Fall 2009 CSDMS WG Update

James Syvitski
CSDMS Integration Facility
Boulder CO

CSDMS
COMMUNITY SURFACE DYNAMICS MODELING SYSTEM

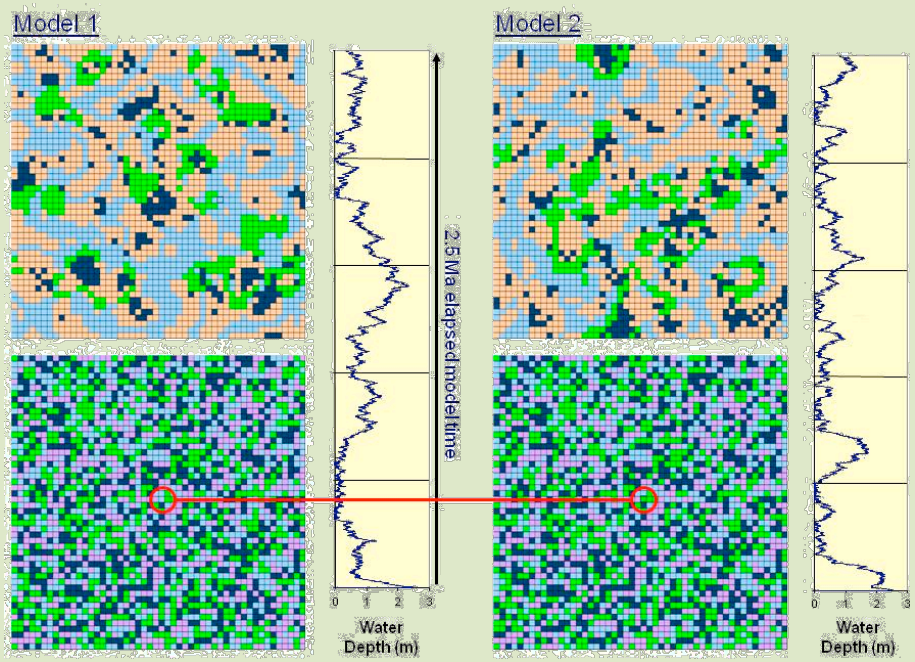
CSDMS Updates

- Community: 320+ members

Terrestrial	150
Marine	76
Coastal	100
EKT	28
Cyber	65
Carbonate	22
Chesapeake	13
Hydrology	53

Carbonate Discussion page Example

I agree that it is the challenge, But check out this model result



The image shows output from two runs of my carbonate cellular automata. The two models start off with the same random distribution of three facies in map view (lower images) differing only in one cell in the 50x50 grid, highlighted by the read circles. The upper map shows …

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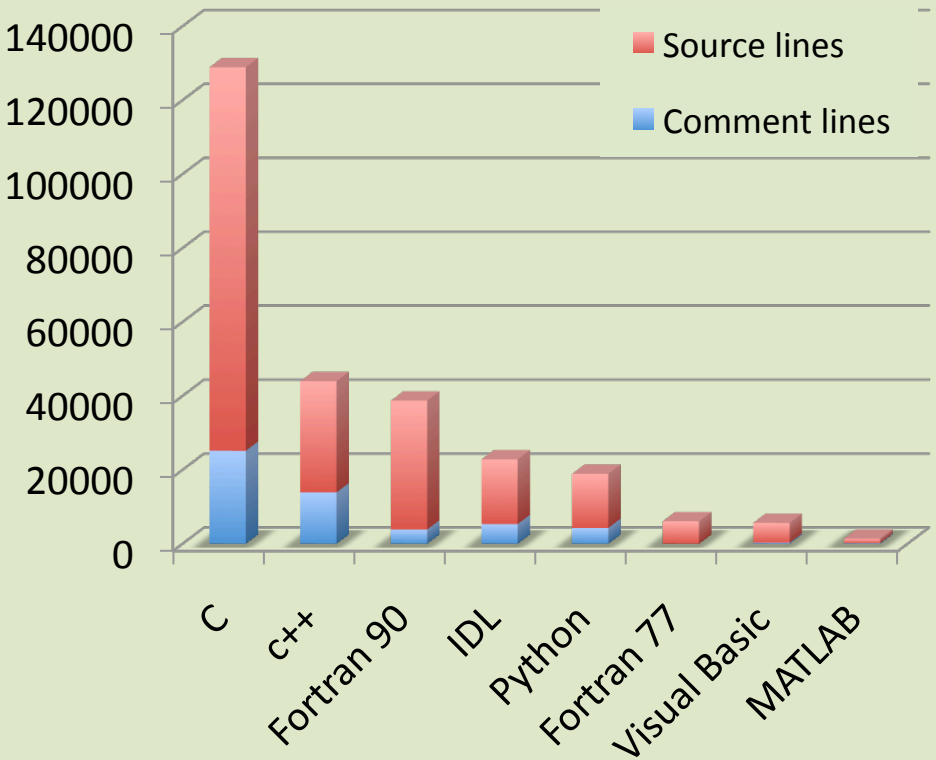
CSDMS Updates

- Repositories: 123 models
  220 downloads/mo



Top model downloads

child,	*135*
topoflow,	*92*
sedflux,	*86*
midas,	*81*
2dflowvel,	*52*
bing,	*49*
Gc2d,	*44*
adi-2d,	*41*
Plume,	*27*
Storm,	*25*
lithflex,	*25*
Waveref,	*24*
Bedrock-Er,	*24*

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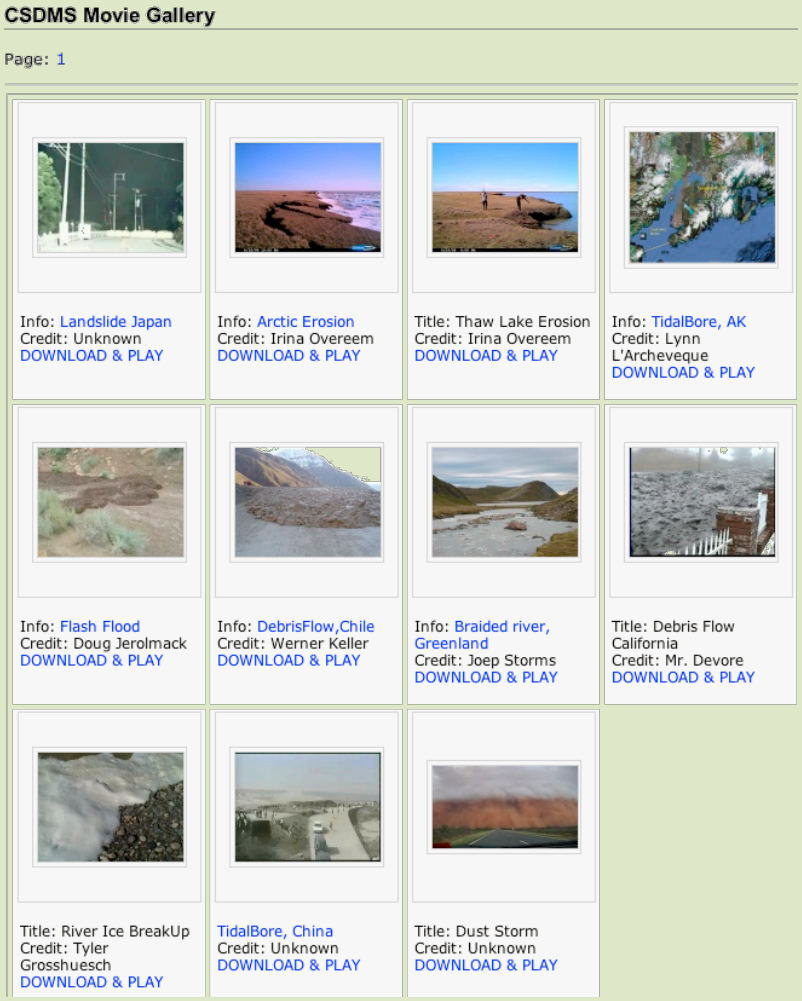
•**Repositories:** 61 (global) databases for model initializations; >100 ppt presentations, lecture materials, movies & simulations.

Database	Number
Topography	11
Bathymetry	3
Climate	6
Hydrography	5
River discharge	3
Cryosphere	3
Geology	2
Soils	2
Sea level	2
Land Cover	2
Population	3
GIS Tools	12
Network Ext	7



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CSDMS protocols for contributed compliant code:

1) Properly **licensed** (GPL2 compatible; OSI approved);
2) Community **vetted** (e.g. Working or Focus Research Group);
3) **Open** source and **stored** in the CSDMS Model Repository;
4) Written in a CCA supported open-source **language** (C, C++, any Fortran, Java, Python), (Note: IDL & Matlab can be made compatible)
5) **Refactored** with a programming interface compatible with CSDMS (e.g. initialize, run, finalize),
6) Source code **annotated** using special keywords within comment blocks to provide basic metadata for the model and its variables.
7) Model **description** with **test files** (input, output),
8) Provides all input & output *exchange items*
9) Clean code that is properly **documented**.

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Automatic Interface Generation (or wrapping) via Annotation

Doxygen a multi-language code parsing tool that supports all of the Babel-supported languages (C, C++, Fortran, Java, Python).

OnRamp a new CCA tool that parses annotated source code to help convert it to a CCA component.

Modelers to add standardized *annotations* (defined by CSDMS) to their source code that provide needed metadata, so as to automatically generate code for the interface functions

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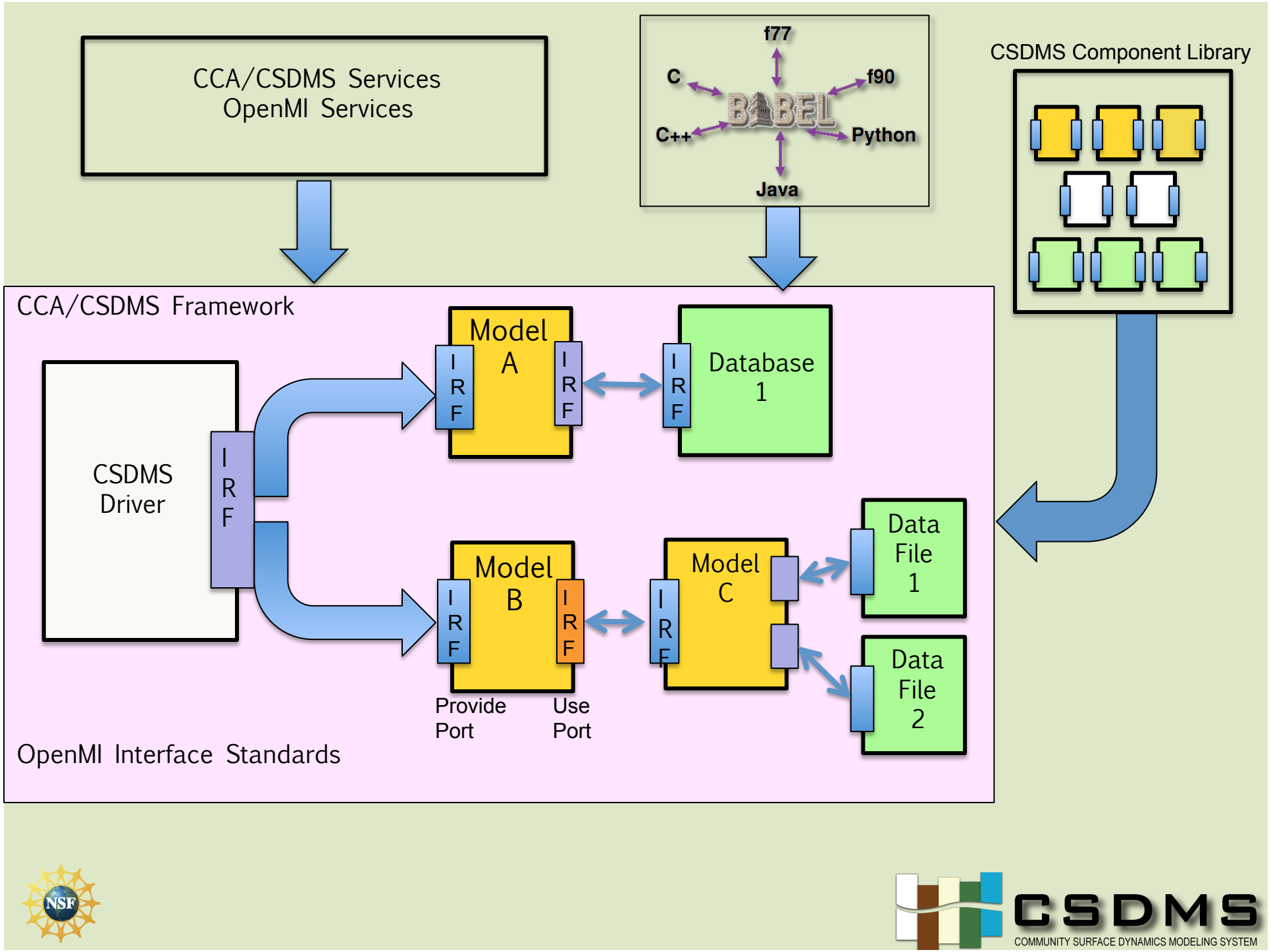
CCA/CSDMS Services
OpenMI Services
f77
C
f90
BABEL
C++
Python
Java
CSDMS Component Library
CCA/CSDMS Framework
CSDMS
Driver
IRF
Model
A
Database
1
Model
B
Model
C
Data
File
1
Data
File
2
Provide
Port
Use
Port
OpenMI Interface Standards
NSF
CSDMS
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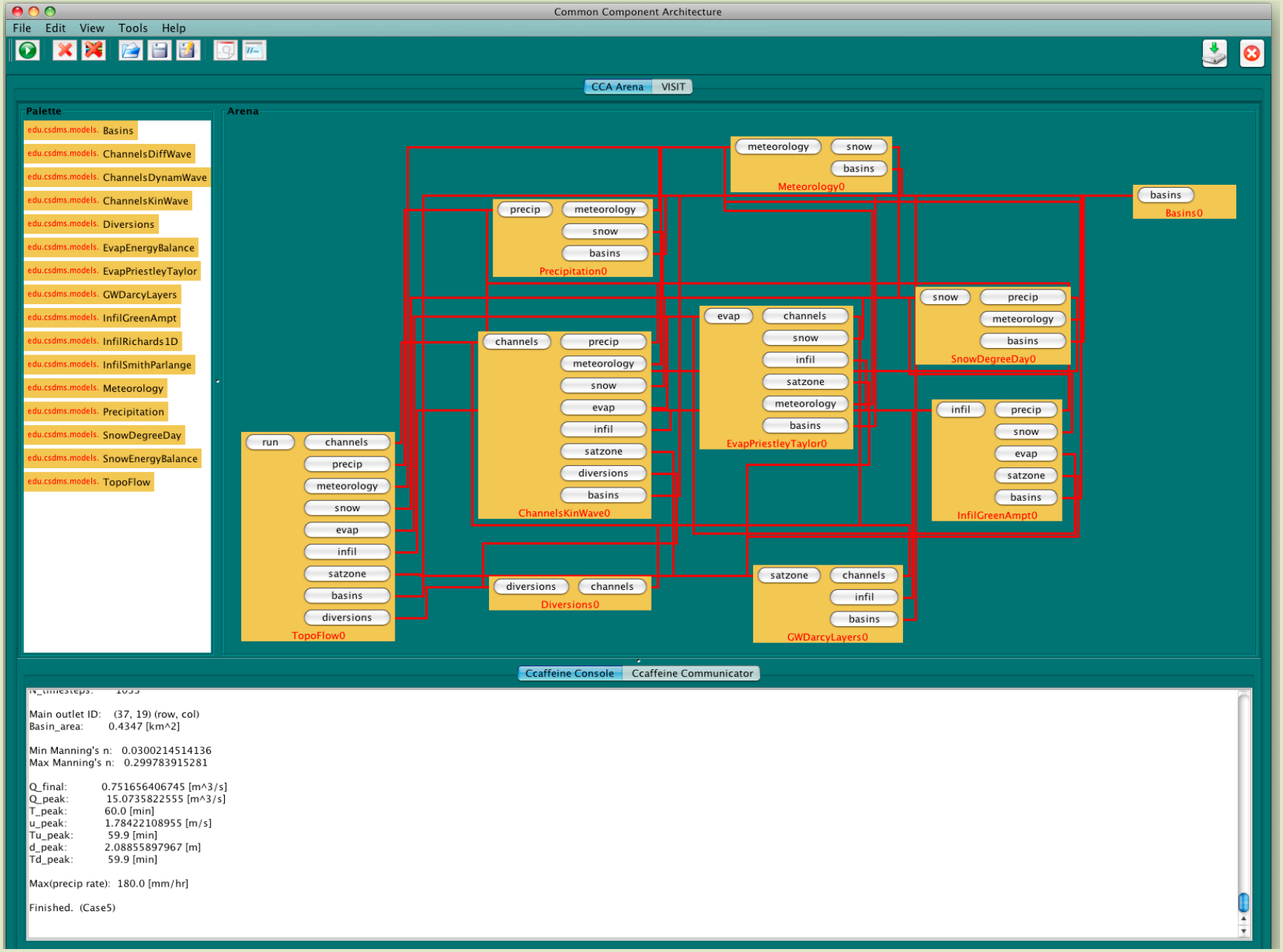
Common Component Architecture
File Edit View Tools Help
CCA Arena VISIT
Palette
edu.csdms.models. Basins
edu.csdms.models. ChannelsDiffWave
edu.csdms.models. ChannelsDynamWave
edu.csdms.models. ChannelsKinWave
edu.csdms.models. Diversions
edu.csdms.models. EvapEnergyBalance
edu.csdms.models. EvapPriestleyTaylor
edu.csdms.models. GWDarcyLayers
edu.csdms.models. InfilGreenAmpt
edu.csdms.models. InfilRichards1D
edu.csdms.models. InfilSmithParlange
edu.csdms.models. Meteorology
edu.csdms.models. Precipitation
edu.csdms.models. SnowDegreeDay
edu.csdms.models. SnowEnergyBalance
edu.csdms.models. TopoFlow
Arena
meteorology snow basins Meteorology0
basins Basins0
precip meteorology snow basins Precipitation0
snow precip meteorology basins SnowDegreeDay0
evap channels snow infil satzone meteorology basins EvapPriestleyTaylor0
channels precip meteorology snow evap infil satzone diversions basins ChannelsKinWave0
infil precip snow evap satzone basins InfilGreenAmpt0
run channels precip meteorology snow evap infil satzone basins diversions TopoFlow0
diversions channels Diversions0
satzone channels infil basins GWDarcyLayers0
Ccaffeine Console
Ccaffeine Communicator
Main outlet ID: (37, 19) (row, col)
Basin_area: 0.4347 [km^2]
Min Manning's n: 0.0300214514136
Max Manning's n: 0.299783915281
Q_final: 0.751656406745 [m^3/s]
Q_peak: 15.0735822555 [m^3/s]
T_peak: 60.0 [min]
u_peak: 1.78422108955 [m/s]
Tu_peak: 59.9 [min]
d_peak: 2.08855897967 [m]
Td_peak: 59.9 [min]
Max(precip rate): 180.0 [mm/hr]
Finished. (Case5)

NSF

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Goals:

1. Interface Standards (done but ongoing)
2. CHILD & SedFlux (90% done)
3. GC2D & TopoFlow (done)
4. HydroTrend & CEM (done)
5. ROMS, WWIII, Delft3D (unique licenses); CSTMS (ongoing)
6. NCED/CCED & RCEM Training Courses (done)
7. HPCC support (done but ongoing: PETSc, VisIt, Torque, MPI)
8. Wiki/RSS (done but ongoing)
9. Sponsorship: TCW; IAMG; RCEM; SediBud; AGU, AAPG; IAS
10. CSDMS proposals (ongoing)
11. Ccaffine GUI (done & ongoing)
12. Repositories (ongoing)
13. Industrial Consortia & Interagency Committee

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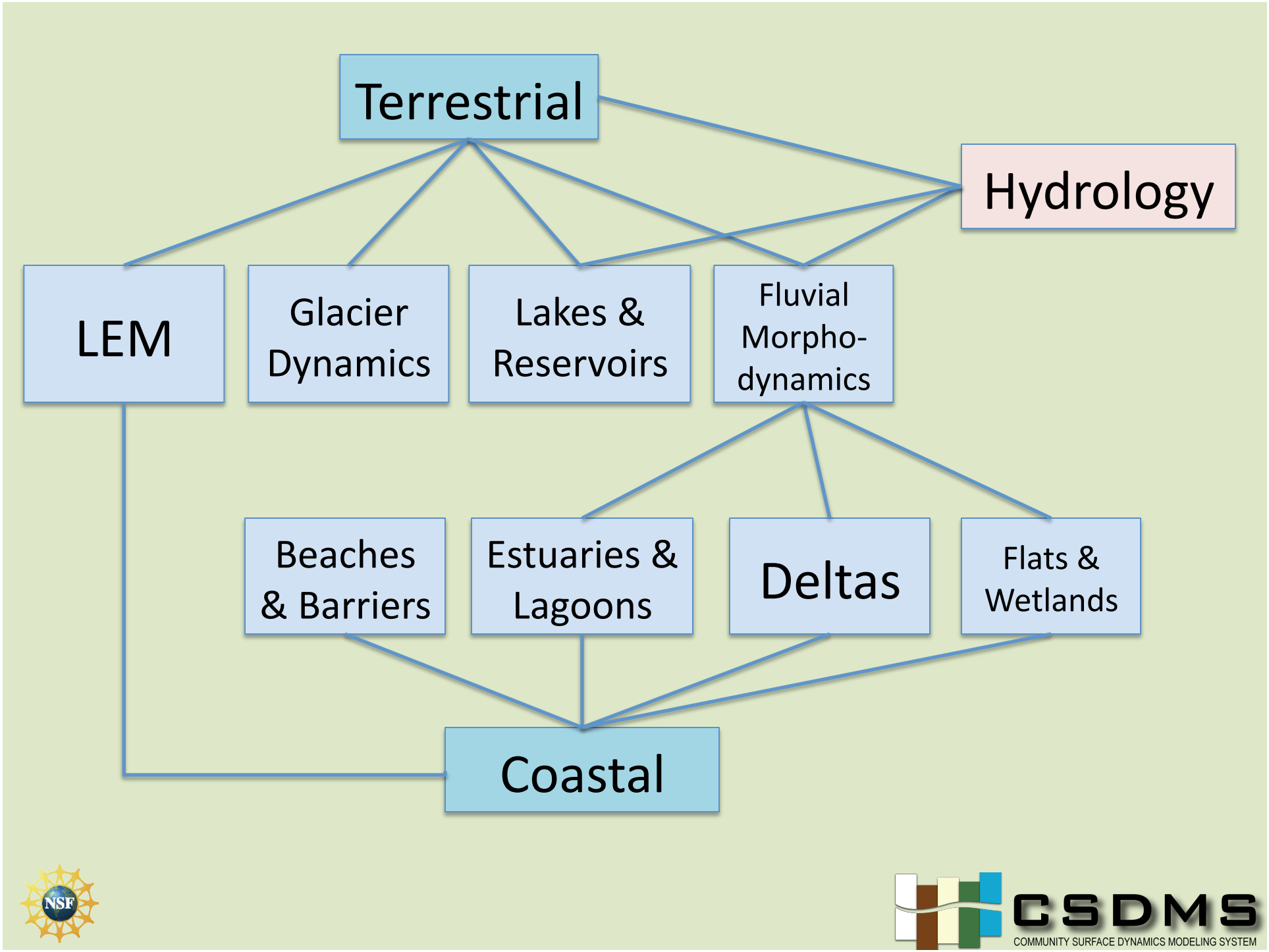

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