Earth System Surface Fluxes SWG breakout group (BOG) synopsis

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The BOG addressed the suggested bulleted discussion topics as follows:

Selection criteria/priorities

Our SWG discussed the strategy how to pick up the promising parameterization schemes that can be included in the next NGGPS implementation. We agreed the criteria should be based on the top earth surface-related problems in the current operational GFS. We identified some priorities:

- Land data assimilation
- Updating some land surface characteristic (LSC) datasets
- Upgrading land surface model to Noah MP
- Incorporation of Fresh lake model and WAVE model
- More advanced sea ice model
- Latest MOM

Unified physics

We discussed and agreed that the unified physics should be scale-aware to account for different spatial and time scales.

- Spatial scale: global, regional---tiling, as long as we have high resolution land data.
- Time scale: seasonal dependent, forecast length dependent (weather, climate)

Noah MP has many physics options. We have to carry out extensive tests to come out the optimal combination for different time scales.

Metrics

In addition to the current set of primary EMC surface metrics (T2m, Td2m, Wind10m), we should also focus on some other land states and surface fluxes to ensure that we get the right answer with the right reason.

- Soil moisture
- Sensible and latent heat fluxes
- SST

- Edge wave
- Ocean profile

Diagnostics

- Like the procedure how we chose FV3 as a dynamic core
- Hierarchy testing: from individual component “simulators” to fully coupled global model
- Evaluation based on metrics