DSM2 Modernization

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Delta Modeling Section/Modeling Support Office

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Delta Simulation Model 2 (DSM2)

- 1D hydrodynamics, water quality, and particle tracking modeling from 1990
  - Simple and Fast
- Widely used for the Delta
  - Operating rules
- Mainly written in Fortran with C/C++ and Java
- Long history, 'technical debt'

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Changes in Computing

- New computing environment
  - Fast, large, and different
- New computer language standards
- Cloud computing
  - Linux, container (Docker)
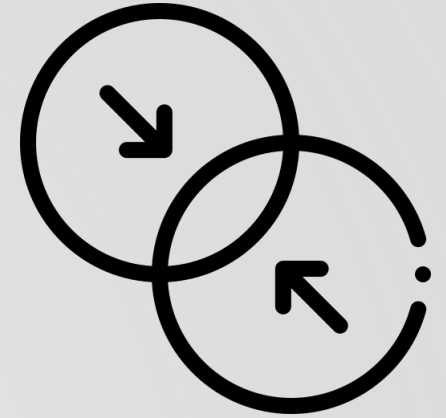- **Can DSM2 utilize all these?**
  - **Need updates**

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Supporting Linux/Cloud

- Linux & new build system, CMake
  - Automatic build (CI/CD/CR), support Windows/Linux
- 64-bit and new compilers
- Massive parallelization on Cloud
- Containerization support
  - Support legacy versions

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Combining Hydro/GTM

- New water quality model, GTM
- GTM/QUAL are not coupled with Hydro
  - No operating rules available for GTM/QUAL
- Coupling Hydro/GTM for operation rules
  - Code clean-up and updates
- Driving DSM2 with Python

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DSM2 modernization

- Open-sourced, continuous release
- New build system and DSM2 Linux version
- New compilers and 64-bit mode
- Cloud/container support
- **Adopt and implement new ideas**, e.g. coupling Hydro/GTM

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