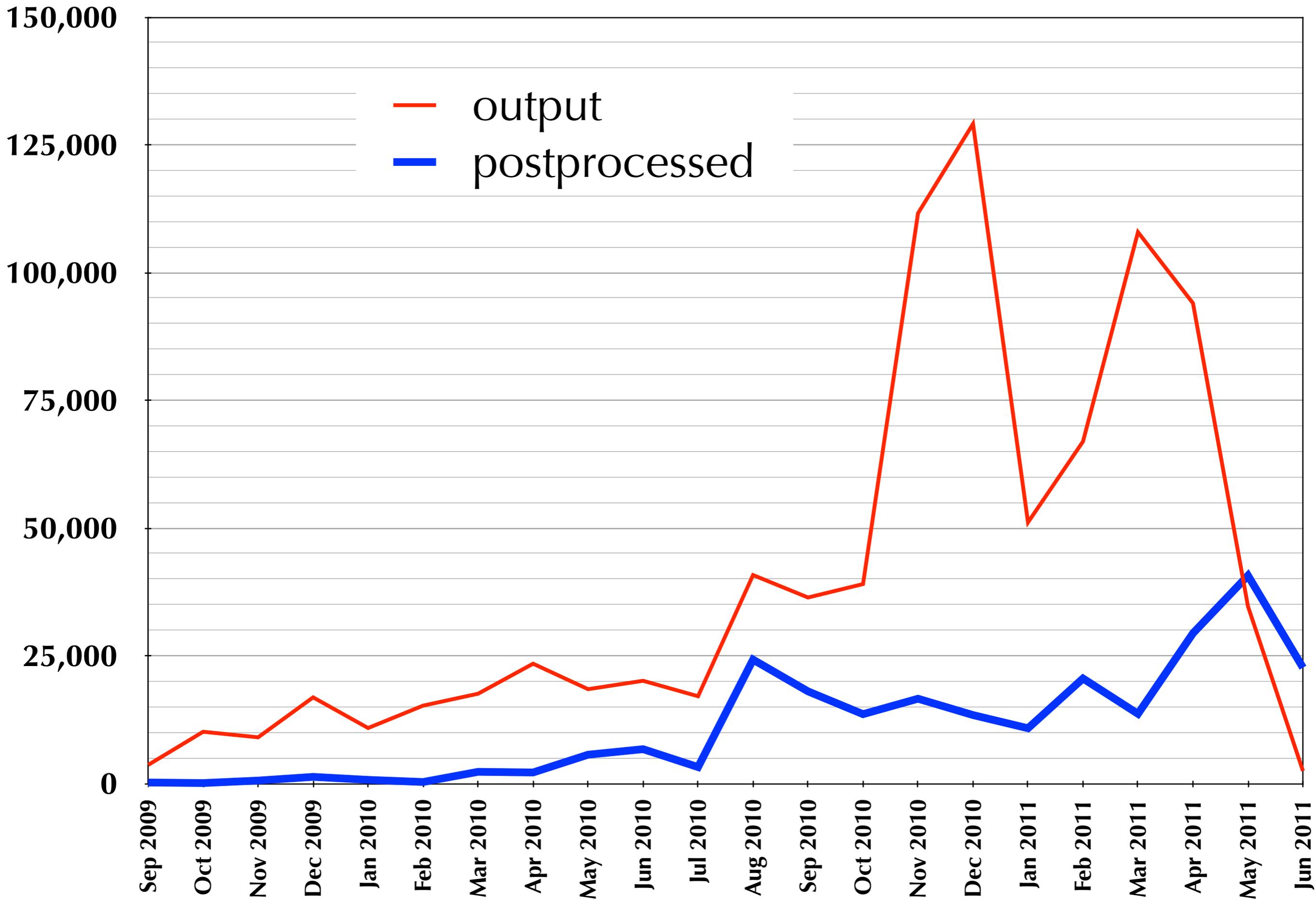


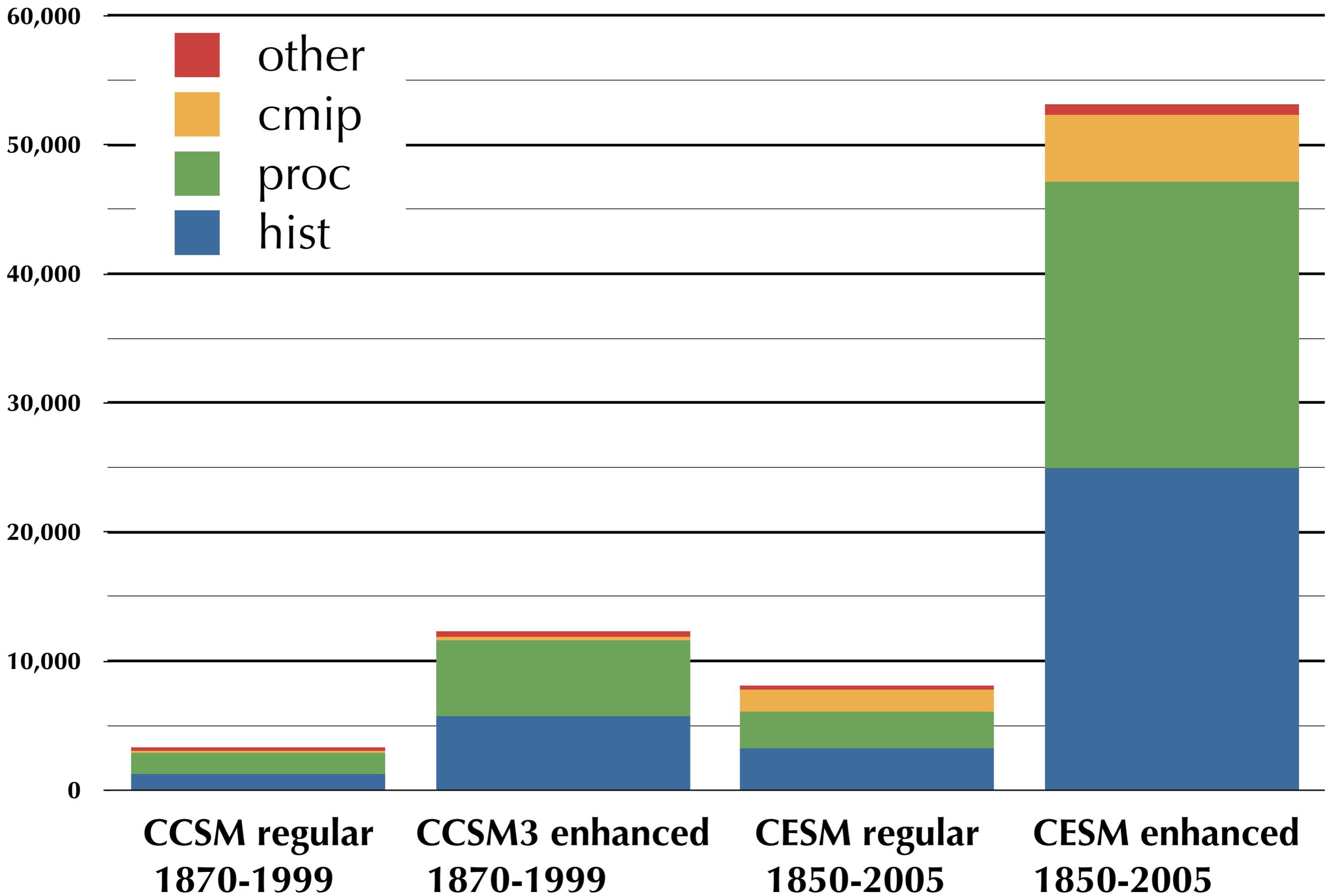
CESM's CMIP5 submission

**Gary Strand
NCAR/NESL/CGD**

output and postproc data (GB/month)



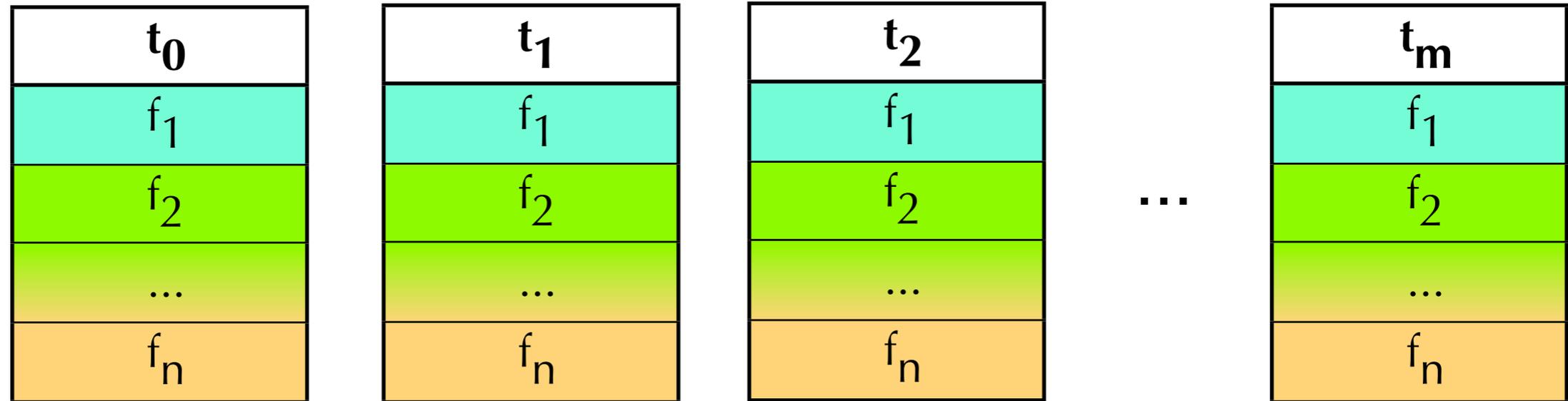
Comparison of CCSM3/CESM1 output volumes (GB)



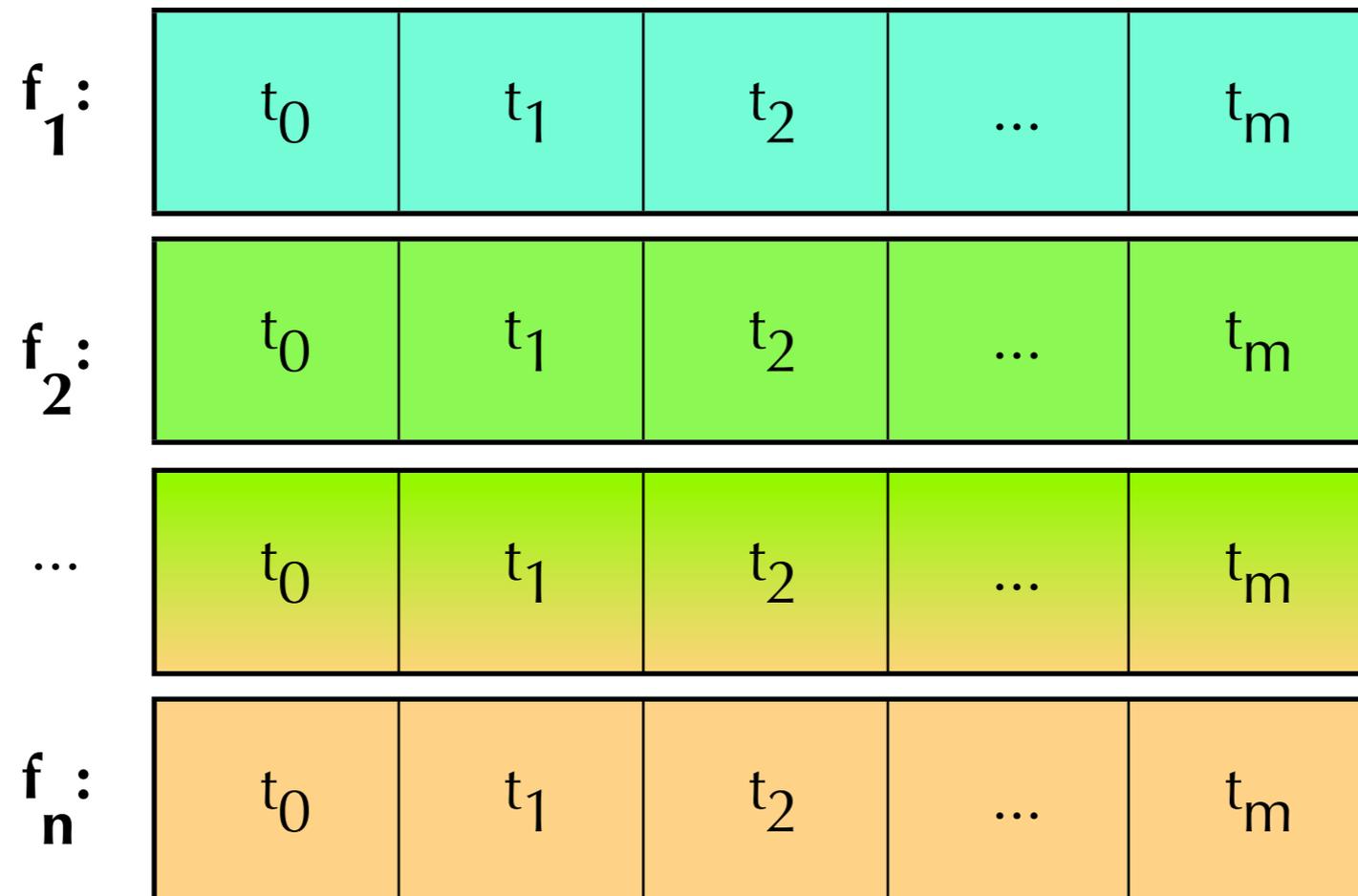
Resolutions

	2x1	1x1
atmosphere	144x96x26	288x192x26
	(280 km x 200 km)	(140 km x 100 km)
land surface	144x96x15	288x192x15
ocean	384x320x60	384x320x60
sea ice	384x320	384x320

CESM output data arrangement



MIP arrangement



CMIP5 runs completed

CMIP5 type	Description	#
piControl	pre-industrial control	3
1% CO2 increase	1 percent per year CO2	2
historical	Simulate 20th century climate and variations	20
historical variations	Single forcing runs, etc.	30
paleoclimate	Past climate (LGM, mid-Holocene, past 1000 years)	3
RCPs	RCPs 2.6, 4.5, 6.0, 8.5	34
Decadal predictions	Predictions (hindcast and forecast)	240
ESM	Earth System Model (BGC, carbon cycle, &c)	2
Other	Sensitivity and "idealized" Earths	6
Totals		340

CMIP5 field counts

	subdaily	daily	monthly	annual	totals
atmosphere	100	75	223	8	406
land surface	3	5	82	0	90
ocean	1	3	127	79	210
sea ice	0	4	40	0	44
totals	104	87	472	87	750

CMIP3 vs. CMIP5

Modeling group		CMIP3 volume (GB)
NCAR	USA	9,172.8
MIROC3	Japan	3,974.9
GFDL	USA	3,842.5
IAP	China	2,867.7
MPI	Germany	2,699.5
CSIRO	Australia	2,088.2
CCCMA	Canada	2,070.6
INGV	Italy	1,472.2
GISS	USA	1,096.8
MRI	Japan	1,024.5
CNRM	France	999.1
IPSL	France	997.7
UKMO	UK	972.8
BCCR	Norway	861.9
MIUB	Germany/Korea	477.2
INMCM3	Russia	368.2
Totals		34,986.6

Modeling group		CMIP5 volume (GB)
MPI	Germany	710,000
NCAR	USA	410,000
MRI	Japan	312,000
GFDL	USA	151,000
MIROC3	Japan	115,000
UKMO	UK	89,000
CNRM	France	64,000
IAP	China	63,000
U Reading	UK	63,000
EC	Europe	50,000
GISS	USA	50,000
INGV	Italy	50,000
IPSL	France	45,000
INMCM3	Russia	32,000
NorClim	Norway	30,000
CCCMA	Canada	29,000
CAWCR	Australia	21,000
CSIRO	Australia	20,000
METRI	Korea	13,000
Totals		2,317,000

Some useful references

ESG

<http://www.earthsystemgrid.org>

CMIP5

<http://cmip.llnl.gov>

CESM

<http://www.cesm.ucar.edu>

CESM experiments page

<http://www.cesm.ucar.edu/experiments/cesm1.0>

NCAR/CCP Plans for Climate-Change Simulation

Trey White
NCAR/NESL/CGD/CCR/CCP

Plans for Climate-Change Simulation

- Coupled CAM4 simulations
- Coupled CAM5 simulations
- High-resolution time-slice experiments
- High-resolution coupled simulations



Coupled CAM4 Simulations

- **CCSM4 with 2° atmosphere**
 - RCP 4.5
 - 4xCO₂
 - GeoMIP: reduce solar constant, inject sulphate aerosols
- **CESM(BGC) with 1° atmosphere**
 - 20th century
 - RCP 8.5

Coupled CAM5 Simulations

- **1° FV atmosphere, 1° ocean**
- **20th century (under way)**
 - **Extra output for aerosols and extreme events**
- **RCPs and extensions**
- **20th-century single forcings**
- **21st-century single forcings**
- **Decadal prediction**

High-Resolution Time-Slice Experiments

- **AMIP: active atmosphere and land**
- **20-30 years**
- **Late 20th and late 21st centuries**
- **1/4° CAM4 FV (done?) and SE**
- **1/4° CAM5 FV (done?) and SE**
- **1/8° CAM5 SE**
- **Higher vertical resolution**

High-Resolution Coupled Simulations

- **CCSM4 with $1/2^\circ$ atmosphere, 1° ocean**
 - Control run (underway)
 - 20th century and RCP
- **CCSM4 with $1/4^\circ$ atmosphere, $1/10^\circ$ ocean**
 - Decadal-prediction simulations
- **CESM(CAM5-SE) with $1/4^\circ$ atmosphere**
 - Control run, 20th century, and RCP with 1° ocean
 - Control run, 20th century, and RCP with $1/10^\circ$ ocean
 - Prescribed aerosols?
- **CESM(CAM5-SE) with $1/8^\circ$ atmosphere**

Computing Plans



Coupled CAM4



Coupled CAM5



**High-Resolution
Time Slices**



**High-Resolution
Coupled**



Some useful references

ESG

<http://www.earthsystemgrid.org>

CMIP5

<http://cmip.llnl.gov>

CESM

<http://www.cesm.ucar.edu>

CESM experiments page

<http://www.cesm.ucar.edu/experiments/cesm1.0>