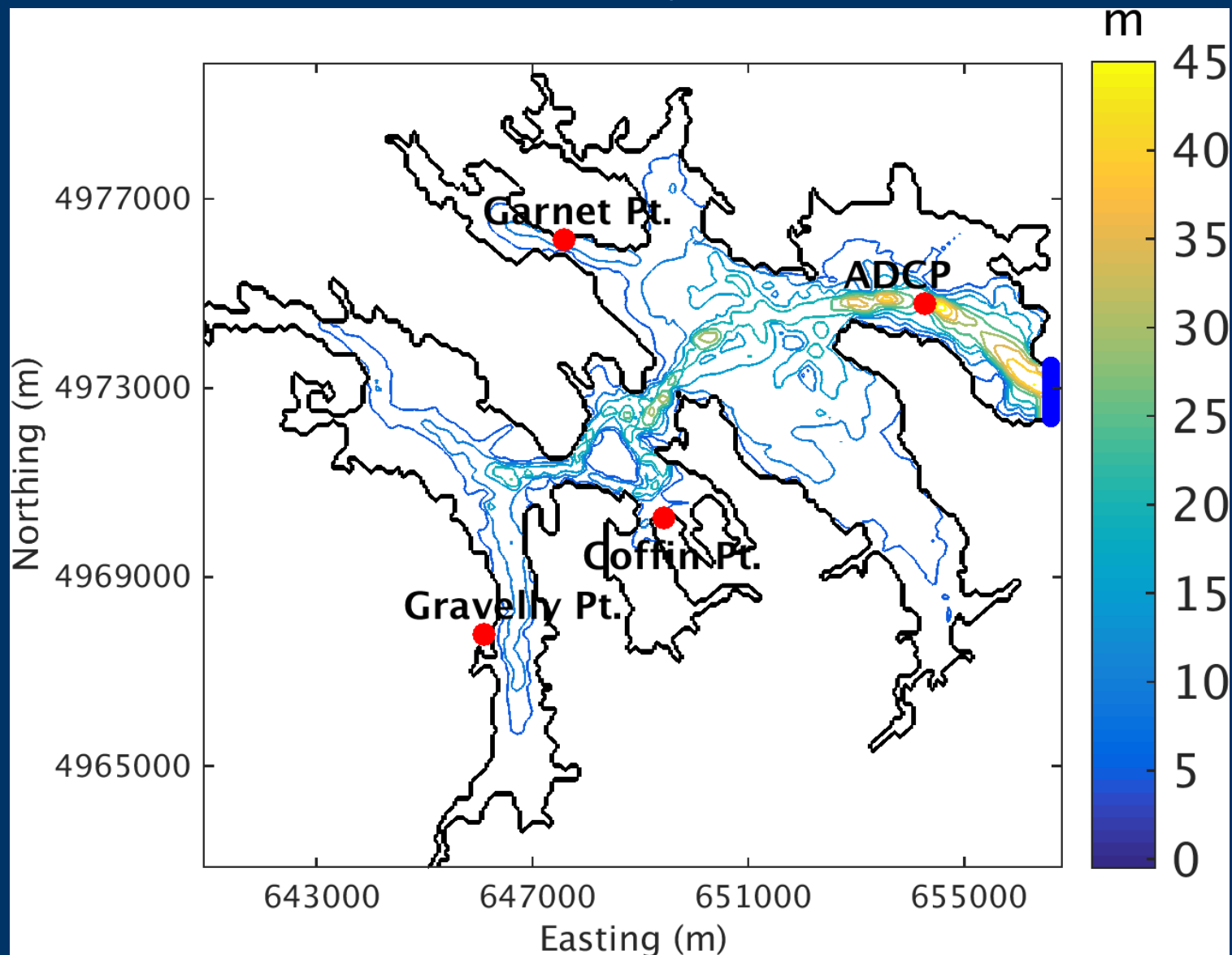
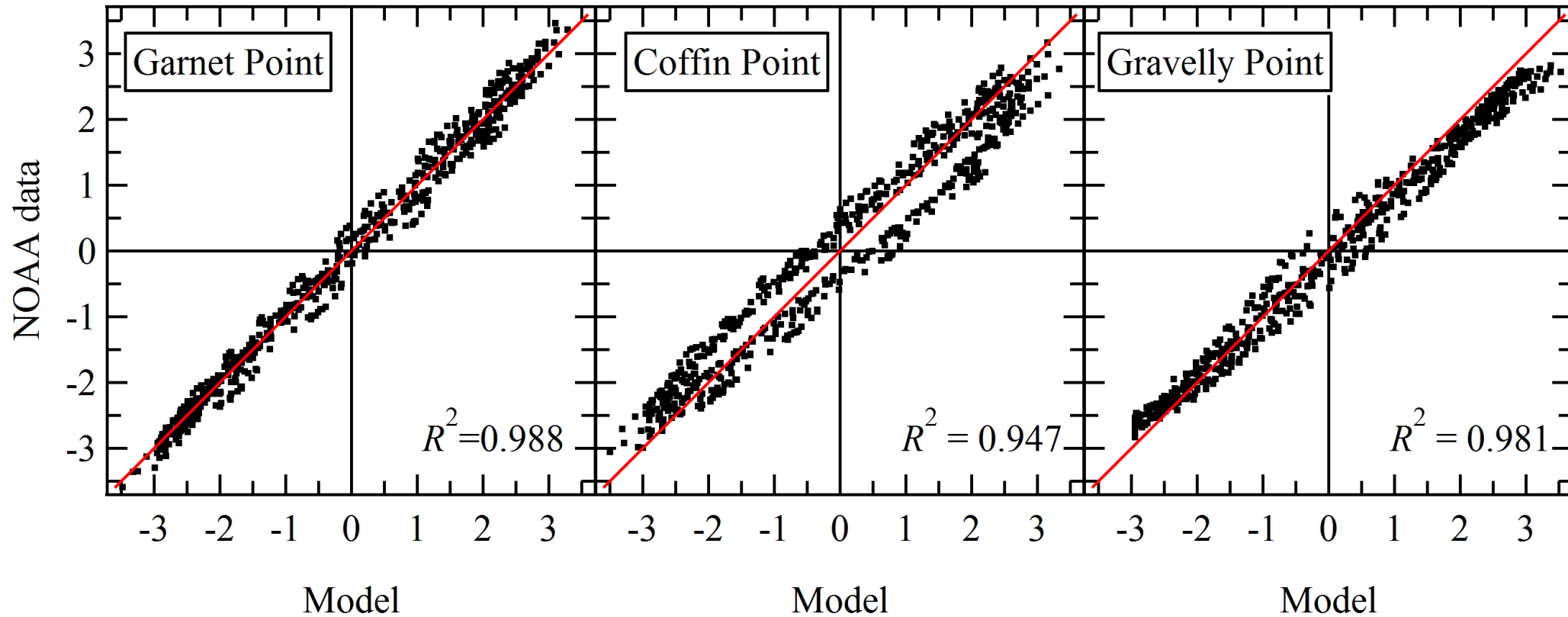


Setting up EFDC and running real-world example

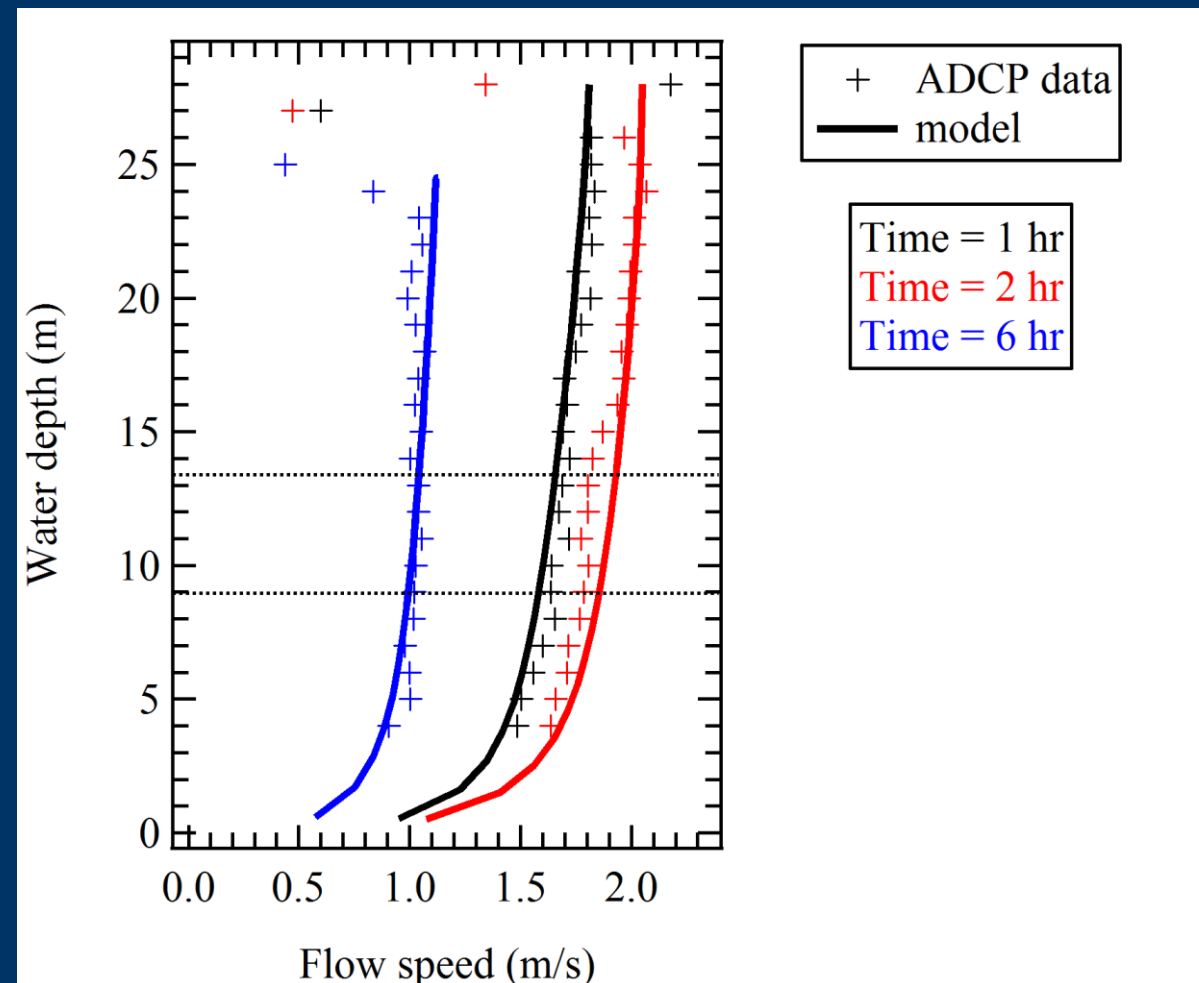
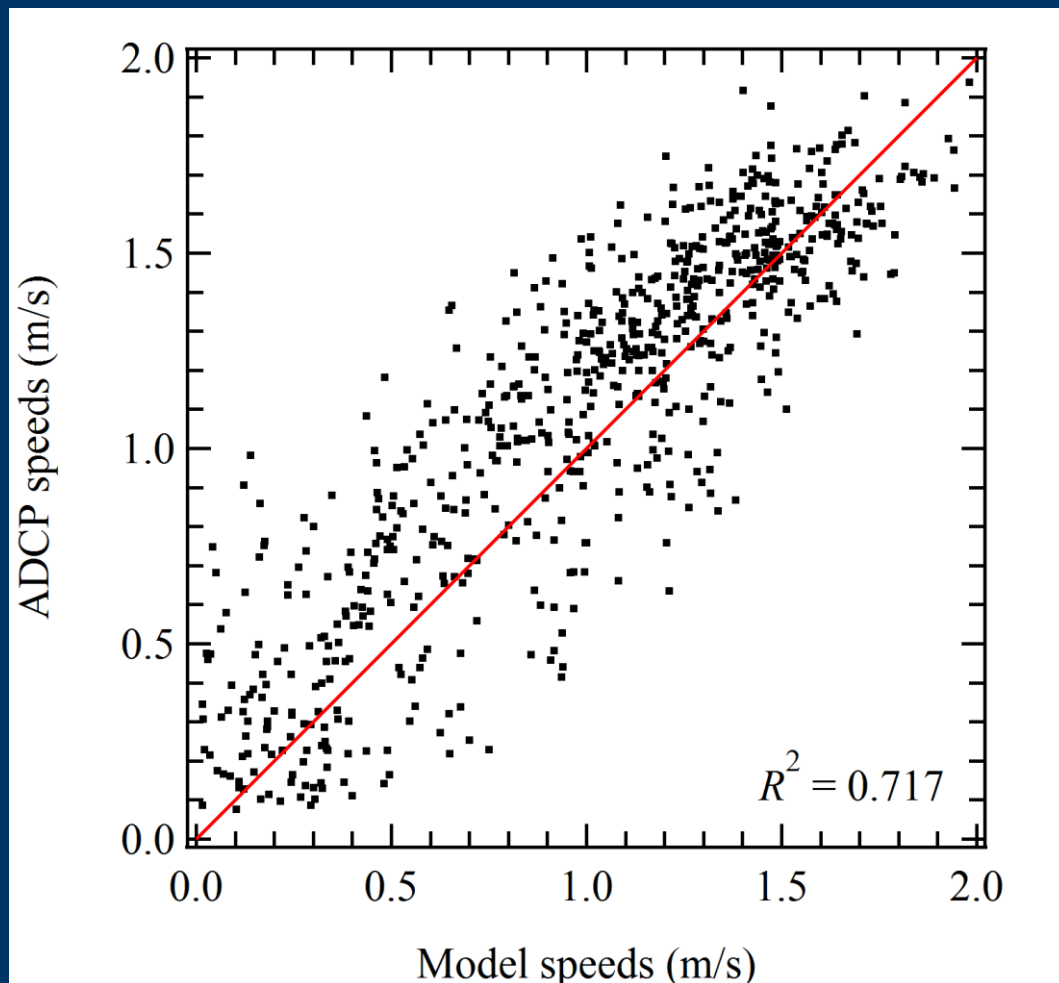
Run real-world example – Cobscook Bay



Computed and measured water elevations



Computed and measured velocities

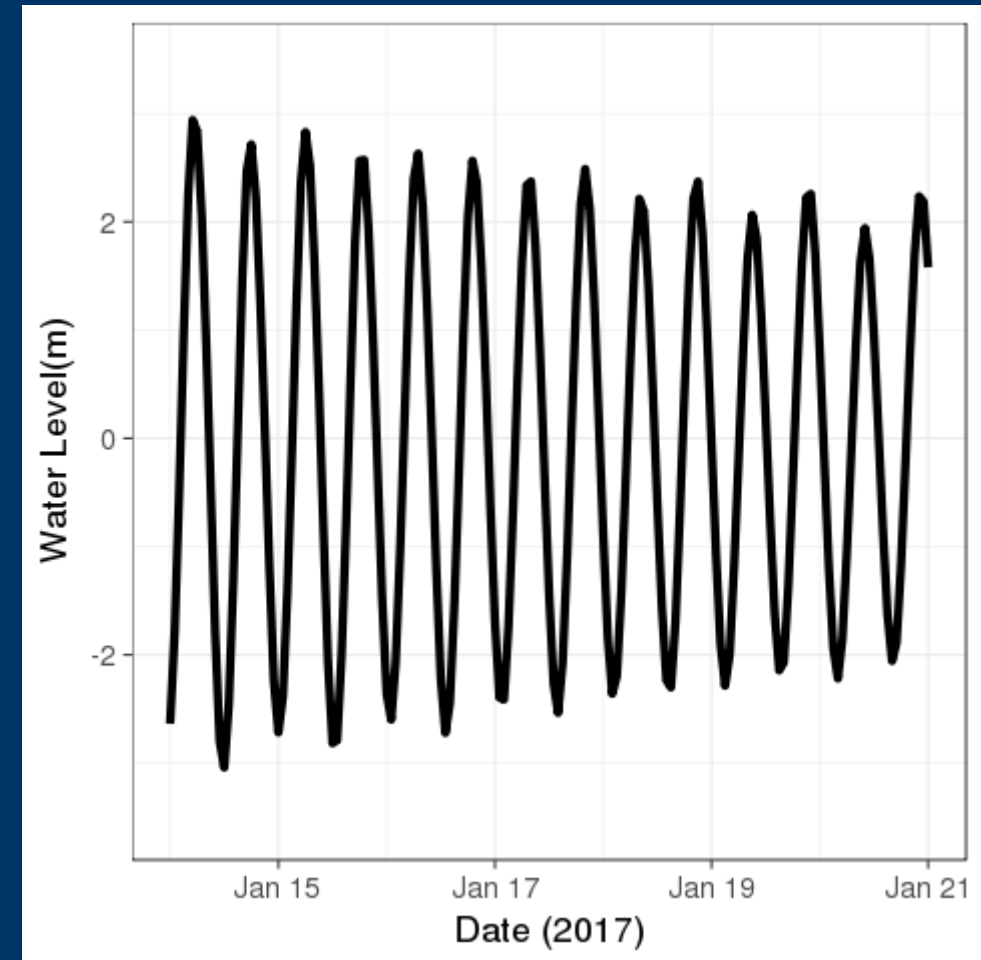
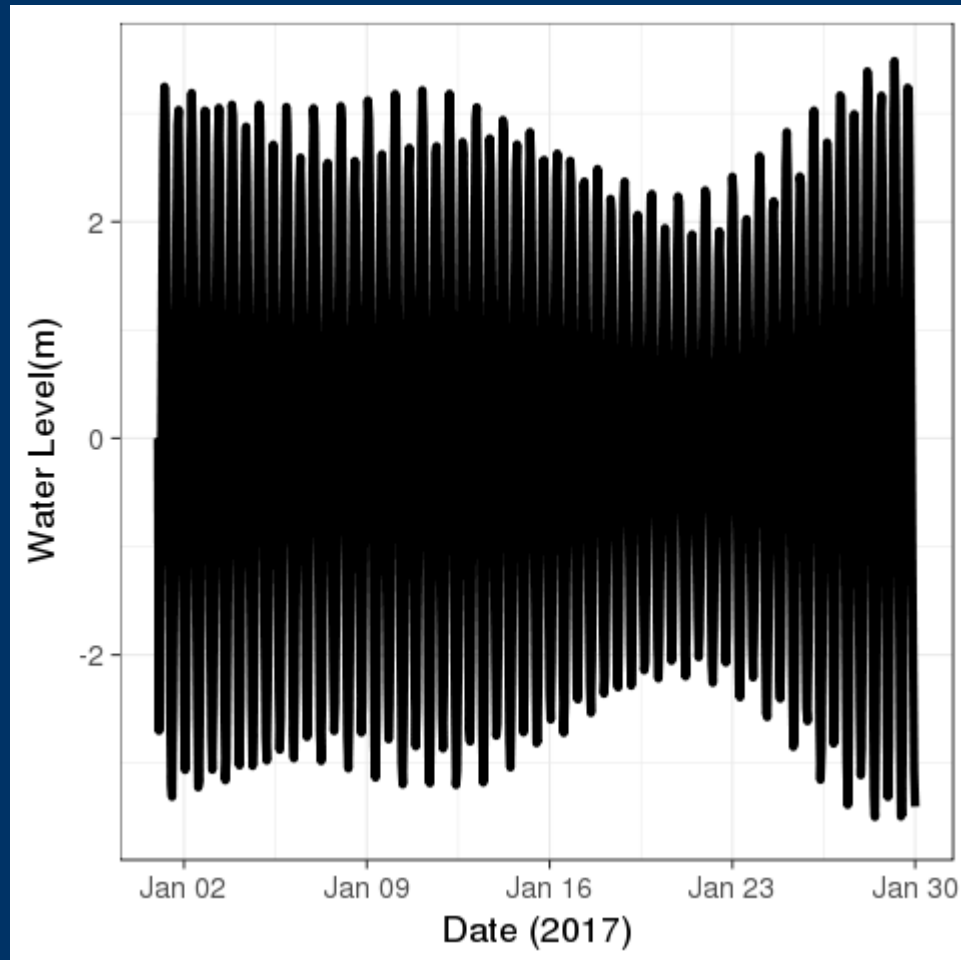


Running our own example

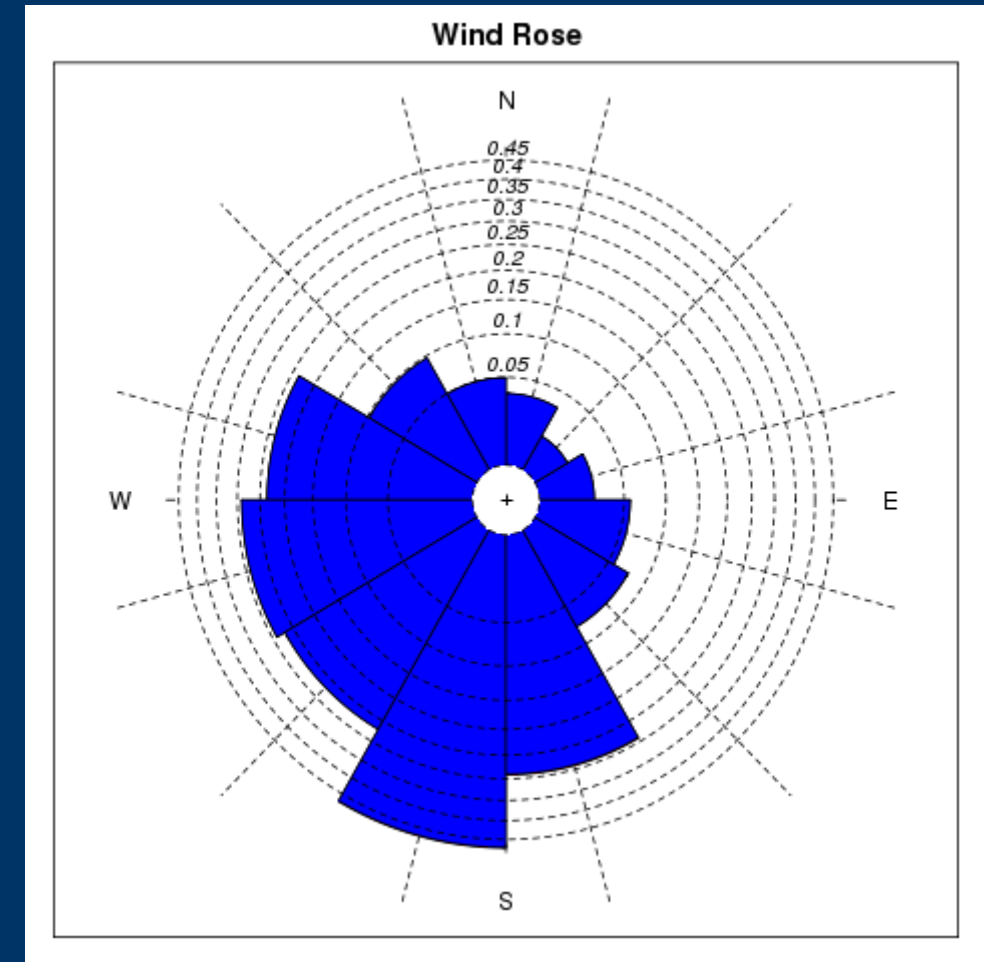
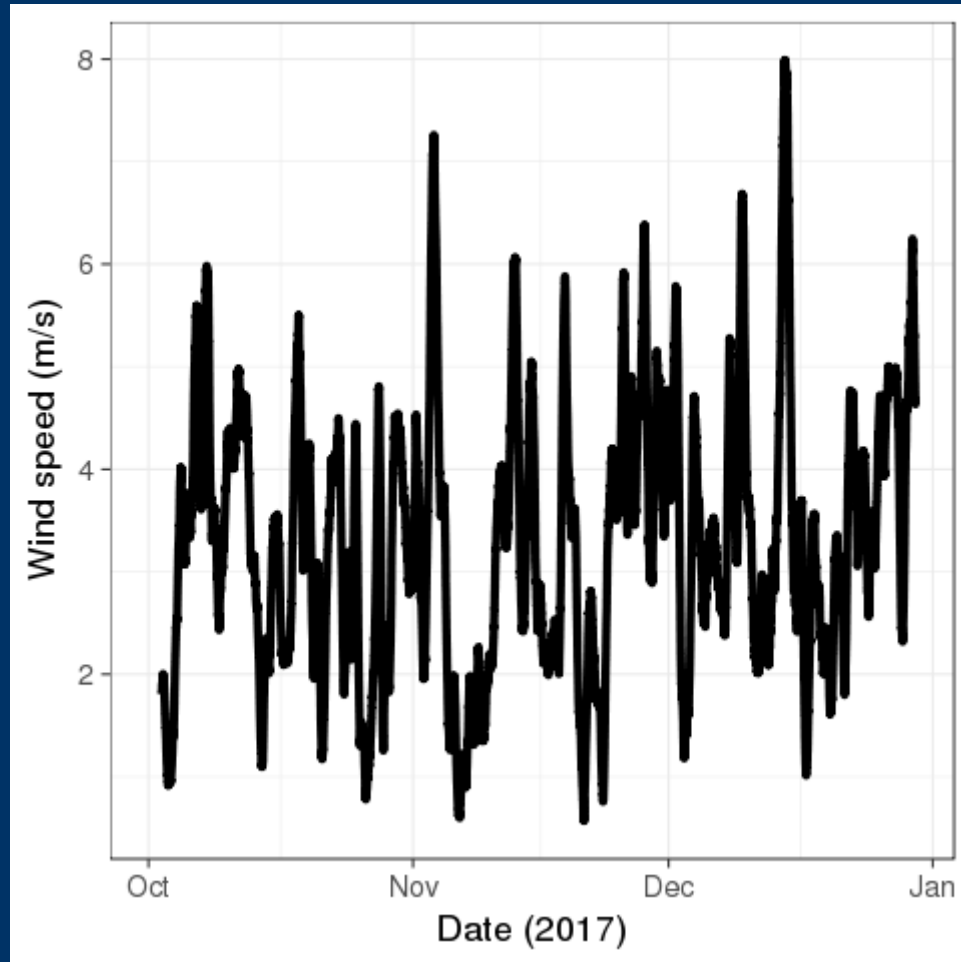
Run real-world example

- `cd /home/efdc/Tutorial/`
- Copy the EFDC executable to the directory containing model configuration files
- `cp Src/EFDC SampleModels/BasicModel`
- `cd SampleModels/CobscookBayModel/`
- `mpirun -np 2 ./EFDC`
 - Run with mpi across 2 compute cores or MPI processes
 - Decomposes global compute domain into 2 sub-domain with MPI synchronization at end of each timestep

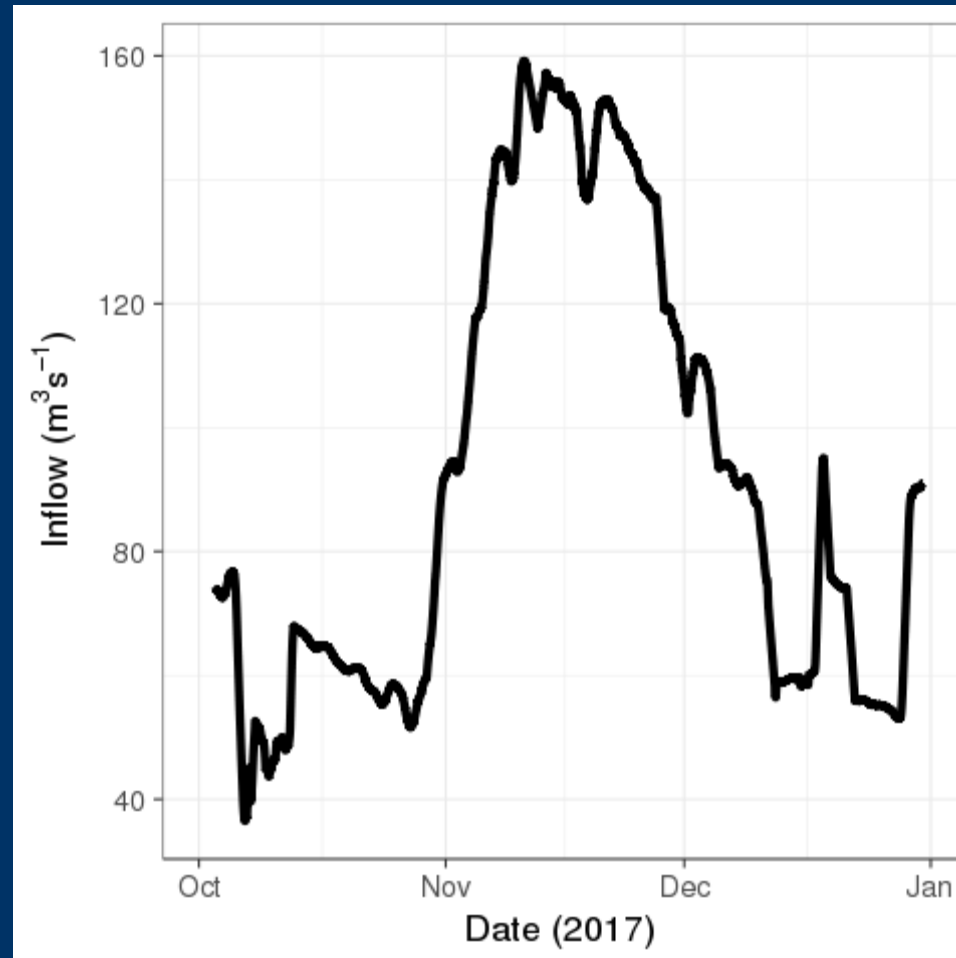
Boundary conditions – Tidal boundary data from harmonic forcing



Boundary conditions – Wind data

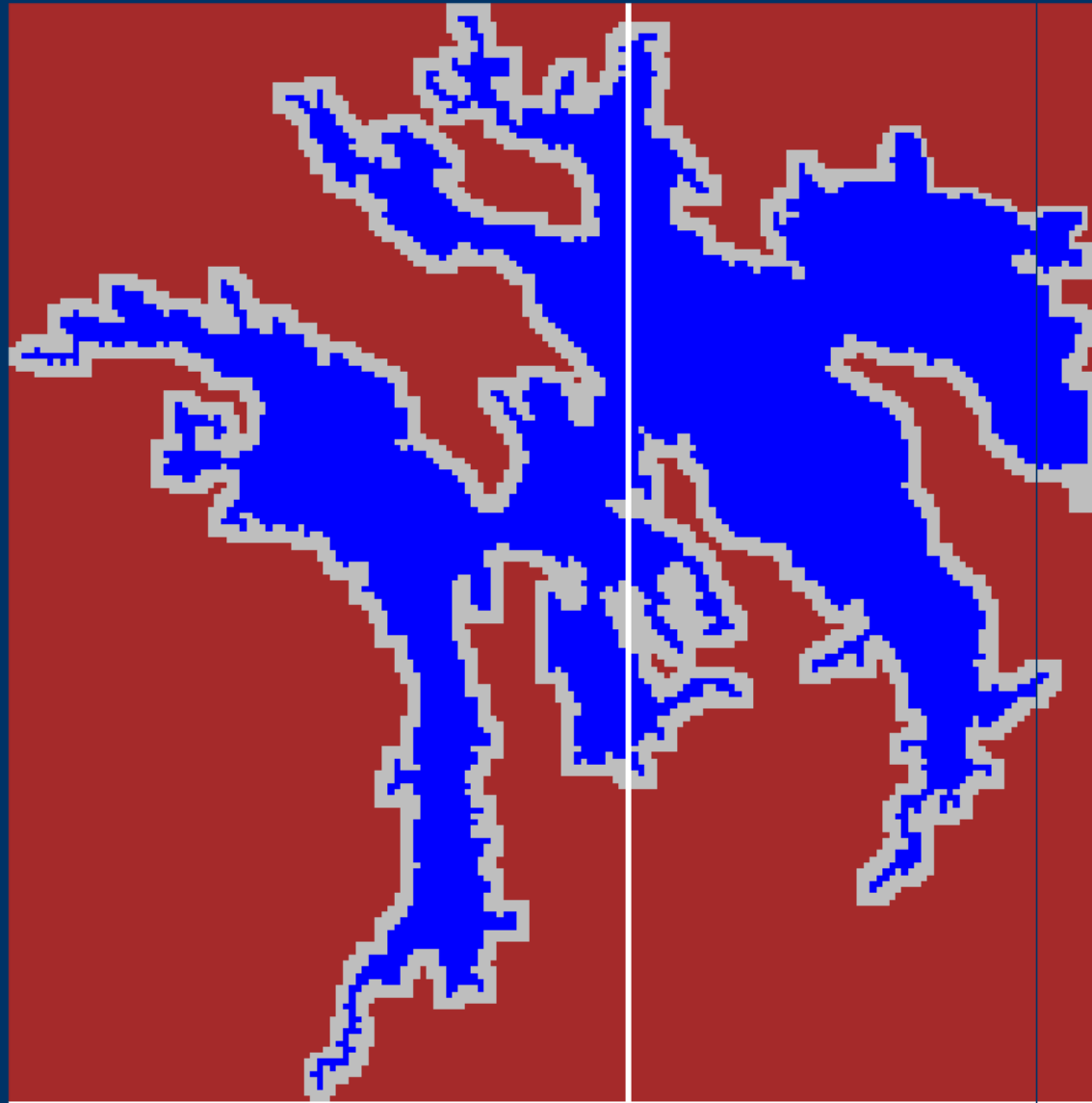


Boundary conditions – River boundary data

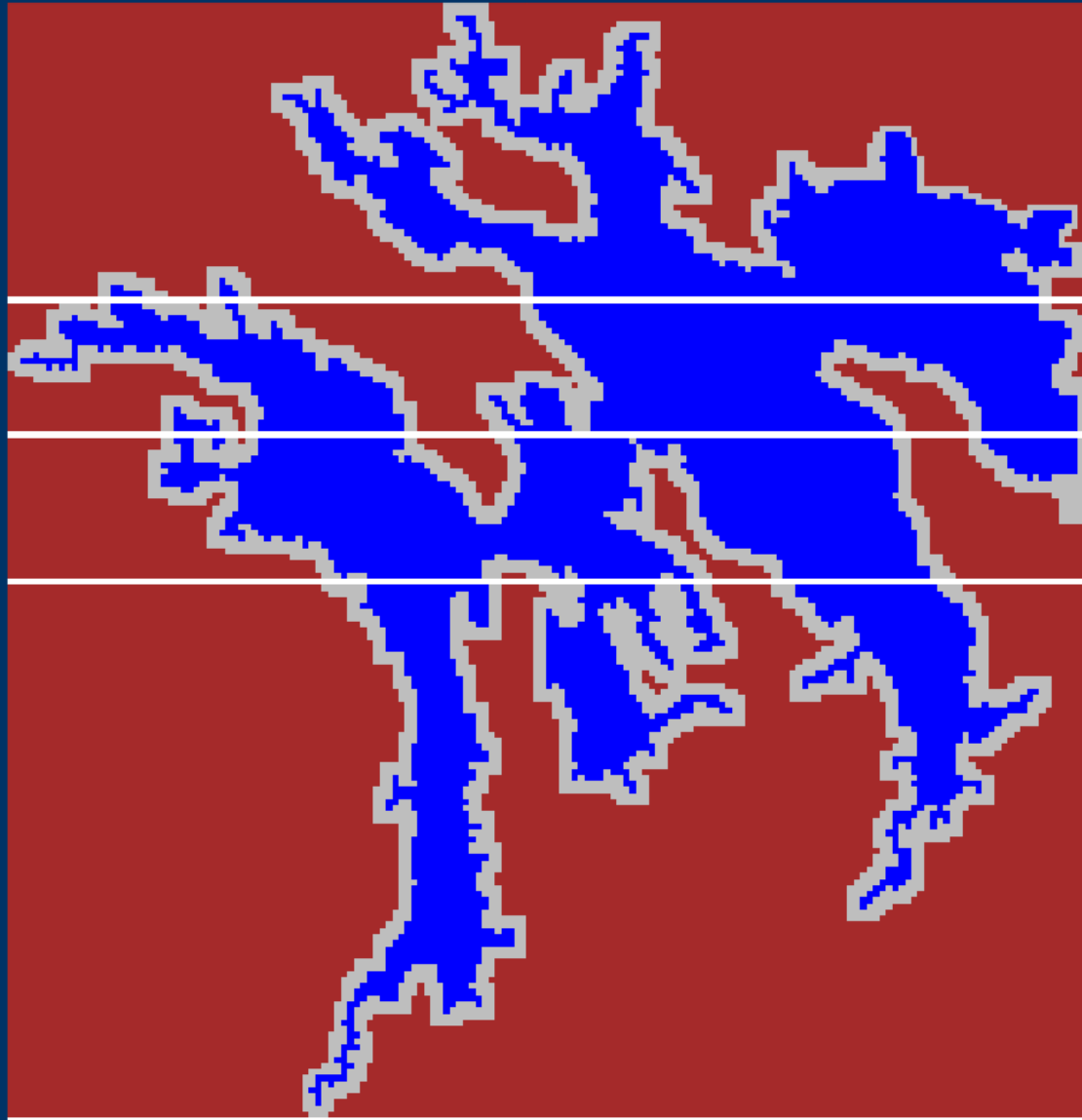


Different MPI configurations

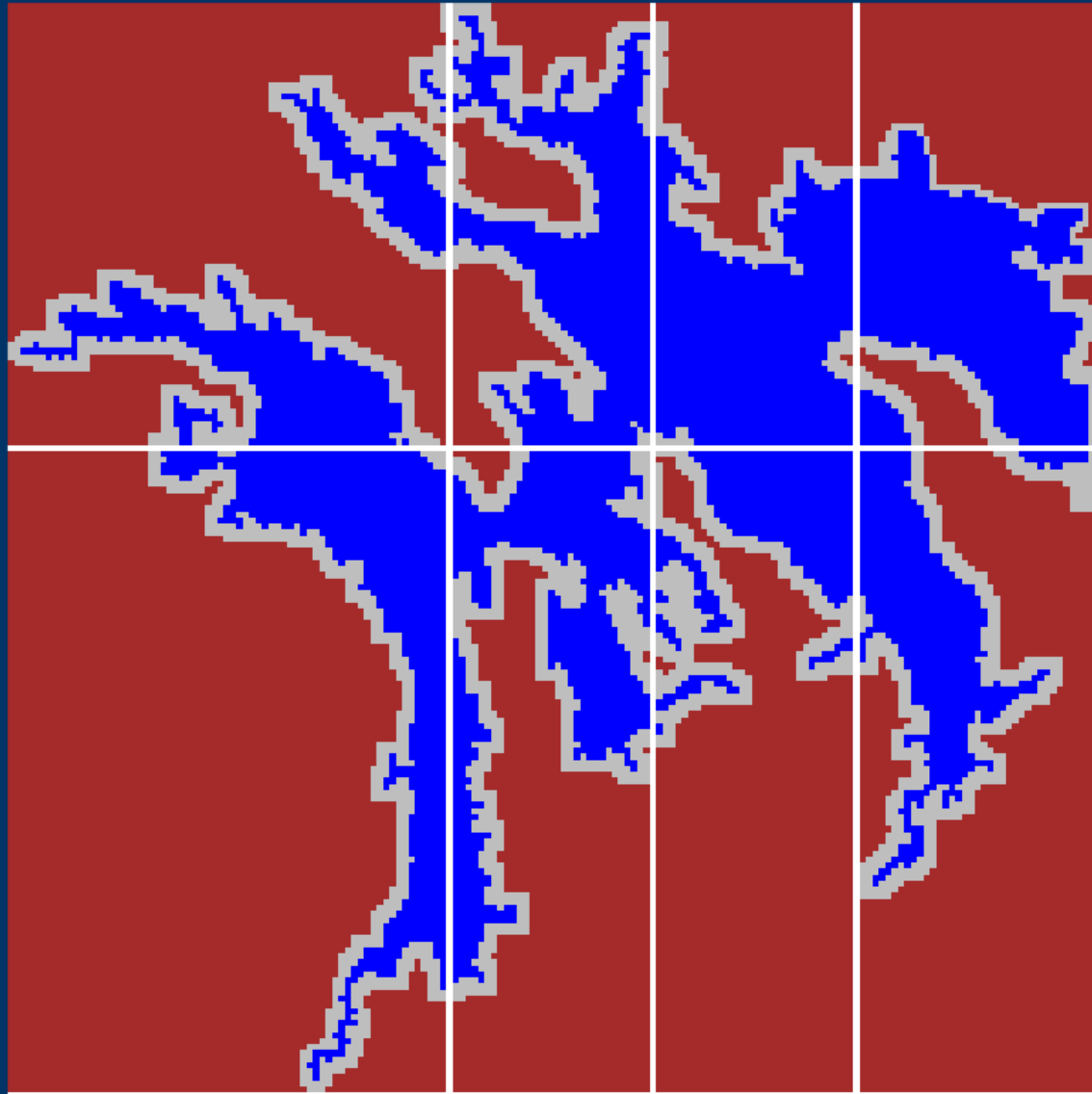
Domain Decomposition - 2



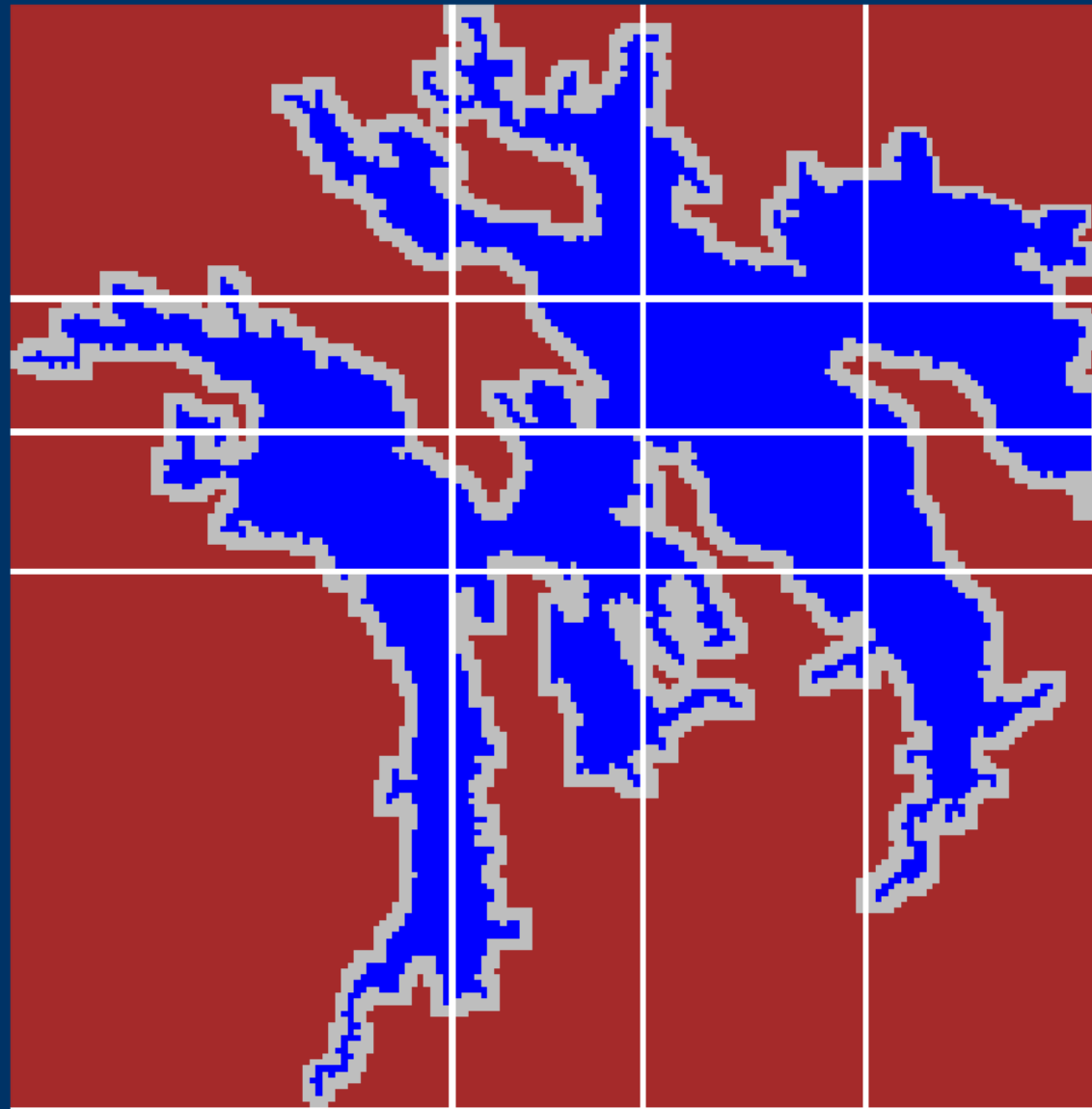
Domain Decomposition - 4



Domain Decomposition - 8

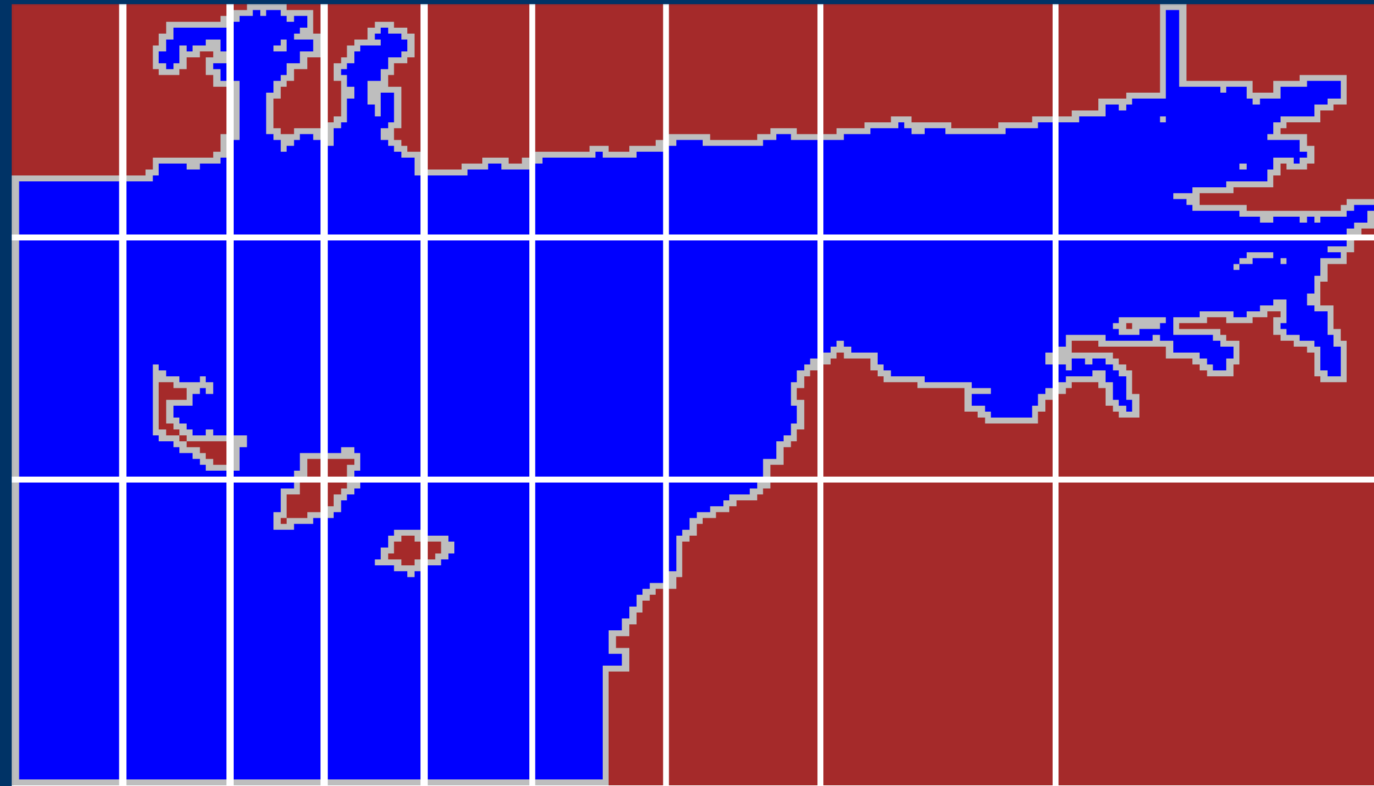


Domain Decomposition - 16



Configuring domain decomposition

- Details on domain decomposition configured in LORP.INP file
 - Number of subdomains must agree with number of MPI processes (i.e. `mpirun -np #`)



Configuring domain decomposition

- Details on domain decomposition configured in LORP.INP file
 - Defines number of partitions and partitioning into rectilinear sub-domains

```
LORP_sc_4_r.INP
LORP input data used for decomposing domain into optimal configuration with 4 processors
NH NV NActive Cost TotalAreaWeight TileAreaWeight TileGhostWeight TileWaterWeight TileNearLandWeight
1 4 4 0.018176 0 0 3.62319e-06 6.36364e-06 2.72727e-06
* IC:    an array of NPARTX size setting x-width for each partition
173
* JC:    an array of NPARTY size setting y-height for each partition
91
27
25
52
* List of active partition IDs, 0-based
0
1
2
3
* Lookup table to go from your partition id to node id (so has full N entries and some are -1, 0-based)
0
1
2
3
□
```


Configuring domain decomposition

- LORP.INP file generated by load balancing module
 - `$ cd /vagrant/Src/Gorp_files/`
 - `$ g++ Gorp.cpp GorpMain.cpp -o Gorp`
 - `$ cp Gorp /vagrant/SampleModels/CobscookBayModel/`
 - `$ cd /vagrant/SampleModels/CobscookBayModel/`
 - `$./Gorp CELL.INP sc 4`
- Replace LORP.INP file that is read with EFDC with that computed above
 - `$ cp LORP_sc_4_r.INP LORP.INP`
 - `$ mpirun -np 4 ./EFDC`

Visualising Results

```
python contour.py SampleModels/CobscookBayModel 2017-01-01-230000 20 u ./
```