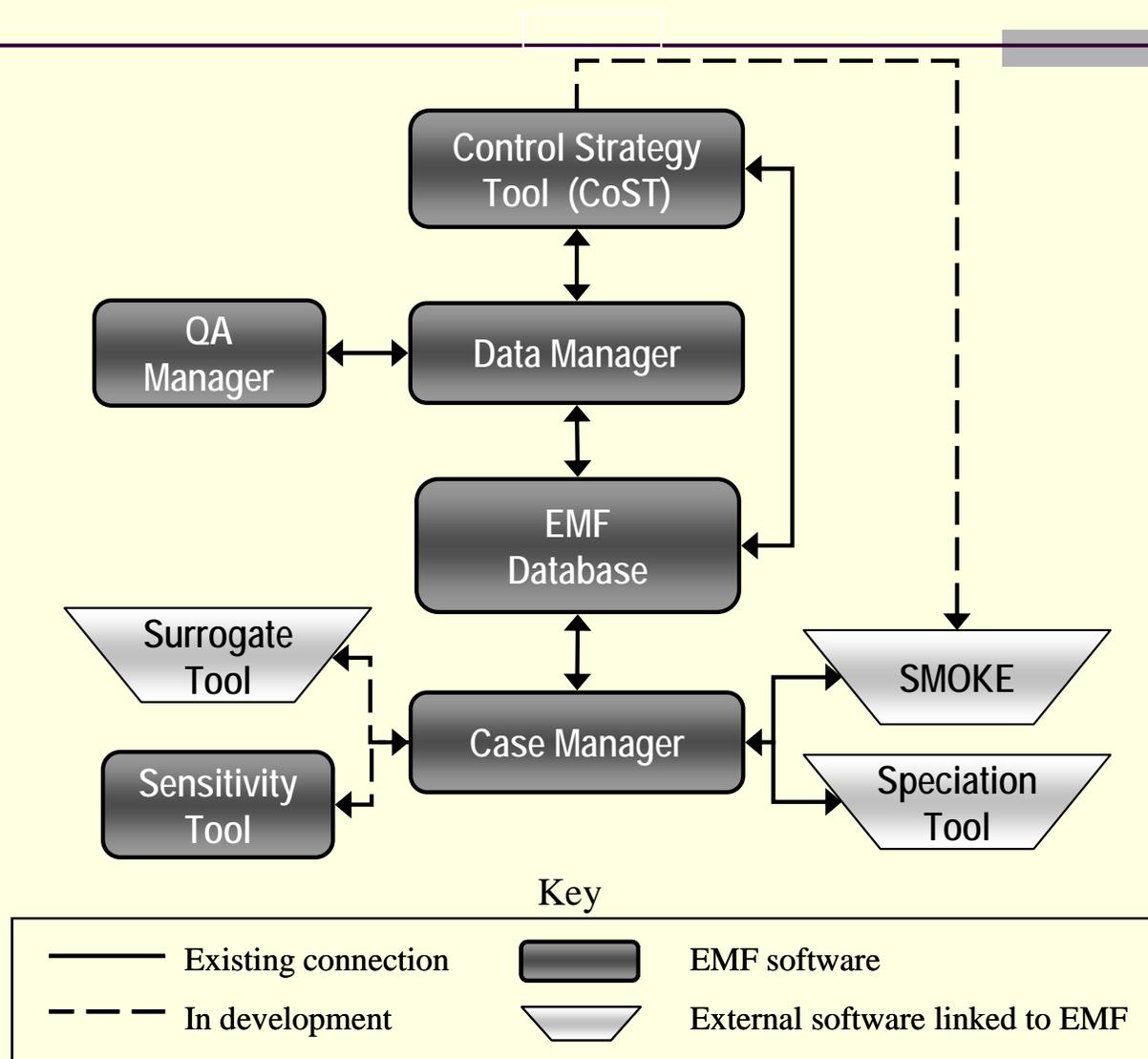
Status

Last Update : 2008/06/02 21:00

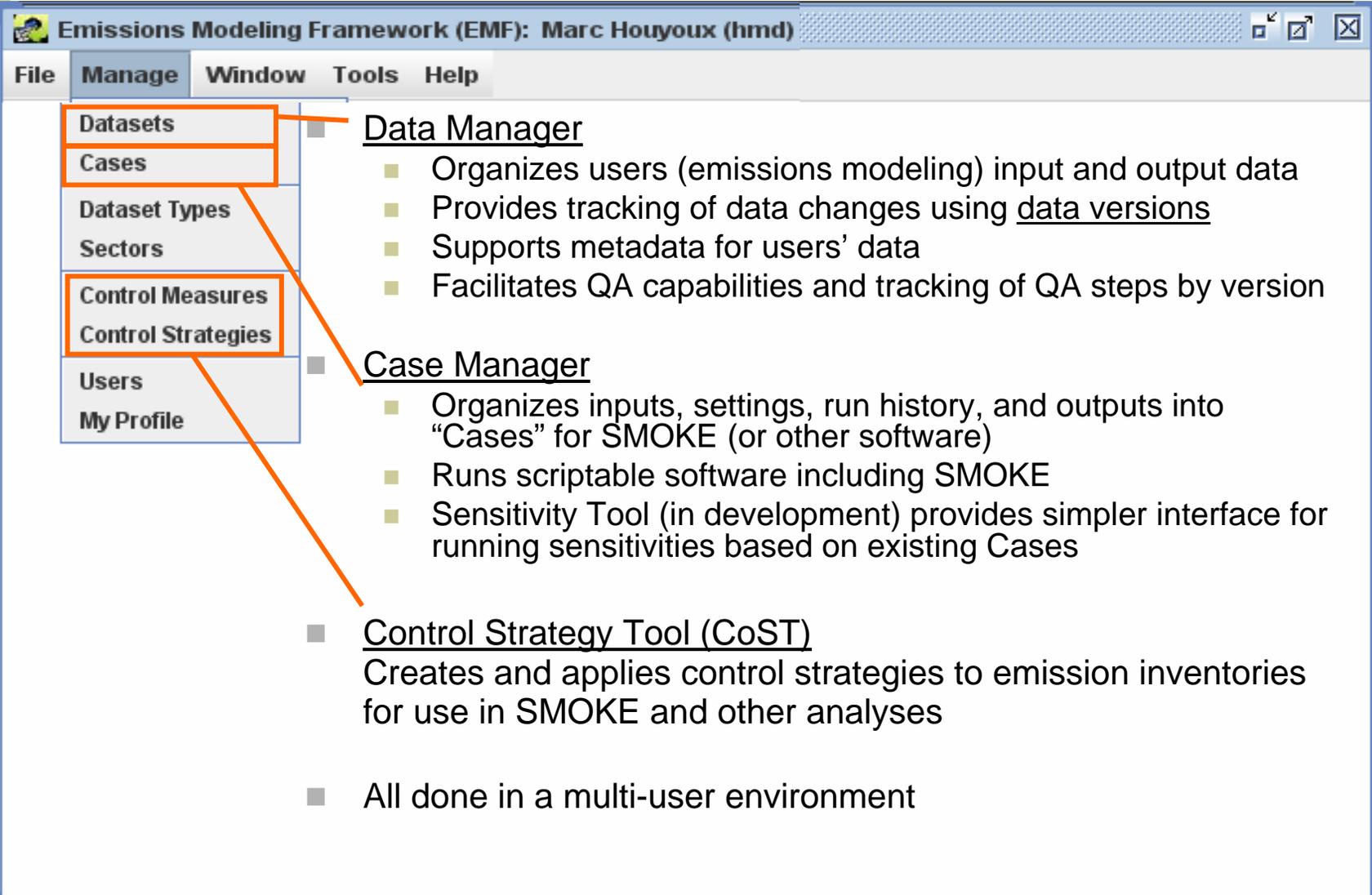
Refresh

Message Type	Message	Timestamp
--------------	---------	-----------

Components of the EMF



What can the EMF do?



Data Manager

- Organizes users (emissions modeling) input and output data
- Provides tracking of data changes using data versions
- Supports metadata for users' data
- Facilitates QA capabilities and tracking of QA steps by version

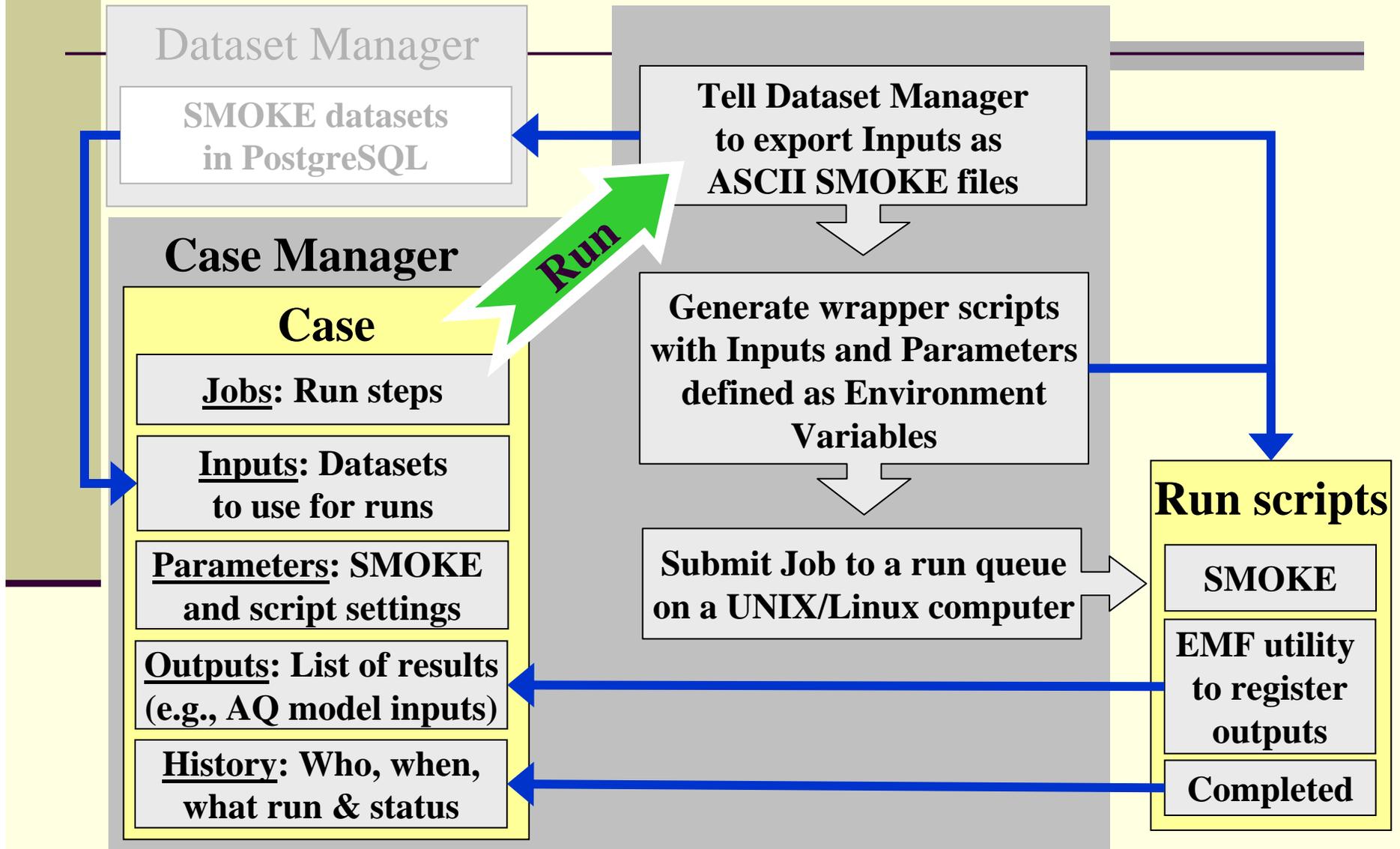
Case Manager

- Organizes inputs, settings, run history, and outputs into "Cases" for SMOKE (or other software)
- Runs scriptable software including SMOKE
- Sensitivity Tool (in development) provides simpler interface for running sensitivities based on existing Cases

■ **Control Strategy Tool (CoST)**
Creates and applies control strategies to emission inventories for use in SMOKE and other analyses

■ All done in a multi-user environment

Running SMOKE in EMF



SMOKE scripts nested in EMF scripts

- A modified version of previous SMOKE scripts is called by an EMF-generated wrapper script

EMF wrapper script – specific for a given Case and Job

SMOKE run script (EMF-enabled)

SMOKE-EMF Assigns file (one for all)

SMOKE Assigns helper scripts

SMOKE run helper scripts

New features of SMOKE scripts for EMF

- One script per processing type (e.g., area-annual, onroad-monthly, point-daily)
- Simplified directory structure – inputs, intermediates, reports, model-ready outputs
- New approach for controlling which programs to run
- New sector-merge script with mrggrid
- Log analyzer summarizes log files
- Timetracker script to record how long each step takes
- Create of Smkinven “list” files for users
- Concatenate many pieces of speciation profiles and cross-references at run time
- Commands to send information back to EMF database, which are also easily turned off if needed

New approach for controlling programs to run: RUNSETTINGS

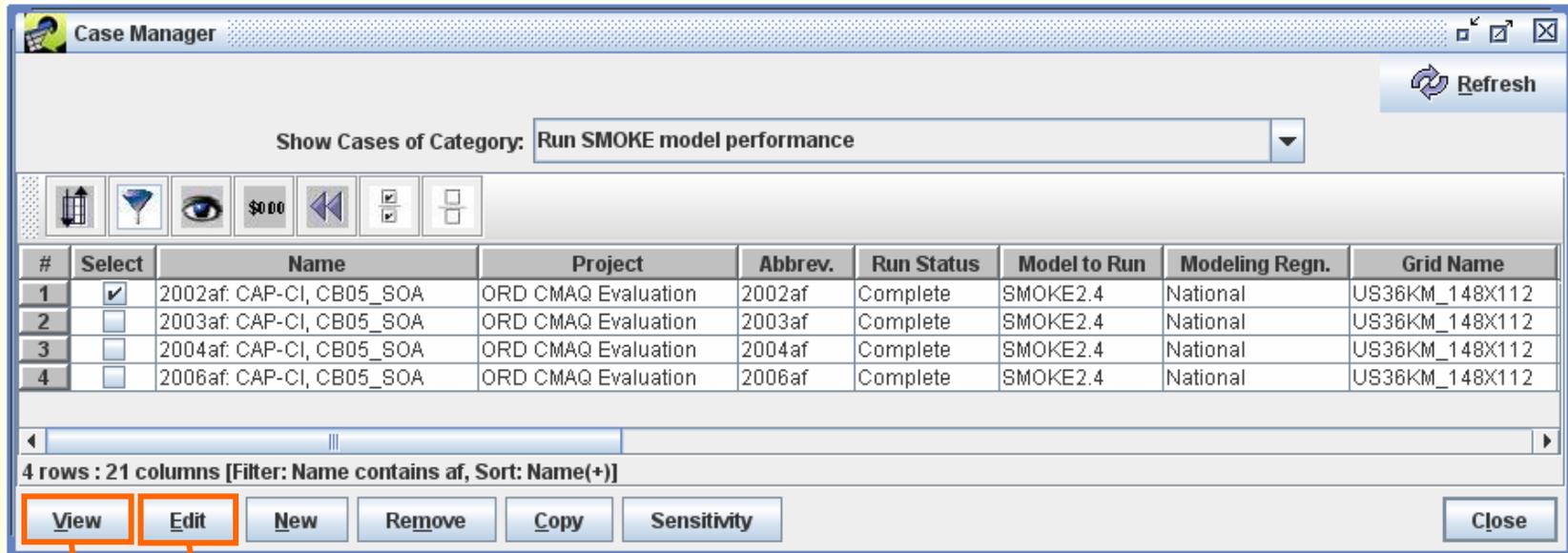
Sector	Grid	Program	Part	Start Date	End Date	Value
all	12EUS1	Smkinven	PART1	0	0	N
all	12EUS1	Spcmat	PART1	0	0	N
all	12EUS1	Temporal	PART2	0	0	N
all	12EUS1	Smkreport	PART2	0	0	N
ptfire	36US1	Smkreport	PART1	0	0	N
ptfire	12EUS1	Smkreport	PART1	0	0	N
mrggrid	12EUS1	Mrggrid	PART4	07/01/2002	12/31/2002	N

New merge approach: SECTORLIST file

Sector	SectorCase	SectBaseYr	MrgApproach	PrevYrSpinup	EndZip
ag	\$CASE	2002	aveday_N	SectBaseYr	N
afdust	\$CASE	2002	aveday_N	SectBaseYr	N
nonpt	\$CASE	2002	mwdss_Y	SectBaseYr	N
alm_no_c3	\$CASE	2002	mwdss_N	SectBaseYr	N
othar	\$CASE	2002	mwdss_N	SectBaseYr	N
nonroad	\$CASE	2002	mwdss_Y	SectBaseYr	N
onroad	\$CASE	2002	week_Y	SectBaseYr	N
othon	\$CASE	2002	week_N	SectBaseYr	N
othpt	\$CASE	2002	mwdss_N	SectBaseYr	N
ptipm	\$CASE	2002	all	SectBaseYr	Y
ptnonipm	\$CASE	2002	mwdss_Y	SectBaseYr	N

Accessing SMOKE runs from EMF

- Uses Case Manager main window
- Organized by “Case Category”



The screenshot shows the Case Manager application window. At the top, there is a title bar with the text "Case Manager" and standard window controls. Below the title bar is a "Refresh" button. A dropdown menu is set to "Run SMOKE model performance". Below this is a toolbar with icons for zooming, filtering, and other functions. The main area contains a table with the following data:

#	Select	Name	Project	Abbrev.	Run Status	Model to Run	Modeling Regn.	Grid Name
1	<input checked="" type="checkbox"/>	2002af: CAP-CI, CB05_SOA	ORD CMAQ Evaluation	2002af	Complete	SMOKE2.4	National	US36KM_148X112
2	<input type="checkbox"/>	2003af: CAP-CI, CB05_SOA	ORD CMAQ Evaluation	2003af	Complete	SMOKE2.4	National	US36KM_148X112
3	<input type="checkbox"/>	2004af: CAP-CI, CB05_SOA	ORD CMAQ Evaluation	2004af	Complete	SMOKE2.4	National	US36KM_148X112
4	<input type="checkbox"/>	2006af: CAP-CI, CB05_SOA	ORD CMAQ Evaluation	2006af	Complete	SMOKE2.4	National	US36KM_148X112

Below the table, there is a status bar that reads "4 rows : 21 columns [Filter: Name contains af, Sort: Name(+)]". At the bottom of the window, there is a toolbar with buttons for "View", "Edit", "New", "Remove", "Copy", "Sensitivity", and "Close". The "View" and "Edit" buttons are highlighted with orange boxes.

Opens Case in “Edit” mode

Opens Case in View-only mode

SMOKE Case - Summary Tab

Case Viewer: 2002af: CAP-CI, CB05_SOA

Summary Jobs Inputs Parameters Outputs History

Name:	2002af: CAP-CI, CB05_SOA	Abbreviation:	2002af		
Category:	Run SMOKE model performance	Is Final:	<input type="checkbox"/>	Is Template:	<input type="checkbox"/>
Description:	2002 Version 3.1 Platform CAP only with Chlorine, using NEI 2002 v3 (with some updates the same as NEI v4), CB05 with CI, SPECIATE4.0		Sectors:	nonpt ag afdust ptipm	
Project:	ORD CMAQ Evaluation	Copied From:	2003af: CAP-CI, CB05_SOA		
Run Status:	Complete	Last Modified By:	Marc Houyoux on 05/14/2008 14:00		
Model to Run:	SMOKE2.4	Air Quality Model:	CMAQ v4.7beta		
Modeling Region:	National	Speciation:	cmaq_cb05_soa		
Control Region:	National	Meteorological Year:	2002		
Grid Name:	US36KM_148X112	Base Year:	2002		
Grid Resolution:	36km	Future Year:	2002		
Start Date & Time:	01/01/2002 00:00	End Date & Time:	12/31/2002 23:59		

Refresh Close

SMOKE Case - Jobs Tab

Case Viewer: 2002af: CAP-CI, CB05_SOA

Summary Jobs Inputs Parameters Outputs History

Output Folder: /orchid/share/em_v31/subsys/smoke24/scripts/cases/2002af

#	Select	Name	Sector	Executable	Run Status	Last Message
1	<input type="checkbox"/>	Annual afdust 36US1	afdust	smk_ar_annual_emf.csh	Quality Assured	Completed job: Annual_afdust_36US1
2	<input type="checkbox"/>	Annual ag 36US1	ag	smk_ar_annual_emf.csh	Quality Assured	Completed job: Annual_ag_36US1
3	<input type="checkbox"/>	Annual alm_no_c3 36US1	alm_no_c3	smk_ar_annual_emf.csh	Quality Assured	Completed job: Annual_alm_no_c3_36US1
4	<input type="checkbox"/>	Annual beis3 36US1	beis	smk_beis_emf.csh	Not Started	
5	<input type="checkbox"/>	Annual nonpt 36US1	nonpt	smk_ar_annual_emf.csh	Quality Assured	Completed job: Annual_nonpt_36US1
6	<input type="checkbox"/>	Annual nonptfire 36US1	nonptfire	smk_ar_annual_emf.csh	Quality Assured	Completed job: Annual_nonptfire_36US1
7	<input type="checkbox"/>	Annual othar 36US1	othar	smk_ar_annual_emf.csh	Quality Assured	Completed job: Annual_othar_36US1
8	<input type="checkbox"/>	Annual othon 36US1	othon	smk_or_annual_emf.csh	Quality Assured	Completed job: Annual_othon_36US1
9	<input type="checkbox"/>	Annual othpt onetime 36US1	othpt	smk_pt_annual_onetime...	Quality Assured	Completed job: Annual_othpt_onetime_36US1
10	<input type="checkbox"/>	Annual othpt byday 36US1	othpt	smk_pt_annual_byday_e...	Quality Assured	Completed job: Annual_othpt_byday_36US1
11	<input type="checkbox"/>	Annual seca_c3 onetime 36US1	seca_c3	smk_pt_annual_onetime...	Quality Assured	Completed job: Annual_seca_c3_onetime_36US1
12	<input type="checkbox"/>	Annual seca_c3 byday 36US1	seca_c3	smk_pt_annual_byday_e...	Quality Assured	Completed job: Annual_seca_c3_byday_36US1
13	<input type="checkbox"/>	Monthly nonroad Q1 Jan-Feb-Mar...	nonroad	smk_ar_monthly_emf.csh	Quality Assured	Completed job: Monthly_nonroad_Q1_Jan-Feb-Mar_36US1
14	<input type="checkbox"/>	Monthly nonroad Q2 Apr-May-Jun...	nonroad	smk_ar_monthly_emf.csh	Quality Assured	Completed job: Monthly_nonroad_Q2_Apr-May-Jun_36US1
15	<input type="checkbox"/>	Monthly nonroad Q3 Jul-Aug-Sep...	nonroad	smk_ar_monthly_emf.csh	Quality Assured	Completed job: Monthly_nonroad_Q3_Jul-Aug-Sep_36US1
16	<input type="checkbox"/>	Monthly nonroad Q4 Oct-Nov-Dec...	nonroad	smk_ar_monthly_emf.csh	Quality Assured	Completed job: Monthly_nonroad_Q4_Oct-Nov-Dec_36US1
17	<input type="checkbox"/>	Monthly onroad Q1 Jan-Feb-Mar ...	onroad	smk_or_monthly_emf.csh	Quality Assured	Completed job: Monthly_onroad_Q1_Jan-Feb-Mar_36US1
18	<input type="checkbox"/>	Monthly onroad Q2 Apr-May-Jun ...	onroad	smk_or_monthly_emf.csh	Quality Assured	Completed job: Monthly_onroad_Q2_Apr-May-Jun_36US1
19	<input type="checkbox"/>	Monthly onroad Q3 Jul-Aug-Sep ...	onroad	smk_or_monthly_emf.csh	Quality Assured	Completed job: Monthly_onroad_Q3_Jul-Aug-Sep_36US1
20	<input type="checkbox"/>	Monthly onroad Q4 Oct-Nov-Dec ...	onroad	smk_or_monthly_emf.csh	Quality Assured	Completed job: Monthly_onroad_Q4_Oct-Nov-Dec_36US1
21	<input type="checkbox"/>	Annual ptnonipm onetime steps ...	ptnonipm	smk_pt_annual_onetime...	Quality Assured	Completed job: Annual_ptnonipm_onetime_steps_36US1
22	<input type="checkbox"/>	Annual ptnonipm Jan-Jun 36US1	ptnonipm	smk_pt_annual_byday_e...	Quality Assured	Completed job: Annual_ptnonipm_Jan-Jun_36US1
23	<input type="checkbox"/>	Annual ptnonipm Jul-Dec 36US1	ptnonipm	smk_pt_annual_byday_e...	Quality Assured	Completed job: Annual_ptnonipm_Jul-Dec_36US1
24	<input type="checkbox"/>	Annual ptipm onetime steps 36U...	ptipm	smk_pt_annual_onetime...	Quality Assured	Completed job: Annual_ptipm_onetime_steps_36US1
25	<input type="checkbox"/>	Daily ptipm Jan-Jun 36US1	ptipm	smk_pt_daily_emf.csh	Quality Assured	Completed job: Daily_ptipm_Jan-Jun_36US1
26	<input type="checkbox"/>	Daily ptipm Jul-Dec 36US1	ptipm	smk_pt_daily_emf.csh	Quality Assured	Completed job: Daily_ptipm_Jul-Dec_36US1
27	<input type="checkbox"/>	Annual ptfire onetime steps 36U...	ptfire	smk_pt_annual_onetime...	Quality Assured	Completed job: Annual_ptfire_onetime_steps_36US1
28	<input type="checkbox"/>	Daily ptfire 36US1	ptfire	smk_pt_daily_emf.csh	Quality Assured	Completed job: Daily_ptfire_36US1
29	<input type="checkbox"/>	Sector merge Jan-Jun 36US1	mrggrid	smk_sectormerge_emf.c...	Completed	Completed job: Sector_merge_Jan-Jun_36US1
30	<input type="checkbox"/>	Sector merge Jul-Dec 36US1	mrggrid	smk_sectormerge_emf.c...	Completed	Completed job: Sector_merge_Jul-Dec_36US1

30 rows : 22 columns [Filter: Name contains 36US1, Sort: Order(+), Sector(+), Name(+), Executable(+)]

View Run Validate Set Status

Refresh Close

SMOKE Case - Inputs Tab

Case Viewer: 2002af: CAP-CI, CB05_SOA

Summary Jobs **Inputs** Parameters Outputs History

Input Folder: /orchid/share/em_v31/inputs/2002af

#	Select	Input	Emt. Var.	Sector	DS Type	Dataset
1	<input type="checkbox"/>	Inventory ptnonipm CAP	EMISINV_A	ptnonipm	ORL Point Inventory (PTINV)	ptnonipm_xportfrac_cap_pf31
2	<input type="checkbox"/>	Inventory ptnonipm HAP	EMISINV_B	ptnonipm	ORL Point Inventory (PTINV)	ptnonipm_hap_pf31
3	<input type="checkbox"/>	Report configuration, ptnonipm gridded	REPCONFIG_GR...	ptnonipm	Report Configurations (Line-based)	repconfig_point_invgrid
4	<input type="checkbox"/>	Report configuration, ptnonipm inventory	REPCONFIG_INV	ptnonipm	Report Configurations (Line-based)	repconfig_point_inv
5	<input type="checkbox"/>	Report configuration, ptnonipm VOCprof	REPCONFIG_INV2	ptnonipm	Report Configurations (Line-based)	repconfig_point_inv2
6	<input type="checkbox"/>	Report configuration, ptnonipm temporal	REPCONFIG_TE...	ptnonipm	Report Configurations (Line-based)	repconfig_point_temporal
7	<input type="checkbox"/>	Country, State, County Information	COSTCY	All sectors	Country, state, and county names and data (COSTCY)	costcy_for_2002
8	<input type="checkbox"/>	emf job header	EMF_JOBHEADER	All sectors	EMF Job Header	emf_jobheader_javacmd
9	<input type="checkbox"/>	Grid Description List	GRIDDESC	All sectors	Grid Descriptions (Line-based)	griddesc_lambertonly
10	<input type="checkbox"/>	GSCNV - pollutant to pollutant conversions	GSCNV	All sectors	Pollutant to Pollutant Conversion (GSCNV)	gscnv_cb05_notoxics_cmaq_new
11	<input type="checkbox"/>	Combination profiles	GSPRO_COMBO	All sectors	Chemical Speciation Combo Profiles (GSPRO_COM...)	gspro_combo_2002
12	<input type="checkbox"/>	Speciation profiles static	GSPROTMP_A	All sectors	Chemical Speciation Profiles (GSPRO)	gspro_static_cmaq
13	<input type="checkbox"/>	Speciation profiles for SO2-SULF	GSPROTMP_B	All sectors	Chemical Speciation Profiles (GSPRO)	gspro_sulf
14	<input type="checkbox"/>	Speciation profiles for PM2.5	GSPROTMP_C	All sectors	Chemical Speciation Profiles (GSPRO)	gspro_pm25
15	<input type="checkbox"/>	Speciation profiles for TOG	GSPROTMP_D	All sectors	Chemical Speciation Profiles (GSPRO)	gspro_tog_cmaq_cb05_soa
16	<input type="checkbox"/>	Speciation profiles for NOX	GSPROTMP_E	All sectors	Chemical Speciation Profiles (GSPRO)	gspro_nox_hono
17	<input type="checkbox"/>	Speciation xref static	GSREFTMP_A	All sectors	Chemical Speciation Cross-Reference (GSREF)	gsref_static_cap
18	<input type="checkbox"/>	Speciation xref for SO2-SULF	GSREFTMP_B	All sectors	Chemical Speciation Cross-Reference (GSREF)	gsref_sulf
19	<input type="checkbox"/>	Speciation xref for PM2.5	GSREFTMP_C	All sectors	Chemical Speciation Cross-Reference (GSREF)	gsref_pm25
20	<input type="checkbox"/>	Speciation xref for VOC, not year-specific	GSREFTMP_D	All sectors	Chemical Speciation Cross-Reference (GSREF)	gsref_voc_general
21	<input type="checkbox"/>	Speciation xref for VOC, year-specific	GSREFTMP_E	All sectors	Chemical Speciation Cross-Reference (GSREF)	gsref_voc_2002
22	<input type="checkbox"/>	Holidays table	HOLIDAYS	All sectors	Holiday Identifications (Line-based)	holidays
23	<input type="checkbox"/>	Inventory Table	INVTABLE	All sectors	Inventory Table Data (INVTABLE)	invtable_cap_pf31
24	<input type="checkbox"/>	NAICS descriptions	NAICSDESC	All sectors	NAICS description file (NAICSDESC)	naicsdesc
25	<input type="checkbox"/>	ORIS Description	ORISDESC	All sectors	ORIS Description (ORISDESC)	orisdesc
26	<input type="checkbox"/>	Elevation Configuration File for Point Sou...	PELVCONFIG	All sectors	Elevated source configuration (PELVCONFIG)	pelvconfig_inline_allpts
27	<input type="checkbox"/>	Stack replacement	PSTK	All sectors	Point-Source Stack Replacements (PSTK)	pstk
28	<input type="checkbox"/>	Temporal profiles, all point	PTPRO	All sectors	Temporal Profile (AM/PTPRO)	amptpro_2002_us_can
29	<input type="checkbox"/>	Temporal xref, point default	PTREF	All sectors	Temporal Cross Reference (AM/PTREF)	amptref_v3_3
30	<input type="checkbox"/>	SCC descriptions	SCCDESC	All sectors	SCC Descriptions (CSV)	sccd_desc_pf31
31	<input type="checkbox"/>	SIC descriptions	SICDESC	All sectors	SIC Descriptions (Line-based)	sic_desc

Show All

SMOKE Case - Parameters Tab

Case Editor: 2002af: CAP-CI, CB05_SOA

Summary Jobs Inputs Parameters Outputs History

\$000

#	Select	Parameter	Order	Emt. Var.	Sector	Value
1	<input type="checkbox"/>	Sector abbreviation	3.00	SECTOR	nonpt	nonpt
2	<input type="checkbox"/>	Use area-to-point	3.00	SMK_ARTOPNT_YN	nonpt	Y
3	<input type="checkbox"/>	Grid abbreviation, grid 1	1.00	GRID_1	All sectors	36US1
4	<input type="checkbox"/>	Grid abbreviation, grid 2	1.00	GRID_2	All sectors	12EUS1
5	<input type="checkbox"/>	I/O API grid name, grid 1	1.00	IOAPI_GRIDNAME_1	All sectors	36US1_148X112
6	<input type="checkbox"/>	I/O API grid name, grid 2	1.00	IOAPI_GRIDNAME_2	All sectors	12EUS1_279X240
7	<input type="checkbox"/>	Platform name	1.00	PLATFORM	All sectors	v31
8	<input type="checkbox"/>	Number of emissions layers	1.00	SMK_EMLAYS	All sectors	10
9	<input type="checkbox"/>	Speciation type name	1.00	SPC	All sectors	\$EMF_SPC
10	<input type="checkbox"/>	Spinup duration grid 1	1.00	SPINUP_DURATION_1	All sectors	10
11	<input type="checkbox"/>	Spinup duration grid 2	1.00	SPINUP_DURATION_2	All sectors	3
12	<input type="checkbox"/>	EGU daily type	1.10	EGU_TYPE	All sectors	model_performance
13	<input type="checkbox"/>	MCIP name abbreviation	1.10	MCIPNAME	All sectors	mcip_v3.3
14	<input type="checkbox"/>	Path, data root	2.00	DAT_ROOT	All sectors	/orchid/share/em_\$PLATFORM
15	<input type="checkbox"/>	Path, intermediate root	2.00	IMD_ROOT	All sectors	/amber/work/cwy/em_\$PLATFORM/intermed
16	<input type="checkbox"/>	Path, Met data root	2.00	MET_ROOT	All sectors	/orchid/share/met/MCIP_v3.3/mm5_2002b_14aL
17	<input type="checkbox"/>	Path, Output data root	2.00	OUT_ROOT	All sectors	/amber/work/cwy/aqm_eval/smoke_out
18	<input type="checkbox"/>	Path, SMOKE home	2.00	SMK_HOME	All sectors	/orchid/share/em_\$PLATFORM
19	<input type="checkbox"/>	Assigns File	2.50	ASSIGNS_FILE	All sectors	\$SMK_HOME/subsys/smoke24/assigns/ASSIGNS.emf
20	<input type="checkbox"/>	Run settings file	2.50	RUNSET	All sectors	\$SMK_HOME/subsys/smoke24/scripts/cases/\$CASE/ru...
21	<input type="checkbox"/>	Fill annual values	3.00	FILL_ANNUAL	All sectors	N
22	<input type="checkbox"/>	Match full SCCs	3.00	FULLSCC_ONLY	All sectors	Y
23	<input type="checkbox"/>	Temporal type	3.00	L_TYPE	All sectors	mwdss
24	<input type="checkbox"/>	Merge type	3.00	M_TYPE	All sectors	mwdss
25	<input type="checkbox"/>	Check for duplicate sources	3.00	RAW_DUP_CHECK	All sectors	Y
26	<input type="checkbox"/>	Report default profiles used	3.00	REPORT_DEFAULTS	All sectors	Y
27	<input type="checkbox"/>	Run holidays	3.00	RUN_HOLIDAYS	All sectors	Y
28	<input type="checkbox"/>	Use average day emissions	3.00	SMK_AVEDAY_YN	All sectors	N
29	<input type="checkbox"/>	Default surrogate code	3.00	SMK_DEFAULT_SRGRID	All sectors	100
30	<input type="checkbox"/>	Maximum errors printed	3.00	SMK_MAXERROR	All sectors	10
31	<input type="checkbox"/>	Maximum warnings printed	3.00	SMK_MAXWARNING	All sectors	10

47 rows : 14 columns [Filter: Sector = nonpt, Sector contains All sectors, Sort: Sector(-), Order(+), Emt. Var.(+)]

Show All

SMOKE Results - Outputs Tab

Case Viewer: 2002af: CAP-CI, CB05_SOA

Summary Jobs Inputs Parameters **Outputs** History

Job: Annual nonpt 36US1

\$000

#	Select	Output name	Job	Sector	Dataset Name	Dataset Type
1	<input type="checkbox"/>	AQM-ready data nonpt	Annual nonpt 36US1	nonpt	Model-ready CMAQ nonpt 2002af	CMAQ Model Ready Emissions:...
2	<input type="checkbox"/>	Level 1 log summary nonpt_2002af_36US1	Annual nonpt 36US1	nonpt	rep_logs_nonpt_2002af_36US1_level1	Log summary
3	<input type="checkbox"/>	Level 3 log summary nonpt_2002af_36US1	Annual nonpt 36US1	nonpt	rep_logs_nonpt_2002af_36US1_level3	Log summary
4	<input type="checkbox"/>	county Smkreport nonpt	Annual nonpt 36US1	nonpt	rep_nonpt_2002af_inv_county	SMOKE Report
5	<input type="checkbox"/>	grid cell Smkreport nonpt	Annual nonpt 36US1	nonpt	rep_nonpt_2002af_invgrid_cell_36US1	SMOKE Report
6	<input type="checkbox"/>	state Smkreport nonpt	Annual nonpt 36US1	nonpt	rep_nonpt_2002af_inv_state	SMOKE Report
7	<input type="checkbox"/>	state w/gridding Smkreport nonpt	Annual nonpt 36US1	nonpt	rep_nonpt_2002af_invgrid_state_grid_36US1	SMOKE Report
8	<input type="checkbox"/>	state/MACT Smkreport nonpt	Annual nonpt 36US1	nonpt	rep_nonpt_2002af_inv_state_mact	SMOKE Report
9	<input type="checkbox"/>	state/NAICS Smkreport nonpt	Annual nonpt 36US1	nonpt	rep_nonpt_2002af_inv_state_naics	SMOKE Report
10	<input type="checkbox"/>	state/SCC Smkreport nonpt	Annual nonpt 36US1	nonpt	rep_nonpt_2002af_inv_state_scc	SMOKE Report
11	<input type="checkbox"/>	state/SCC/PM25 profile Smkreport nonpt	Annual nonpt 36US1	nonpt	rep_nonpt_2002af_inv_state_scc_pm25prof	SMOKE Report
12	<input type="checkbox"/>	state/SCC/Srgcode Smkreport nonpt	Annual nonpt 36US1	nonpt	rep_nonpt_2002af_invgrid_state_scc_srgid_36US1	SMOKE Report
13	<input type="checkbox"/>	state/SCC/VOC profile Smkreport nonpt	Annual nonpt 36US1	nonpt	rep_nonpt_2002af_inv_state_scc_vocprof	SMOKE Report
14	<input type="checkbox"/>	state/SIC Smkreport nonpt	Annual nonpt 36US1	nonpt	rep_nonpt_2002af_inv_state_sic	SMOKE Report
15	<input type="checkbox"/>	county daily Smkreport nonpt (External)	Annual nonpt 36US1	nonpt	rep_nonpt_temporal_county_2002af	SMOKE Report (External)
16	<input type="checkbox"/>	county/moncode daily Smkreport nonpt (Ex...	Annual nonpt 36US1	nonpt	rep_nonpt_temporal_county_moncode_2002af	SMOKE Report (External)
17	<input type="checkbox"/>	county/SCC Smkreport nonpt (External)	Annual nonpt 36US1	nonpt	rep_nonpt_inv_county_scc_2002af (External)	SMOKE Report (External)
18	<input type="checkbox"/>	state daily Smkreport nonpt (External)	Annual nonpt 36US1	nonpt	rep_nonpt_temporal_state_2002af	SMOKE Report (External)
19	<input type="checkbox"/>	state Smkmerge nonpt	Annual nonpt 36US1	nonpt	Smkmerge nonpt 2002af state reports	SMOKE Report (External)
20	<input type="checkbox"/>	state/SCC daily Smkreport nonpt (External)	Annual nonpt 36US1	nonpt	rep_nonpt_temporal_state_scc_2002af	SMOKE Report (External)
21	<input type="checkbox"/>	Timelog nonpt_2002af_36US1	Annual nonpt 36US1	nonpt	SMOKE timelog nonpt_2002af_36US1	SMOKE time log

21 rows : 11 columns [Filter: None, Sort: Dataset Type(+), Output name(+), Job(+)]

SMOKE Results - History Tab

Case Editor: 2002af: CAP-CI, CB05_SOA

Summary Jobs Inputs Parameters Outputs **History**

Job: Annual nonpt 36US1

#	Select	Job	Exec. Name	Period	Type	Message	Status	Remote User
1	<input type="checkbox"/>	Annual nonpt 36US1			i	Completed job: Annual_nonpt_36US1	Completed	cvy
2	<input type="checkbox"/>	Annual nonpt 36US1		dec_2002	i	Running SMOKE steps for month dec		cvy
3	<input type="checkbox"/>	Annual nonpt 36US1		nov_2002	i	Running SMOKE steps for month nov		cvy
4	<input type="checkbox"/>	Annual nonpt 36US1		oct_2002	i	Running SMOKE steps for month oct		cvy
5	<input type="checkbox"/>	Annual nonpt 36US1		sep_2002	i	Running SMOKE steps for month sep		cvy
6	<input type="checkbox"/>	Annual nonpt 36US1		aug_2002	i	Running SMOKE steps for month aug		cvy
7	<input type="checkbox"/>	Annual nonpt 36US1		jul_2002	i	Running SMOKE steps for month jul		cvy
8	<input type="checkbox"/>	Annual nonpt 36US1		jun_2002	i	Running SMOKE steps for month jun		cvy
9	<input type="checkbox"/>	Annual nonpt 36US1		may_2002	i	Running SMOKE steps for month may		cvy
10	<input type="checkbox"/>	Annual nonpt 36US1		apr_2002	i	Running SMOKE steps for month apr		cvy
11	<input type="checkbox"/>	Annual nonpt 36US1		mar_2002	i	Running SMOKE steps for month mar		cvy
12	<input type="checkbox"/>	Annual nonpt 36US1		feb_2002	i	Running SMOKE steps for month feb		cvy
13	<input type="checkbox"/>	Annual nonpt 36US1		jan_2002	i	Running SMOKE steps for month jan		cvy
14	<input type="checkbox"/>	Annual nonpt 36US1		2002	i	Running SMOKE steps for one-time steps		cvy
15	<input type="checkbox"/>	Annual nonpt 36US1	set_months_v2.csh		i	Running set_months		cvy
16	<input type="checkbox"/>	Annual nonpt 36US1			i		Running	cvy
17	<input type="checkbox"/>	Annual nonpt 36US1	smk_ar_annual_emf.csh		i	Running top level script for job: Annual_nonpt_36US1		cvy

17 rows : 11 columns [Filter: None, Sort: Received Date(-)]

Remove

Refresh Save Close

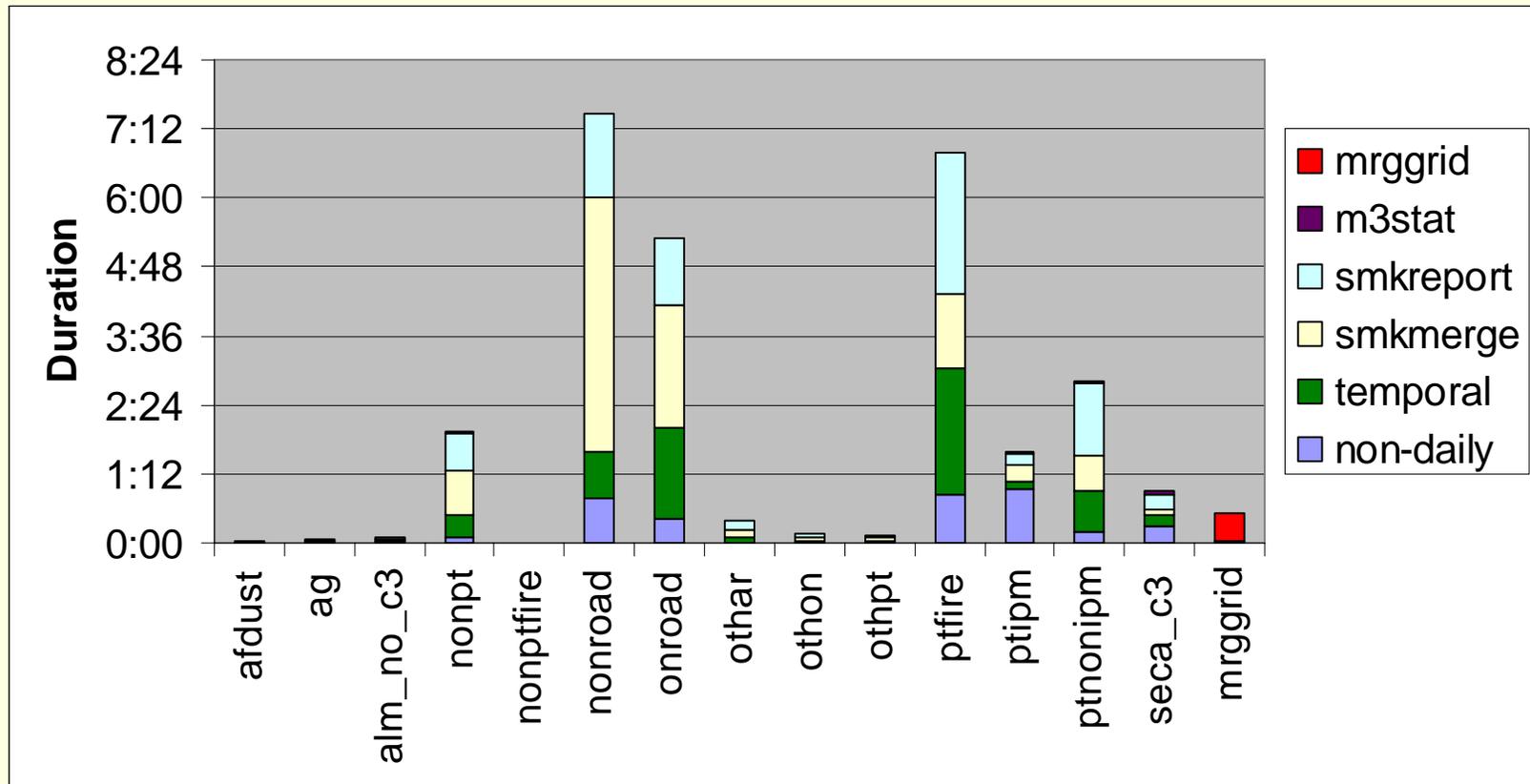
How SMOKE/EMF helped this project

- Data in a “Case” (SMOKE run) linked to datasets in Data Manager. We have one system to use for data handling and running SMOKE. All of our data files are stored, viewable, and retrievable.
- Exports all SMOKE-ready files needed for a SMOKE run with a single mouse click. Saves time and prevents possible errors associated with manually writing out many data files & formats from many other data sources. Also, checks for latest version.
- User interface for SMOKE. We have a permanent record of SMOKE inputs, settings, stores reports, and location of outputs. Could reduce learning curve for new emissions modelers.
- Submits SMOKE jobs to a compute server and not run on local computer. Supports desktop access to data and SMOKE cases, while running elsewhere (e.g., Linux servers or clusters) to meet computational needs.
- Single, more powerful SMOKE scripts easier to use and maintain

Run time results

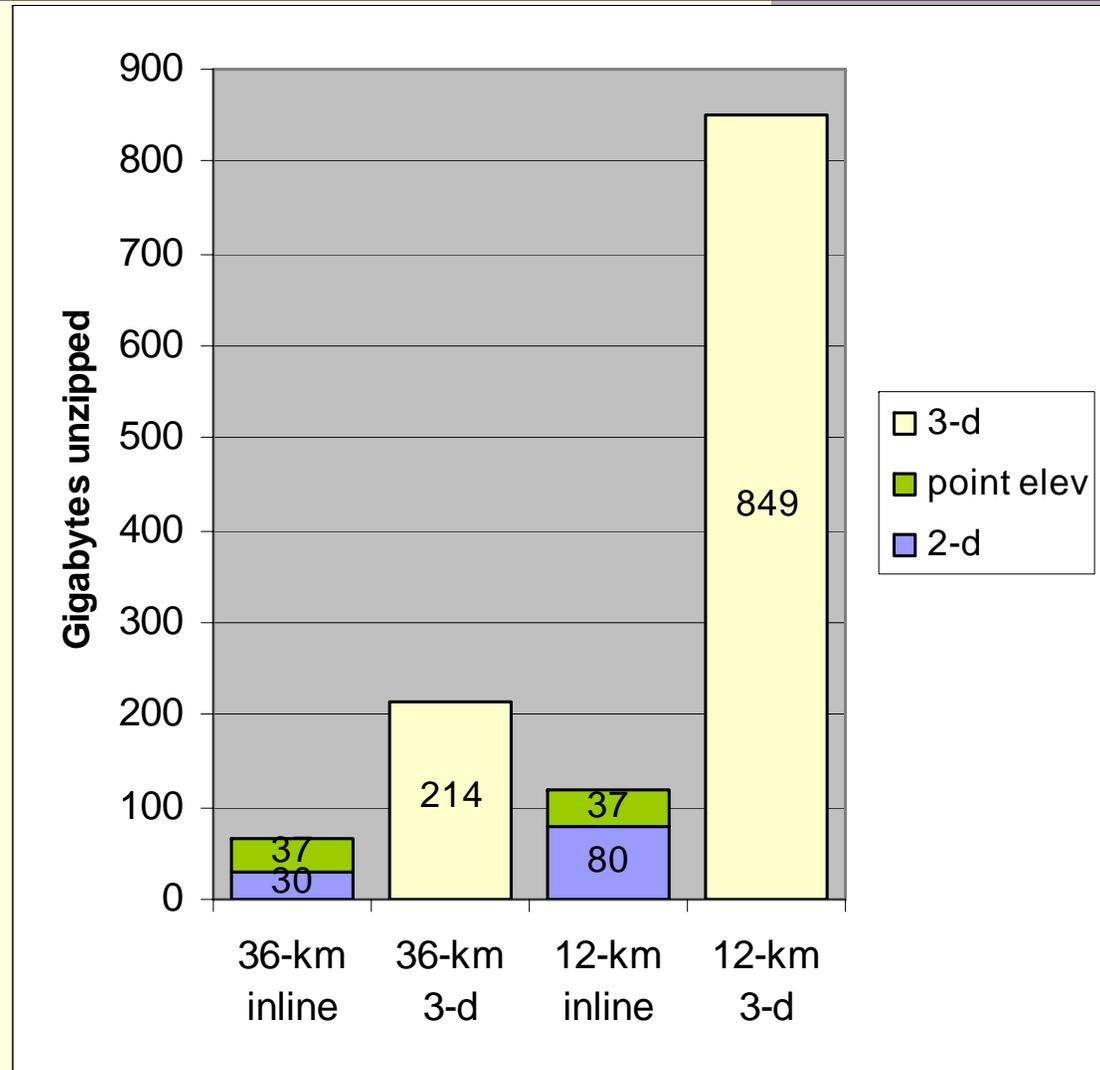
- 2002 36-km: 28:09 ; 12-km: 30:48
- 2004 36-km: 23:33 ; 12-km: 30:52

2002 36-km



Comparison of inline vs. standard CMAQ input sizes

- CB05-SOA, annual
- 3-d files have 10 emissions layers



Project results

- 2002, 2003, and 2004 annual emissions and 2006 summer emissions completed in about 2 months
- Only error discovered to date was a data error, not a processing error
 - HONO was intended for all mobile sources, not just onroad mobile
 - Discovered by ORD HONO researcher looking in EMF to understand the basis of the data
- Shorter time since most datasets used not new
- Shorter time and smaller file sizes with “inline” approach for point
- EMF-SMOKE linkage has increased our productivity and our team coordination
- Have not experienced pitfalls of “Models-3”

In progress

- Sensitivity Tool
 - Initial version end of September
- Pilot just starting for CMAQ/CAMx support from EMF Environmental Modeling System”?
- CHIEF EMF Website coming
EMF Website now:
<http://www.ie.unc.edu/cempd/projects/emf/install/>

Community interest?

- Would like to request funding for a beta-users program in 2009, with 2-3 beta sites
- Would like to know interest from states, locals, RPOs, Regional Offices, and others before funding request
- Talk to me or email me at houyoux.marc@epa.gov