Water temperature, mixed layer depth, turbulence, height of ice cover
Fetch
Vertical heat flux

OUTPUT: Methane Production, Transportation and Release to the Atmosphere

OUTPUT: Water table dynamics and changes in overgrown fraction

Methane Cycle Module

Hydrology Module

Bare and overgrown areas and water depths

Evaporation

Soil-Heat Module

Methane Cycle Module

Hydrology Module

Pond Physics Module

Soil-Heat Module

Water temperatures, mixed layer depth, turbulence, height of ice cover

Thaw depth

Thaw depth, soil temperatures

Fetch

Vertical heat flux

Water temperatures

Evaporation

NO

PC

H

mol m-2 s-1

PCH4

mol m-3

C

H

4

sat

mol m-2 s-1

Fplant

mol m-2 s-1

Fdiff

mol m-2 s-1

Febul

mol m-3

C

H

4

aq

mol m-3

O2

aq

mol m-3

3

2

1

(b)