

# *ECCO Version 4 Release 5*

## Major features of Release 4

- 1) Optimization for 1992-2017,
- 2) Improved optimization (data, constraints, controls),
- 3) Daily output,
- 4) Includes atmospheric pressure loading,
- 5) Hosted by PO.DAAC.

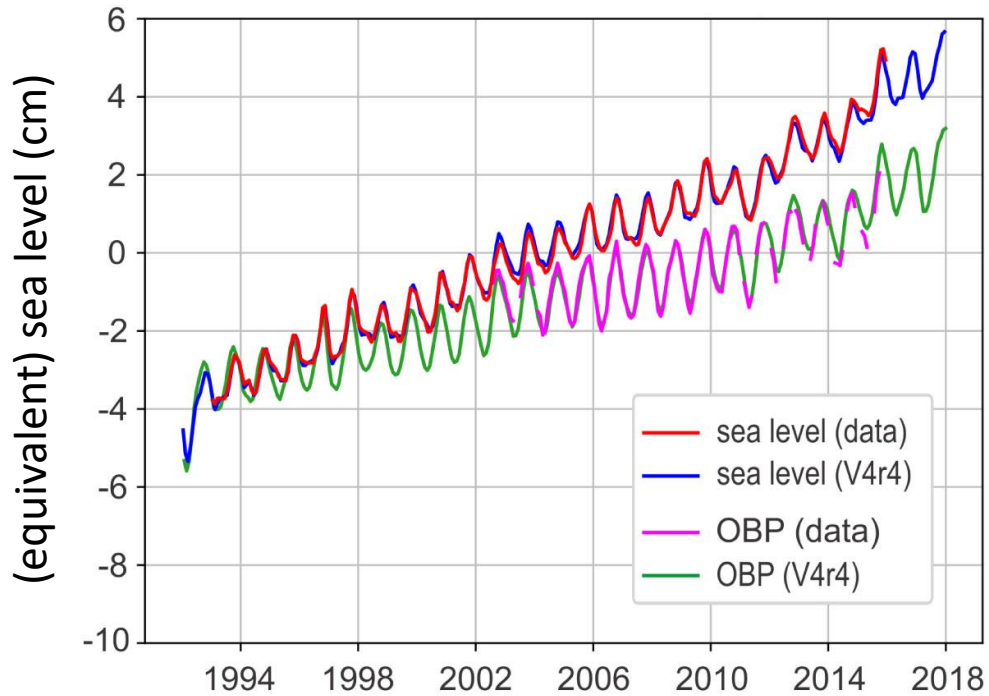
## Release 5 advancements from Release 4

- 1) Optimization for 1992-2019,
- 2) Near real-time extension as simulation to 09/2022,
- 3) Improved optimization (data, constraints, controls),
- 4) Ice shelves and shelf cavities in Antarctica,
- 5) Sea-ice adjoint,
- 6) Momentum budget.

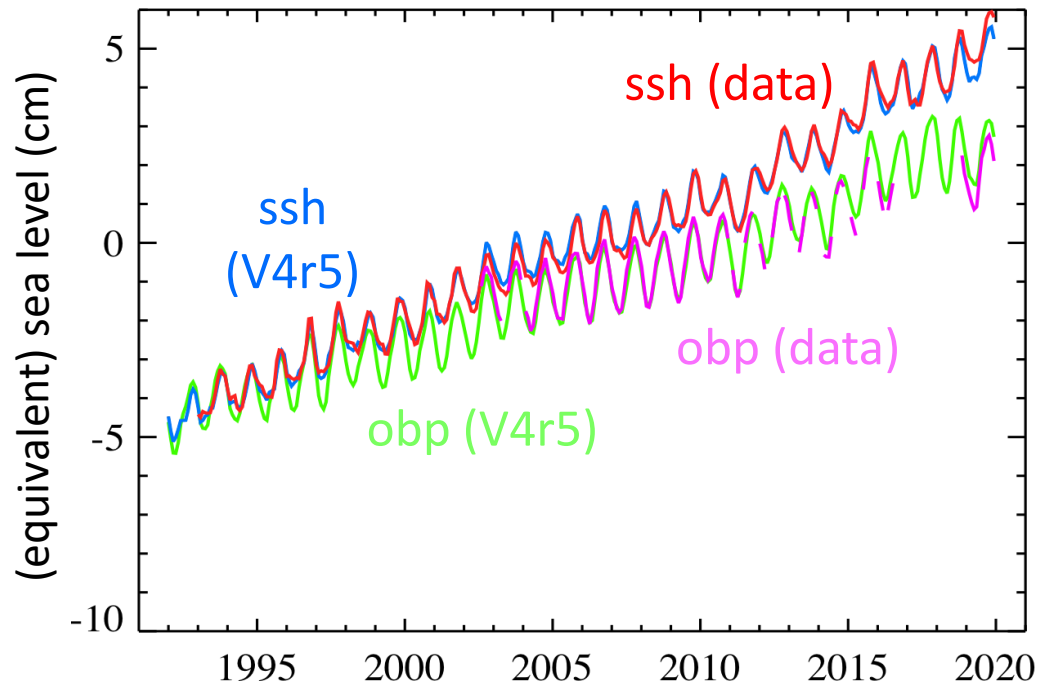
# *V4r5 is as skillful as V4r4, if not better*

## Global Mean Sea Level & Ocean Bottom Pressure

Release 4



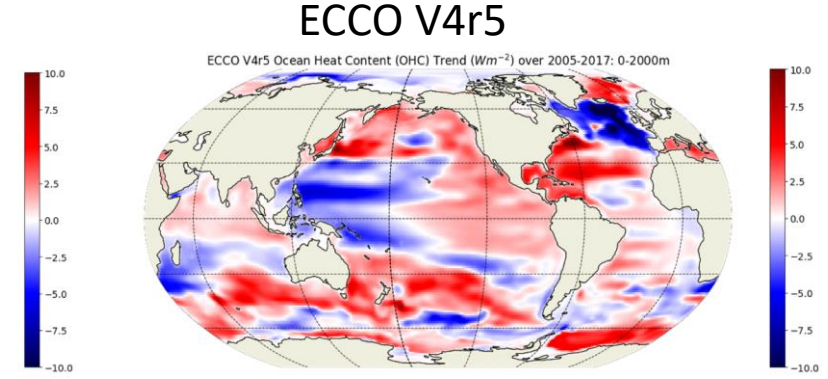
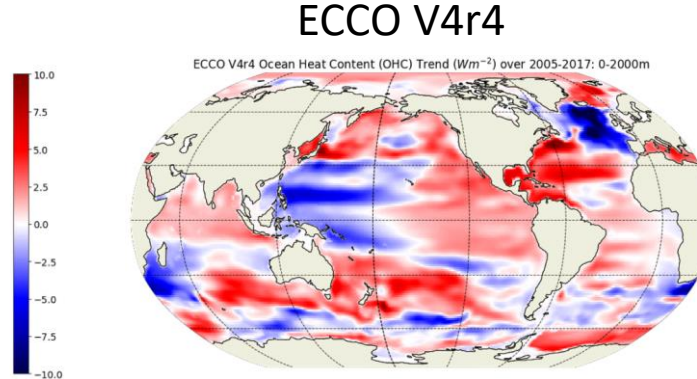
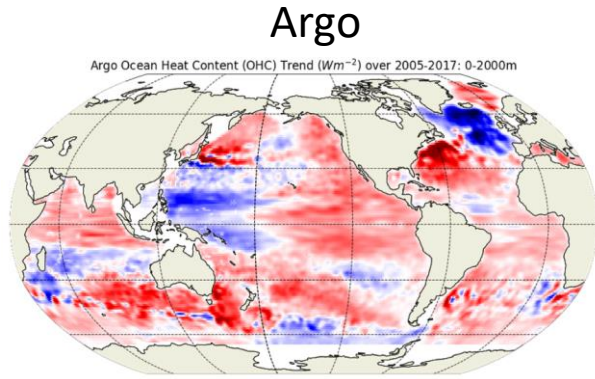
Release 5



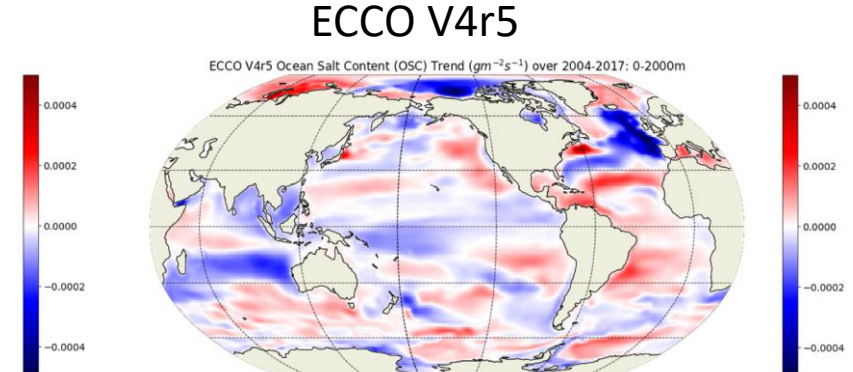
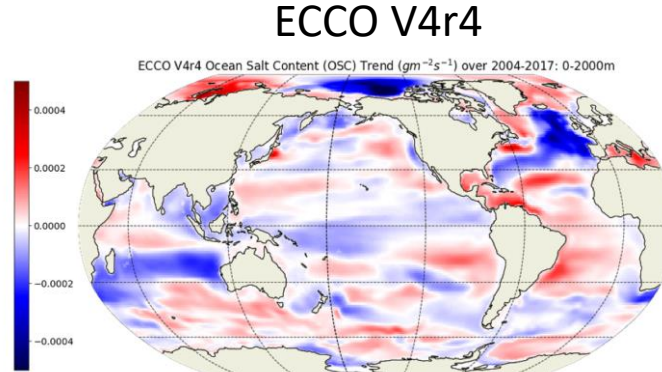
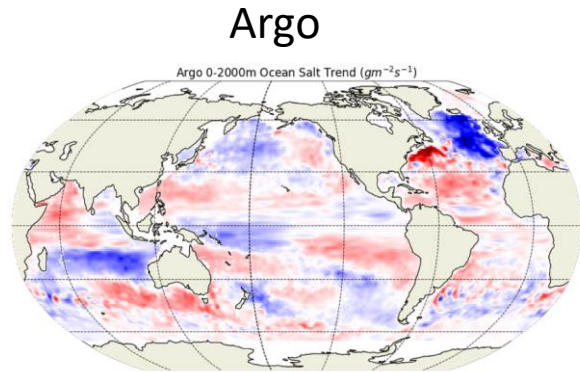
# *V4r5 is as skillful as V4r4, if not better*

Heat and Salt Content trend: 0-2000m, 2005-2017

Heat  
( $\text{W m}^{-2}$ )



Salt  
( $\text{g m}^{-2} \text{s}^{-1}$ )

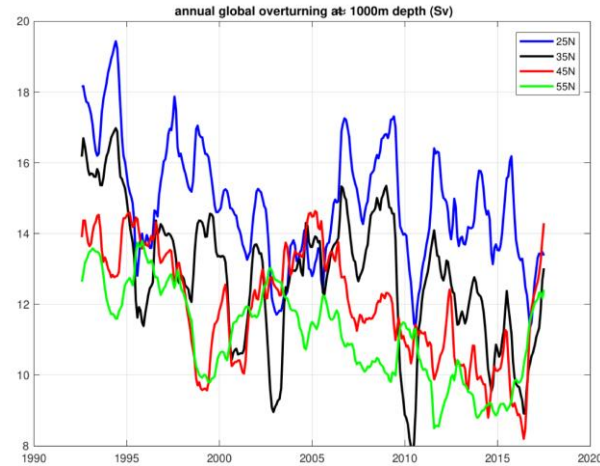


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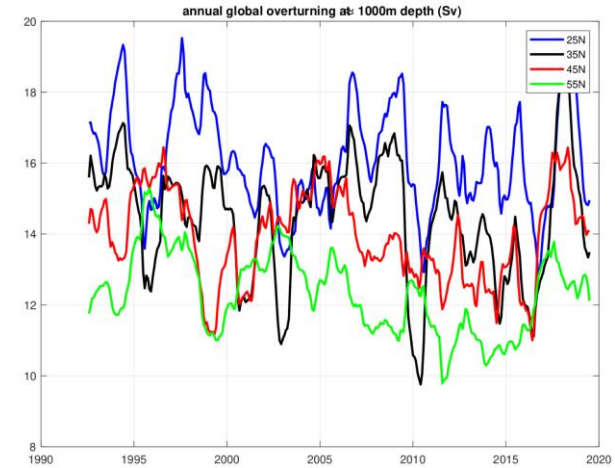
## Meridional Streamfunction (Sv)

Global

V4r4

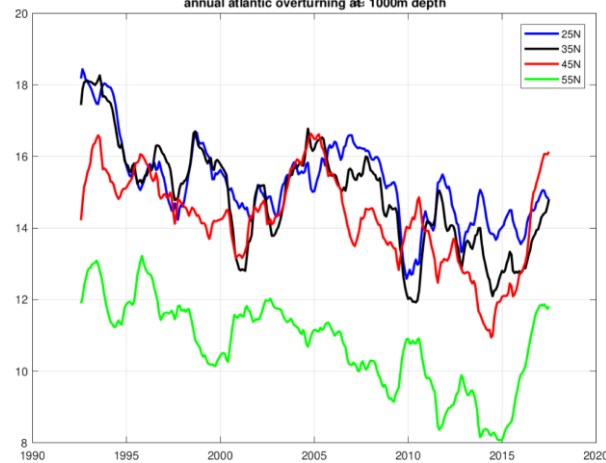


V4r5

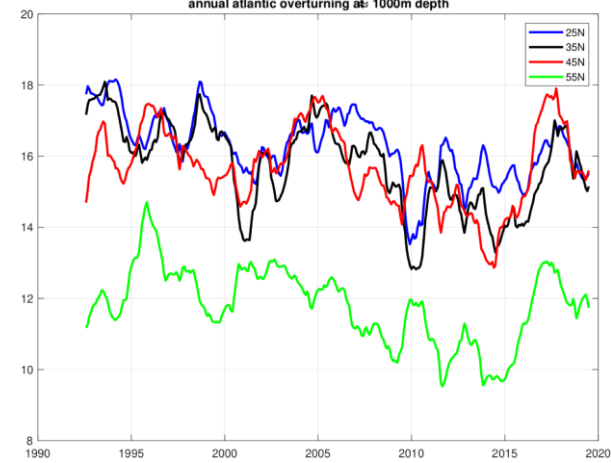


Atlantic

annual atlantic overturning at: 1000m depth



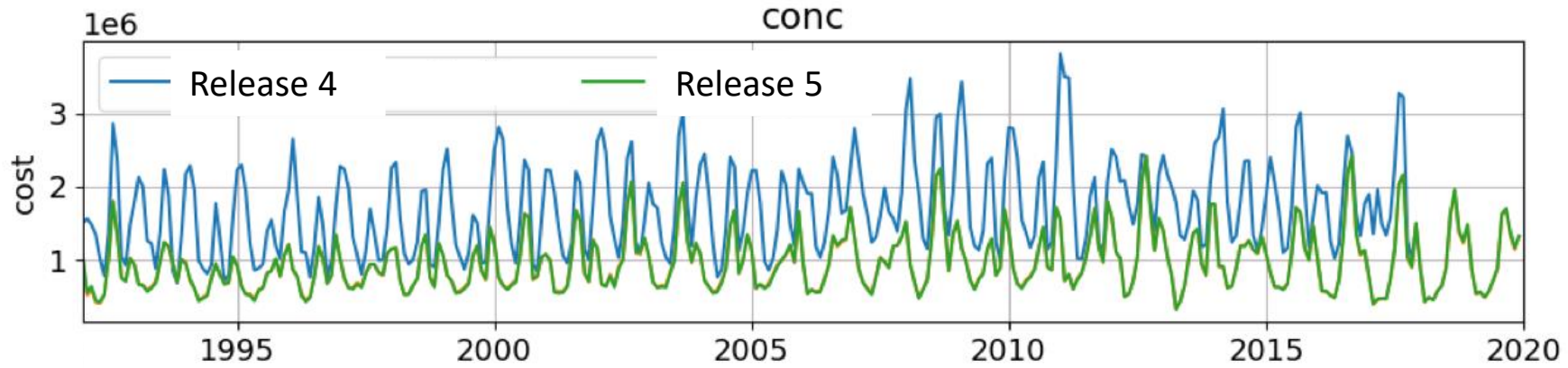
annual atlantic overturning at: 1000m depth



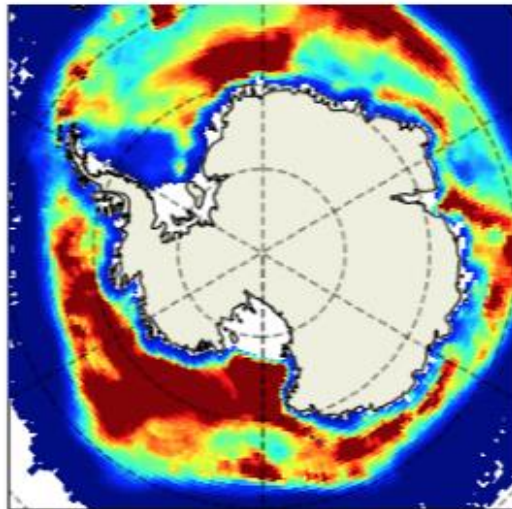
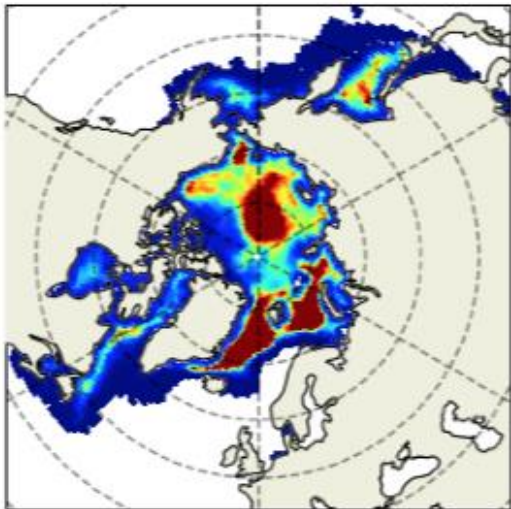


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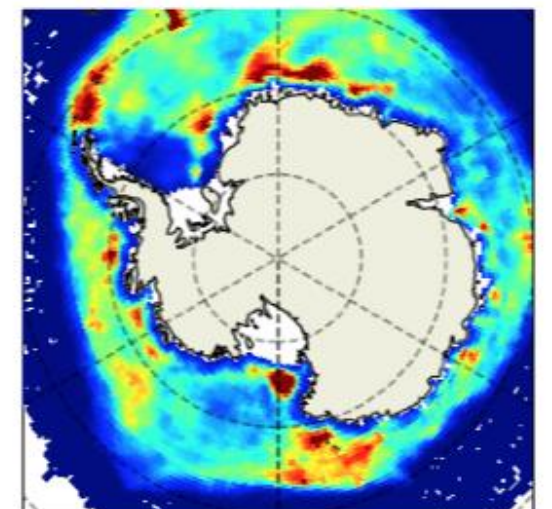
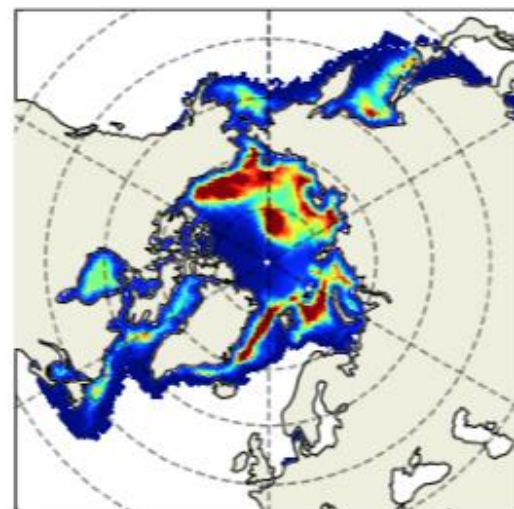
## Sea-ice concentration cost



Release 4

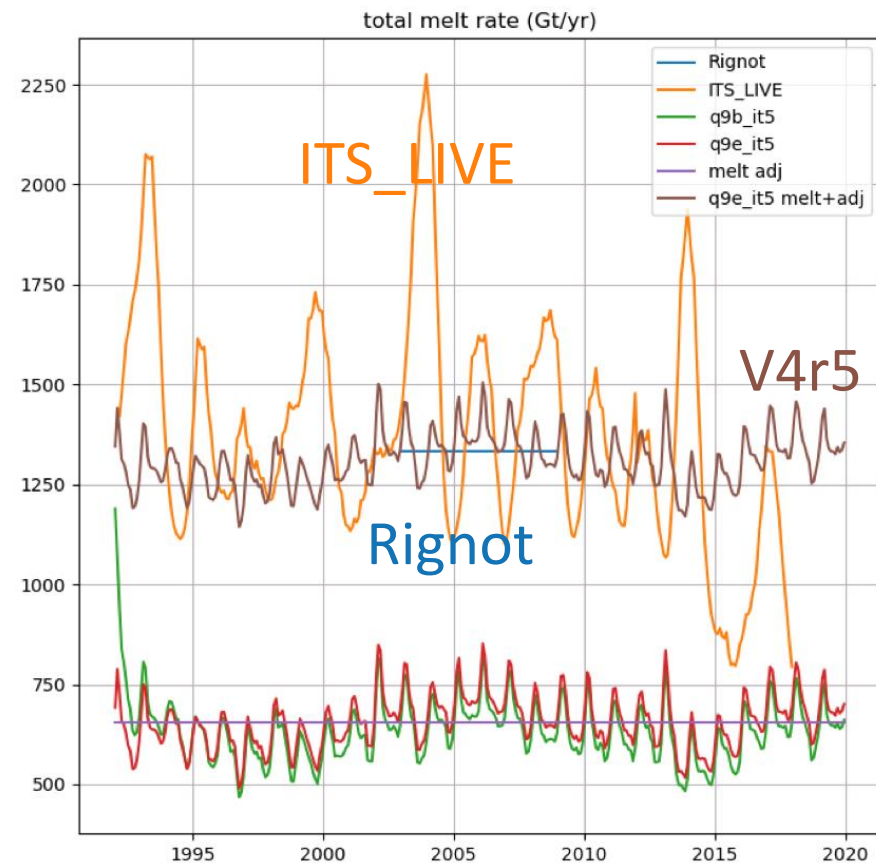
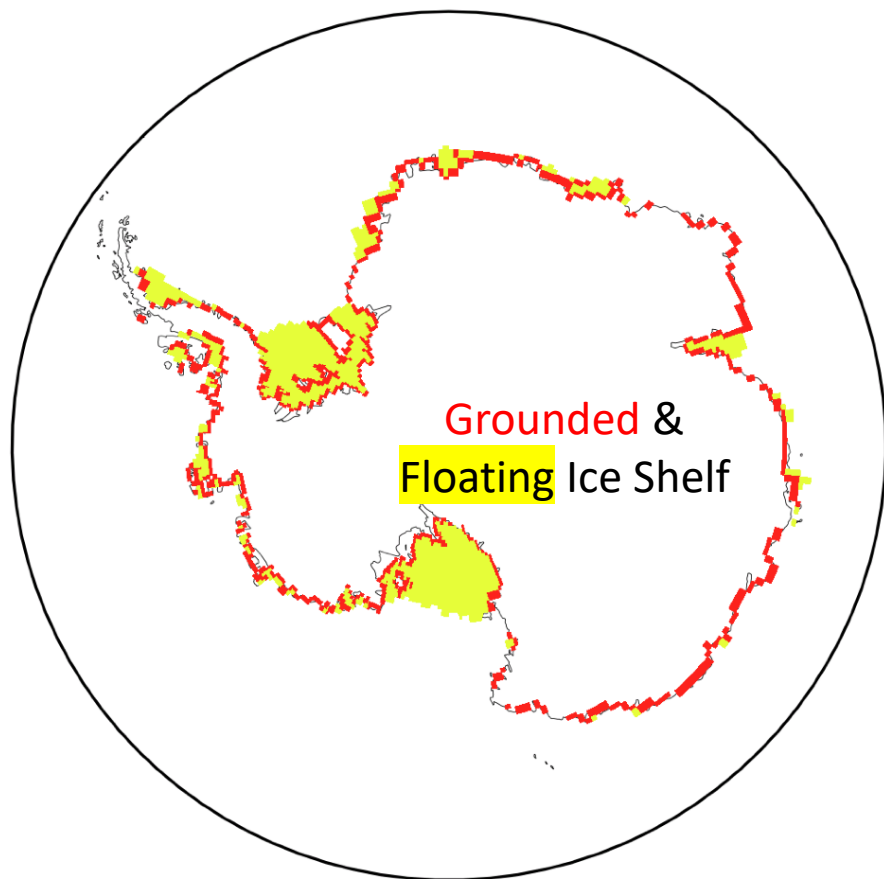


Release 5



# V4r5 skillful in resolving Antarctic Ice Shelf Melt

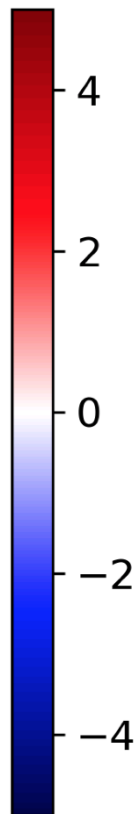
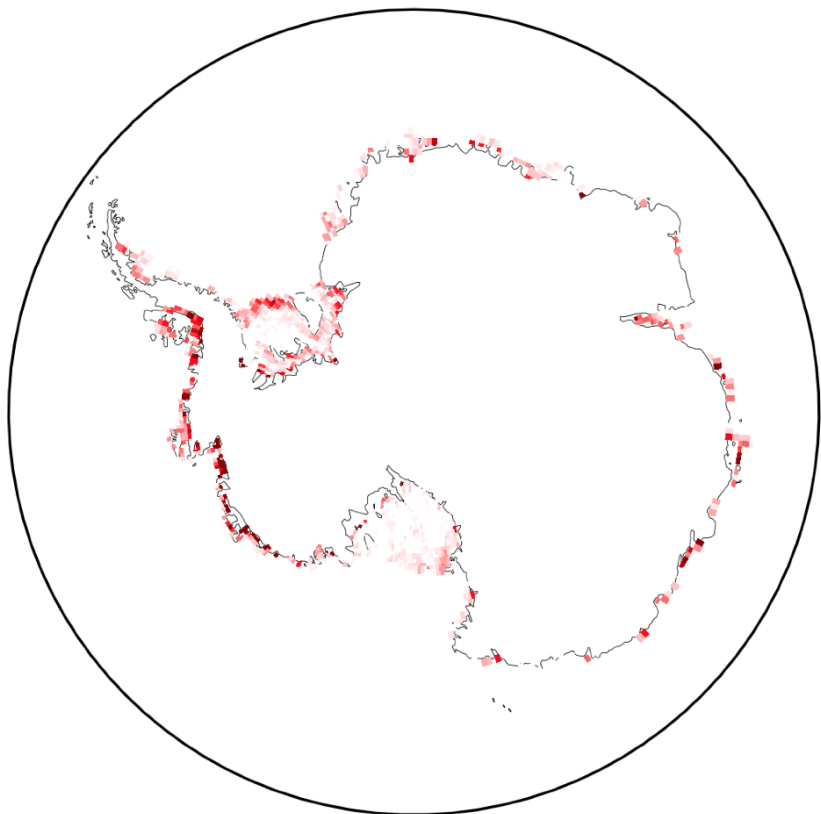
Antarctic Ice Shelf Melt rate (Gt/yr)



# *V4r5 skillful in resolving Antarctic Ice Shelf Melt*

Antarctic Ice Shelf Melt rate (Gt/yr)

Rignot (m/yr)



V4r5 (m/yr)

