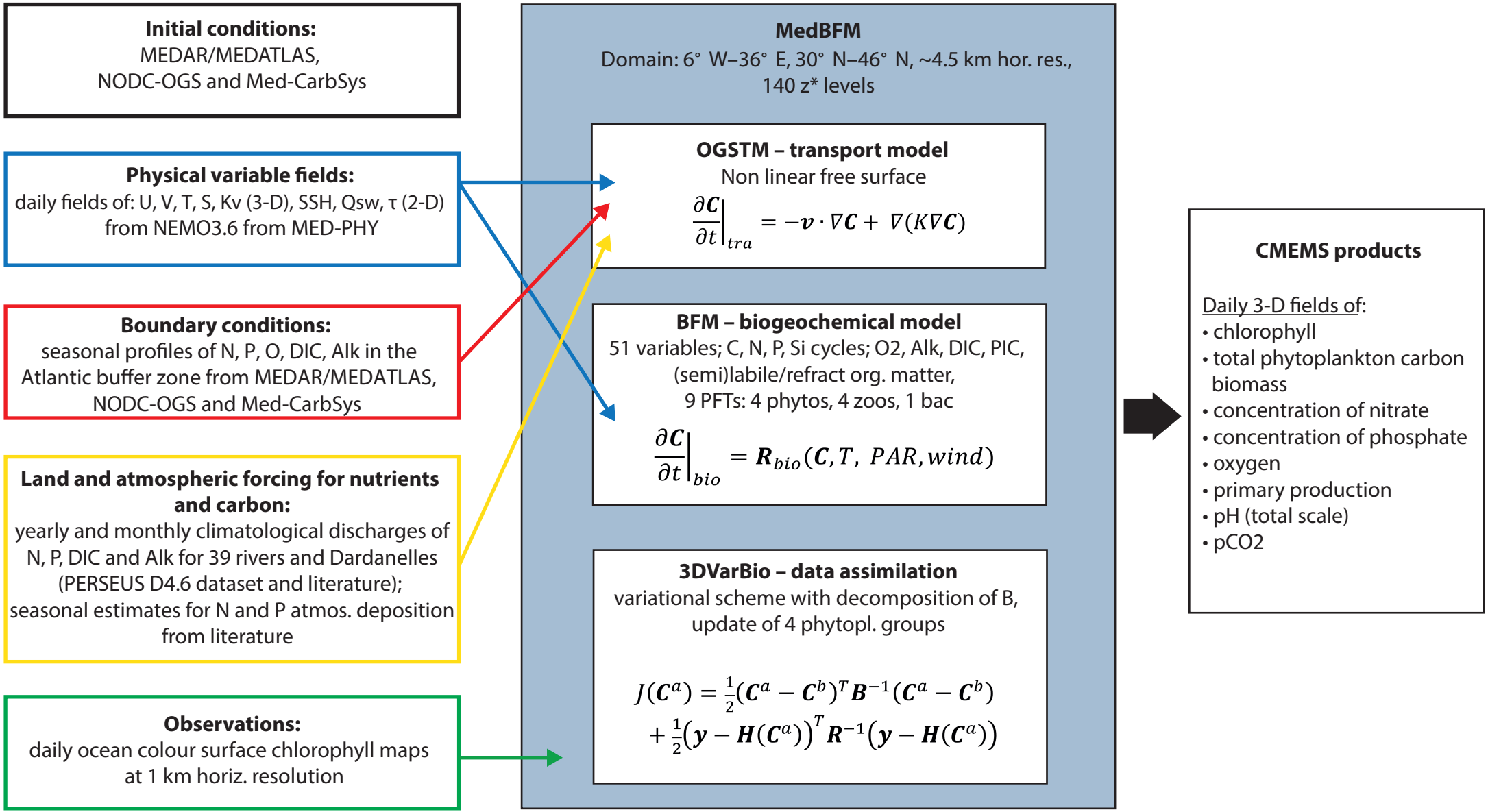
Initial conditions:
MEDAR/MEDATLAS,
NODC-OGS and Med-CarbSys
Physical variable fields:
daily fields of: U, V, T, S, Kv (3-D), SSH, Qsw, τ (2-D)
from NEMO3.6 from MED-PHY
Boundary conditions:
seasonal profiles of N, P, O, DIC, Alk in the
Atlantic buffer zone from MEDAR/MEDATLAS,
NODC-OGS and Med-CarbSys
Land and atmospheric forcing for nutrients and carbon:
yearly and monthly climatological discharges of
N, P, DIC and Alk for 39 rivers and Dardanelles
(PERSEUS D4.6 dataset and literature);
seasonal estimates for N and P atmos. deposition
from literature
Observations:
daily ocean colour surface chlorophyll maps
at 1 km horiz. resolution
MedBFM
Domain: 6° W–36° E, 30° N–46° N, ~4.5 km hor. res.,
140 z* levels
OGSTM – transport model
Non linear free surface
$\frac{\partial \boldsymbol{C}}{\partial t}\Big|_{tra} = -\boldsymbol{v}\cdot\nabla\boldsymbol{C} + \nabla(K\nabla\boldsymbol{C})$
BFM – biogeochemical model
51 variables; C, N, P, Si cycles; O2, Alk, DIC, PIC,
(semi)labile/refract org. matter,
9 PFTs: 4 phytos, 4 zoos, 1 bac
$\frac{\partial \boldsymbol{C}}{\partial t}\Big|_{bio} = \boldsymbol{R}_{bio}(\boldsymbol{C}, T, PAR, wind)$
3DVarBio – data assimilation
variational scheme with decomposition of B,
update of 4 phytopl. groups
$J(\boldsymbol{C}^a) = \frac{1}{2}(\boldsymbol{C}^a - \boldsymbol{C}^b)^T\boldsymbol{B}^{-1}(\boldsymbol{C}^a - \boldsymbol{C}^b)$
$+ \frac{1}{2}\left(\boldsymbol{y} - \boldsymbol{H}(\boldsymbol{C}^a)\right)^T\boldsymbol{R}^{-1}\left(\boldsymbol{y} - \boldsymbol{H}(\boldsymbol{C}^a)\right)$
CMEMS products
Daily 3-D fields of:
• chlorophyll
• total phytoplankton carbon biomass
• concentration of nitrate
• concentration of phosphate
• oxygen
• primary production
• pH (total scale)
• pCO2