

CESM Basic Workflow

Cécile Hannay

NCAR is sponsored by the National Science Foundation

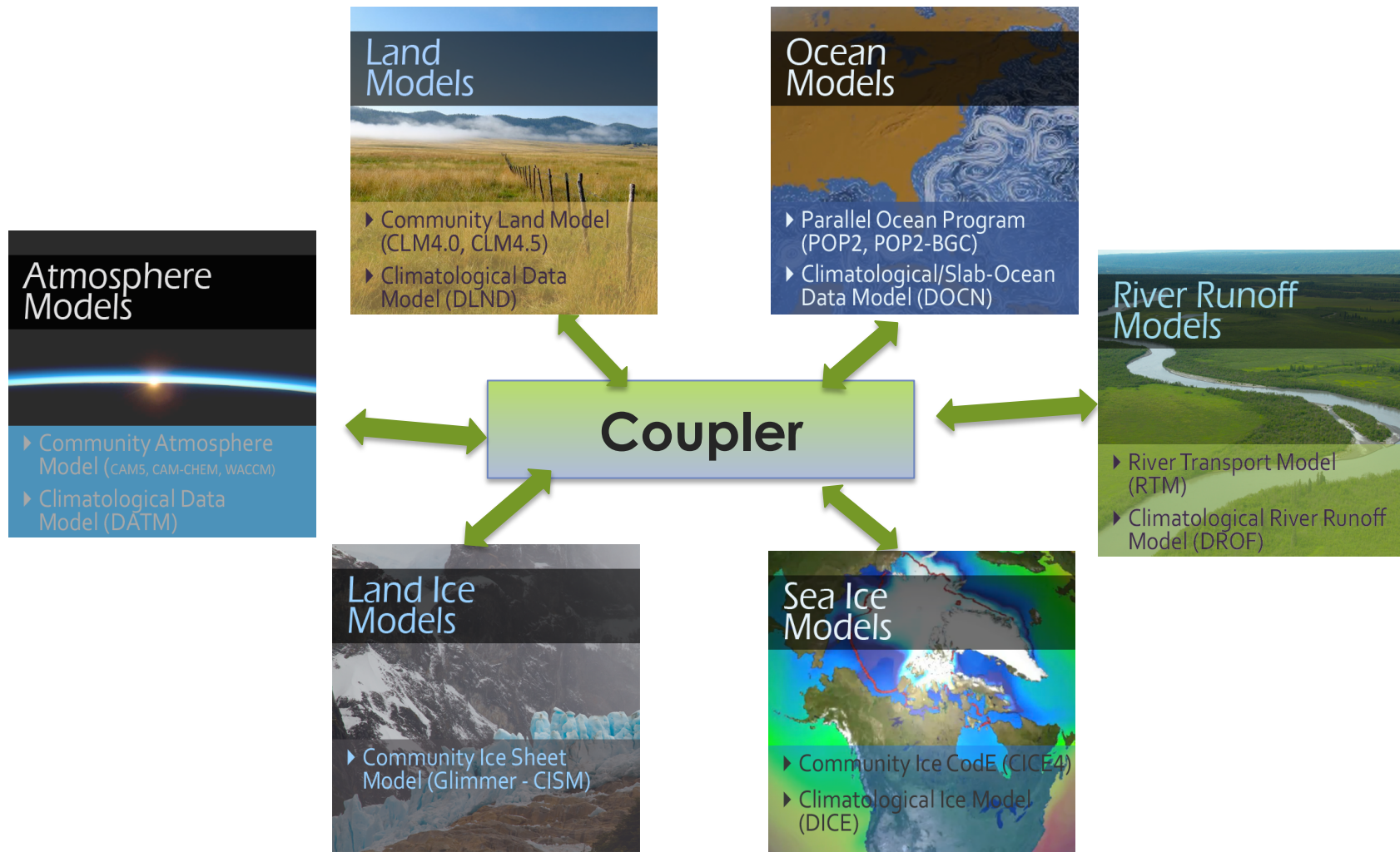


Outline

- **CESM at a glance**
 - 1) **The CESM framework**
 - 2) **Overview of CESM directories**
 - 3) **The CESM webpage**
- **CESM workflow**
 - 1) **Create a new case**
 - 2) **Invoke cesm_setup**
 - 3) **Build the executable**
 - 4) **Run and output data**
- **Getting help**
- **Appendix**

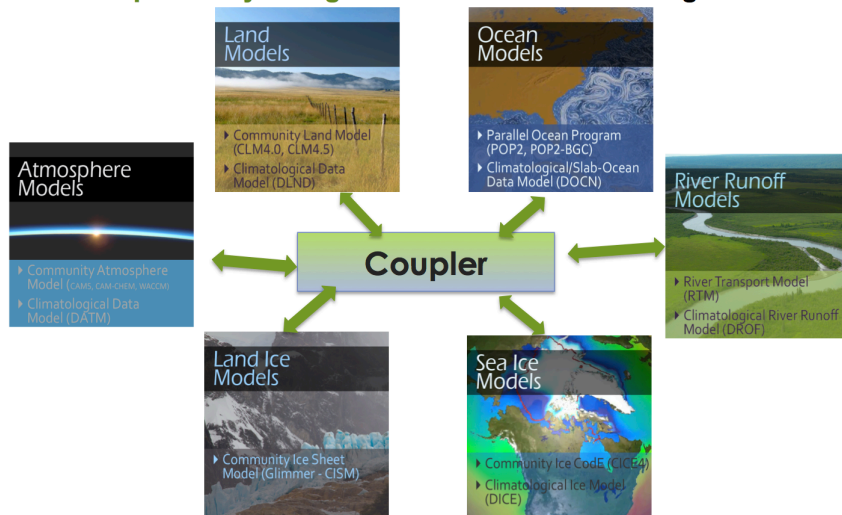
The CESM framework

The Community Earth System Model (CESM) is a set of models that can be run **independently** or **together** to simulate the Earth global climate.



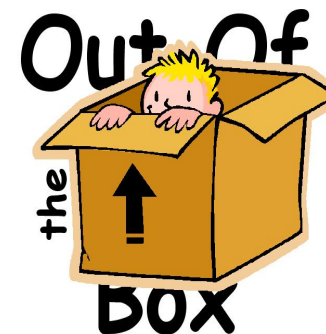
The CESM framework

The Community Earth System Model (CESM) is a set of models that can be run **independently** or **together** to simulate the Earth global climate.



The CESM can be run through a set of **scripts** provided with the model.

This talk is a **quick start** to the CESM workflow (out-of the box)



out of the box = works immediately after installation without any modification

Overview of CESM Directories

CESM data

```
/glade/p/cesm/cseg/inputdata  
$DIN_LOC_ROOT
```

CESM Code

```
/glade/p/cesm/lmwg/  
CLM2014_tutorial_n03_clm4_5_62  
$CCSMROOT
```

CESM lives in 2 directories:

- **CESM code**

/glade/p/cesm/lmwg/CLM2014_tutorial_n03_clm4_5_62

- **CESM data**

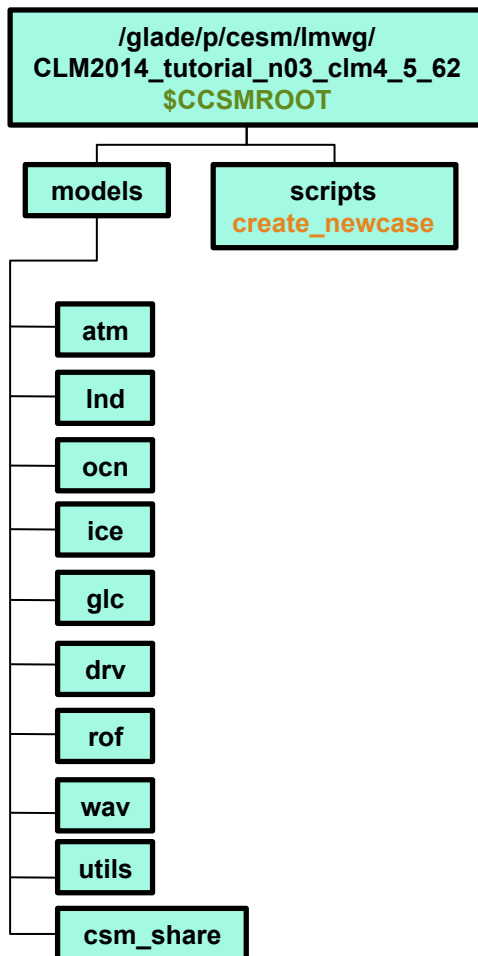
/glade/p/cesm/cseg/inputdata

Overview of CESM Directories

CESM data

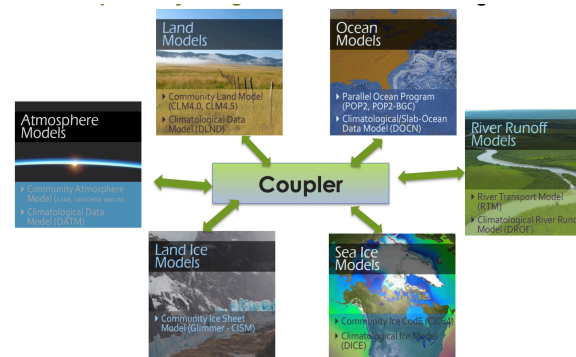
`/glade/p/cesm/cseg/inputdata`
`$DIN_LOC_ROOT`

CESM Code



CESM code has 2 subdirectories:

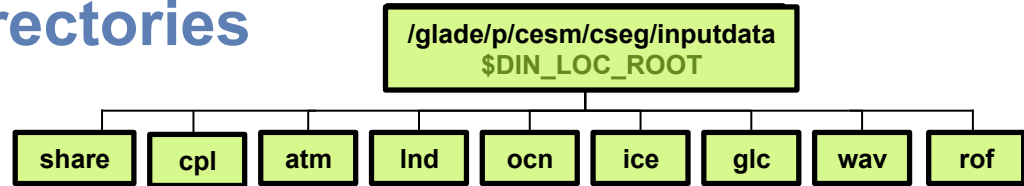
- **models**: contains the code for every component



- **scripts**: contains the scripts you need to run CESM

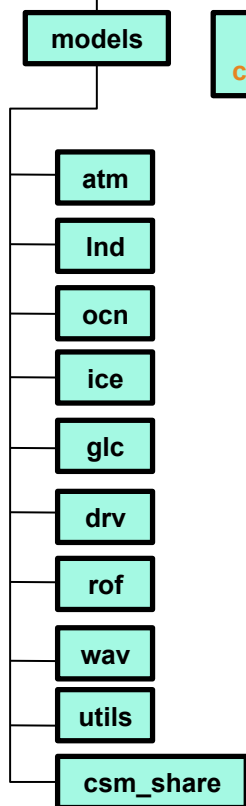
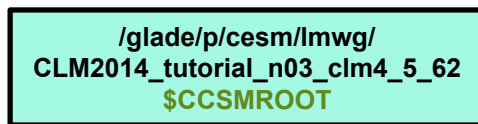
Overview of CESM Directories

CESM data



Inputdata directory `$DIN_LOC_ROOT` contains all input data required to run the model

CESM Code



If you use your own machine (not for this tutorial)

- To download input data: use the script `check_input_data`
 - downloads **only** the data needed
 - puts the data in the proper subdirectories
 - **Do NOT download input data manually** (ie. by using `svn co`)

CESM 1.2 Web Page

<http://www.cesm.ucar.edu/models/cesm1.2/>

CESM Models

Home » CESM Models » CESM1.2 Series Public Release

CESM1.2 SERIES PUBLIC RELEASE

ABOUT THIS RELEASE SERIES

The CESM1.2 release has numerous new key features among which are the addition of CLM4.5, new science changes to CAMS running with the CAM-SE dynamical core, and new scripting infrastructure for the generation of component sets, grids and model testing.

CESM1.2 SERIES RELEASE NOTES

Please read the [CESM1.2 Series Release Notes](#) which includes What's New - Science, What's New - Software, Answer-Changing Features, Supported Machines, and Known Problems. The new scripting infrastructure is described in detail in the [CESM1.2 User's Guide](#).

SCIENTIFIC VALIDATION

Scientific validation consists of a multi-decadal model run of the given component set at the target resolution, followed by scientific review of the model output diagnostics. All scientifically supported component sets are also accompanied by diagnostic and model output data. Validated CESM1.2 model results and diagnostics will be added to the CESM1.2 website as they become available.

What version of the model should I use?

For a scientifically supported target component set and resolution, please refer to the [Scientifically Validated Configurations](#) for that target configuration. For component sets and resolutions that are not scientifically validated in any supported release (e.g. cesm1.0.5 and cesm1.1.1), CSEG strongly urges you to use the latest model release (in this case cesm1.2.0).

DIAGNOSTIC PACKAGES AND NAMING CONVENTIONS

- [Post Processing Utilities](#)
- [Model File Naming Conventions](#)
- [Experiment Case Naming Conventions](#)

MODEL DOCUMENTATION

CESM1.2

- ▶ [User's Guide](#)
- ▶ [Machines, Resolutions, Component sets](#)
- ▶ [Model Component Namelists](#)
- ▶ [\\$CASEROOT xml files](#)

Atmosphere Models

- ▶ [Community Atmosphere Model \(CAM, CAM-ORCA, WACCM\)](#)
- ▶ [Climatological Data Model \(OATM\)](#)

Land Models

- ▶ [Community Land Model \(CLM4, CLM4.5\)](#)
- ▶ [Climatological Data Model \(CLM4\)](#)

Sea Ice Models

- ▶ [Community Ice CodE \(ICE\)](#)
- ▶ [Climatological Ice Model \(OICE\)](#)

Coupler

- ▶ [CESM Coupler \(CPL7\)](#)

Ocean Models

- ▶ [Parallel Ocean Program \(POP2, POP2-86C\)](#)
- ▶ [Climatological/Slab-Ocean Data Model \(OOCN\)](#)

Land Ice Models

- ▶ [Community Ice Sheet Model \(Glimmer - CISM\)](#)

River Models

- ▶ [River Transport Model \(RTM\)](#)
- ▶ [Climatological River Runoff Model \(CRRM\)](#)

CESM PROJECT

The **Community Earth System Model (CESM)** is a fully-coupled, global climate model that provides state-of-the-art computer simulations of the Earth's past, present, and future climate states.

CESM is sponsored by the National Science Foundation (NSF) and the U.S. Department of Energy (DOE). Administration of the CESM is maintained by the Climate and Global Dynamics Division (CGD) at the National Center for Atmospheric Research (NCAR).

MODEL SOURCE CODE

Copyright and Terms of Use

All CESM source code is subject to the following [Copyright Notice and Disclaimer](#).

Acquiring the Release Code

The source code for CESM releases is distributed through a public Subversion code repository. This code can be checked out using Subversion client software, such as the command tool `svn`, or simply [view the latest version with a web browser](#).

A short [registration](#) is required to access the repository. After registering, you will receive an email containing a user name and password that is necessary to gain access to the repository.

Acquisition of the code is more fully described in the most recent version of the [CESM1.2 User's Guide](#).

REPORTING A PROBLEM

If you have any problems, please first read the User's Guide including the sections on FAQs and Use Cases. Please also refer to the [CESM Bulletin Board](#), which is in place to facilitate communication within the CESM community. Finally, please also refer to the [Release Notes](#) entries that are provided with every release and release update. If questions or problems still exist, then please send an email to cesm-help@cgd.ucar.edu. Support questions will be answered as resources are available.

CESM SUPPORT POLICY

[CESM Support Policy - November 2012](#)

CESM DATA MANAGEMENT & DISTRIBUTION PLAN

The **Community Earth System Model (CESM) Data Management and Data Distribution Plan** documents the procedures for the storage and distribution of data produced with

Release Notes



Scientific validation



Guidance on model versions



Post processing Tools



Model Documentation



Background and Sponsors



How to acquire the code



Reporting problems Getting Help



CESM 1.2 Web Page

<http://www.cesm.ucar.edu/models/cesm1.2/>

MODEL DOCUMENTATION

CESM1.2

- ▶ User's Guide
- ▶ Machines, Resolutions, Component sets
- ▶ Model Component Namelists
- ▶ \$CASEROOT xml files

Atmosphere Models

- ▶ Community Atmosphere Model (CAM5, CAM-ORCA, WACCM)
- ▶ Climatological Data Model (CDM)

Land Models

- ▶ Community Land Model (CLM4.0, CLM5)
- ▶ Climatological Data Model (CLM4)

Sea Ice Models

- ▶ Community Ice Code (CICE)
- ▶ Climatological Ice Model (CICE)

Coupler

- ▶ CESM Coupler (CPL7)

Ocean Models

- ▶ Parallel Ocean Program (POP2, POP2-8GC)
- ▶ Climatological/Slab-Ocean Data Model (COO)

Land Ice Models

- ▶ Community Ice Sheet Model (Glimmer-CISM)

River Models

- ▶ River Transport Model (RTM)
- ▶ Climatological River Runoff Model (CROR)

EXTERNAL LIBRARY DOCUMENTATION

- Parallel I/O Library (PIO)
- Model Coupling Toolkit (MCT)
- Earth System Modeling Framework (ESMF)

MODEL INPUT DATA

The input data necessary to run all supported component sets is made available from a public [Subversion input data repository](#). Note that the inputdata repository has much more data in it than you need to run CESM1.2 ---- **DO NOT attempt to svn checkout the whole input data repository**. The [CESM1.2 User's Guide](#) explains how to obtain the subset of input data required for your needs.

PERFORMANCE AND LOAD BALANCING DATA

The timing table provides performance data that will continue to evolve due to changes in the model, machine hardware and input from the user community. For CESM1.2, please refer to the [CESM1.1.1 Timing Table](#).

A short **registration** is required to access the repository. After registering, you will receive an email containing a user name and password that is necessary to gain access to the repository.

Acquisition of the code is more fully described in the most recent version of the [CESM1.2 User's Guide](#).

REPORTING A PROBLEM

If you have any problems, please first read the User's Guide including the sections on FAQs and Use Cases. Please also refer to the [CESM Bulletin Board](#), which is in place to facilitate communication within the CESM community. Finally, please also refer to the [Release Notes](#) entries that are provided with every release and release update. If questions or problems still exist, then please send an email to cesm-help@cgd.ucar.edu. Support questions will be answered as resources are available.

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[CESM Support Policy - November 2012](#)

CESM DATA MANAGEMENT & DISTRIBUTION PLAN


The [Community Earth System Model \(CESM\) Data Management and Data Distribution Plan](#) documents the procedures for the storage and distribution of data associated with the CESM project.

← Data management and distribution

Model Input data →

Timing and load balance →

Outline

- **CESM**
 - 1) **The CESM framework**
 - 2) **Overview of CESM directories**
 - 3) **CESM webpage**
-  • **CESM workflow**
 - 1) **Create a new Case**
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 - 4) **Run and output data**
- **Getting More Help**
- **Appendix**

Work Flow: Super Quick Start

CESM can be run with a set of **4 commands**

```
# go into scripts directory into the source code download  
cd /glade/p/cesm/lmwg/CLM2014_tutorial_n03_clm4_5_62/scripts
```

(1) # (1) create a new case in your home directory
`./create_newcase -case ~/I1850_001 -res f19_g16 -compset I1850CLM45 -mach yellowstone`

```
# go into the case you just created in the last step  
cd ~/I1850_001
```

(2) # (2) invoke cesm_setup
`./cesm_setup`

(3) # (3) build the executable
`./I1850_001.build`

(4) # (4) submit your run to the batch queue
`./I1850_001.submit`

It is that easy !



Basic Work Flow

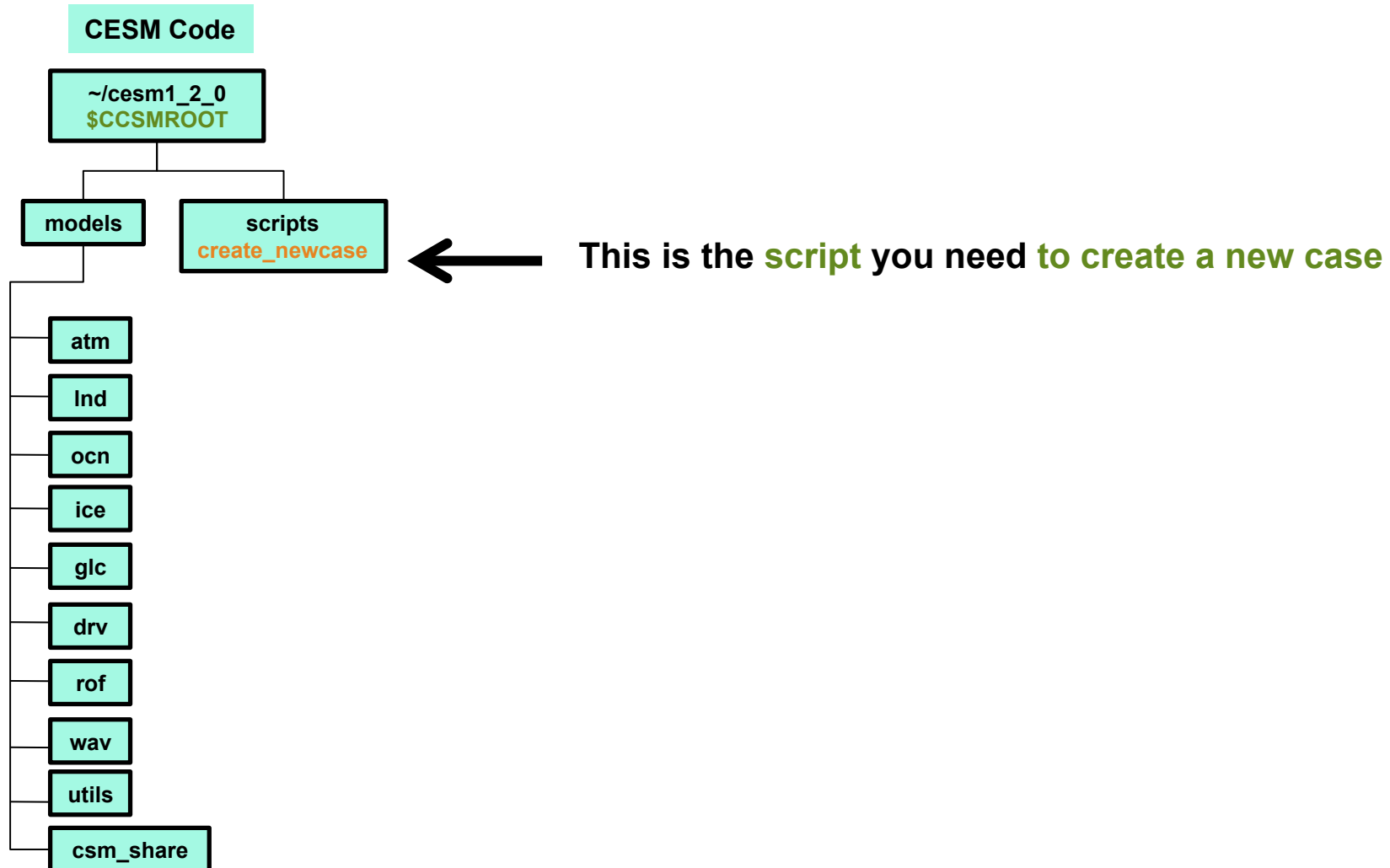
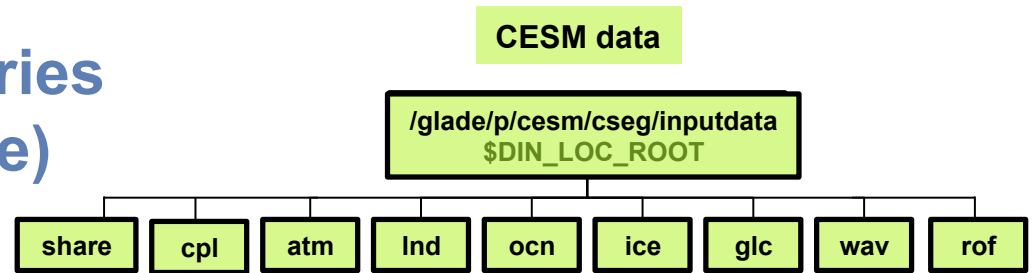
(or how to set up and run an experiment)

Creating & Running a Case



- (1) Create a New Case**
- (2) Invoke `cesm_setup`**
- (3) Build the Executable**
- (4) Run the Model and Output Data Flow**

Overview of CESM directories (+ before create_newcase)



Work Flow: Super Quick Start

CESM can be run with a set of **4 commands**

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`./create_newcase -case ~/I1850_001 -res f19_g16 -compset I1850CLM45 -mach yellowstone`

```
# go into the case you just created in the last step  
cd ~/I1850_001
```

(2) # (2) invoke cesm_setup
`./cesm_setup`

(3) # (3) build the executable
`./I1850_001.build`

(4) # (4) submit your run to the batch queue
`./I1850_001.submit`

It is that easy !



Create a new case

In the scripts directory, `create_newcase` is the tool that generates a new case.

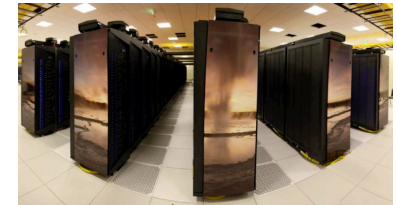
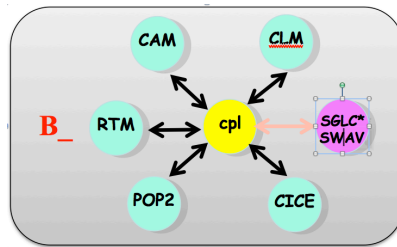
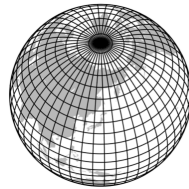
`create_newcase` requires 4 arguments

What is the casename ?

Which resolution?

Which model configuration ?
Which set of components ?

Which machine are you running on?



`create_newcase -case I1850_001 -res f19_g16 -compset I1850CLM45 -mach yellowstone`

create_newcase arguments

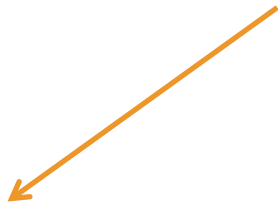
create_newcase requires 4 arguments

```
create_newcase -case ~/I1850_001 -res f19_g16 -compset I1850CLM45 -mach  
yellowstone
```

create_newcase arguments

create_newcase requires 4 arguments

```
create_newcase -case ~/I1850_001 -res f19_g16 -compset I1850CLM45 -mach yellowstone
```



case is the name and location of the case being created
~/I1850_001

Recommendation: Use meaningful names

create_newcase arguments

create_newcase requires 4 arguments

```
create_newcase -case ~/I1850_001 -res f19_g16 -compset I1850CLM45 -mach yellowstone
```

res specifies the **model resolutions** (or grid): f19_g16 (atm/Ind_ocn/ice)

Grid naming convention

Each model resolution can be specified by its alias, short name and long name.

Example of equivalent alias, short name and long name:

- alias: f19_g16 (atm/Ind_ocn/ice)
 - short name: 1.9x2.5_gx1v6
 - long name = a%1.9x2.5_l%1.9x2.5_oi%gx1v6_r%r05_m%gx1v6_g%null_w%null
- ↑ ↑ ↑ ↑ ↑ ↑ ↑
- atm Ind ocn/ice river Ind Ind-ice wave
- mask

create_newcase arguments

create_newcase requires 4 arguments

```
create_newcase -case ~/I1850_001 -res f19_g16 -compset I1850CLM45 -mach yellowstone
```

 **compset** specifies the “component set”

Component set specifies component models, forcing scenarios and physics options for those models

Compset naming convention

Each model compset can be specified by its alias, short name and long name.

Example of equivalent alias, short name and long name:

- alias: I1850CLM45
- short name: I_1850_CLM45
- long name = 1850_DATM%QIA_CLM45%SP_SICE_SOCN_RTM_SGLC_SWAV


time atm Ind ice ocn river Ind-ice wave

More on CESM component sets

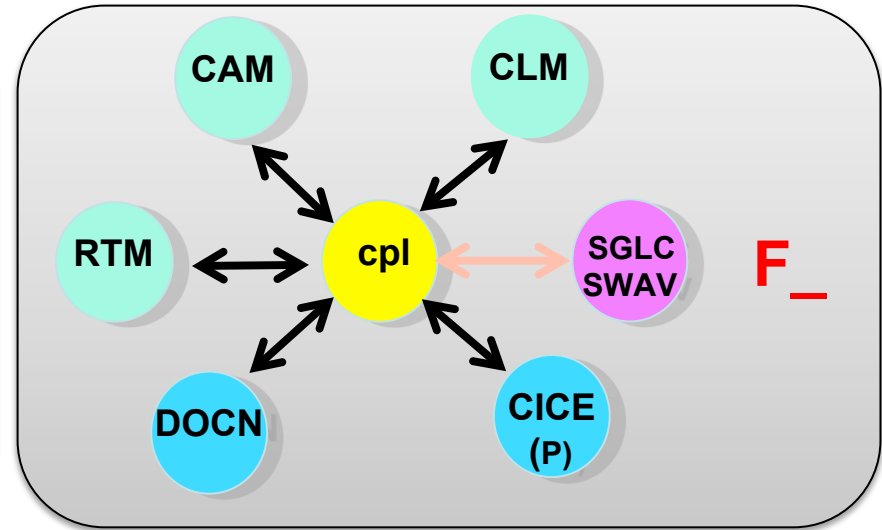
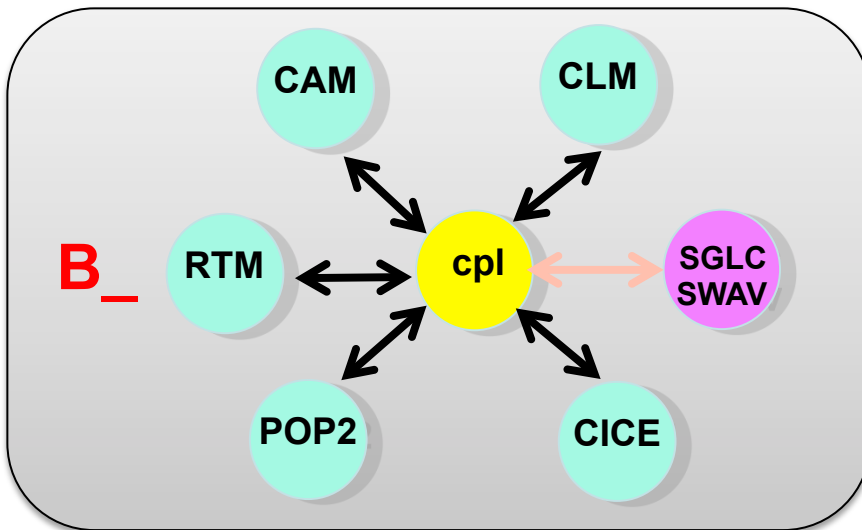
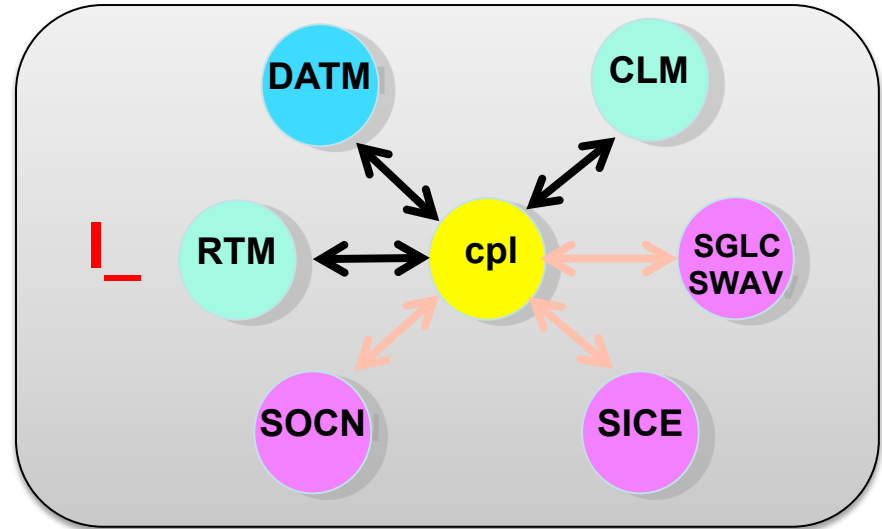
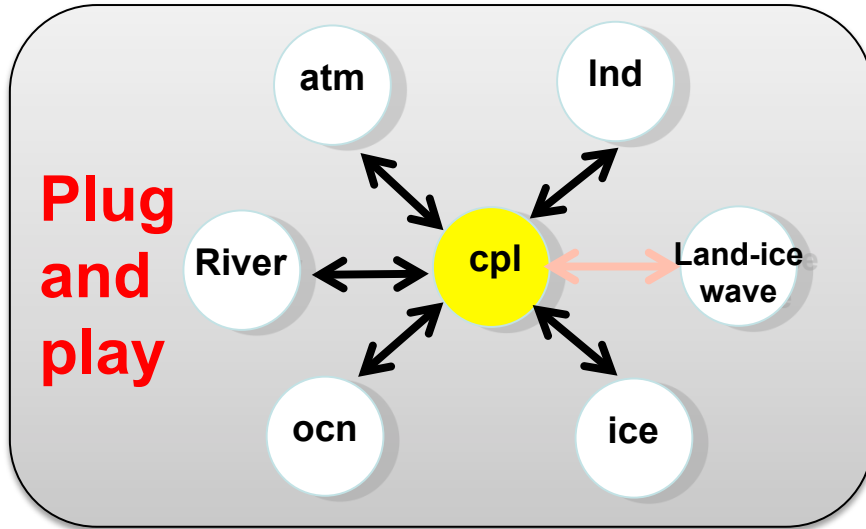
Plug and play of components with different component models

Color code:

active

data

stub



create_newcase arguments

create_newcase requires 4 arguments

```
create_newcase -case ~/I1850_001 -res f19_g16 -compset I1850CLM45 -mach yellowstone
```



mach specifies the **machine** that will be used.

“supported” machines tested regularly, eg. yellowstone, titan, hopper, intrepid

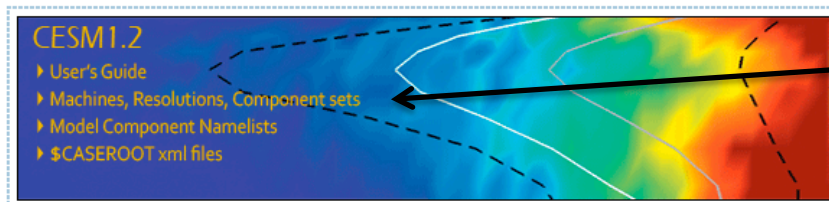
Valid Values for res, compset, and mach

Command line to list all the valid choices for grids, compsets and machines

`./create_newcase -list <type>`

with type can be [compsets, grids, machines]

MODEL DOCUMENTATION

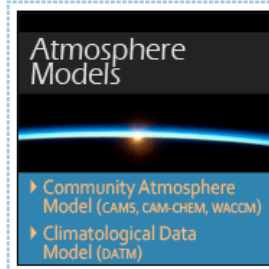


CESM1.2

- ▶ User's Guide
- ▶ Machines, Resolutions, Component sets
- ▶ Model Component Namelists
- ▶ \$CASEROOT xml files

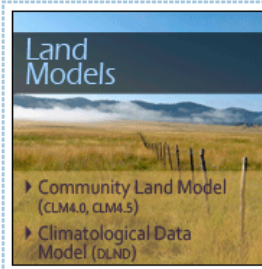
List of valid values is also available from the CESM website

<http://www.cesm.ucar.edu/models/cesm1.2/>



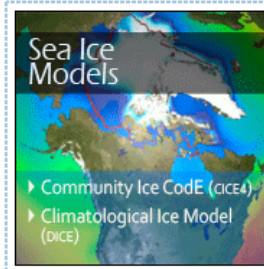
Atmosphere Models

- ▶ Community Atmosphere Model (CAM5, CAM-CHEM, WACCM)
- ▶ Climatological Data Model (DATM)



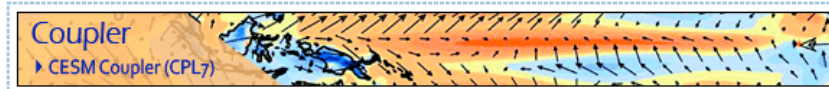
Land Models

- ▶ Community Land Model (CLM4.0, CLM4.5)
- ▶ Climatological Data Model (DLND)



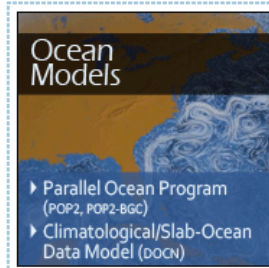
Sea Ice Models

- ▶ Community Ice CodE (cice4)
- ▶ Climatological Ice Model (DICE)



Coupler

- ▶ CESM Coupler (CPL7)



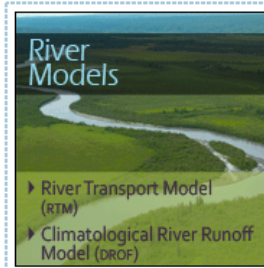
Ocean Models

- ▶ Parallel Ocean Program (POP2, POP2-BGC)
- ▶ Climatological/Slab-Ocean Data Model (DOCN)



Land Ice Models

- ▶ Community Ice Sheet Model (Glimmer - CISM)



River Models

- ▶ River Transport Model (RTM)
- ▶ Climatological River Runoff Model (PROF)

About create_newcase

- `./create_newcase -help` lists all the available options
- Most often only four options are used: `case`, `compset`, `res`, and `mach`

```
cd ../cesm1_2_0/scripts/  
./create_newcase -help
```

SYNOPSIS

```
create_newcase [options]
```

OPTIONS

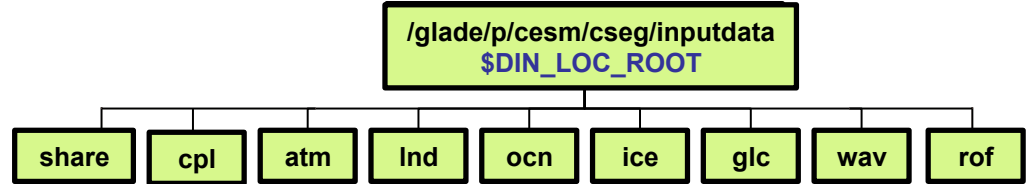
User supplied values are denoted in angle brackets (<>). Any value that contains white-space must be quoted. Long option names may be supplied with either single or double leading dashes. A consequence of this is that single letter options may NOT be bundled.

<code>-case <name></code>	Specifies the case name (required).
<code>-compset <name></code>	Specify a CESM compset (required).
<code>-res <name></code>	Specify a CESM grid resolution (required).
<code>-mach <name></code>	Specify a CESM machine (required).
<code>-compiler <name></code>	Specify a compiler for the target machine (optional) default: default compiler for the target machine
<code>-mpilib <name></code>	Specify a mpi library for the target machine (optional) default: default mpi library for the target machine allowed: openmpi, mpich, ibm, mpi-serial, etc redundant with <code>_M</code> <code>confopts</code> setting
<code>-mach_dir <path></code>	Specify the locations of the Machines directory (optional). default: <code>/glade/p/cesm/cseg/collections/cesm1_2_0_beta08/scripts/ccsm_utils/Machines</code>
<code>-pecount <name></code>	Value of <code>S,M,L,X1,X2</code> (optional). default: <code>M</code> , partially redundant with <code>confopts _P</code>
<code>-pes_file <name></code>	Full pathname of <code>pes</code> file to use (will overwrite default settings) (optional). See <code>sample_pes_file.xml</code> for an example.
<code>-user_compset</code>	Long name for new user compset file to use (optional) This assumes that all of the compset settings in the long name have been defined.
<code>-grid_file <name></code>	Full pathname of grid file to use (optional) See <code>sample_grid_file.xml</code> for an example. Note that compset components must support the new grid.
<code>-help [or -h]</code>	Print usage to <code>STDOUT</code> (optional).
<code>-list <type></code>	Only list valid values, type can be <code>[compsets, grids, machines]</code> (optional).

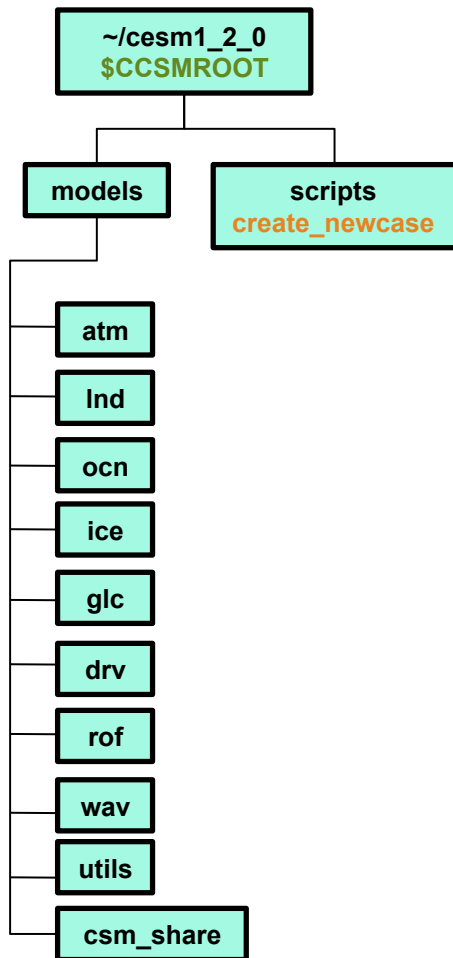
...

Overview of Directories (after create_newcase)

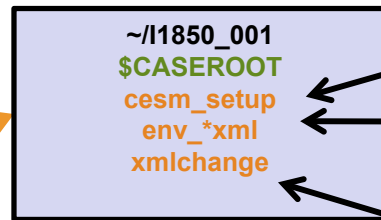
INPUTDATA Directory



CESM Code



CASE Directory



`create_newcase` creates case directory that contains:

`cesm_setup`: script used in the next step

files with xml variables used by CESM scripts

script to edit `env_*.xml` files

subdirectory for case specific code modifications

About env_*.xml files

- env_*.xml contains variables used by scripts -- some can be changed by the user
 - env_case.xml: set by create_newcase and cannot be modified
 - env_mach_pes.xml : specifies layout of components
 - env_build.xml: specifies build information
 - env_run.xml : sets run time information (such as length of run, frequency of restarts, ...)
User interacts with this file most frequently

- Here's a snippet of the env_run.xml file

```
<!--"sets the run length in conjunction with STOP_N and STOP_DATE, valid values: none,never,nst  
eps,nstep,nseconds,nsecond,nminutes,nminute,nhours,nhour,ndays,nday,nmonths,nmonth,nyears,nyea  
r,date,ifdays0,end (char) " -->  
<entry id="STOP_OPTION" value="ndays" />  
  
<!--"sets the run length in conjunction with STOP_OPTION and STOP_DATE (integer) " -->  
<entry id="STOP_N" value="5" />
```

“id” - variable name

“value” – variable value

CESM will run for 5 days

- To modify a variable in an xml file – use xmlchange
./xmlchange STOP_N=20

Basic Work Flow

(or how to set up and run an experiment)

Creating & Running a Case

(1) Create a New Case



(2) Invoke `cesm_setup`

(3) Build the Executable

(4) Run the Model and Output Data Flow

Work Flow: Super Quick Start

CESM can be run with a set of **4 commands**

```
# go into scripts directory into the source code download  
cd /glade/p/cesm/lmwg/CLM2014_tutorial_n03_clm4_5_62/scripts
```

(1) # (1) create a new case in your home directory
`./create_newcase -case ~/I1850_001 -res f19_g16 -compset I1850CLM45 -mach yellowstone`

```
# go into the case you just created in the last step  
cd ~/I1850_001
```

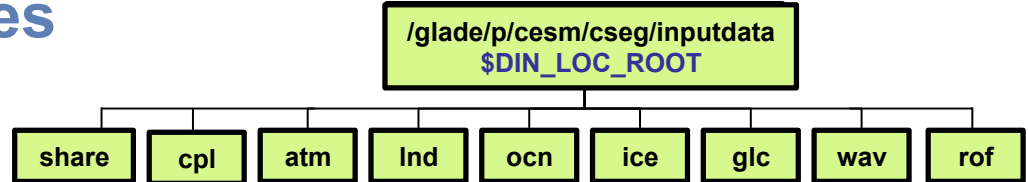
(2) # (2) invoke cesm_setup
`./cesm_setup`

(3) # (3) build the executable
`./I1850_001.build`

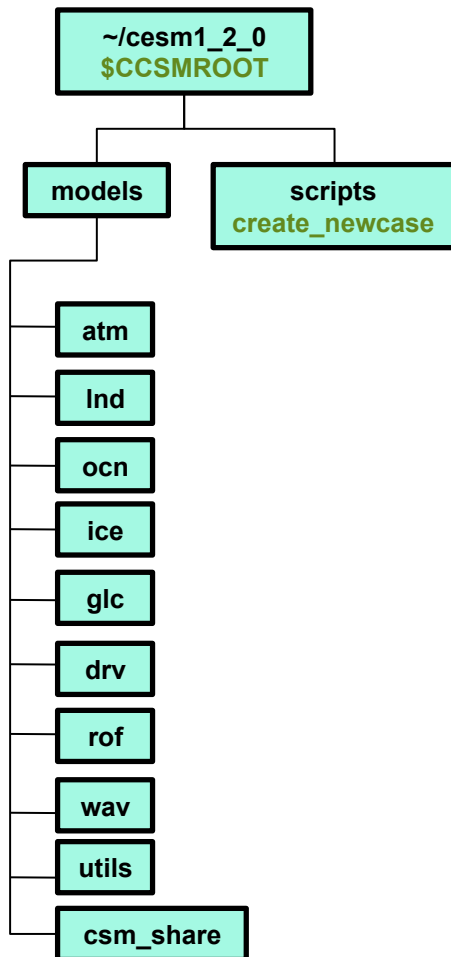
(4) # (4) submit your run to the batch queue
`./I1850_001.submit`

(2) Overview of Directories (after cesm_setup)

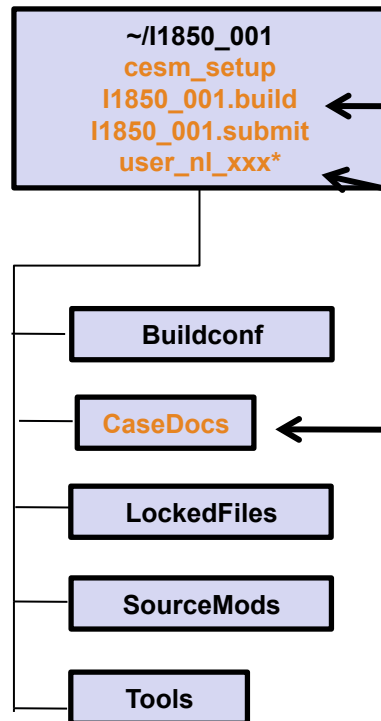
INPUTDATA Directory



CESM Code



CASE Directory



cesm_setup creates:

case scripts (to build, run and archive)

namelist modification files **user_nl_*****
this is where you modify **your namelists**

CaseDocs: contains **copy of the namelists**
This is for reference only and files in this directory **SHOULD NOT BE EDITED.**

Basic Work Flow

(or how to set up and run an experiment)

Creating & Running a Case

(1) Create a New Case

(2) Invoke `cesm_setup`

 (3) Build the Executable

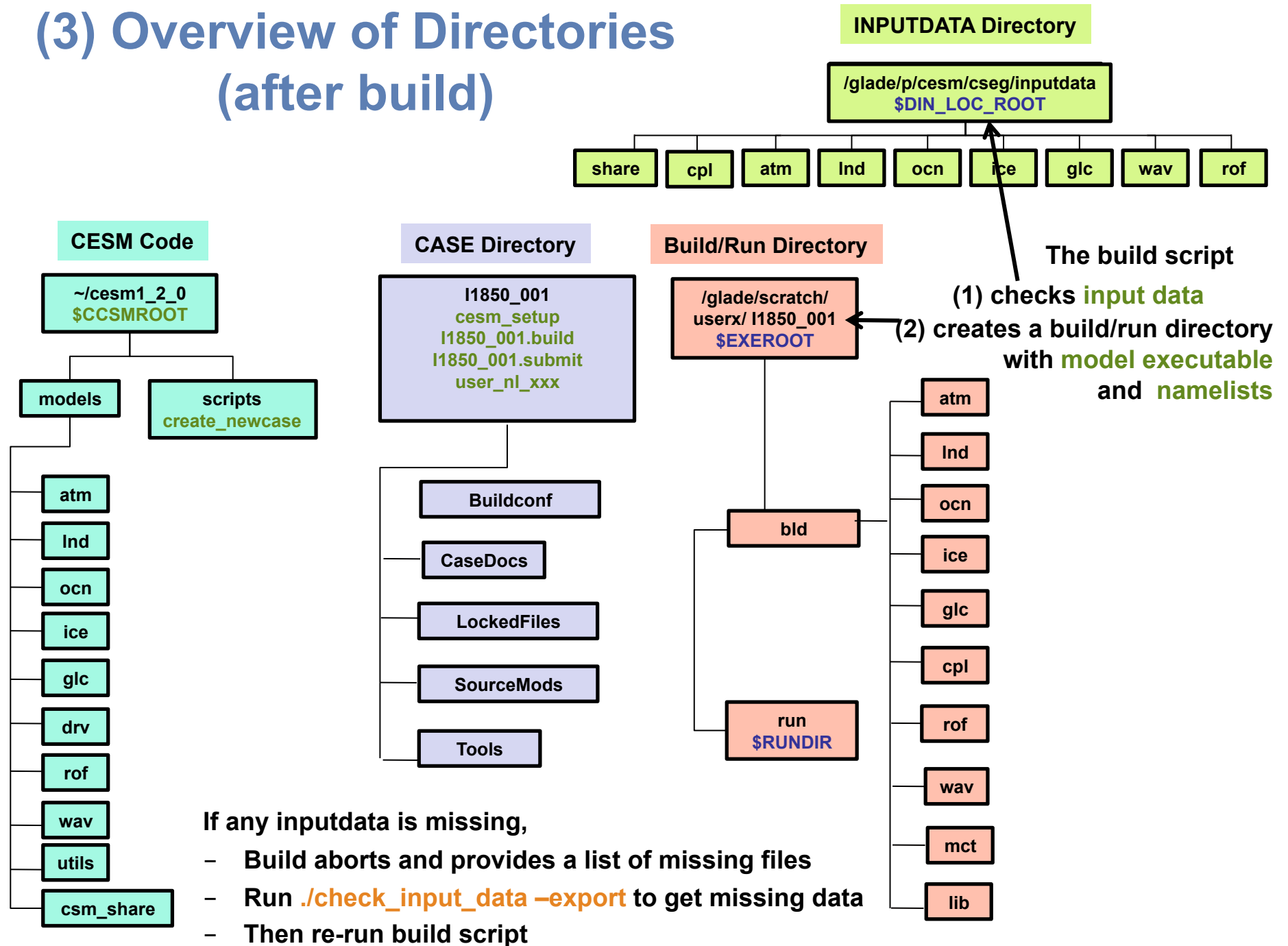
(4) Run the Model and Output Data Flow

Work Flow: Super Quick Start

CESM can be run with a set of **4 commands**

- ```
go into scripts directory into the source code download
cd /glade/p/cesm/lmwg/CLM2014_tutorial_n03_clm4_5_62/scripts
```
- (1) # (1) create a new case in your home directory  
`./create_newcase -case ~/I1850_001 -res f19_g16 -compset I1850CLM45 -mach yellowstone`
- ```
# go into the case you just created in the last step
cd ~/I1850_001
```
- (2) # (2) invoke cesm_setup
`./cesm_setup`
- (3) # (3) build the executable
`./I1850_001.build`
- (4) # (4) submit your run to the batch queue
`./I1850_001.submit`

(3) Overview of Directories (after build)



Basic Work Flow

(or how to set up and run an experiment)

Creating & Running a Case

(1) Create a New Case

(2) Invoke `cesm_setup`

(3) Build the Executable

 (4) Run the Model and Output Data Flow

Work Flow: Super Quick Start

CESM can be run with a set of **4 commands**

```
# go into scripts directory into the source code download  
cd /glade/p/cesm/lmwg/CLM2014_tutorial_n03_clm4_5_62/scripts
```

(1) # (1) create a new case in your home directory
`./create_newcase -case ~/I1850_001 -res f19_g16 -compset I1850CLM45 -mach yellowstone`

```
# go into the case you just created in the last step  
cd ~/I1850_001
```

(2) # (2) invoke cesm_setup
`./cesm_setup`

(3) # (3) build the executable
`./I1850_001.build`

(4) # (4) submit your run to the batch queue
`./I1850_001.submit`

(4) Running the Model

When you submit your jobs

```
~/I1850_001>I1850_001.submit  
check_case OK  
Job <959733> is submitted to queue <regular>
```

Use “**bjobs**” to check if job is running

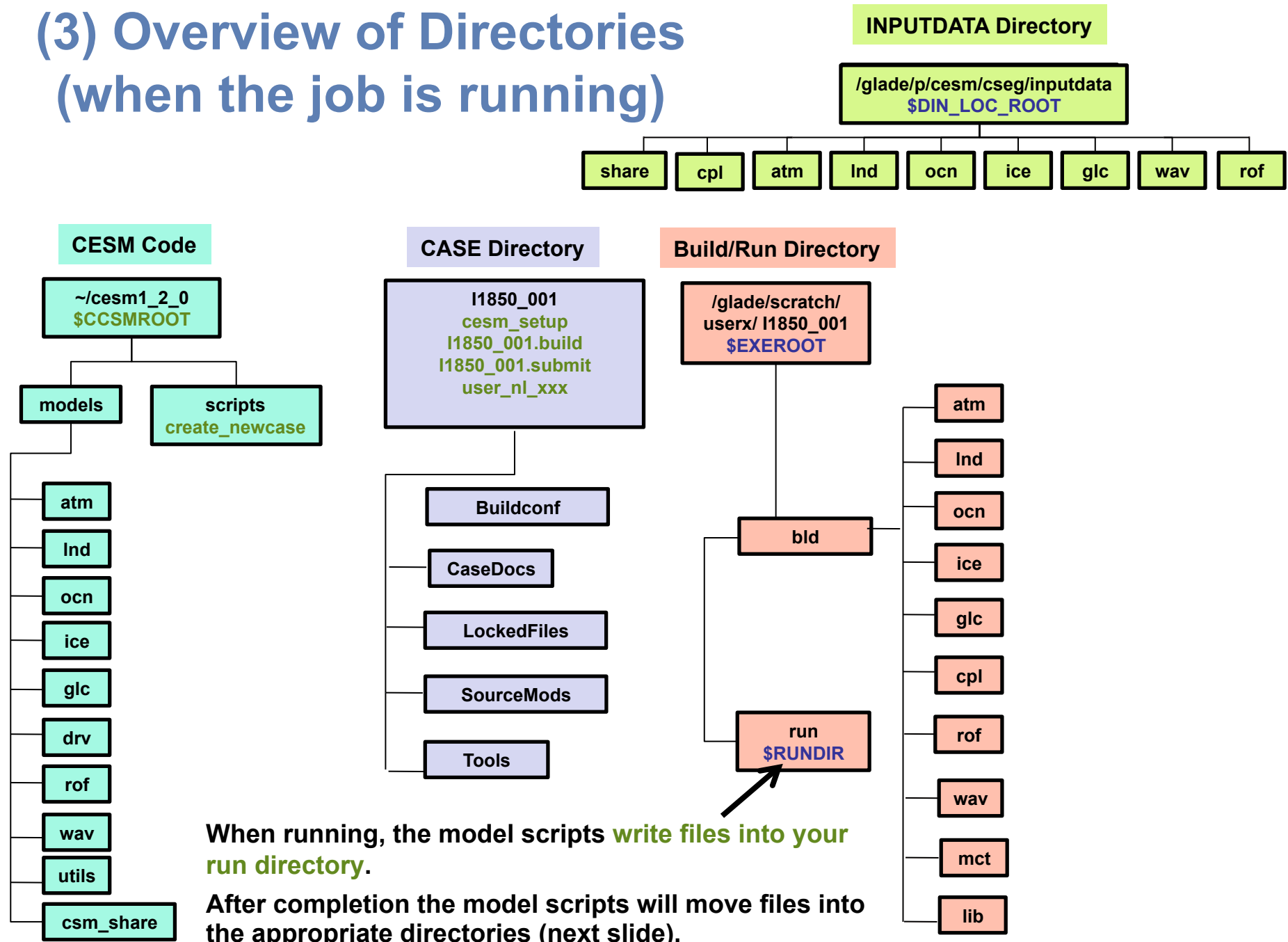
```
~/I1850_001>bjobs  
JOBID  USER  STAT  QUEUE  FROM_HOST  EXEC_HOST  JOB_NAME  SUBMIT_TIME  
960463  userx  PEND  regular  yslogin3-ib  I1850_001  Jun 17 08:34
```

Your job is waiting in the queue

```
~/I1850_001>bjobs  
JOBID  USER  STAT  QUEUE  FROM_HOST  EXEC_HOST  JOB_NAME  SUBMIT_TIME  
960463  userx  RUN   regular  yslogin3-ib  15*ys0702-i I1850_001  Jun 17 08:34  
15*ys1872-ib  
15*ys1906-ib  
15*ys1907-ib  
15*ys1908-ib  
15*ys1918-ib  
15*ys2055-ib  
15*ys2057-ib  
15*ys2058-ib  
15*ys2130-ib  
15*ys2131-ib  
15*ys2132-ib  
15*ys2216-ib  
15*ys2218-ib
```

Your job is running

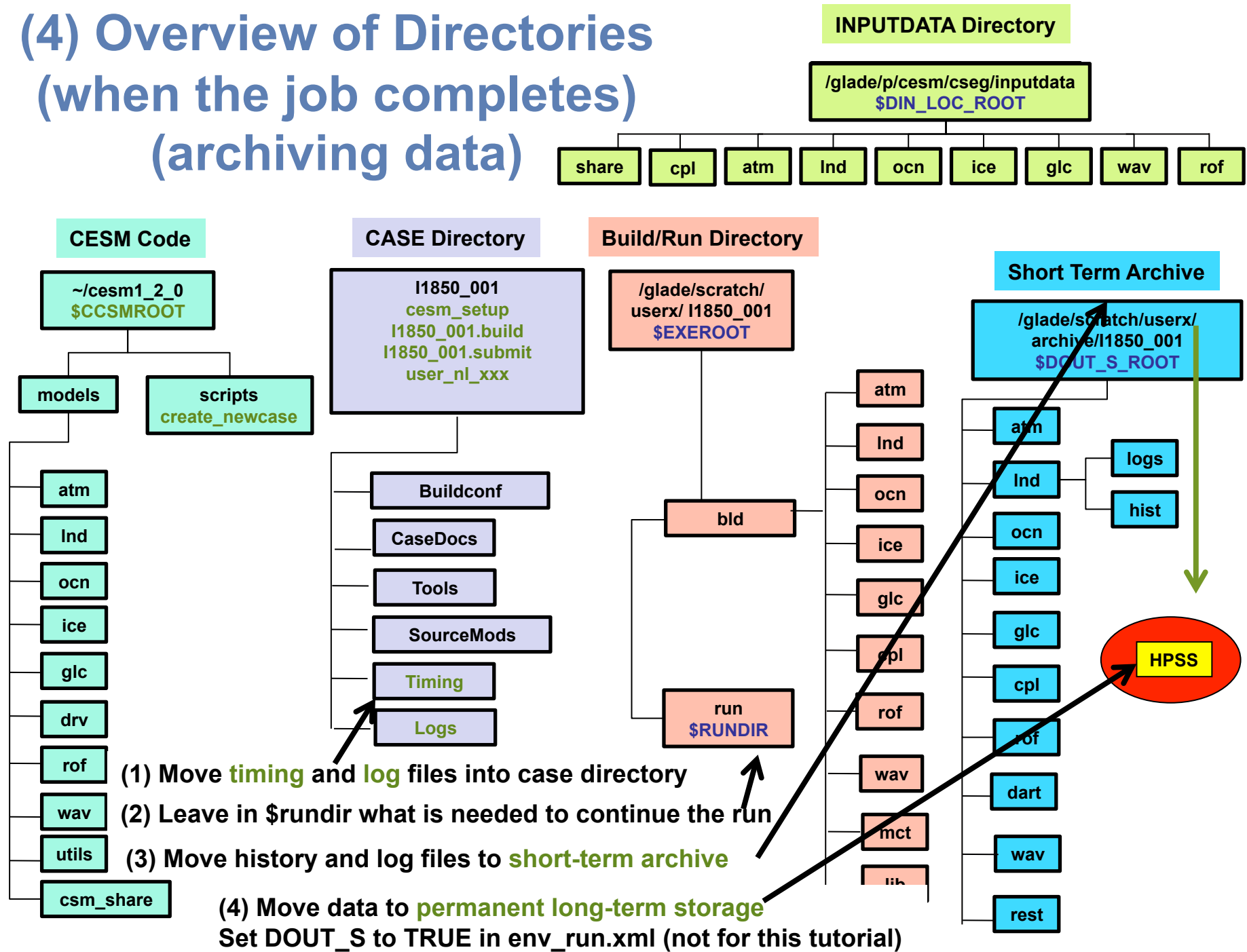
(3) Overview of Directories (when the job is running)



When running, the model scripts **write files into your run directory.**

After completion the model scripts will move files into the appropriate directories (next slide).

(4) Overview of Directories (when the job completes) (archiving data)



Outline

- **CESM**
 - 1) **The CESM framework**
 - 2) **Overview of CESM directories**
 - 3) **CESM webpage**
- **CESM workflow**
 - 1) **Create a new Case**
 - 2) **Invoke cesm_setup**
 - 3) **Build the executable**
 - 4) **Run and output data**
- **Getting More Help**
- **Appendix**



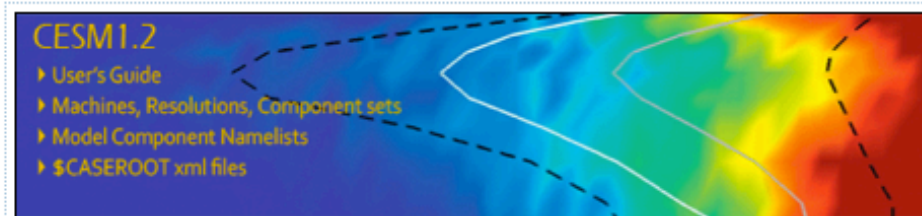
More Information/Getting Help

Model User Guides: <http://www.cesm.ucar.edu/models/cesm1.2/>

MODEL DOCUMENTATION

CESM1.2

- ▶ User's Guide
- ▶ Machines, Resolutions, Component sets
- ▶ Model Component Namelists
- ▶ \$CASEROOT xml files



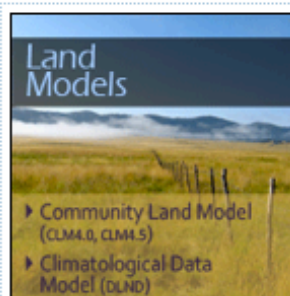
Atmosphere Models

- ▶ Community Atmosphere Model (CAM5, CAM-chem, WACM)
- ▶ Climatological Data Model (DATM)



Land Models

- ▶ Community Land Model (CLM4.0, CLM5)
- ▶ Climatological Data Model (CLND)



Sea Ice Models

- ▶ Community Ice Code (ICE4)
- ▶ Climatological Ice Model (ICE)



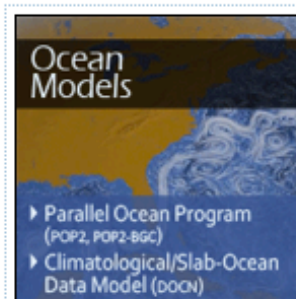
Coupler

- ▶ CESM Coupler (CPL7)



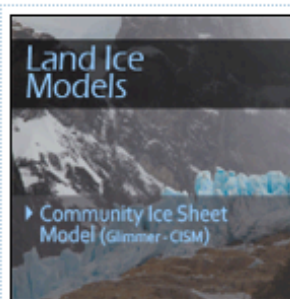
Ocean Models

- ▶ Parallel Ocean Program (POP2, POP2-BGC)
- ▶ Climatological/Slab-Ocean Data Model (POCN)



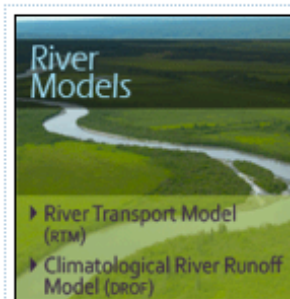
Land Ice Models

- ▶ Community Ice Sheet Model (Glimmer-CISM)



River Models

- ▶ River Transport Model (RTM)
- ▶ Climatological River Runoff Model (PROF)



More Information/Getting Help

CESM Bulletin Board: <http://bb.cgd.ucar.edu/>

NCAR UCAR DiscussCESM COMMUNITY Earth System MODEL

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CESM - General
 The Community Earth System Model (CESM) is a fully coupled, global climate model that provides state-of-the-art computer simulations of the Earth's past, present, and future climate states.

Forum	Topics	Posts	Last post
Announcements	16	41	CESM1.2.0 Release Announcement by aliceb June 12, 2013 - 11:52am
Bug reporting	110	306	output date error - monthly history files shifted 1 month by eaton 11 hours 50 min ago
Input Data Inquiries	108	260	CICE Input data for B20TR? by marvel1@... 11 hours 3 min ago
Output Data Inquiries	85	202	start time by hannay May 22, 2013 - 2:02pm
Tools A place for questions about the ESMF mapping tools and the cpnc tool as well as any topics related to grid generation.	3	10	runoff_to_ocn by cyoo@... May 23, 2013 - 8:22am
Software Development Includes issues for building/running on supported machines and porting to unsupported machines	174	515	Error in porting CESM by jedwards June 14, 2013 - 10:00am
General Discussion Includes requests for new features and configuration inquiries	193	458	More general MOC computation in POP by afrigola@... June 10, 2013 - 11:48am
Subversion Issues Forum for issues related to the new version control system	9	20	CCSM4/CESM1_0 download problem by sirajkhan78@... March 4, 2011 - 5:06pm
Tutorials For discussion regarding the web based modeling tutorials	5	13	Basic B_1850 Compilation by sstrey2@... June 4, 2013 - 9:10am

Appendix

- **Registration**
- **Download the source code**
- **Hardware/software requirements**

(A) Registration

- Go to CSM1.2 home page: <http://www.cesm.ucar.edu/models/cesm1.2/>

CESM1.2 SERIES PUBLIC RELEASE

ABOUT THIS RELEASE SERIES

The CESM1.2 release has numerous new key features among which are the addition of CLM4.5, new science changes to CAM5 running with the CAM-SE dynamical core, and new scripting infrastructure for the generation of component sets, grids and model testing.

CESM1.2 SERIES RELEASE NOTES

Please read the CESM1.2 Series Release Notes which includes What's New - Science, What's New - Software, Answer-Changing Features, Supported Machines, and Known Problems. The new scripting infrastructure is described in detail in the CESM1.2 User's Guide.

SCIENTIFIC VALIDATION

Scientific validation consists of a multi-decadal model run of the given component set at the target resolution, followed by scientific review of the model output diagnostics. All scientifically supported component sets are also accompanied by diagnostic and model output data. Validated CESM1.2 model results and diagnostics will be added to the CESM1.2 website as they become available.

What version of the model should I use?

For a scientifically supported target component set and resolution, please refer to the Scientifically Validated Configurations for that target configuration. For component sets and resolutions that are not scientifically validated in any supported release (e.g. cesm1.0.5 and cesm1.1.1), CSEG strongly urges you to use the latest model release (in this case cesm1.2.0).

DIAGNOSTIC PACKAGES AND NAMING CONVENTIONS

- Post Processing Utilities
- Model File Naming Conventions
- Experiment Case Naming Conventions

MODEL DOCUMENTATION

CESM1.2

- User's Guide
- Machines, Resolutions, Component sets
- Model Component NameLists
- \$CASEROOT xml files

Atmosphere Models

- Community Atmosphere Model (CAM5, CAM5-CM2.3.4, WACCM4)
- Climatological Data Model (ccsm)

Land Models

- Community Land Model (CLM4.5, CLM4.5S)
- Climatological Data Model (clm4)

Sea Ice Models

- Community Ice Code (cice)
- Climatological Ice Model (cice)

Coupler

- CESM Coupler (CPL7)

Ocean Models

- Parallel Ocean Program

Land Ice Models

- Community Ice Sheet

River Models

- River Transport Model

CESM PROJECT

The Community Earth System Model (CESM) is a fully-coupled, global climate model that provides state-of-the-art computer simulations of the Earth's past, present, and future climate states.

CESM is sponsored by the National Science Foundation (NSF) and the U.S. Department of Energy (DOE). Administration of the CESM is maintained by the Climate and Global Dynamics Division (CGD) at the National Center for Atmospheric Research (NCAR).

MODEL SOURCE CODE

Copyright and Terms of Use

All CESM source code is subject to the following Copyright Notice and Disclaimer.

Acquiring the Release Code

The source code for CESM releases is distributed through a public Subversion code repository. This code can be checked out using Subversion client software, such as the command tool svn, or simply view the latest version with a web browser.

A short registration is required to access the repository. After registering, you will receive an email containing a user name and password that is necessary to gain access to the repository.

Acquisition of the code is more fully described in the most recent version of the CESM1.2 User's Guide.

REPORTING A PROBLEM

If you have any problems, please first read the User's Guide including the sections on FAQs and Use Cases. Please also refer to the CESM Bulletin Board, which is in place to facilitate communication within the CESM community. Finally, please also refer to the Release Notes entries that are provided with every release and release update. If questions or problems still exist, then please send an email to cesm-help@cgd.ucar.edu. Support questions will be answered as resources are available.

CESM SUPPORT POLICY

CESM Support Policy - November 2012

CESM DATA MANAGEMENT & DISTRIBUTION PLAN

The Community Earth System Model

- Right hand column has a link to the registration page, click on it

Community Earth System Model

CESM1.0 Release User Registration

Required fields

Last Name:

First Name:

E-Mail:

Institution:

Purpose:

Valid special characters to use: `period, hyphen, apostrophe, forward slash, colon, comma`. No additional special characters are allowed.

(Maximum characters: 400)
You have characters left.

Have you used previous versions of CESM/CESM? Yes No

Publications using previous versions of CESM/CESM:

If you have used previous versions of CESM/CESM, please provide publications you have using the code. Valid special characters to use: `period, hyphen, apostrophe, forward slash, colon, comma`. No additional special characters are allowed.

(Maximum characters: 400)
You have characters left.

Copyright and Terms of Use

The Community Earth System Model (CESM) was developed in cooperation with the National Science Foundation (NSF), the Department of Energy (DOE), the National Aeronautics and Space Administration (NASA), the University Corporation for Atmospheric Research (UCAR) and the National Center for Atmospheric Research (NCAR). Except for the segregable components listed in the copyright, CESM is public domain software. There are third party tools and libraries that are embedded and they are subject to their own copyright notices and terms.

Please read the Copyright and Terms of Use on the CESM1.0 release home page.

Access to the Model

Once you agree to the Copyright and Terms of Use and submit your user information, you will be contacted via email with a subversion repository user name and password. This user name and password will allow you to access the source code.

Agree to Terms Yes No

- Register -- you will be emailed a username and password

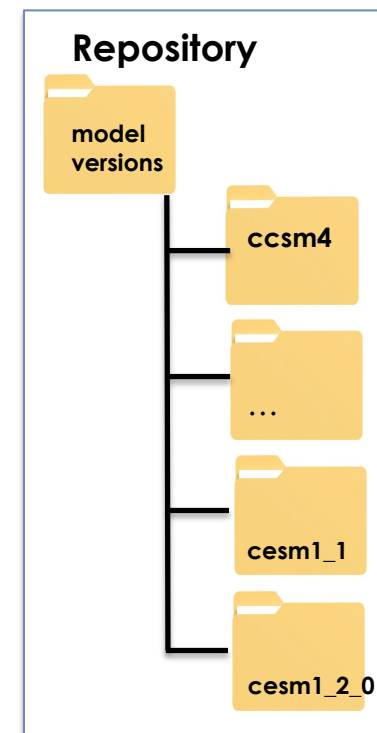
(B) Download the Source Code

- Code and input datasets are in a subversion repository (*)

https://svn-ccsm-release.cgd.ucar.edu/model_versions

- List the versions available on the CESM repository

`svn list https://svn-ccsm-release.cgd.ucar.edu/model_versions`



- Check out a working copy from the repository (“Download code”)

`svn co https://svn-ccsm-release.cgd.ucar.edu/model_versions/cesm1_2_0`

(*) You can get subversion at <http://subversion.apache.org/>



(C) Hardware/Software Requirements

- **Supported platforms**

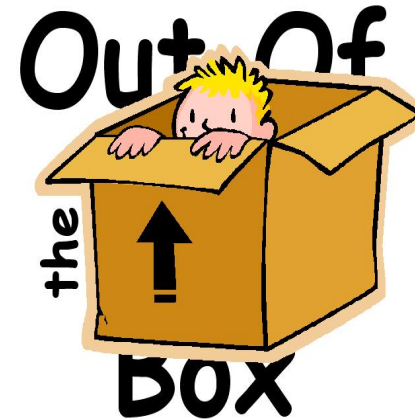
CESM currently runs “**out of the box**” today on the following machines

- **yellowstone** – NCAR IBM
- **titan** – ORNL Cray XK6
- **hopper** – NERSC Cray XE6
- **edison** – NERSC Cray Cascade
- **bluewaters** – ORNL Cray XE6
- **intrepid** – ANL IBM Bluegene/P
- **mira** – ANL IBM Bluegene/Q
- **janus** – Univ Colorado HPC cluster
- **pleiades** – NASA SGI ICE cluster
- **and a few others**

- **Running CESM on other platforms**

Require porting + software

- Subversion client (version 1.4.2 or greater)
- Fortran and C compilers (recommend pgi, intel, or ibm xlf compilers)
- NetCDF library (recommend netcdf4.1.3 or later)
- MPI (MPI1 is adequate, Open MPI or MPICH seem to work on Linux clusters)



out of the box = works immediately after installation without any modification