Building and running WRF-Hydro

Compiling and Running (Ch. 2.4 in Documentation)

1. Configure
   – Setting up environment & dependencies
   – Choose compiler options

2. Compiling
   – For coupled runs, WRF-Hydro will be compiled as a library (.o) and called by WRF as an external function.

3. Run (constant files and one namelist file)
   – Offline
   – Coupled with other systems

Compiling and Running

- ## Configure

    – ### Setting up some environments and dependencies:

    setenv WRF_HYDRO 1   - A "1" will activate additional WRF-Hydro environment settings. "0" or no definition will default to the WRF model environment settings only when WRF is run.

    (optional) setenv HYDRO_D 1   - A "1" for HYDRO_D results in WRF-Hydro producing some run-time diagnostic information. When HYDRO_D is set to "0 "or not defined, the diagnostic information will not be produced during run-time.

    setenv NETCDF_INC   "$path/netcdf/include"

    setenv NETCDF_LIB   "$path/netcdf/lib"

Compiling and Running

- Configure
    - Choose compiler options

        %./configure   - Executing this command will produce the following options:

        Please select from following supported options.

        1. Linux PGI compiler sequential
        2. Linux PGI compiler dmpar
        3. IBM AIX compiler sequential, xlf90_r
        4. IBM AIX compiler dmpar
        5. Linux gfort compiler sequential
        6. Linux gfort compiler dmpar
        7. Linux ifort compiler sequential
        8. Linux ifort compiler dmpar
        0. exit only

        Enter selection [0-8] :
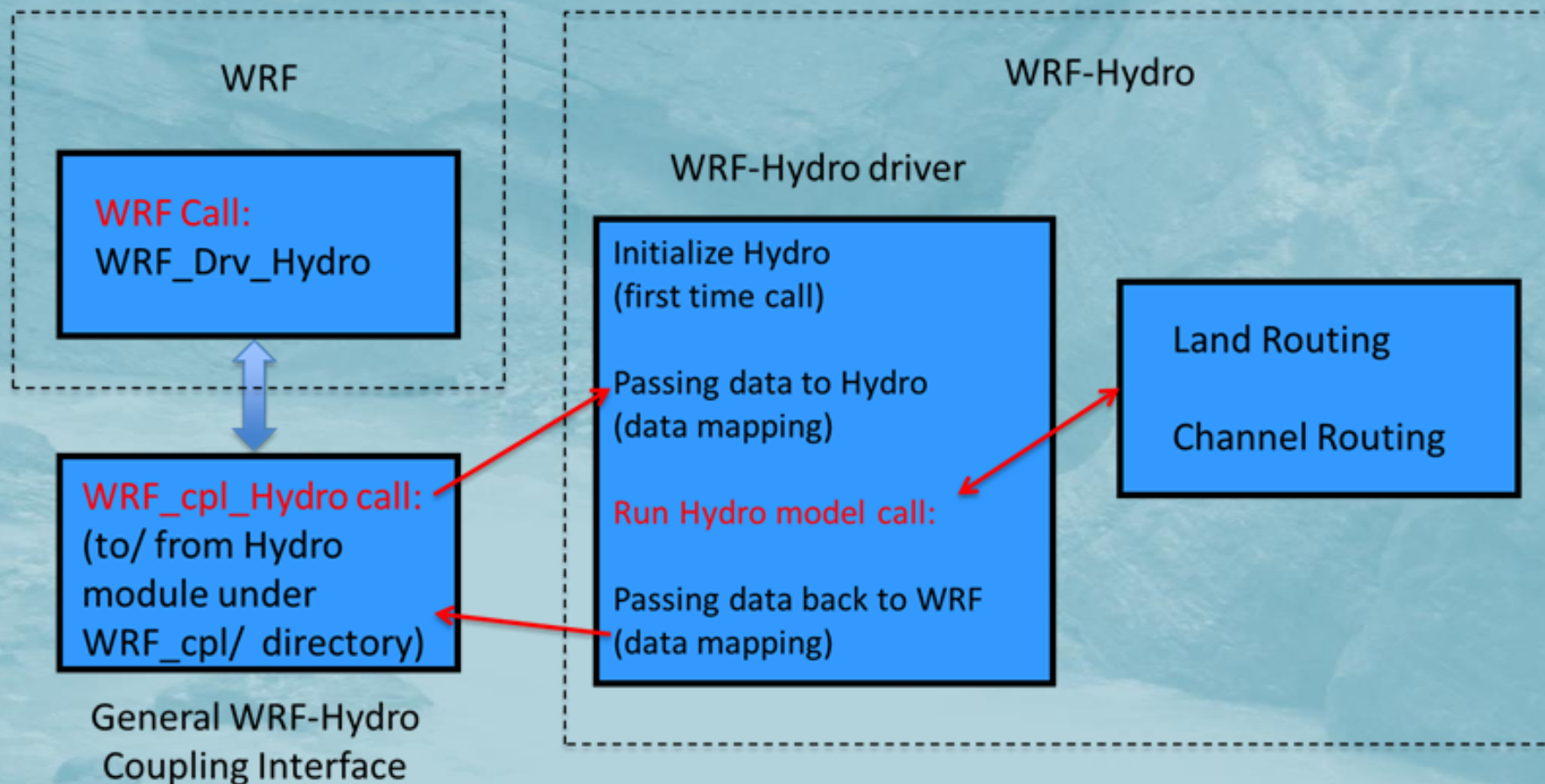
Compiling and Running

- Compiling

Compiling and Running

- Compiling:
  - Uncoupled to WRF:
  - Issue proper compile script:
    - compile_Noah.csh OR compile_NoahMP.csh
    - This will produce the 'uncoupled' executable in the 'Run/' directory, called wrf_hydro.exe

  - Coupled to WRF:
    - First verify that uncoupled model compiles
    - Then issue 'make clean'
    - Compile wrf as normal, setting of 'WRF_HYDRO 1' environment variable will 'instruct' wrf to compile wrf-hydro…successful compile will produce 1 'wrf.exe' file

Compiling and Running

- Coupling structure:

WRF

WRF Call:
WRF_Drv_Hydro

WRF_cpl_Hydro call:
(to/ from Hydro
module under
WRF_cpl/ directory)

General WRF-Hydro
Coupling Interface

WRF-Hydro

WRF-Hydro driver

Initialize Hydro
(first time call)

Passing data to Hydro
(data mapping)

Run Hydro model call:

Passing data back to WRF
(data mapping)

Land Routing

Channel Routing

Compiling and Running

- Running:
  - Fill out namelists:
    - Uncoupled: namelist.hrldas – for Noah   and the hydro.namelist for hydrological model options

    - Coupled to LIS: LIS.config - for LIS and the hydro.namelist for hydrological model options

    - Coupled to WRF: namelist.input – for WRF and the hydro.namelist for hydrological model options