Effects of incl. all forms of water in CAM's total energy equation

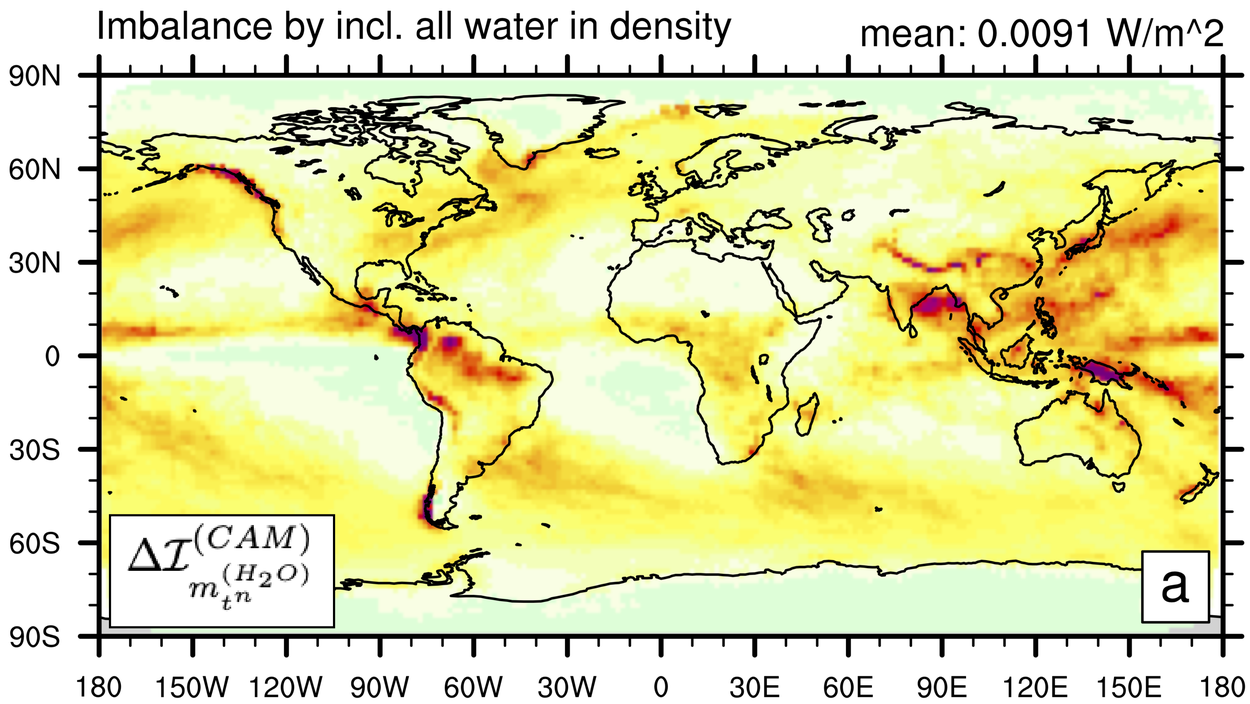
Imbalance of incl. all forms of water in CAM's parameterization total energy equation:

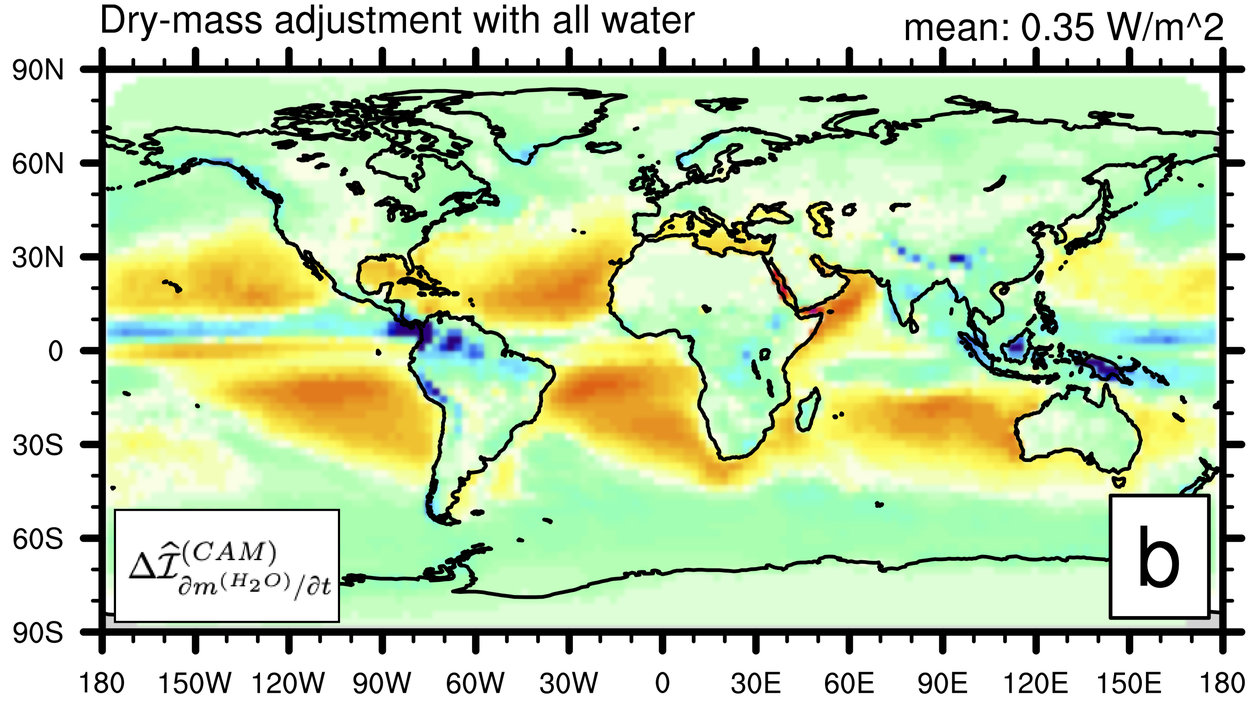
$$\Delta\mathcal{I}^{(CAM)}_{m^{(H_2O)}_{t^n}} = \int \left[\rho^{(d)} \left(\sum_{\ell\in\mathcal{L}_{cond}} \overline{m}^{(\ell)}_{t^n}\right)\right] \frac{\partial}{\partial t}\left(\overline{K} + \overline{\Phi}_s + c_p^{(d)}\overline{T}\right) dz$$

"Dry−mass adjustment" incl. all water (energy tendency associated /w falling precip/evap)

$$\Delta\widehat{\mathcal{I}}^{(CAM)}_{\partial m^{(H_2O)}/\partial t} = \int \frac{\partial}{\partial t}\left[\rho^{(d)}\overline{\widehat{m}}^{(H_2O)}\right]\left(\overline{K} + \overline{\Phi}_s + c_p^{(d)}\overline{T}\right) dz$$

$$\Delta\check{\mathcal{I}}^{(CAM)}_{\partial m^{(H_2O)}/\partial t} = 0 \quad \text{(no "spurious phase change" term)}$$





global min = -0.002551 global max=0.1103

-0.048 -0.032 -0.016 0 0.016 0.032 0.048

global min = -80.39 global max= 34.95

-30 -24 -18 -12 -6 0 6 12 18 24 30

*Note: imbalance terms depend on the specific reference state used in CAM $h^{(ice)}_{00} \equiv 0J/kg^2, T_{00} = 0K$