

# Porting NH dycore to C++/Kokkos

The preqx target already ported and performant (GMD paper just accepted). The theta-l target porting has started.

Picture:

- ▶ several structures/routines can be recycled from the preqx effort (tracers, utilities)
- ▶ some structures need minor adjustments (MPI halo exchange, sphere operators)
- ▶ some structures need to be fully rewritten (RK stages for dynamics)

Expectations:

- ▶ have a working dycore in the next few months (3-6)
- ▶ optimize performance in the next 3 months
- ▶ hook up to e3sm and be ready for GB submission in early 2020.

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## Status:

- ▶ identified (and separated) code that is preqx-specific from code that can be recycled
- ▶ implemented “utility” ops (e.g., compute level quantities from interface quantities, or vertical derivatives)
- ▶ first draft of `compute_andor_apply_rhs` (caar) implemented

## Next:

- ▶ test caar kernels
- ▶ implement HV functor (fairly similar to preqx impl)
- ▶ tridiag solver (check with kokkos-kernels if there's room for recycling their work)
- ▶ performance optimizations