

ESMF conservative regridding

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Ocean models

- ESMP does not allow masking at the moment
- ESMF people state that it should be available soon
- Mean that conservative regridding, while it works, is not correct

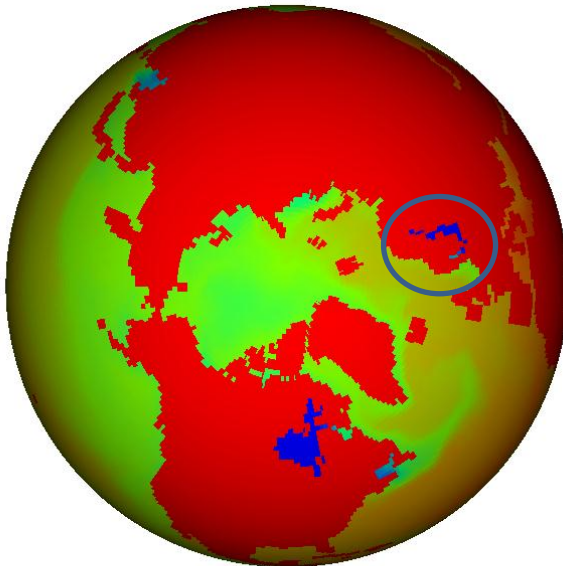
Ocean models

Destination 180-360

Source

DB: ACCESS1-0_historical_0180-0360_ESMF.vsh5

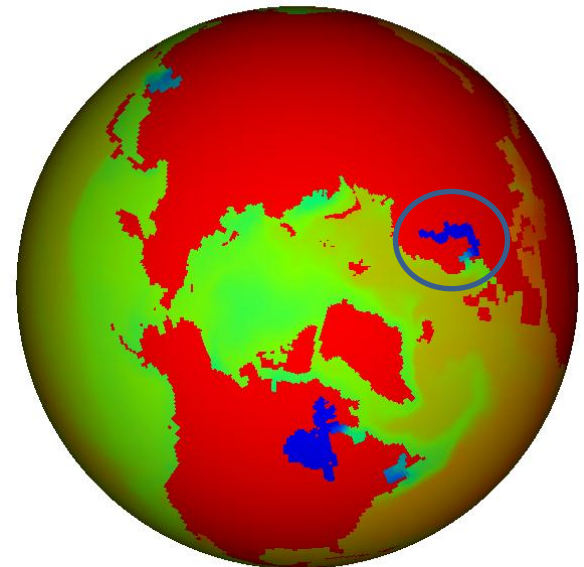
Pseudocolor
Var: salinity
42.00
36.50
31.00
25.50
20.00
Max: 1.000e+20
Min: 9.697



Y
Z X

DB: ACCESS1-0_historical_src.vsh5

Pseudocolor
Var: salinity
42.00
36.50
31.00
25.50
20.00
Max: 1.000e+20
Min: 9.683



Y
Z X

Atmospheric models

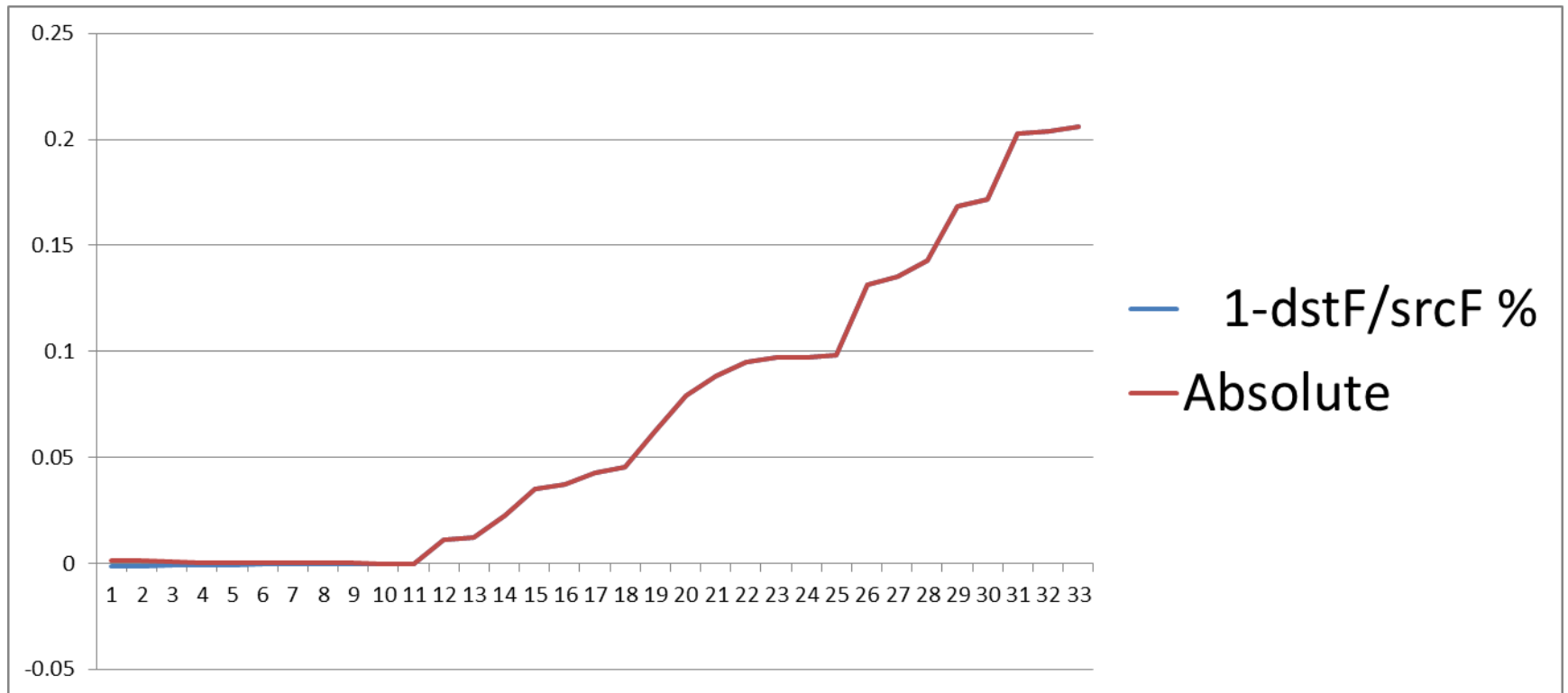
- Regrids just fine
- Models are all cross products of axes
- ACCESS model bounds exceed 90
 - +/- 90.625
- All other bounds are +/- 90.000
- Conservation tests
 - Area calculation $R^2 \theta \cos(\phi) d\theta d\phi$
 - Difference on order of 0.1 %

Conservative Results

	(1-(dst/src))%	Absolute
Mean	0.066061758	0.06643
St Dev	0.070190889	0.069831
Min	-0.001535	0.000013
Max	0.206141	0.206141

Model	Conservation
HadCM3_decadal1960	-0.001535
CFSv2-2011_decadal2006	0.000013
CanAM4_amip	0.206141

Conservation Test for different atm models

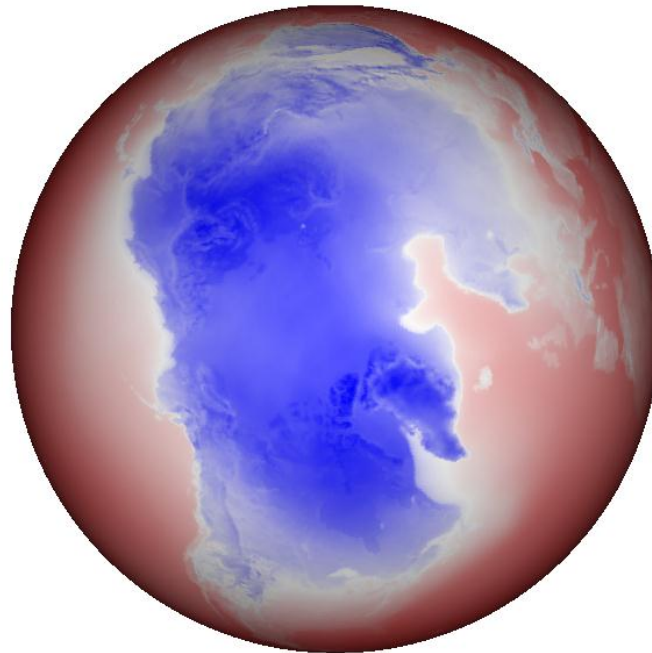


GFDL HIRAM 360 TAS

DB: GFDL-HIRAM-C360_amip_src.vsh5

Source

Pseudocolor
Var: tas
309.7
289.2
268.7
248.2
227.6
Max: 309.7
Min: 227.6



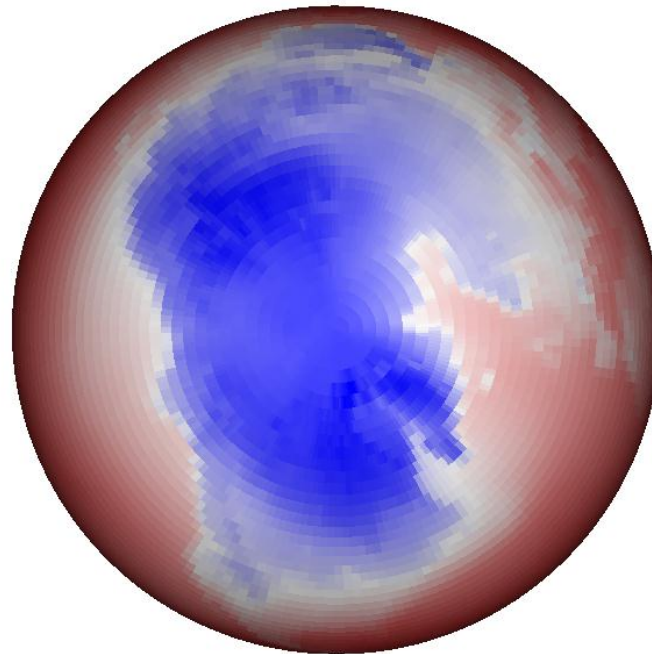
Y
Z X

GFDL HIRAM 360 TAS

Destination 90 x 180

DB: GFDL-HIRAM-C360_armp_0090-01&0_ESMF.vsh5

Pseudocolor
Var: tas
308.4
288.9
269.5
250.1
230.6
Max: 308.4
Min: 230.6



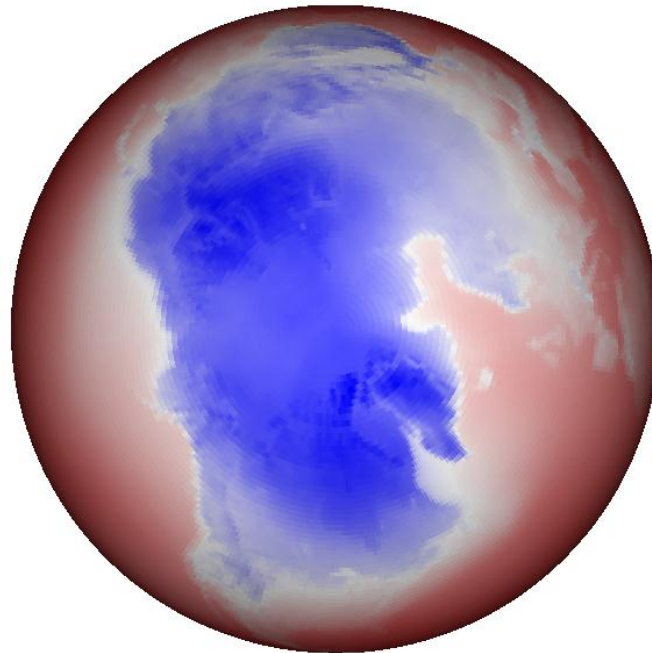
Y
Z X

GFDL HIRAM 360 TAS

Destination 180 x 360

DB: GFDL-HIRAM-C360_amip_0180-0360_ESMF.vsh5

Pseudocolor
Var: tas
308.8
288.9
269.0
249.0
229.1
Max: 308.8
Min: 229.1



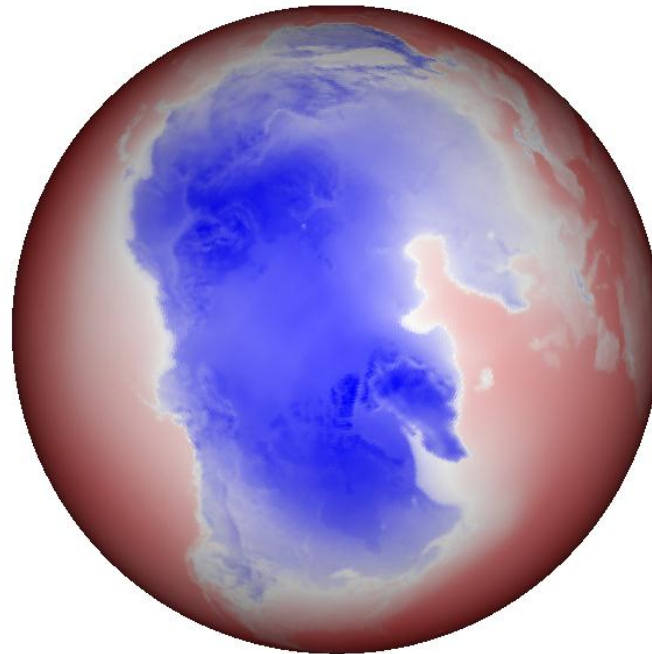
Y
Z X

GFDL HIRAM 360 TAS

Destination 360 x 720

DB: GFDL-HIRAM-C360_armp_0360-0720_ESMF.vsh5

Pseudocolor
Var: tas
309.3
289.1
268.8
248.5
228.3
Max: 309.3
Min: 228.3



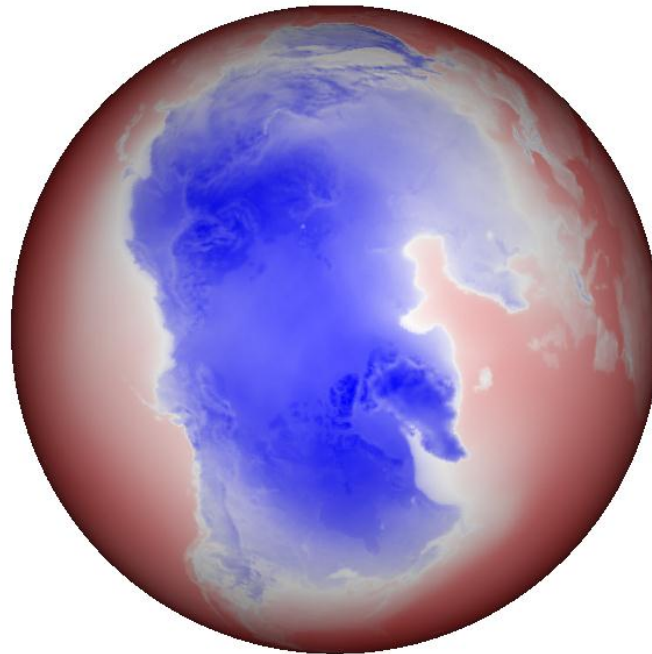
Y
Z X

GFDL HIRAM 360 TAS

Destination 720 x 1440

DB: GFDL-HIRAM-C360_arnip_0720-1440_ESMF.vsh5

Pseudocolor
Var: tas
309.4
289.0
268.6
248.2
227.7
Max: 309.4
Min: 227.7



Y
Z X

Future work

- Add masking
- Calculating statistics on tripolar, cubed-sphere grids.
- Stats on GRIDSPEC grids