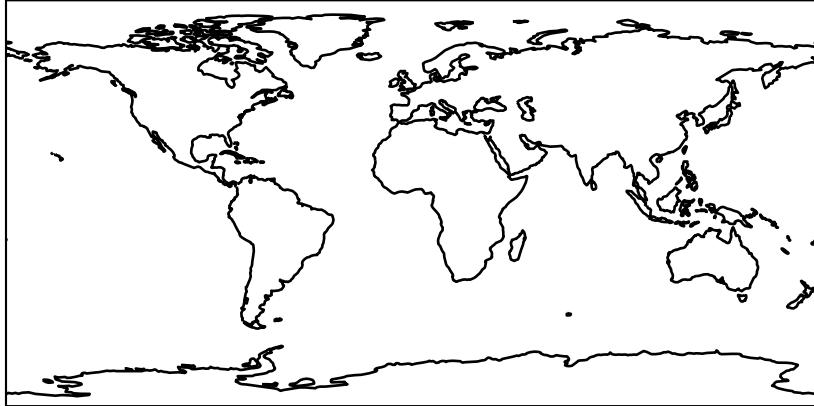


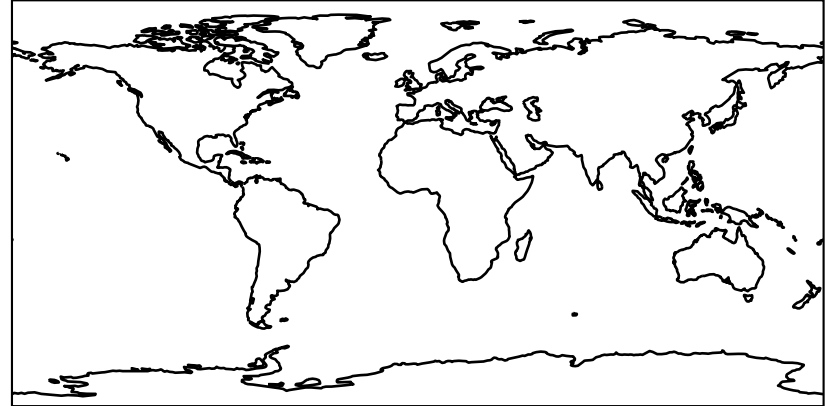
# EmisALD2\_Ship (Oct2019)

GCHP\_13.0.0 (Ref)  
c48



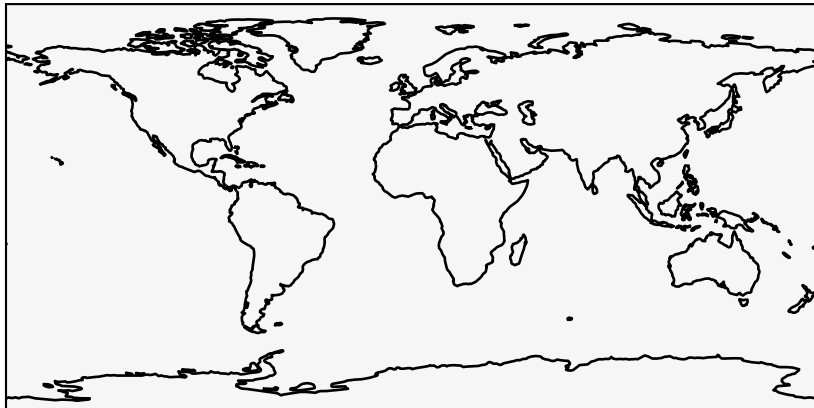
Zero throughout domain  
kg/m2/s

GCHP\_14.0.0 (Dev)  
c24



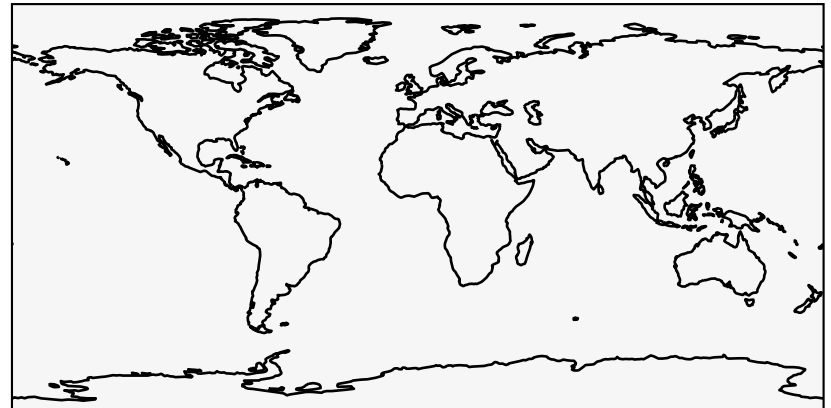
Zero throughout domain  
kg/m2/s

Difference (1x1.25)  
Dev - Ref, Dynamic Range



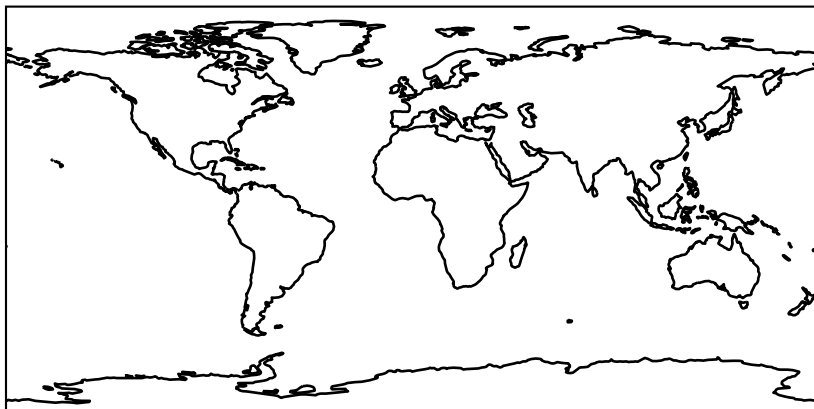
Zero throughout domain  
kg/m2/s

Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Zero throughout domain  
kg/m2/s

Ratio (1x1.25)  
Dev/Ref, Dynamic Range



Undefined throughout domain  
unitless

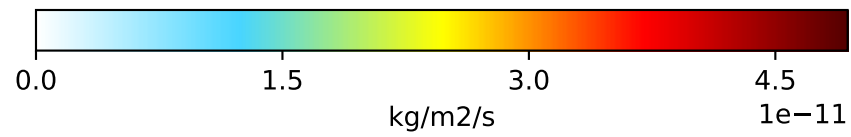
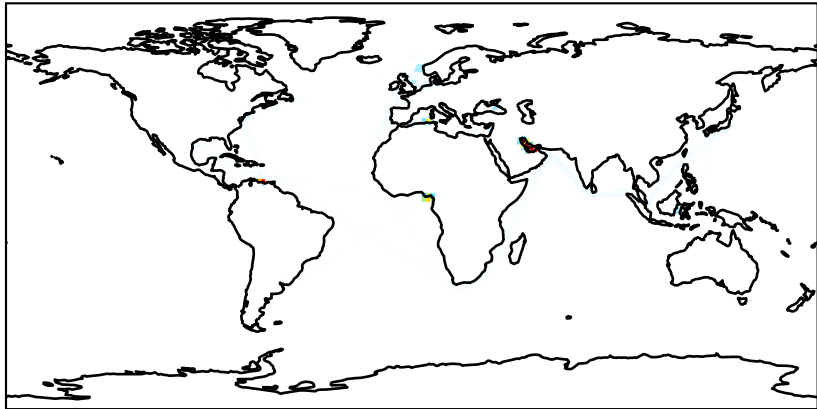
Ratio (1x1.25)  
Dev/Ref, Fixed Range



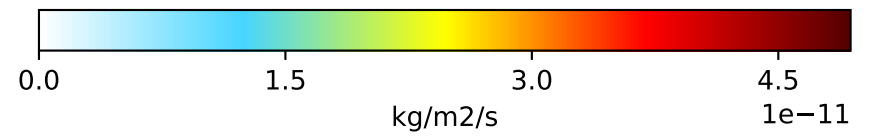
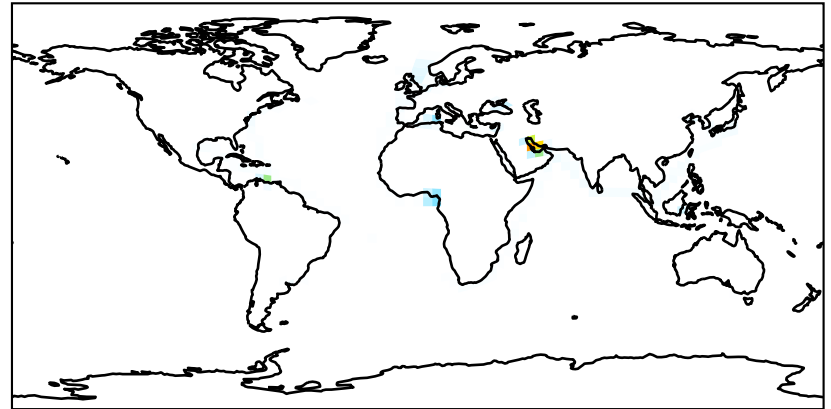
Undefined throughout domain  
unitless

# EmisALK4\_Ship (Oct2019)

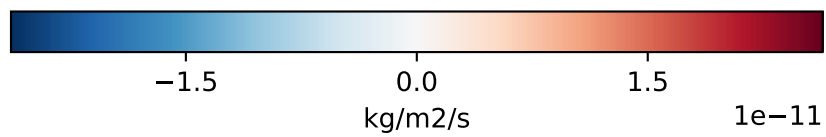
GCHP\_13.0.0 (Ref)  
c48



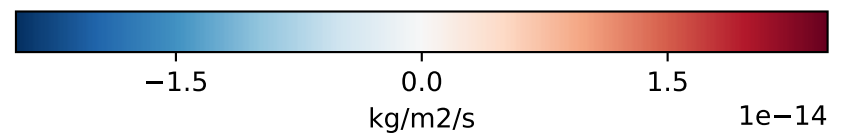
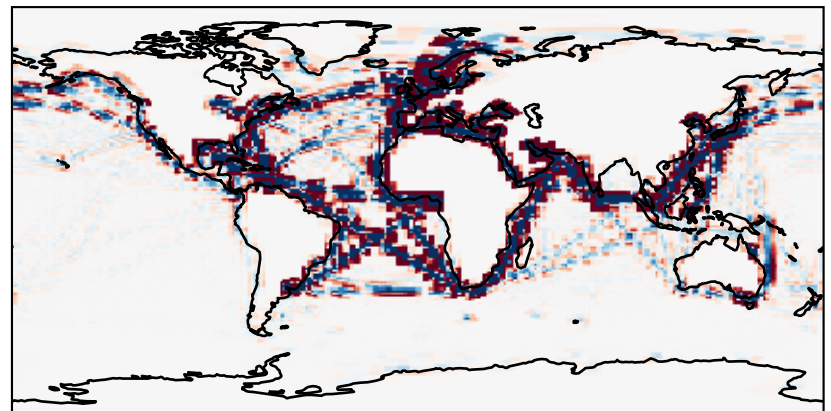
GCHP\_14.0.0 (Dev)  
c24



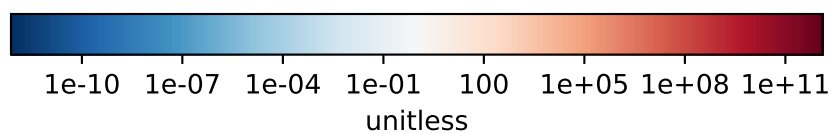
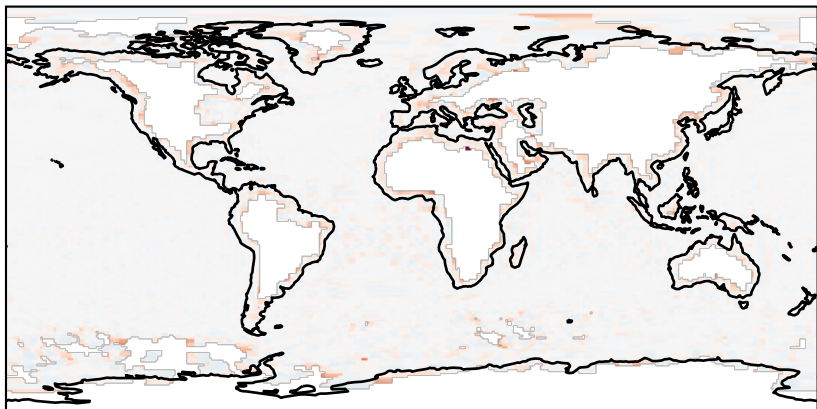
Difference (1x1.25)  
Dev - Ref, Dynamic Range



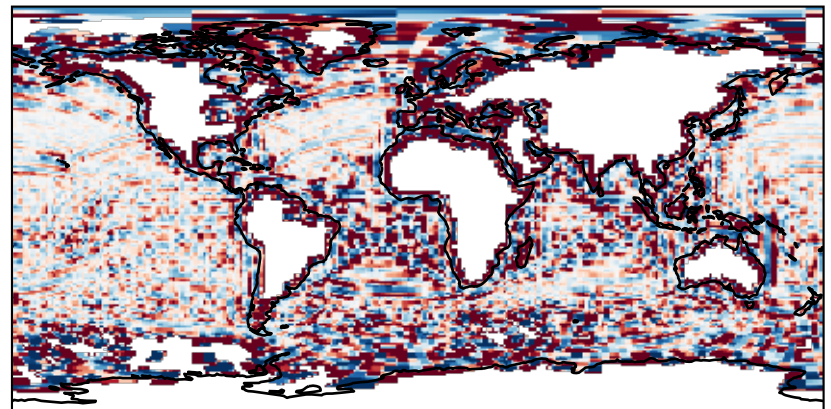
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range

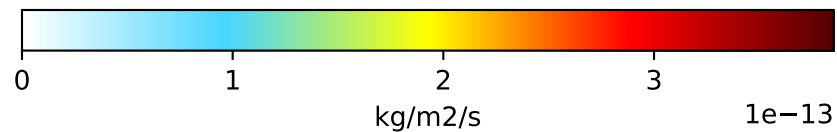
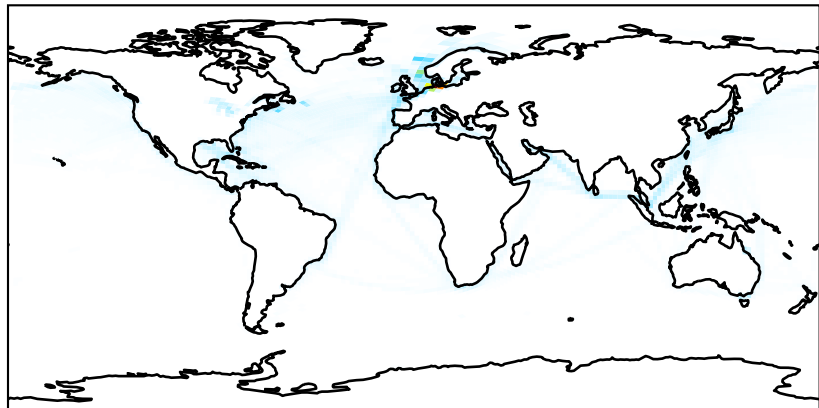


Ratio (1x1.25)  
Dev/Ref, Fixed Range

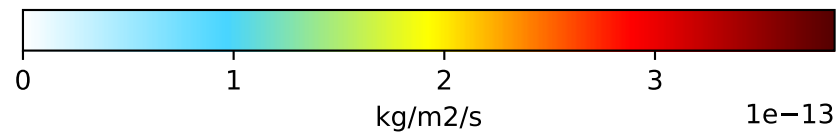


# EmisBCPI\_Ship (Oct2019)

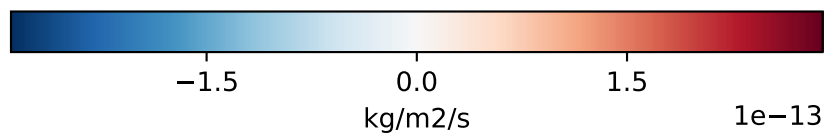
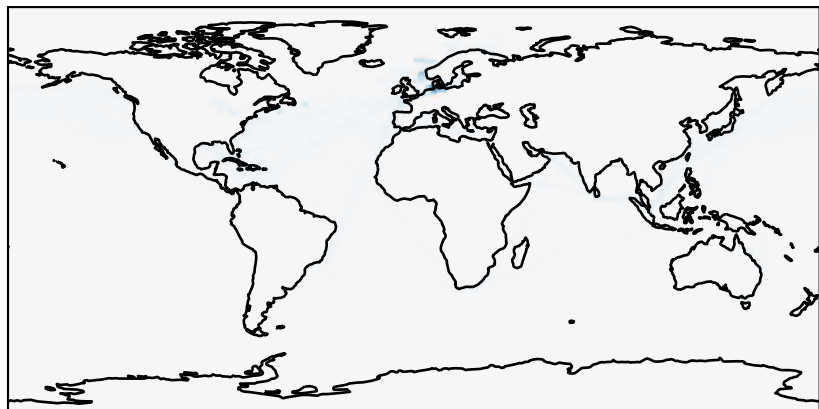
GCHP\_13.0.0 (Ref)  
c48



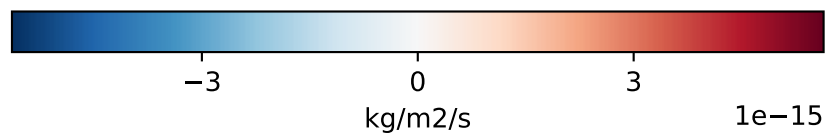
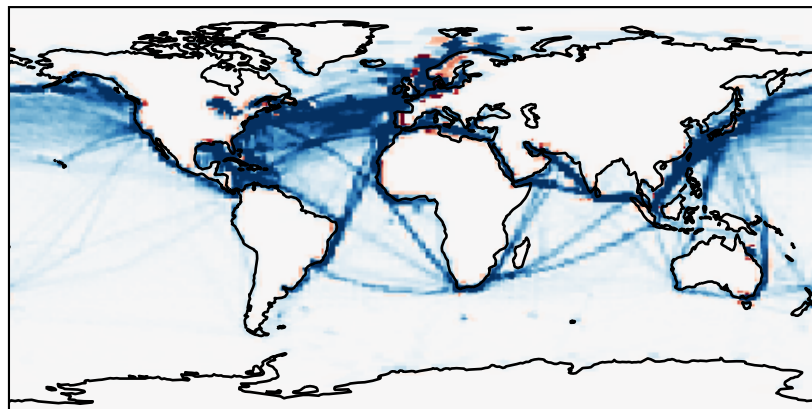
GCHP\_14.0.0 (Dev)  
c24



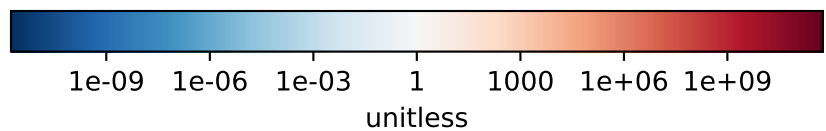
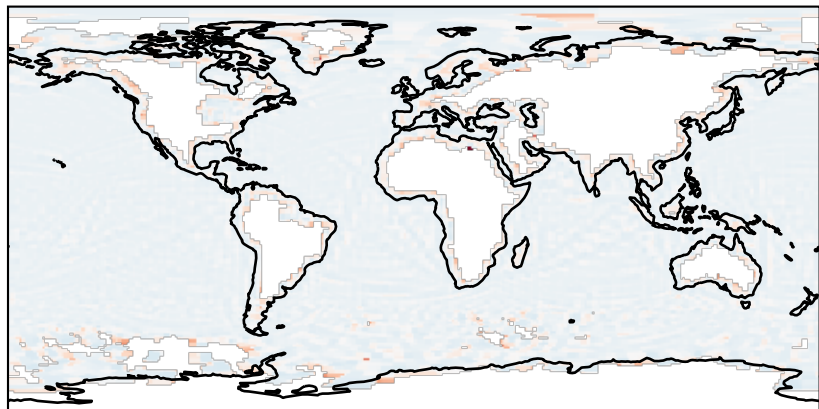
Difference (1x1.25)  
Dev - Ref, Dynamic Range



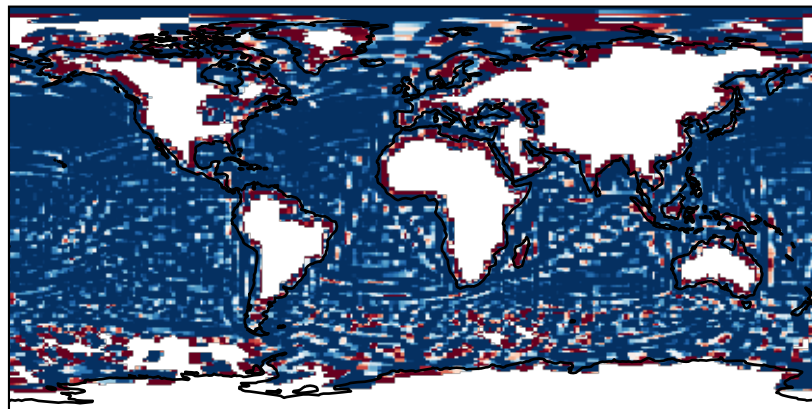
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range

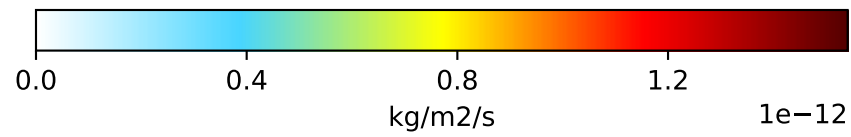
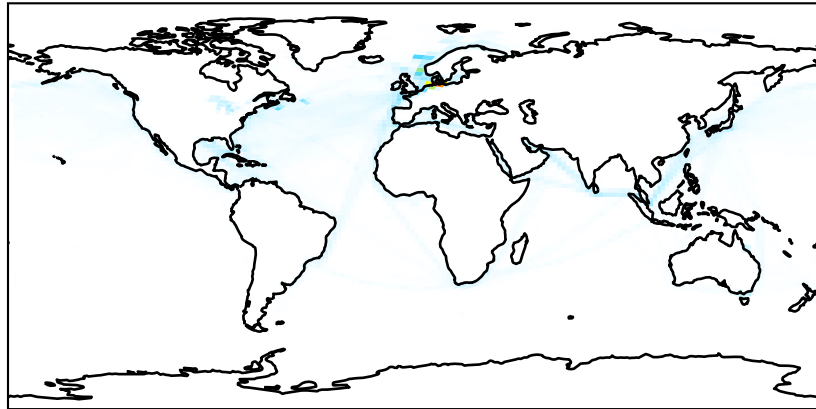


Ratio (1x1.25)  
Dev/Ref, Fixed Range

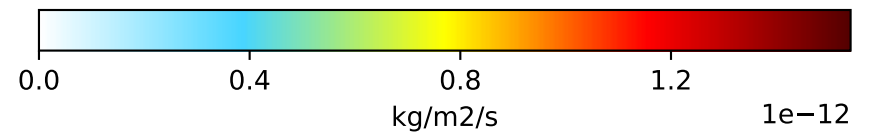


# EmisBCPO\_Ship (Oct2019)

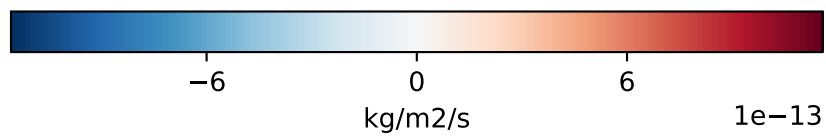
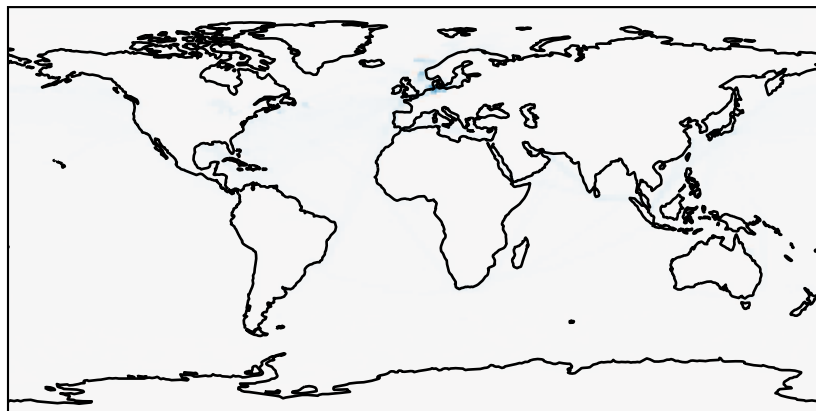
GCHP\_13.0.0 (Ref)  
c48



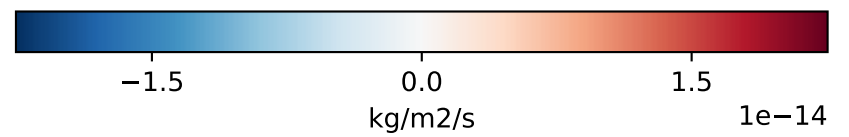
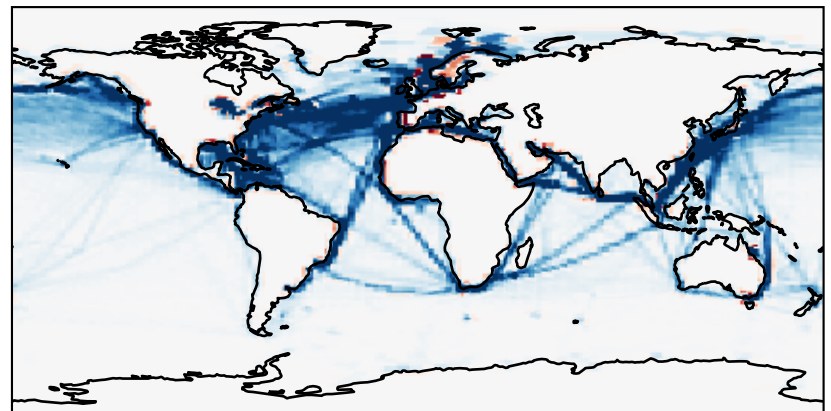
GCHP\_13.0.0 (Dev)  
c24



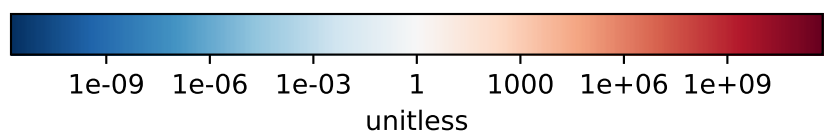
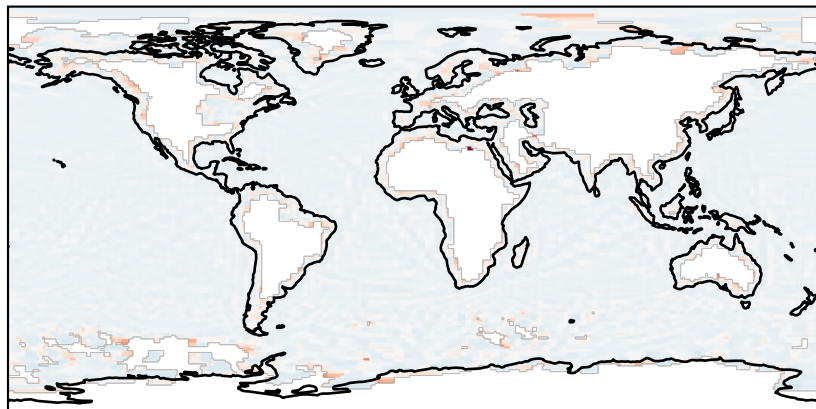
Difference (1x1.25)  
Dev - Ref, Dynamic Range



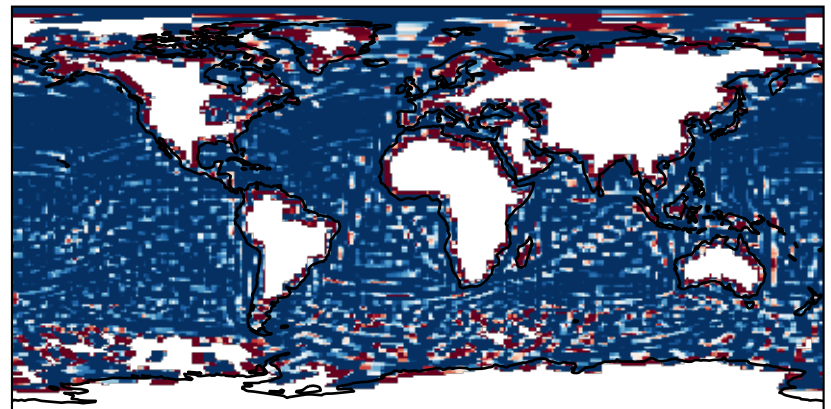
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range

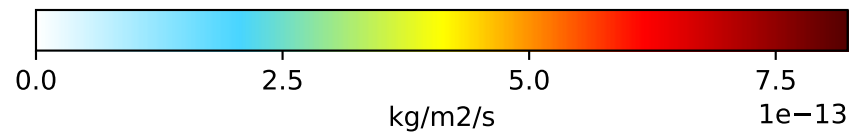
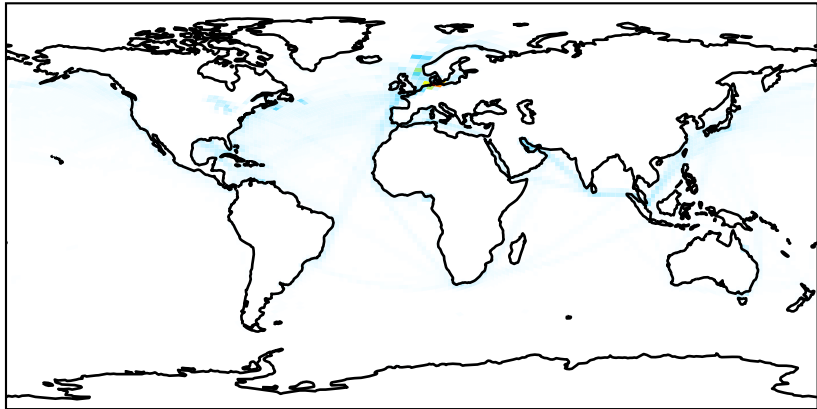


Ratio (1x1.25)  
Dev/Ref, Fixed Range

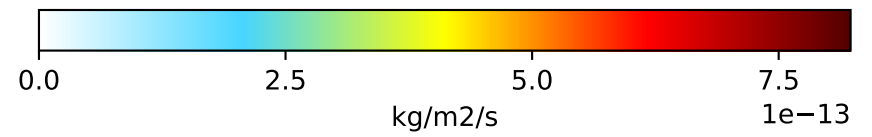
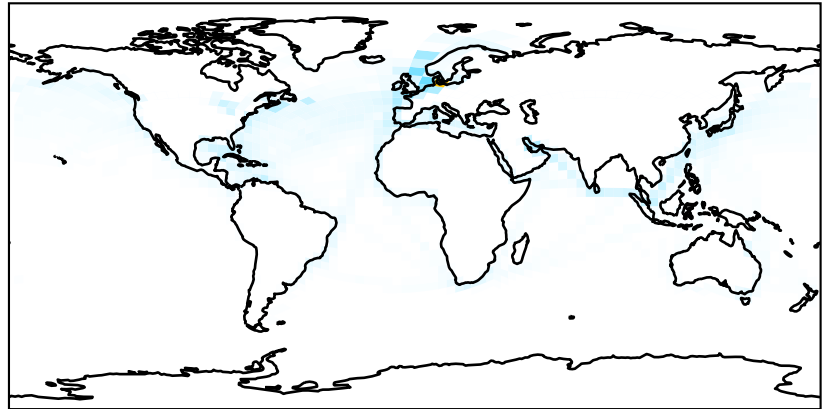


# EmisBENZ\_Ship (Oct2019)

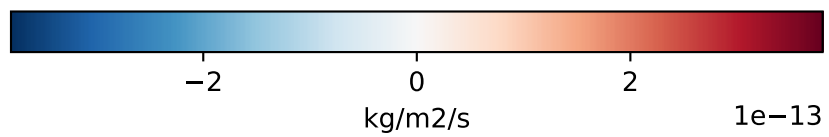
GCHP\_13.0.0 (Ref)  
c48



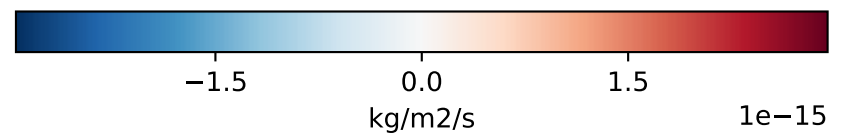
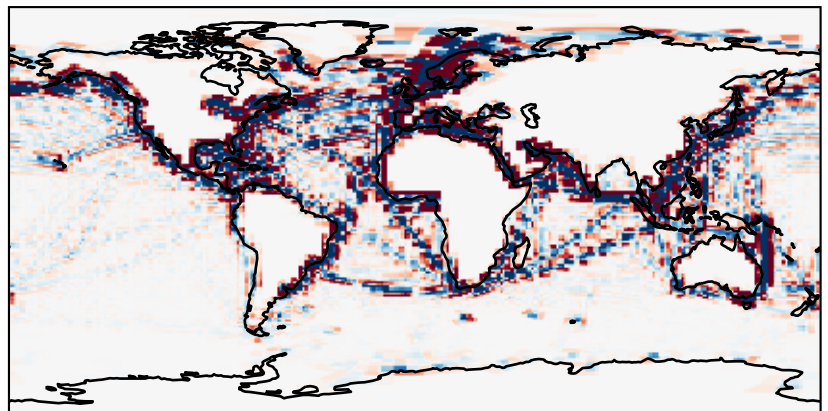
GCHP\_14.0.0 (Dev)  
c24



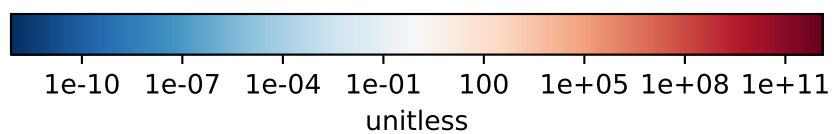
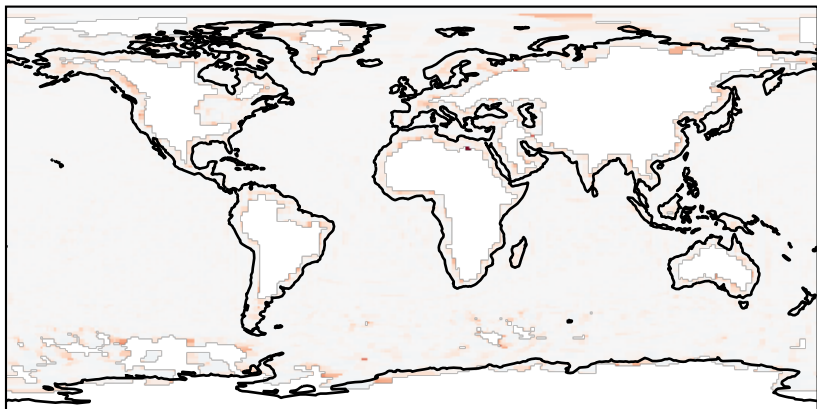
Difference (1x1.25)  
Dev - Ref, Dynamic Range



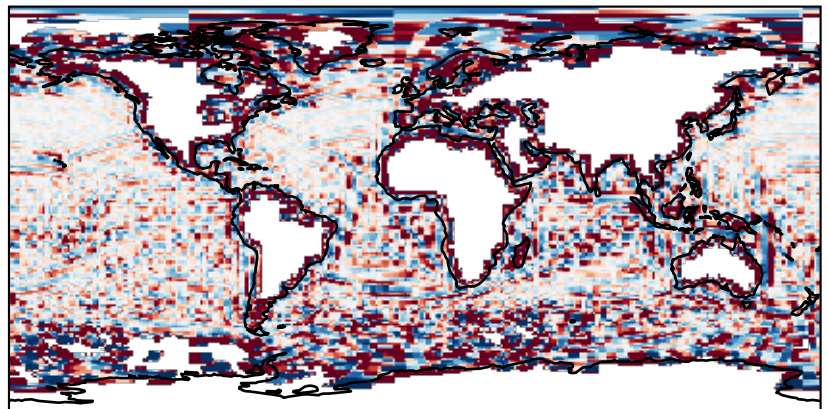
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range

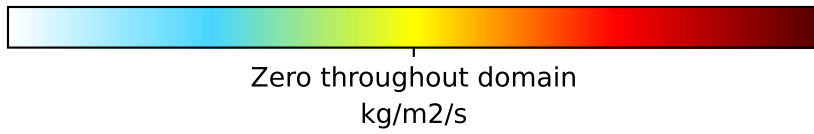
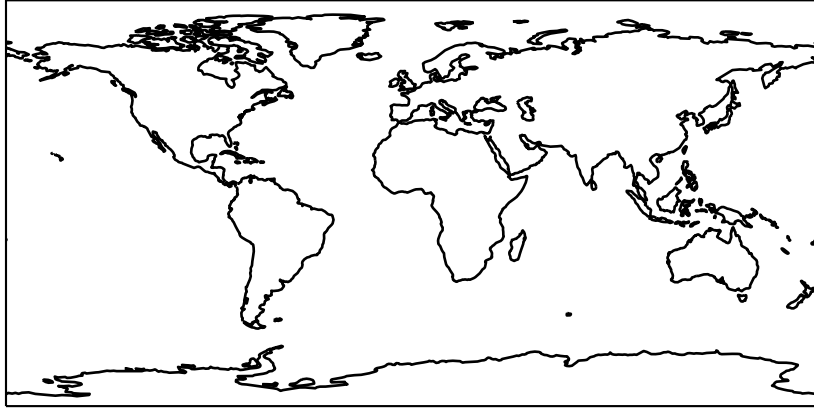


Ratio (1x1.25)  
Dev/Ref, Fixed Range

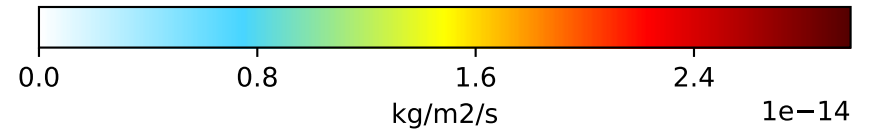
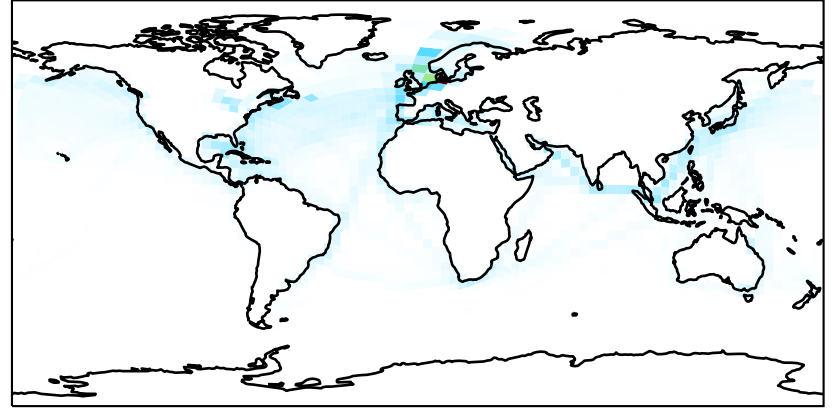


# EmisC2H2\_Ship (Oct2019)

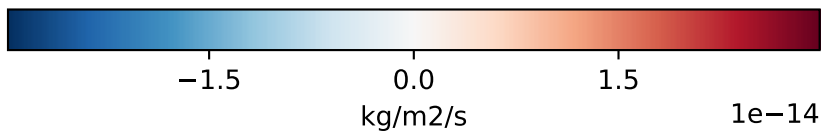
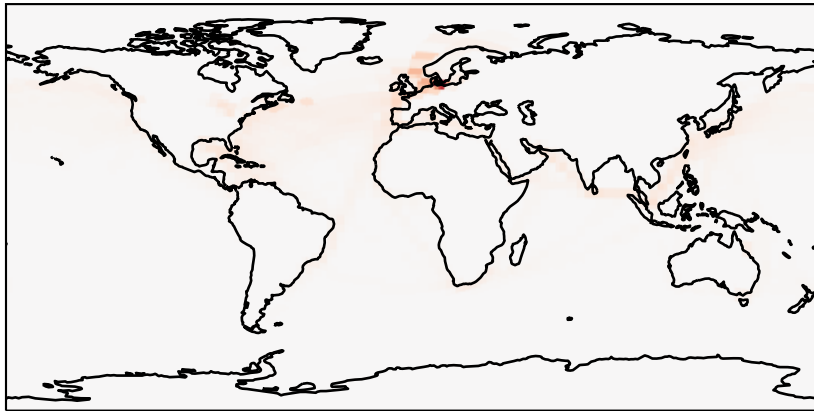
GCHP\_13.0.0 (Ref)  
c48



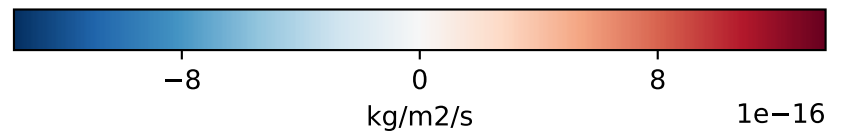
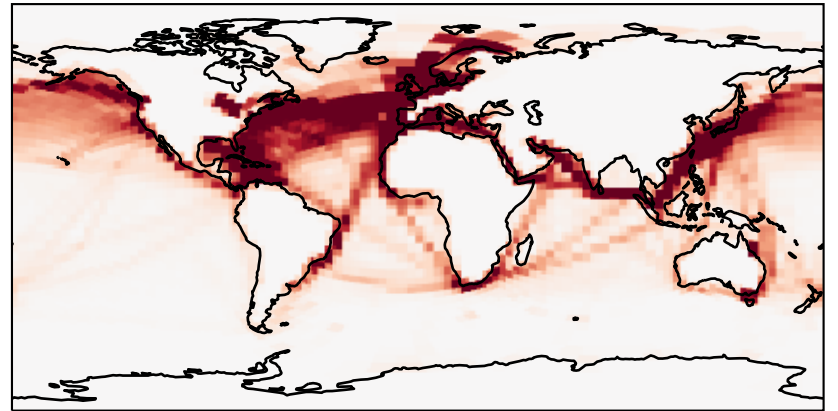
GCHP\_14.0.0 (Dev)  
c24



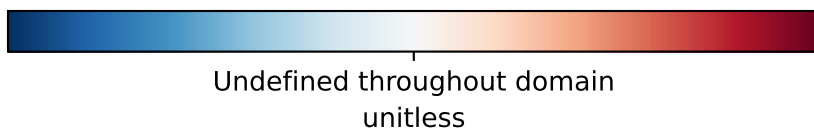
Difference (1x1.25)  
Dev - Ref, Dynamic Range



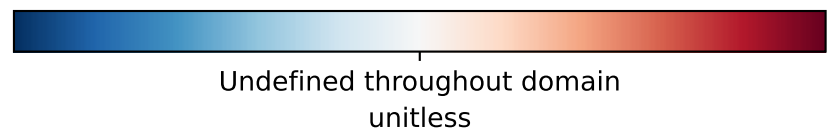
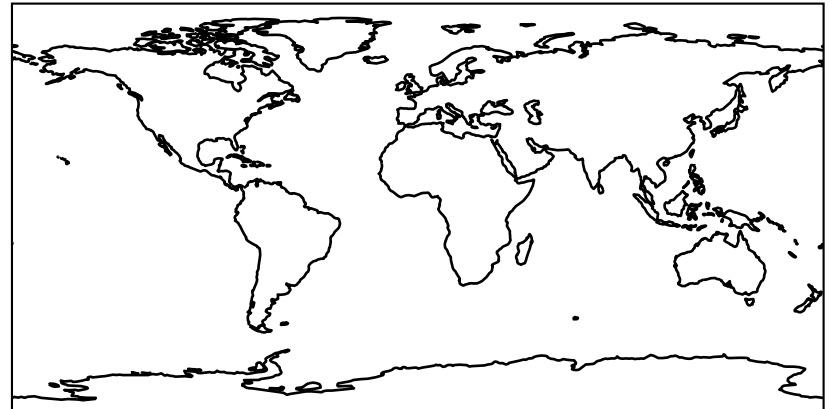
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range

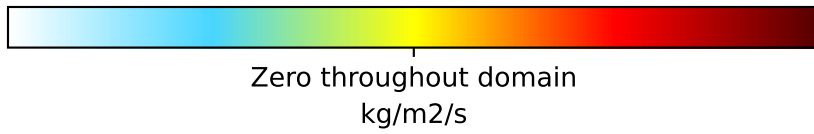
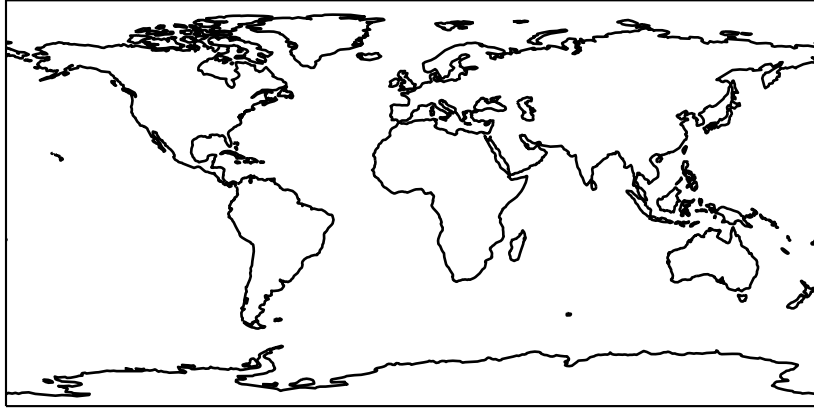


Ratio (1x1.25)  
Dev/Ref, Fixed Range

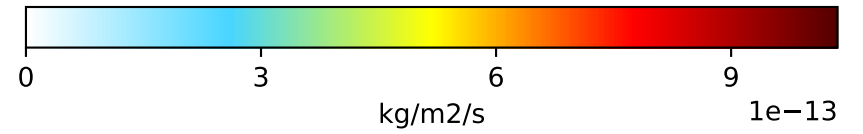
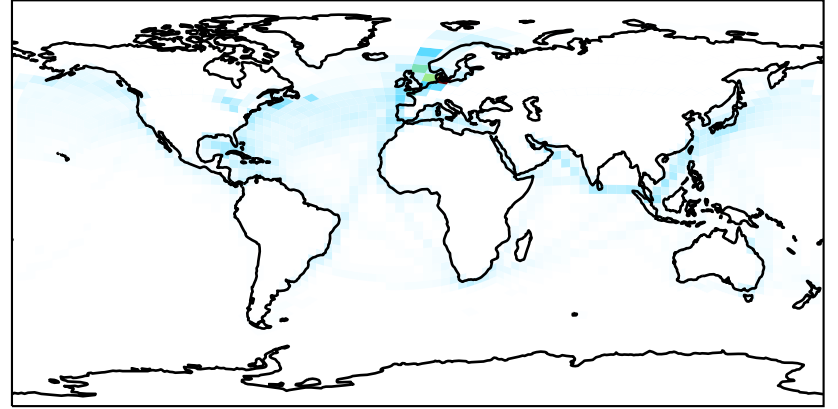


# EmisC2H4\_Ship (Oct2019)

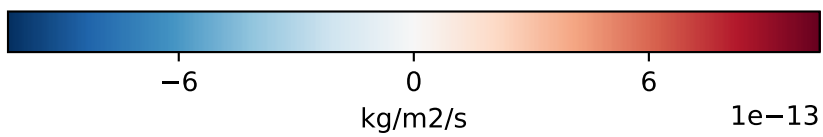
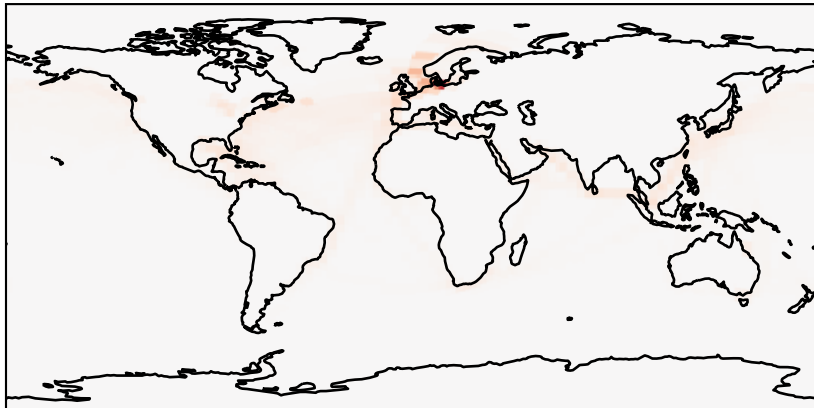
GCHP\_13.0.0 (Ref)  
c48



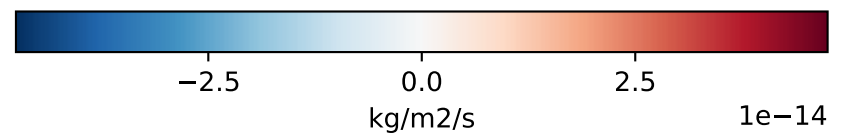
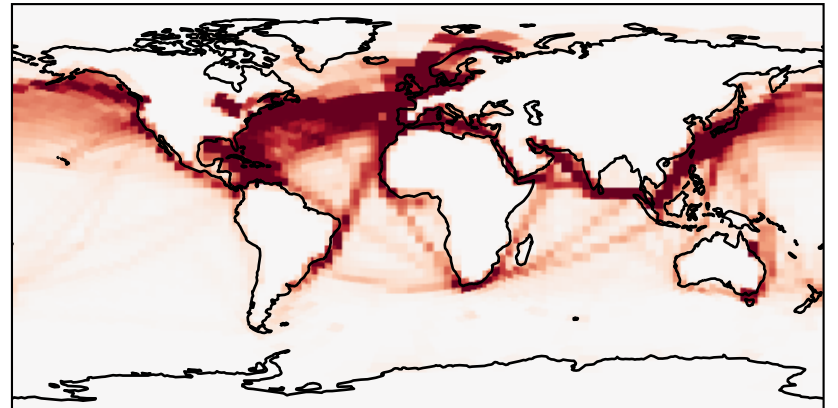
GCHP\_14.0.0 (Dev)  
c24



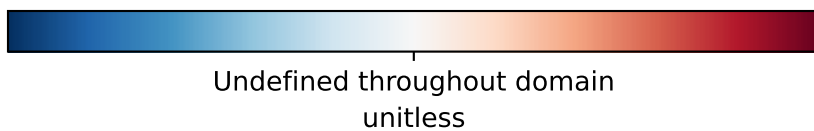
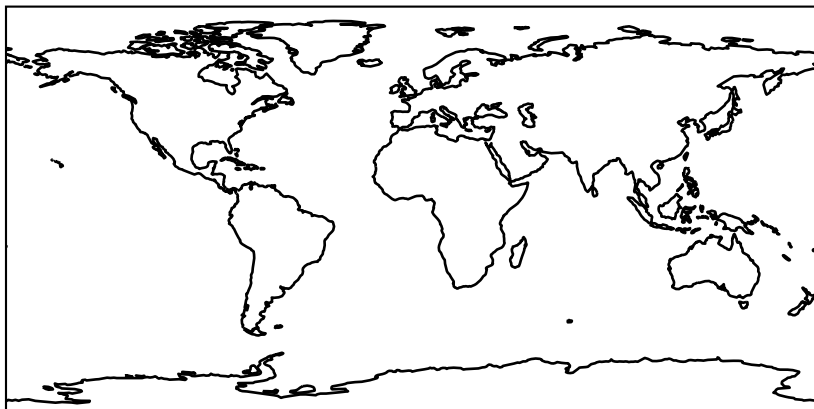
Difference (1x1.25)  
Dev - Ref, Dynamic Range



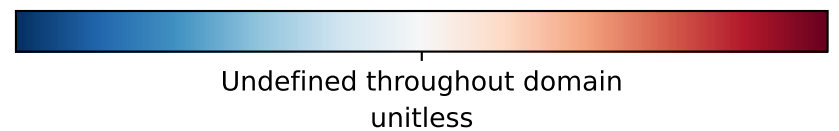
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range

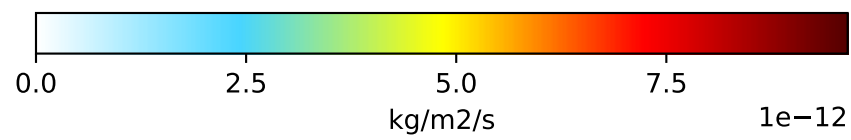
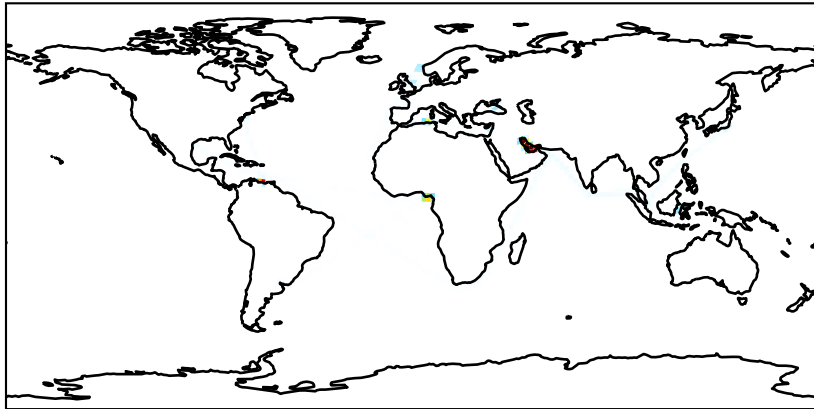


Ratio (1x1.25)  
Dev/Ref, Fixed Range

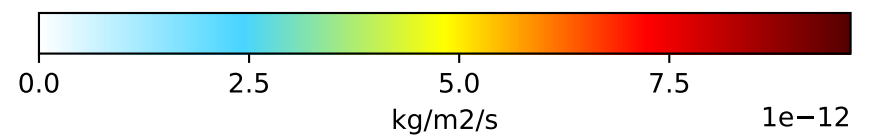
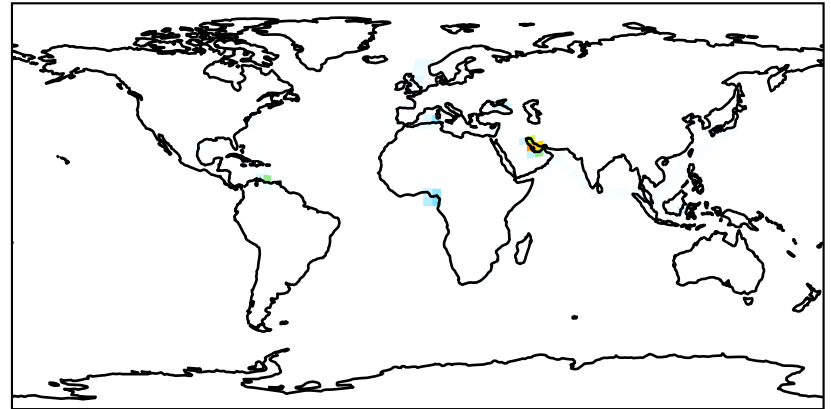


# EmisC2H6\_Ship (Oct2019)

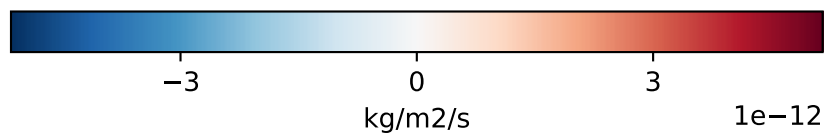
GCHP\_13.0.0 (Ref)  
c48



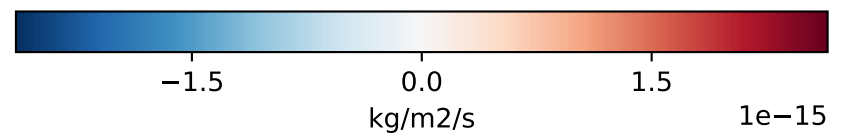
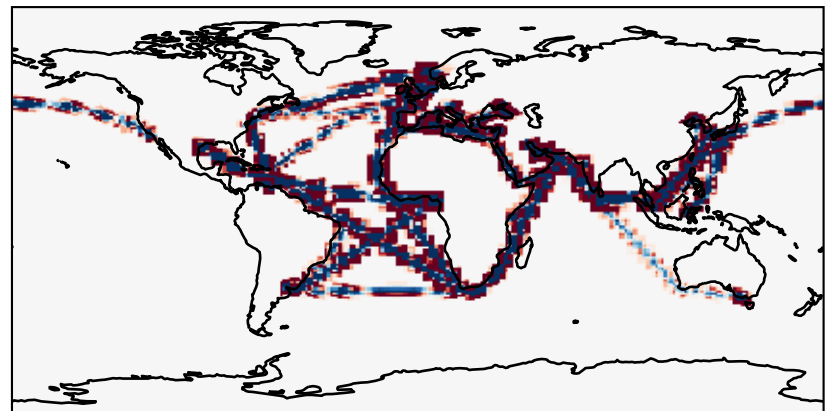
GCHP\_14.0.0 (Dev)  
c24



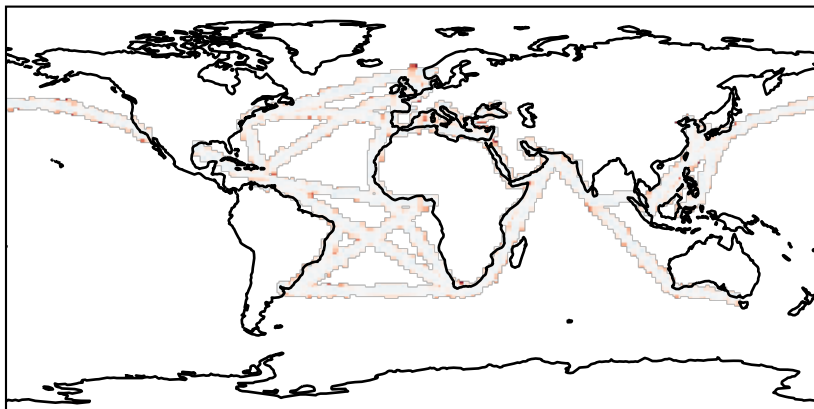
Difference (1x1.25)  
Dev - Ref, Dynamic Range



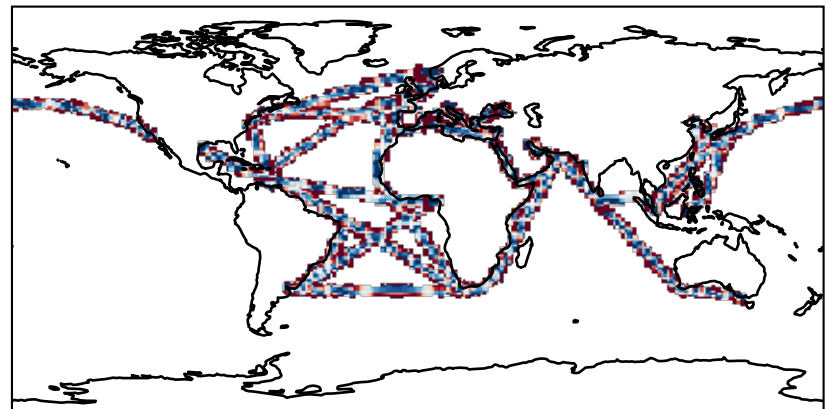
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range



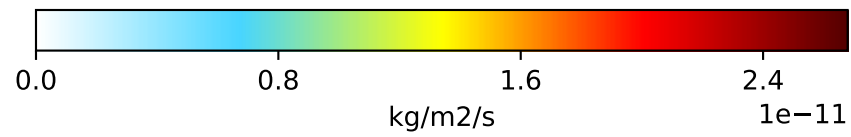
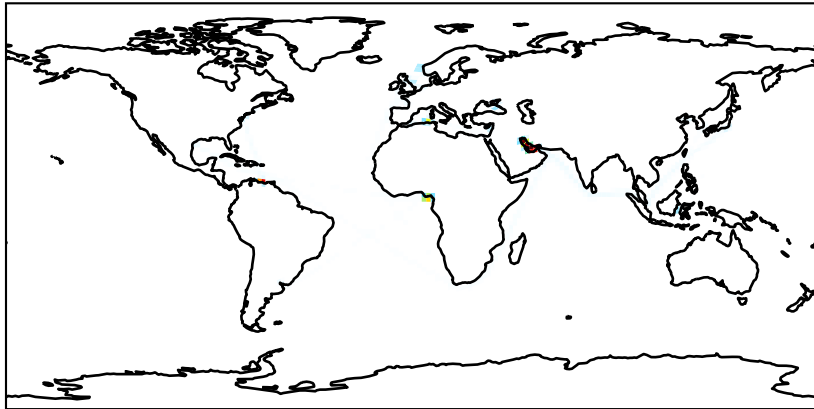
Ratio (1x1.25)  
Dev/Ref, Fixed Range



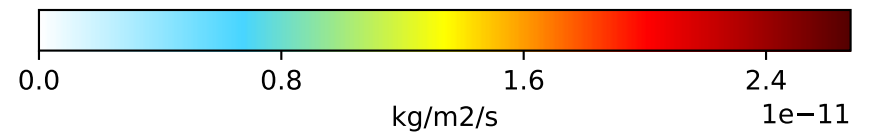
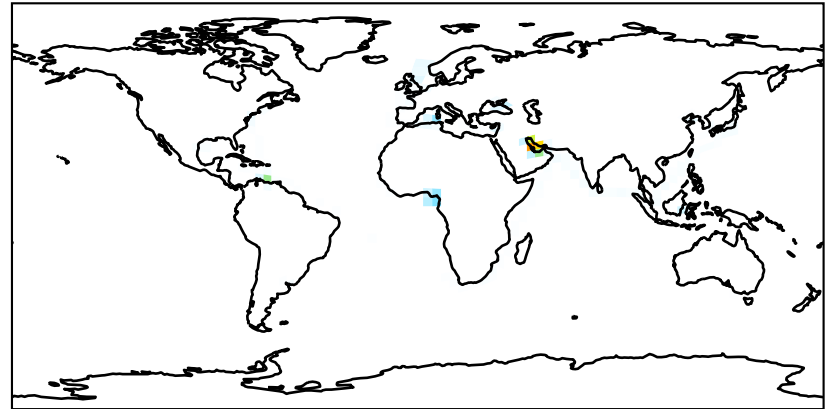


# EmisC3H8\_Ship (Oct2019)

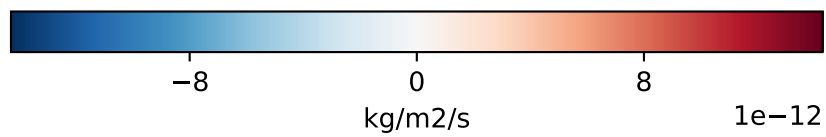
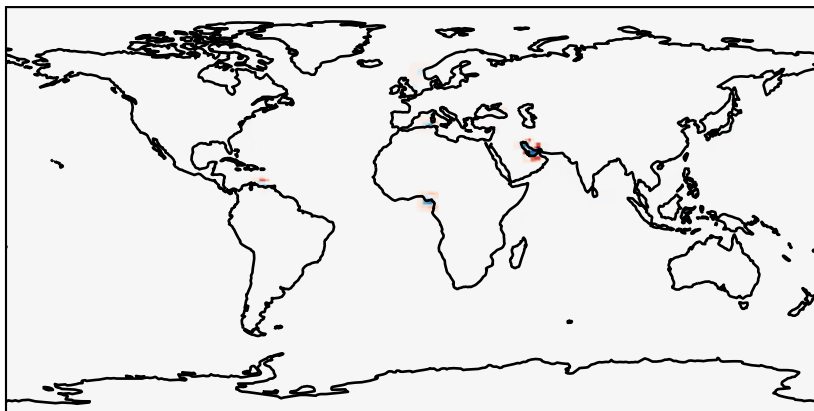
GCHP\_13.0.0 (Ref)  
c48



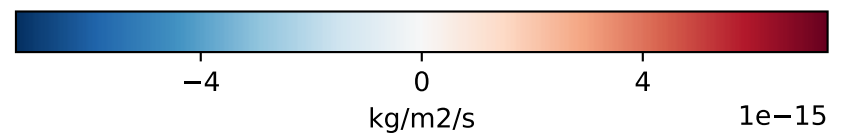
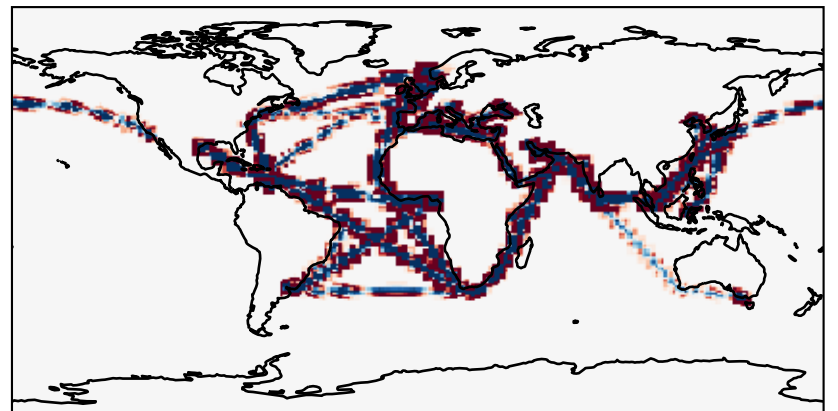
GCHP\_14.0.0 (Dev)  
c24



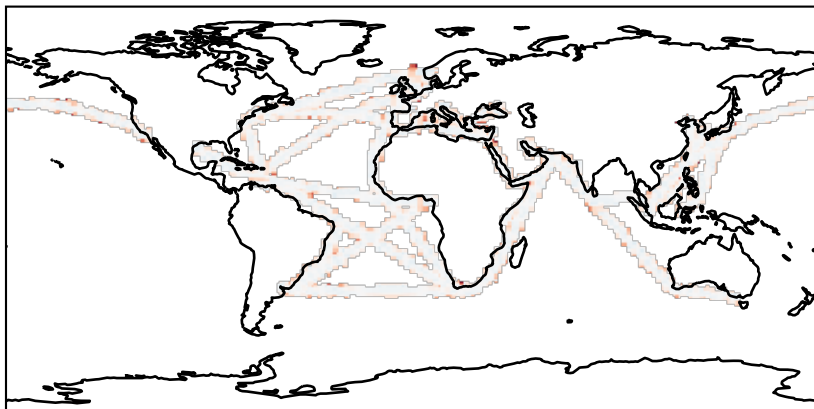
Difference (1x1.25)  
Dev - Ref, Dynamic Range



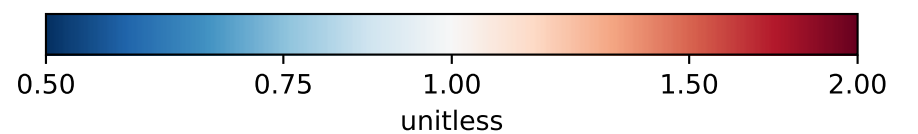
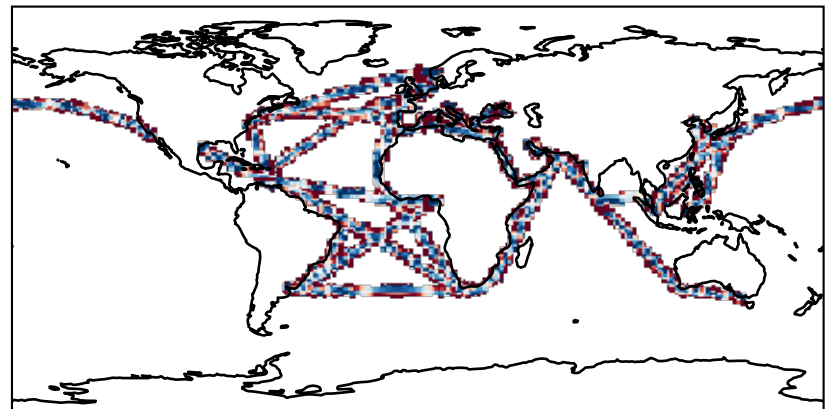
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range

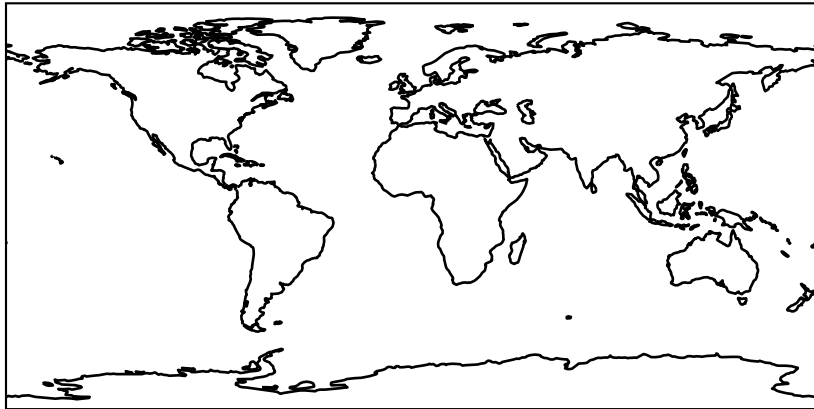


Ratio (1x1.25)  
Dev/Ref, Fixed Range



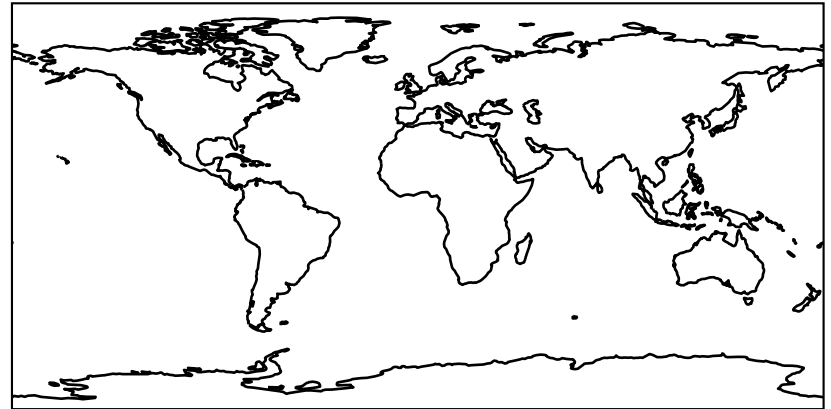
# EmisCH20\_Ship (Oct2019)

GCHP\_13.0.0 (Ref)  
c48



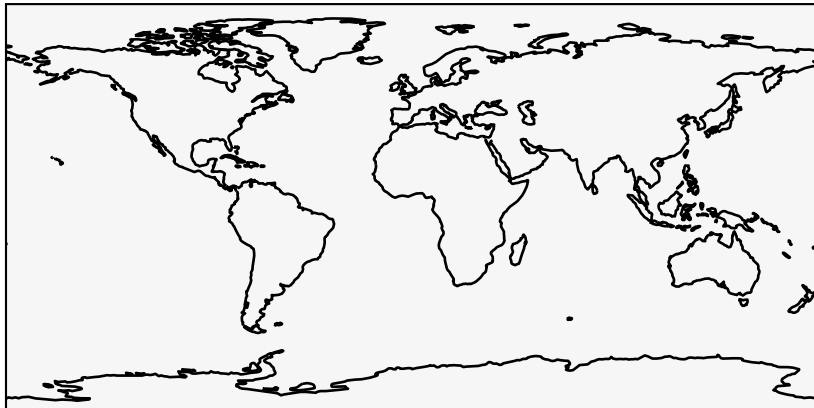
Zero throughout domain  
kg/m2/s

GCHP\_14.0.0 (Dev)  
c24



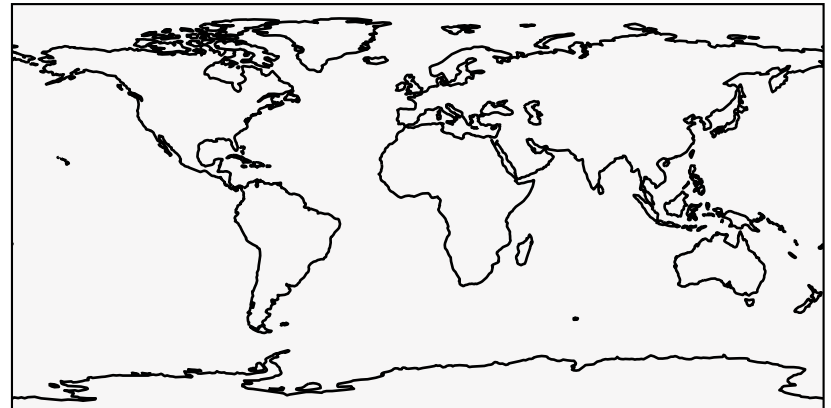
Zero throughout domain  
kg/m2/s

Difference (1x1.25)  
Dev - Ref, Dynamic Range



Zero throughout domain  
kg/m2/s

Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Zero throughout domain  
kg/m2/s

Ratio (1x1.25)  
Dev/Ref, Dynamic Range



Undefined throughout domain  
unitless

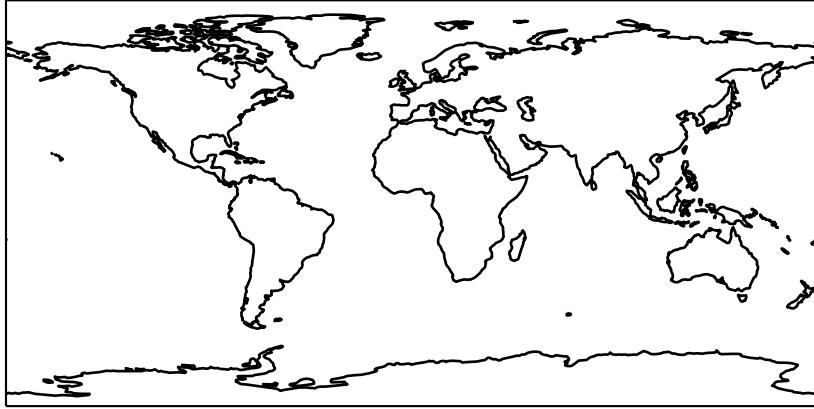
Ratio (1x1.25)  
Dev/Ref, Fixed Range



Undefined throughout domain  
unitless

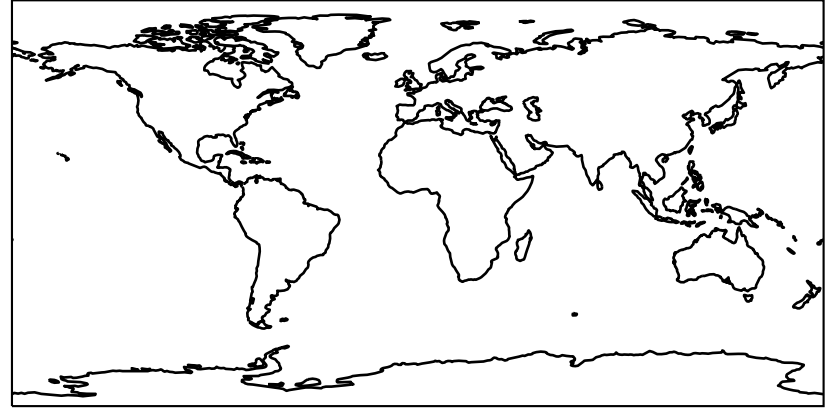
# EmisCO2\_Ship (Oct2019)

GCHP\_13.0.0 (Ref)  
c48



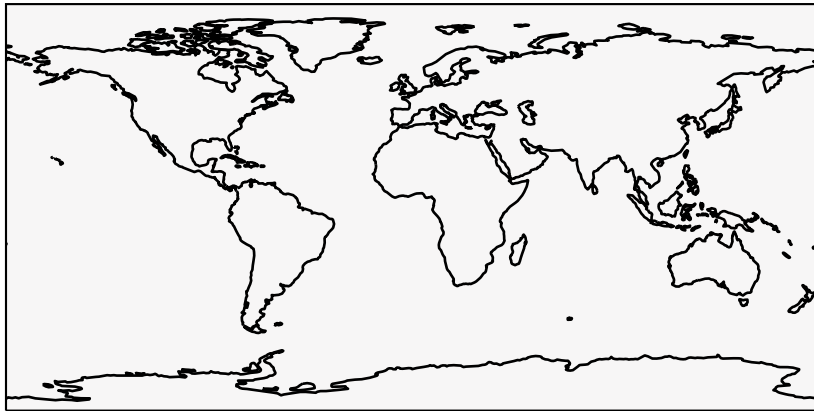
Zero throughout domain  
kg/m2/s

GCHP\_14.0.0 (Dev)  
c24



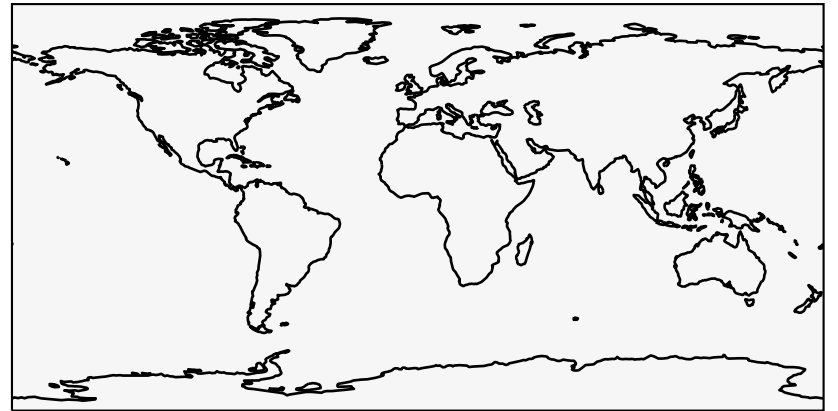
Zero throughout domain  
kg/m2/s

Difference (1x1.25)  
Dev - Ref, Dynamic Range



Zero throughout domain  
kg/m2/s

Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Zero throughout domain  
kg/m2/s

Ratio (1x1.25)  
Dev/Ref, Dynamic Range



Undefined throughout domain  
unitless

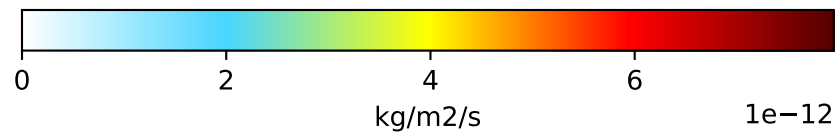
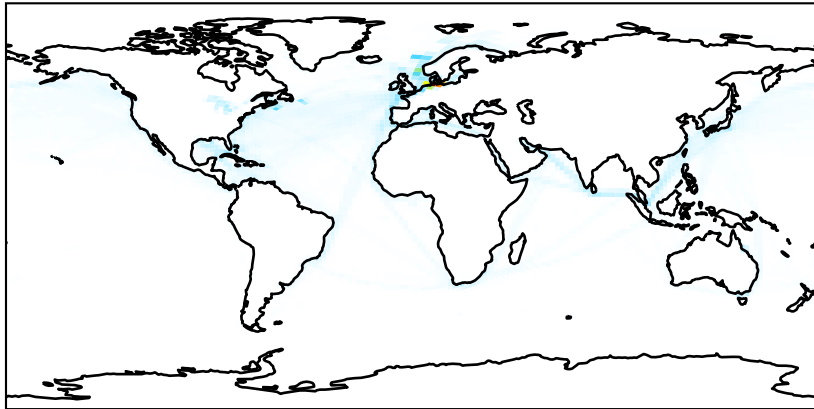
Ratio (1x1.25)  
Dev/Ref, Fixed Range



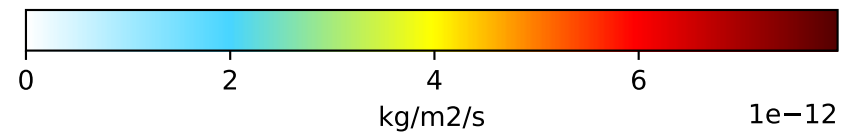
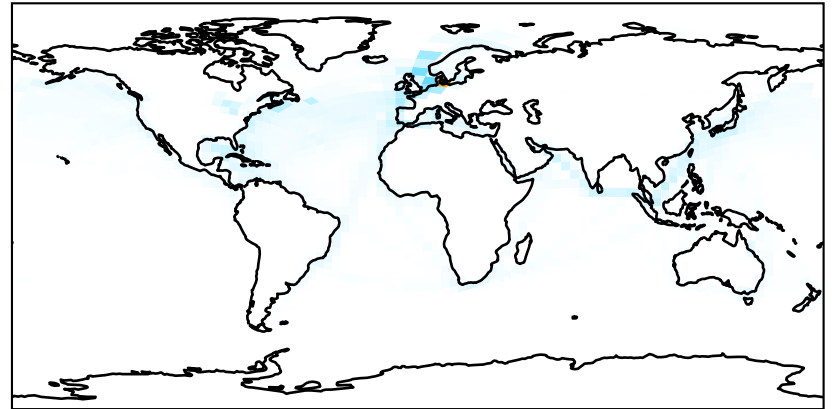
Undefined throughout domain  
unitless

# EmisCO\_Ship (Oct2019)

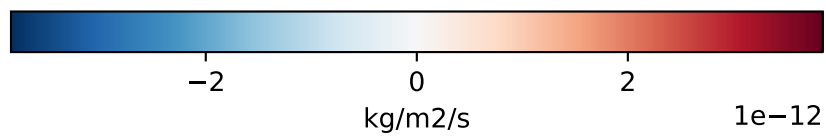
GCHP\_13.0.0 (Ref)  
c48



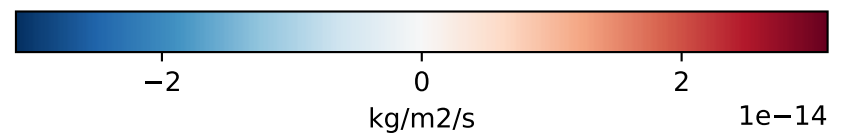
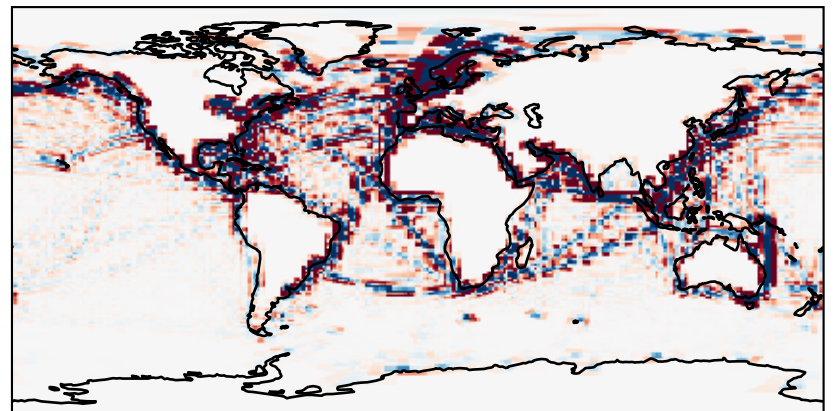
GCHP\_14.0.0 (Dev)  
c24



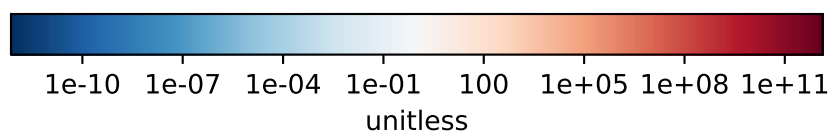
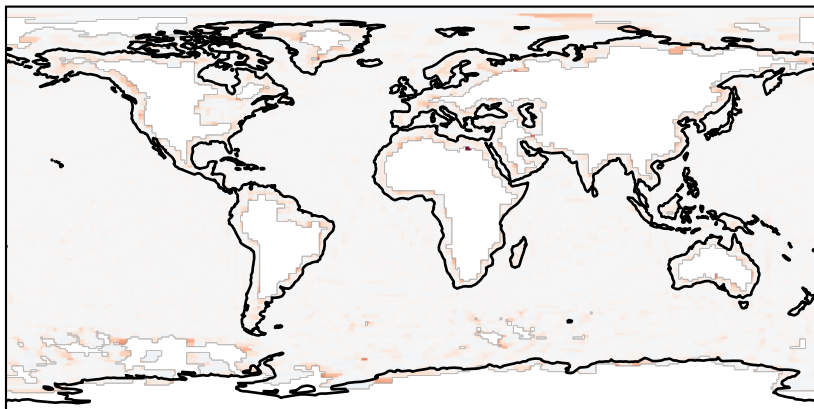
Difference (1x1.25)  
Dev - Ref, Dynamic Range



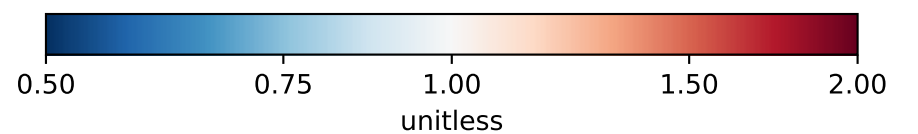
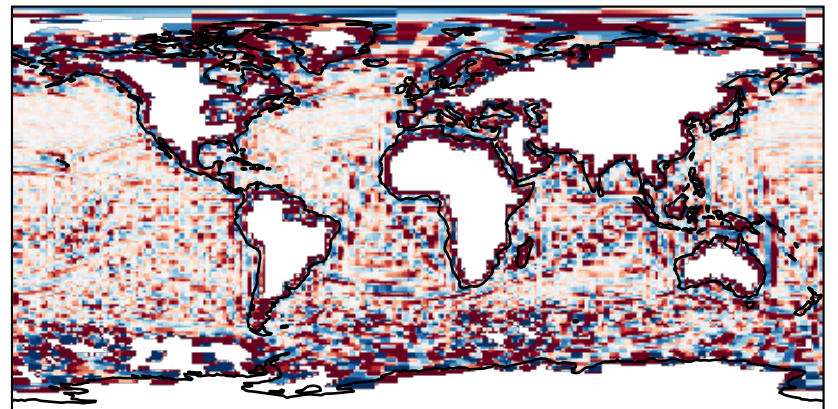
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range

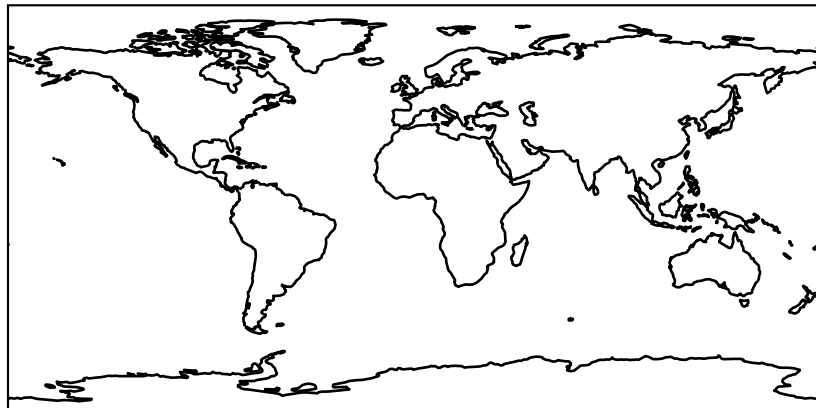


Ratio (1x1.25)  
Dev/Ref, Fixed Range



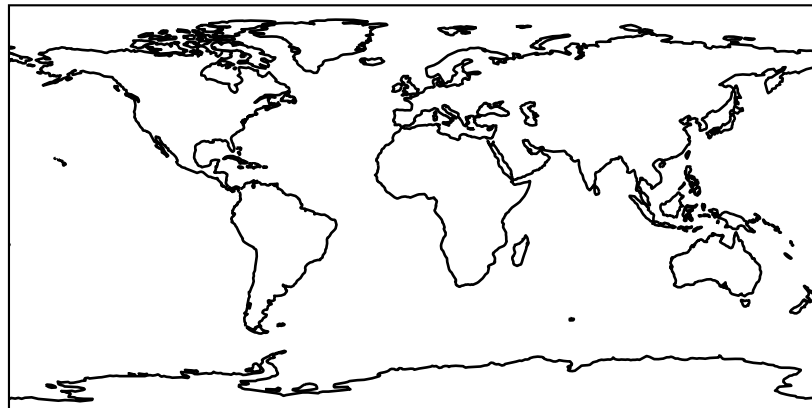
# EmisEOH\_Ship (Oct2019)

GCHP\_13.0.0 (Ref)  
c48



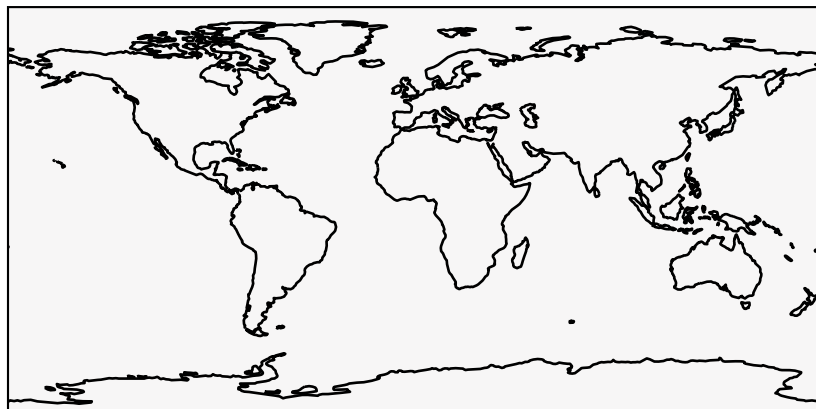
Zero throughout domain  
kg/m2/s

GCHP\_14.0.0 (Dev)  
c24



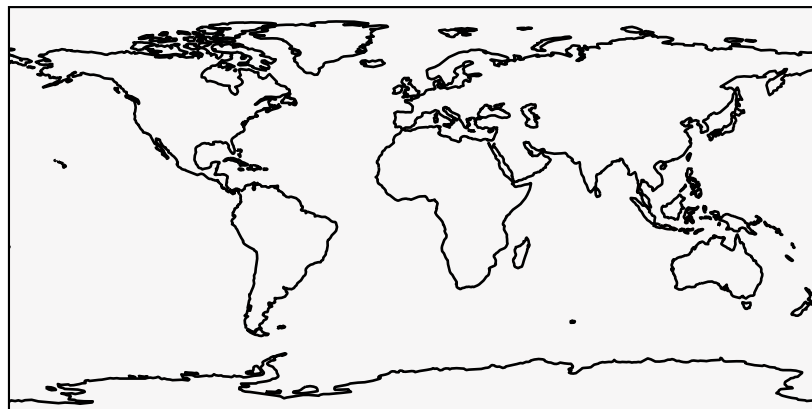
Zero throughout domain  
kg/m2/s

Difference (1x1.25)  
Dev - Ref, Dynamic Range



Zero throughout domain  
kg/m2/s

Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Zero throughout domain  
kg/m2/s

Ratio (1x1.25)  
Dev/Ref, Dynamic Range



Undefined throughout domain  
unitless

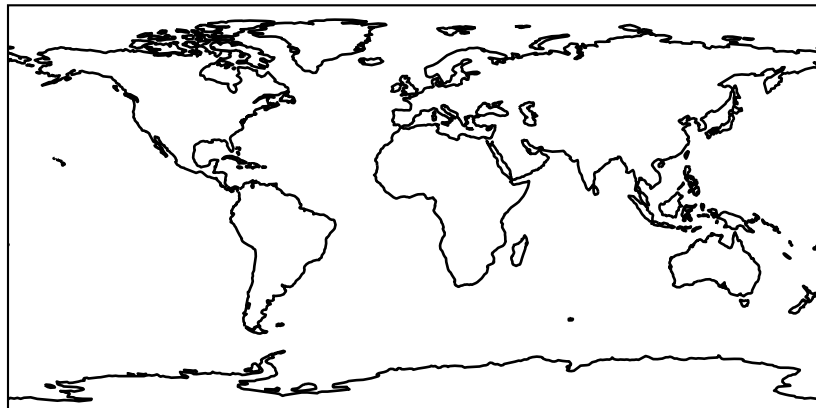
Ratio (1x1.25)  
Dev/Ref, Fixed Range



Undefined throughout domain  
unitless

# EmisHCOOH\_Ship (Oct2019)

GCHP\_13.0.0 (Ref)  
c48



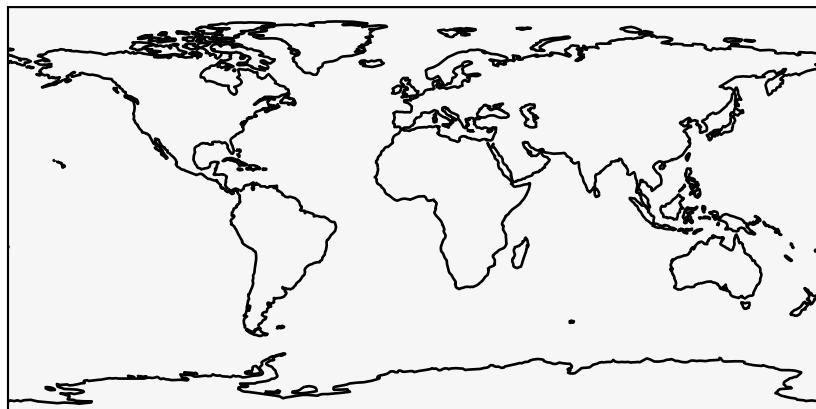
Zero throughout domain  
kg/m<sup>2</sup>/s

GCHP\_14.0.0 (Dev)  
c24



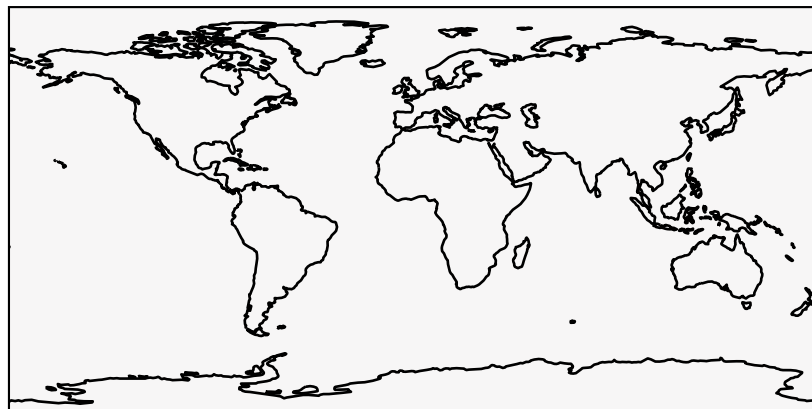
Zero throughout domain  
kg/m<sup>2</sup>/s

Difference (1x1.25)  
Dev - Ref, Dynamic Range



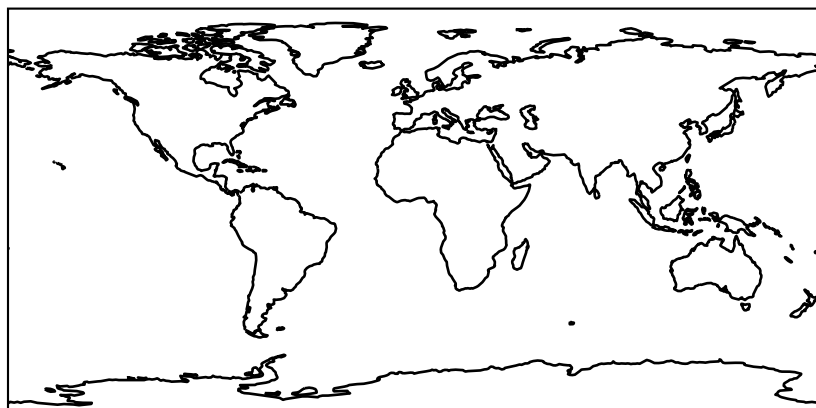
Zero throughout domain  
kg/m<sup>2</sup>/s

Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



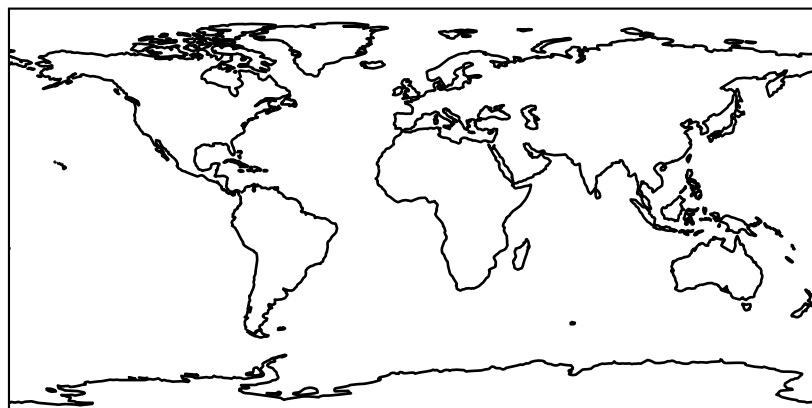
Zero throughout domain  
kg/m<sup>2</sup>/s

Ratio (1x1.25)  
Dev/Ref, Dynamic Range



Undefined throughout domain  
unitless

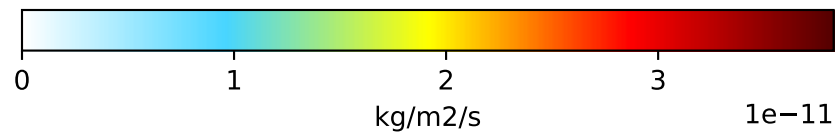
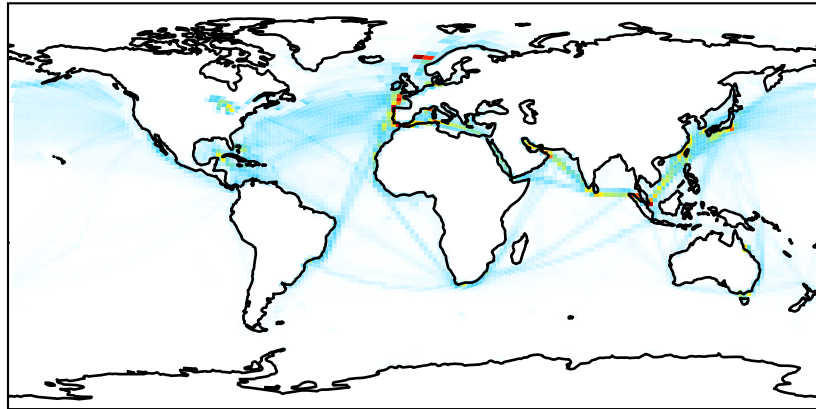
Ratio (1x1.25)  
Dev/Ref, Fixed Range



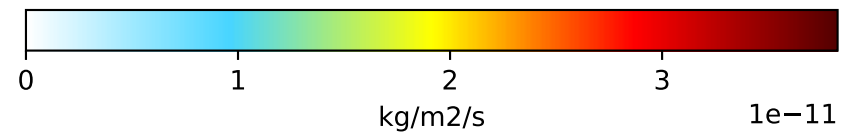
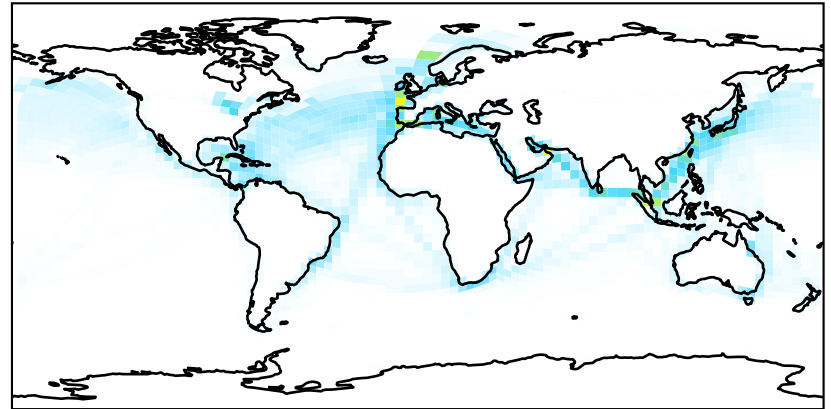
Undefined throughout domain  
unitless

# EmisHNO3\_Ship (Oct2019)

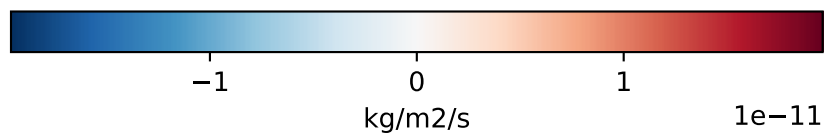
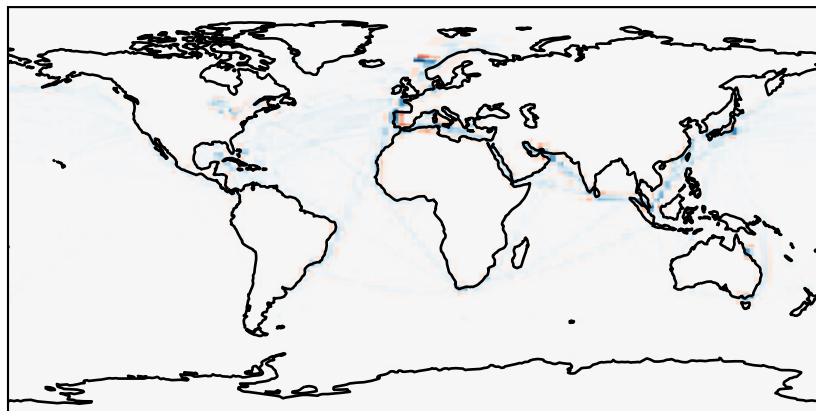
GCHP\_13.0.0 (Ref)  
c48



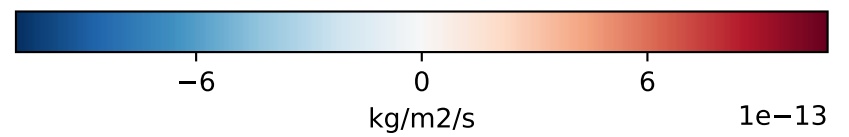
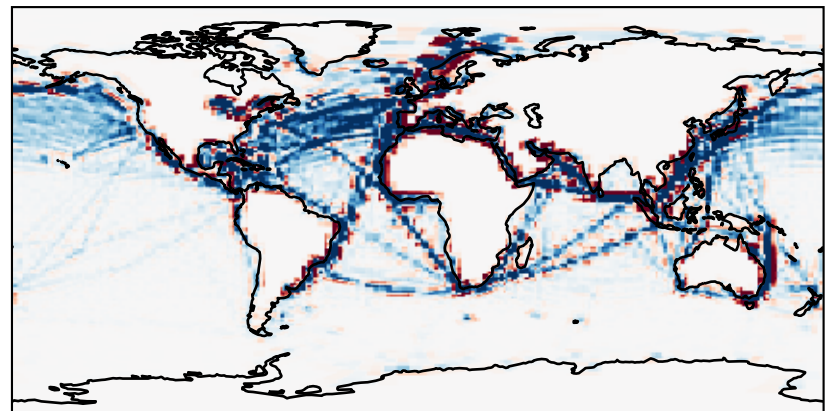
GCHP\_14.0.0 (Dev)  
c24



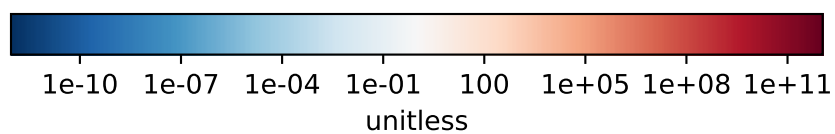
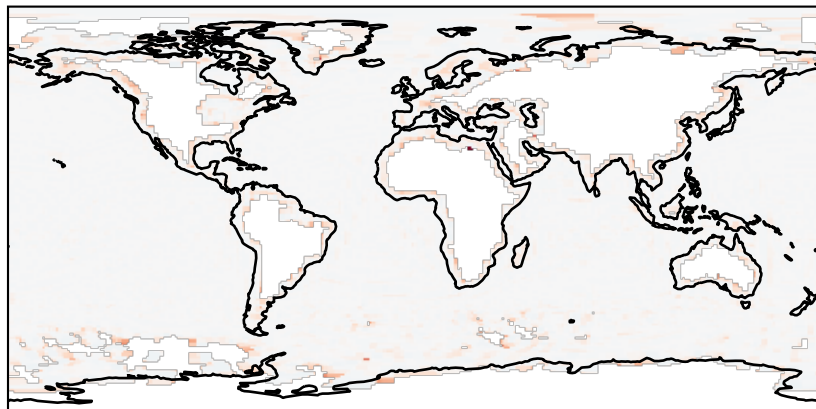
Difference (1x1.25)  
Dev - Ref, Dynamic Range



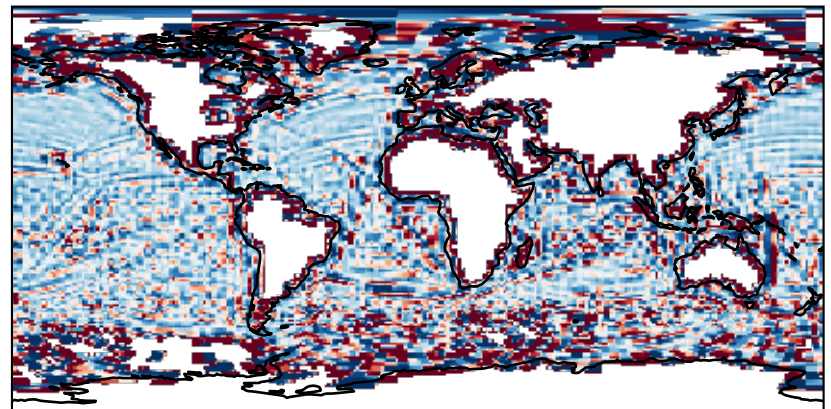
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range

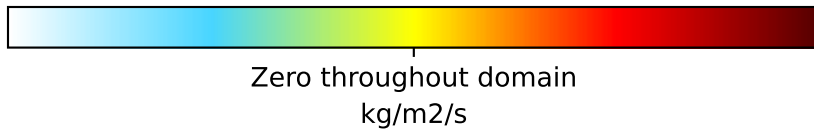
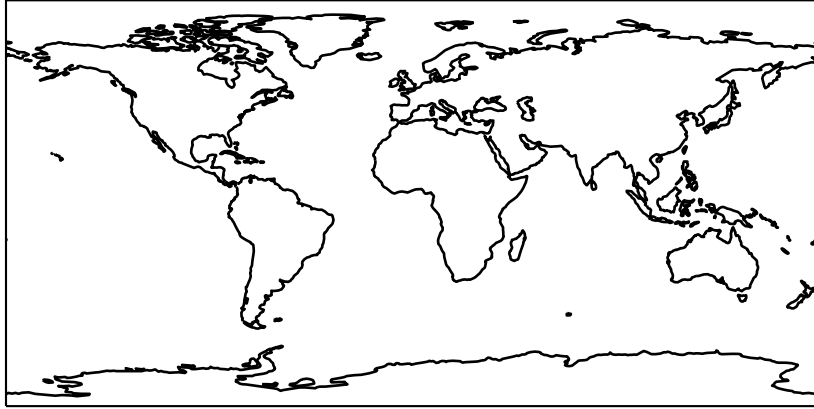


Ratio (1x1.25)  
Dev/Ref, Fixed Range

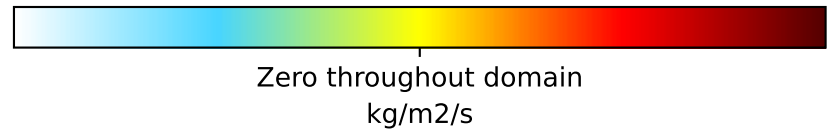
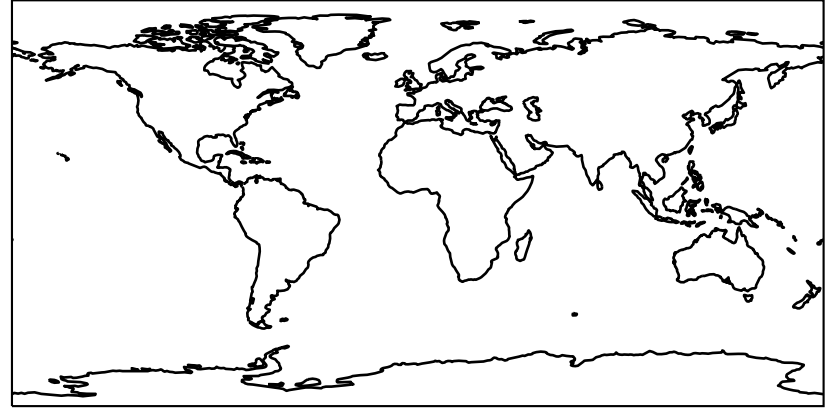


# EmisMEK\_Ship (Oct2019)

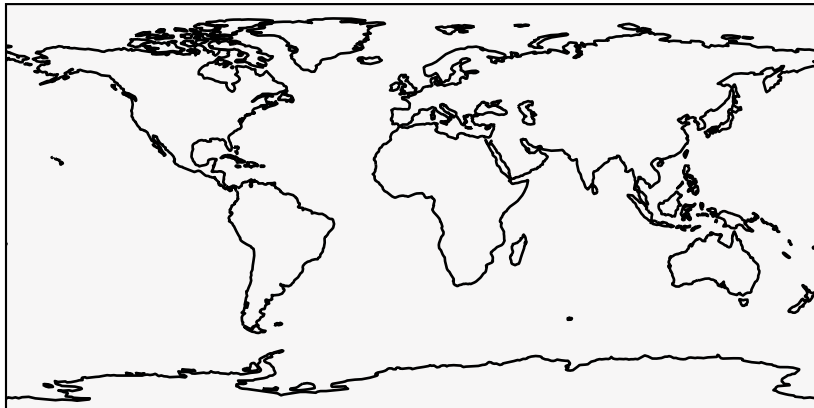
GCHP\_13.0.0 (Ref)  
c48



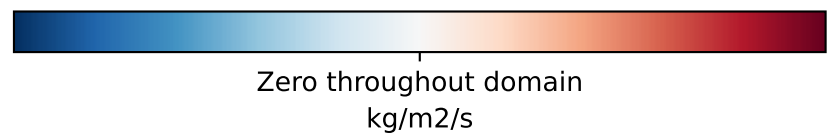
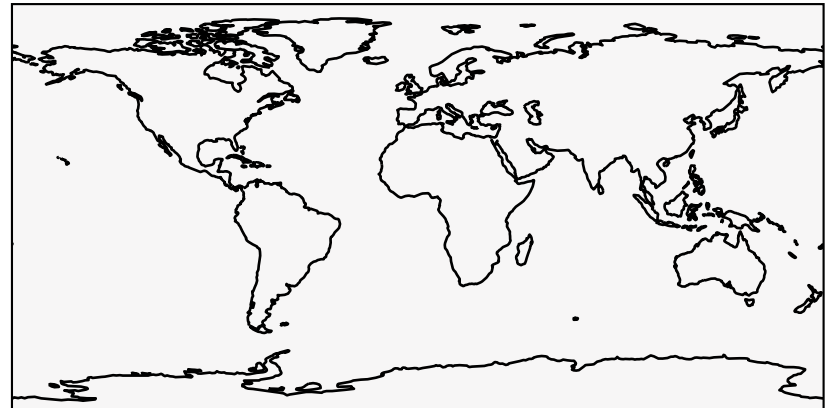
GCHP\_14.0.0 (Dev)  
c24



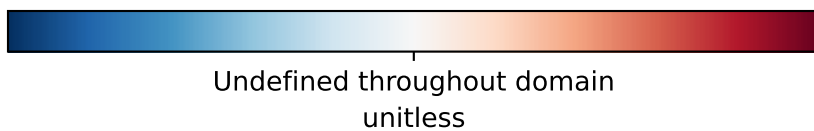
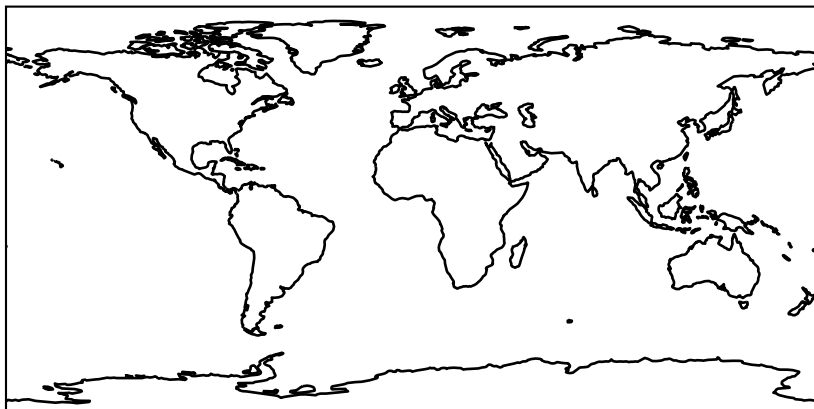
Difference (1x1.25)  
Dev - Ref, Dynamic Range



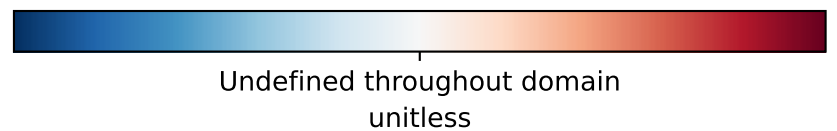
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range



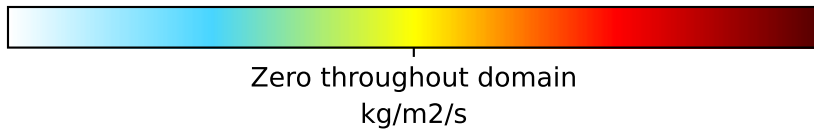
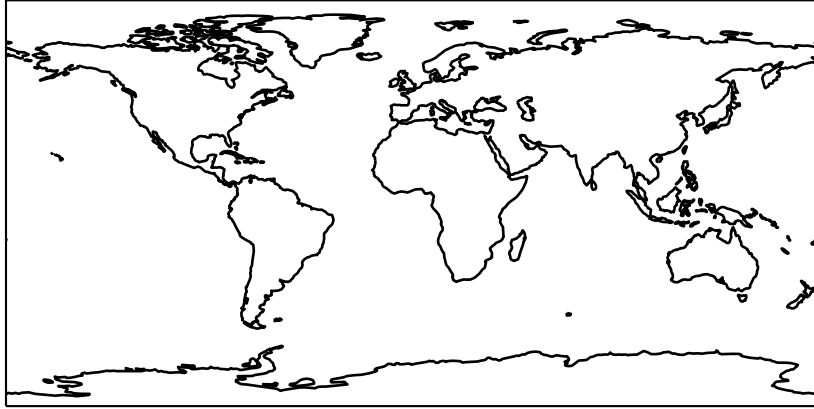
Ratio (1x1.25)  
Dev/Ref, Fixed Range



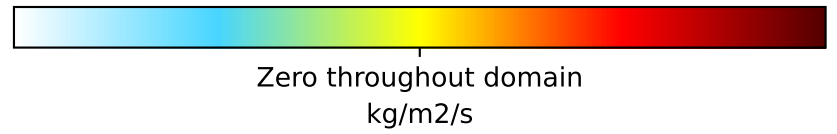
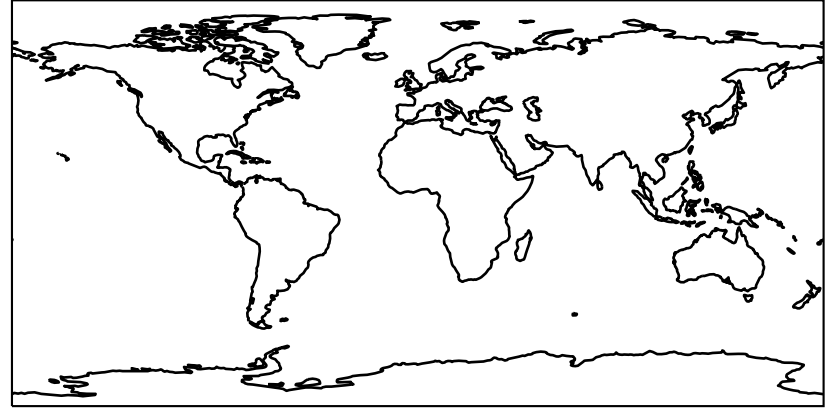


# EmisMOH\_Ship (Oct2019)

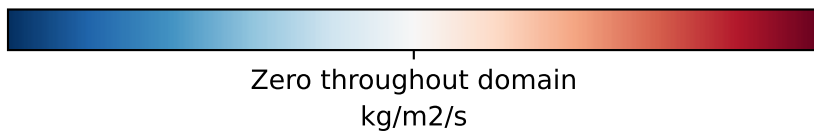
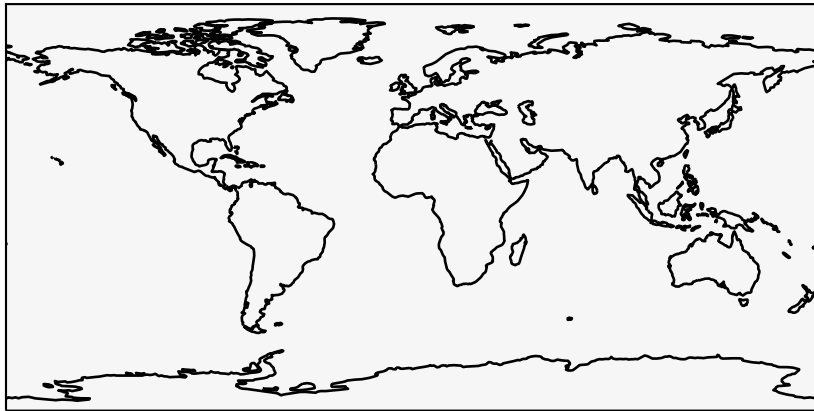
GCHP\_13.0.0 (Ref)  
c48



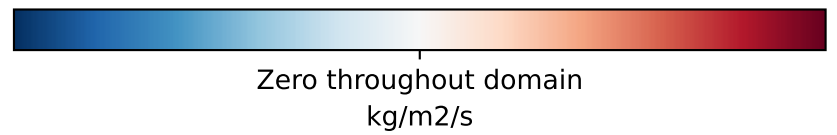
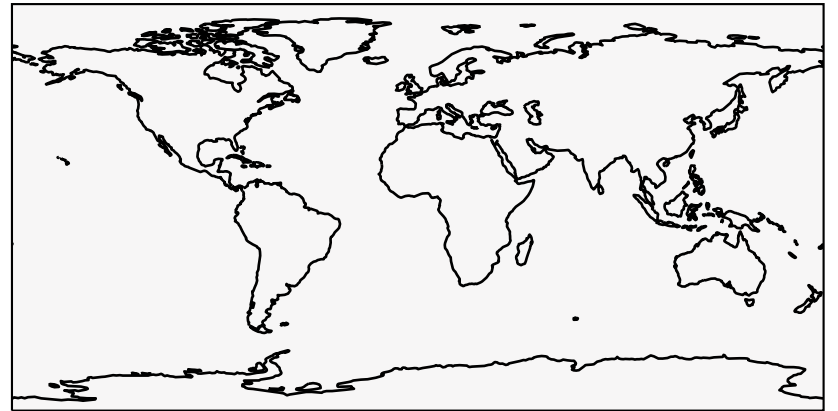
GCHP\_14.0.0 (Dev)  
c24



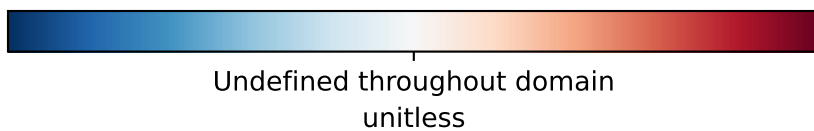
Difference (1x1.25)  
Dev - Ref, Dynamic Range



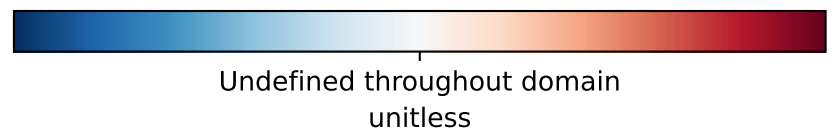
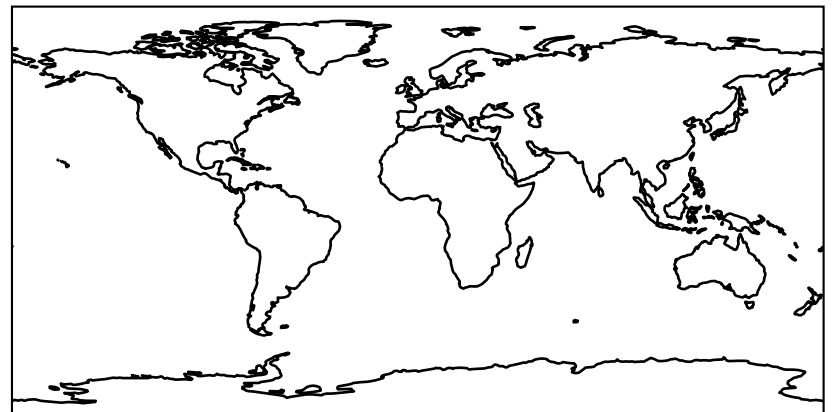
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range

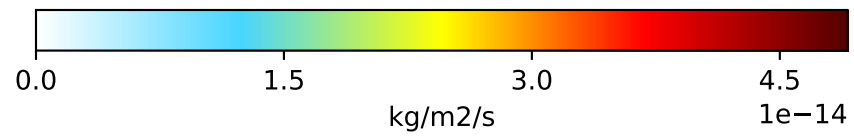
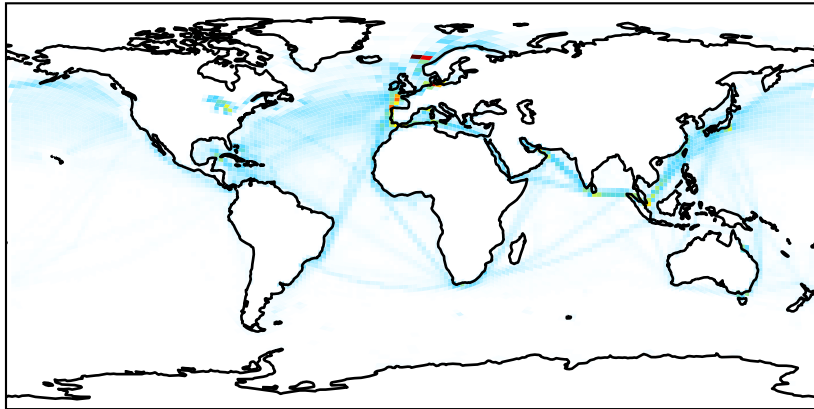


Ratio (1x1.25)  
Dev/Ref, Fixed Range

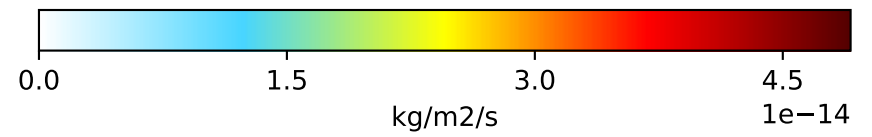
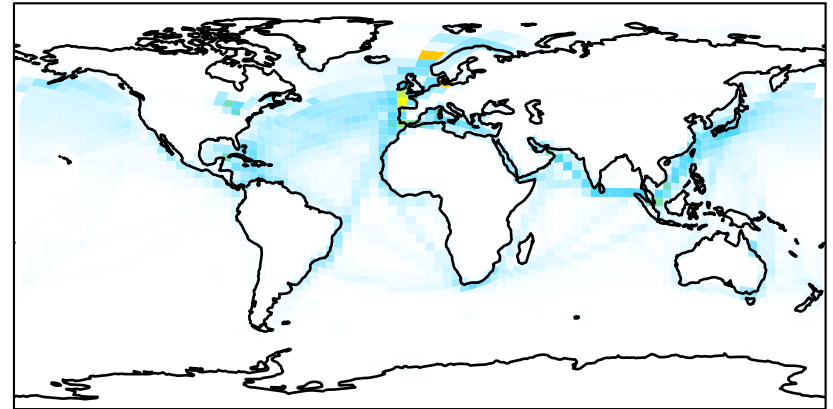


# EmisNH3\_Ship (Oct2019)

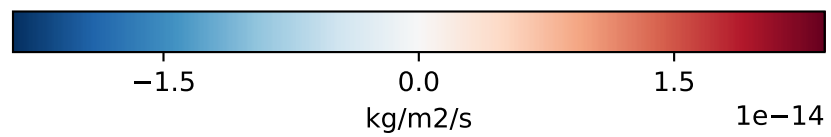
GCHP\_13.0.0 (Ref)  
c48



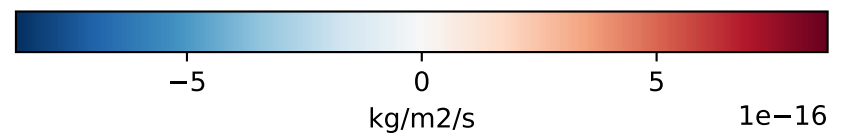
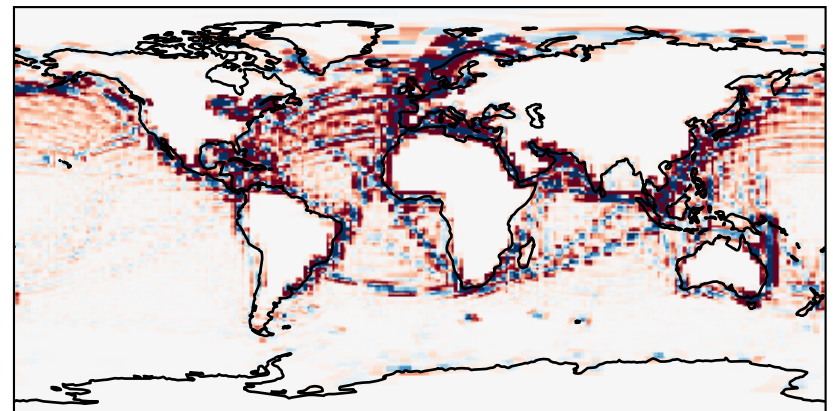
GCHP\_14.0.0 (Dev)  
c24



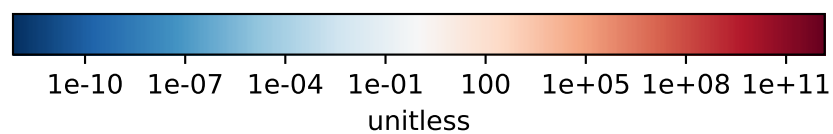
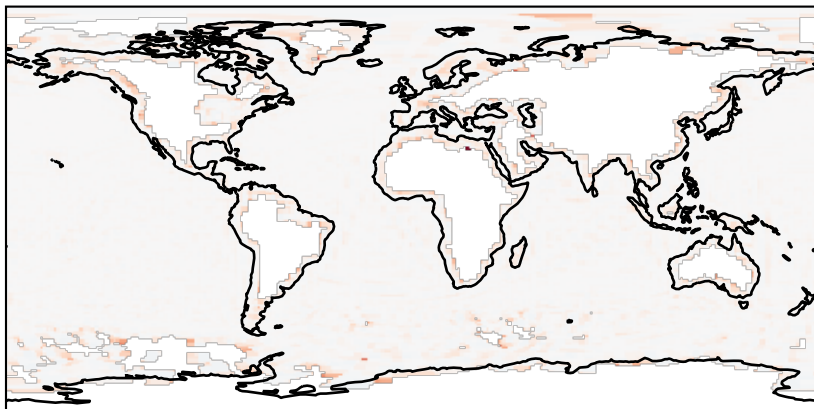
Difference (1x1.25)  
Dev - Ref, Dynamic Range



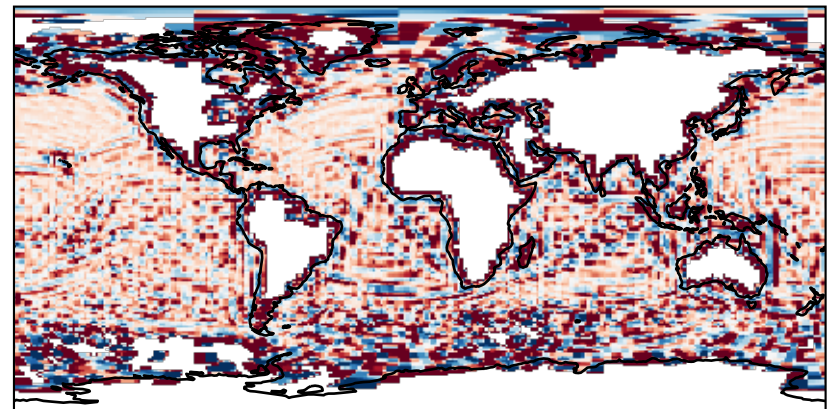
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range

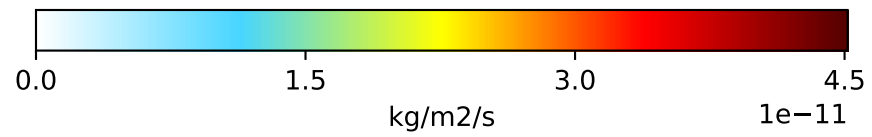
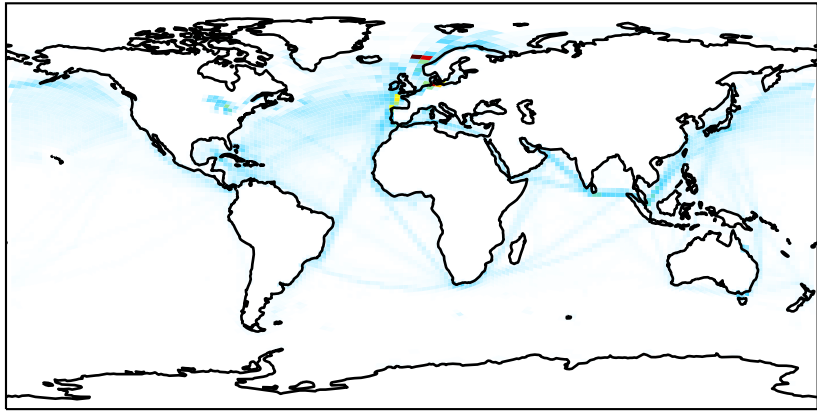


Ratio (1x1.25)  
Dev/Ref, Fixed Range

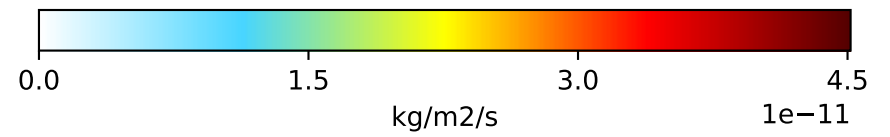
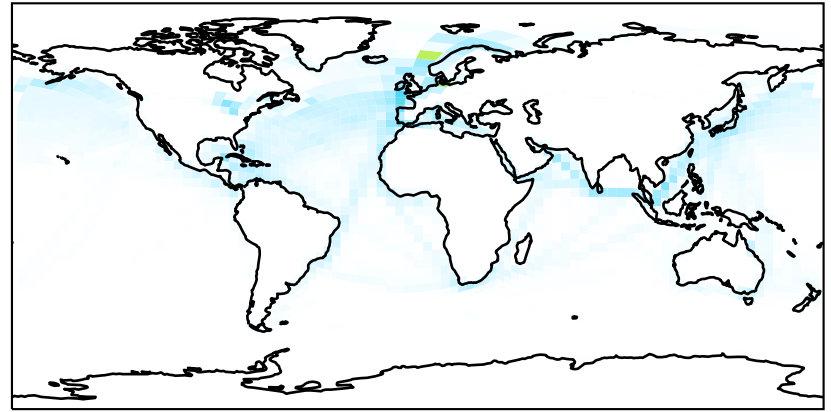


# EmisNO2\_Ship (Oct2019)

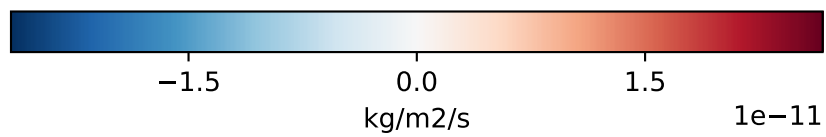
GCHP\_13.0.0 (Ref)  
c48



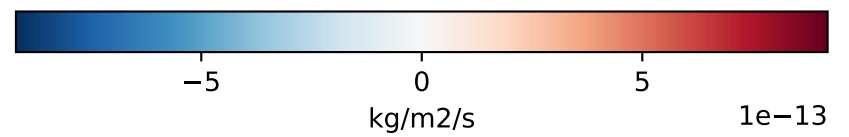
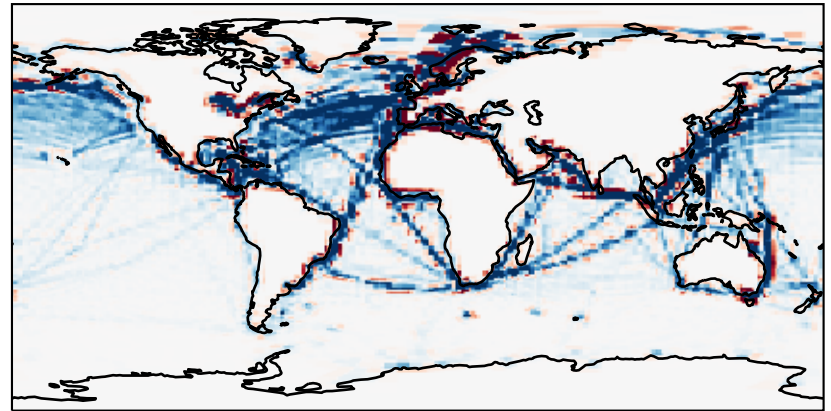
GCHP\_14.0.0 (Dev)  
c24



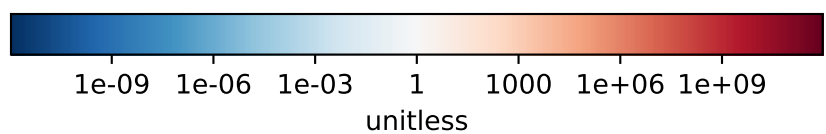
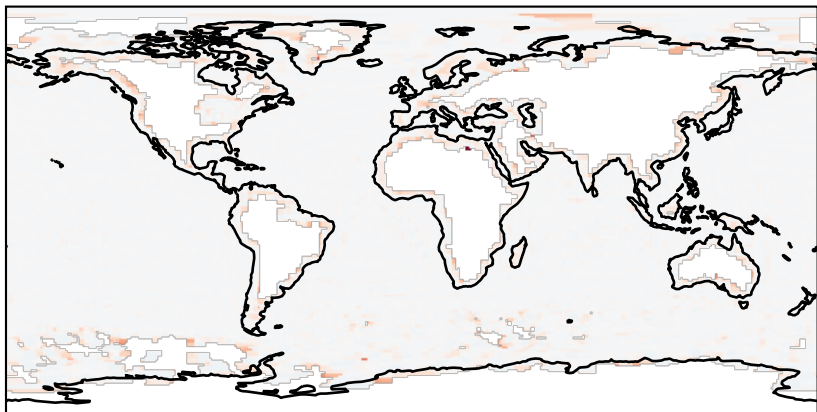
Difference (1x1.25)  
Dev - Ref, Dynamic Range



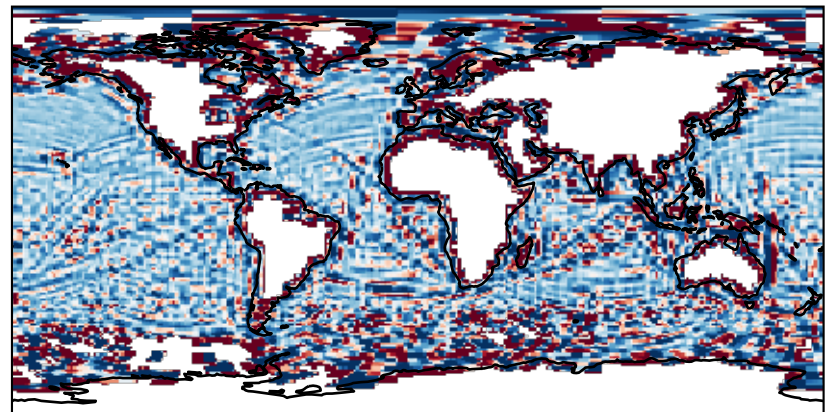
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range

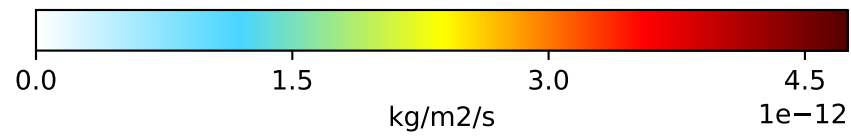
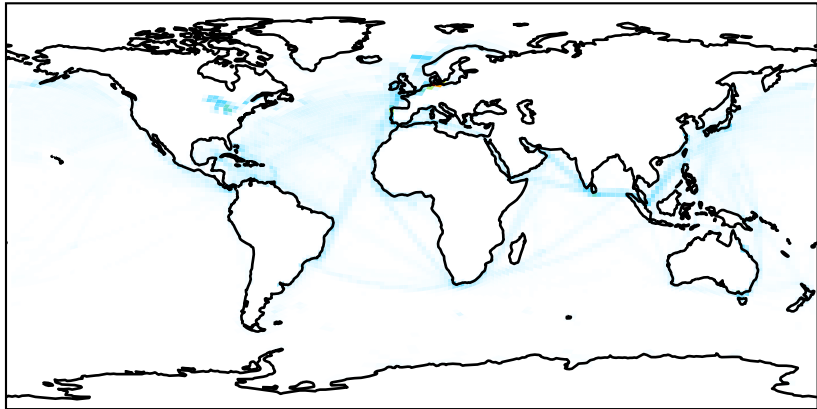


Ratio (1x1.25)  
Dev/Ref, Fixed Range

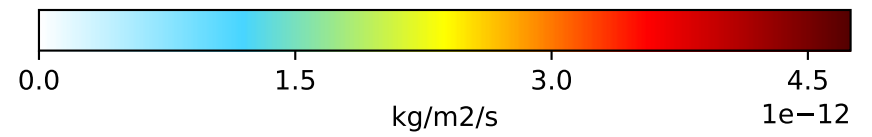
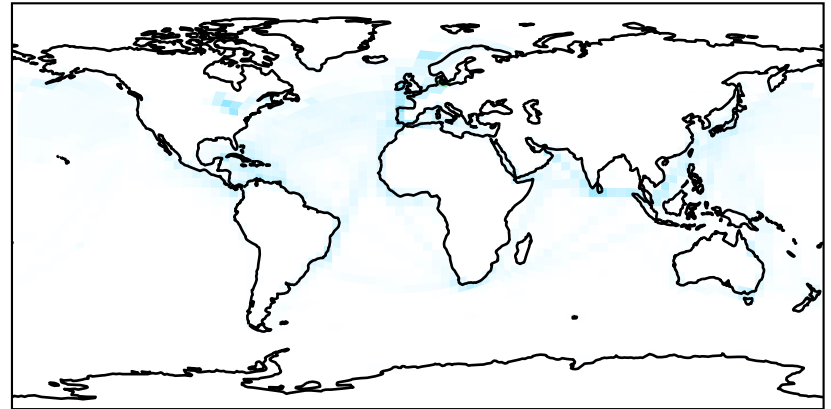


# EmisNO\_Ship (Oct2019)

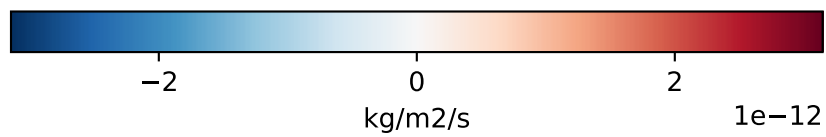
GCHP\_13.0.0 (Ref)  
c48



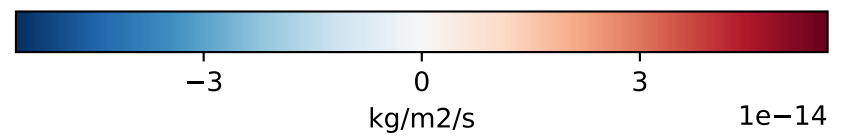
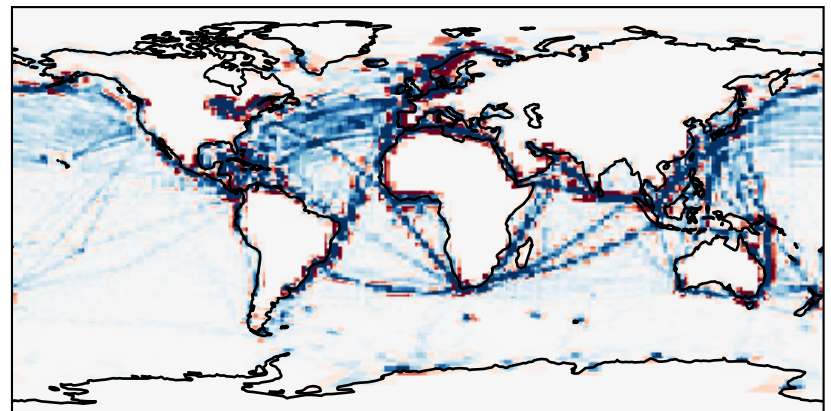
GCHP\_14.0.0 (Dev)  
c24



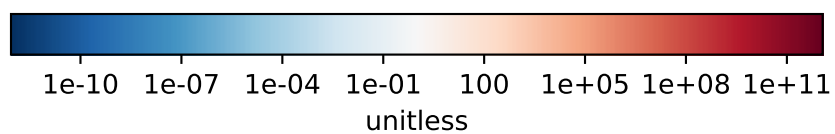
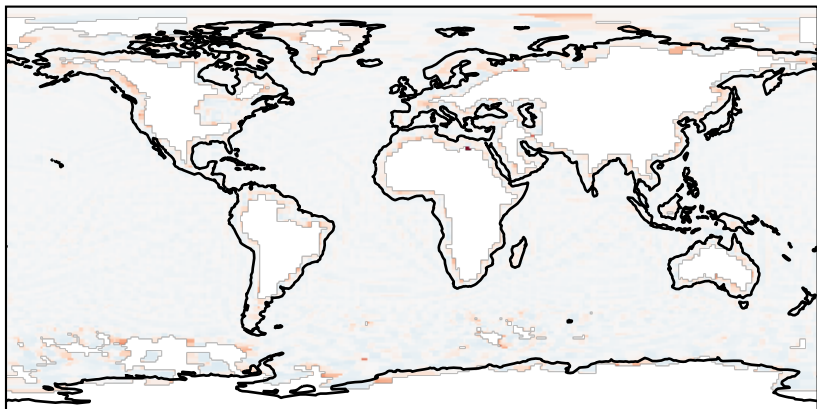
Difference (1x1.25)  
Dev - Ref, Dynamic Range



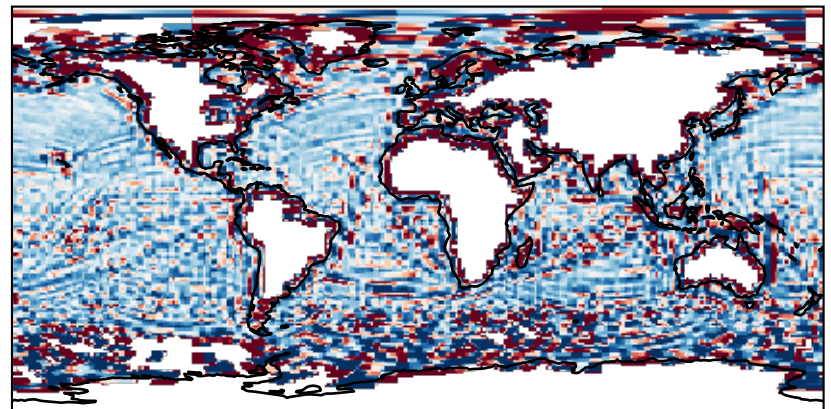
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range

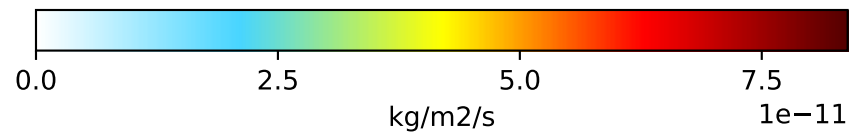
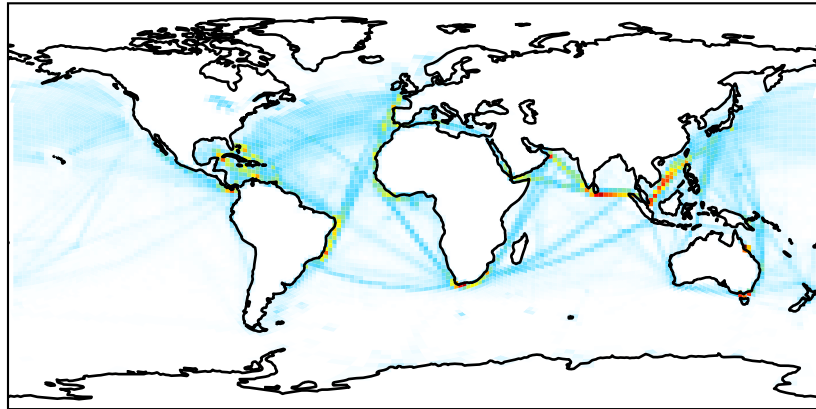


Ratio (1x1.25)  
Dev/Ref, Fixed Range

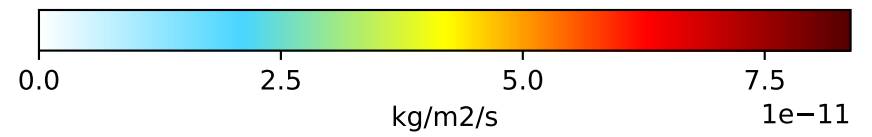
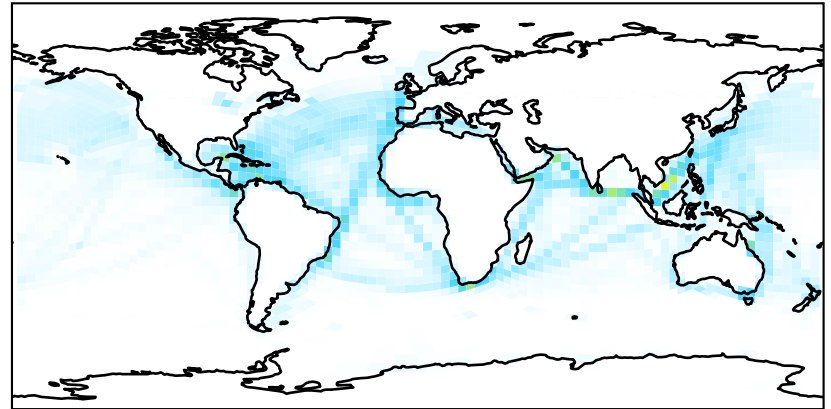


# EmisO3\_Ship (Oct2019)

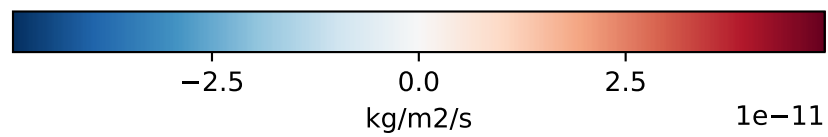
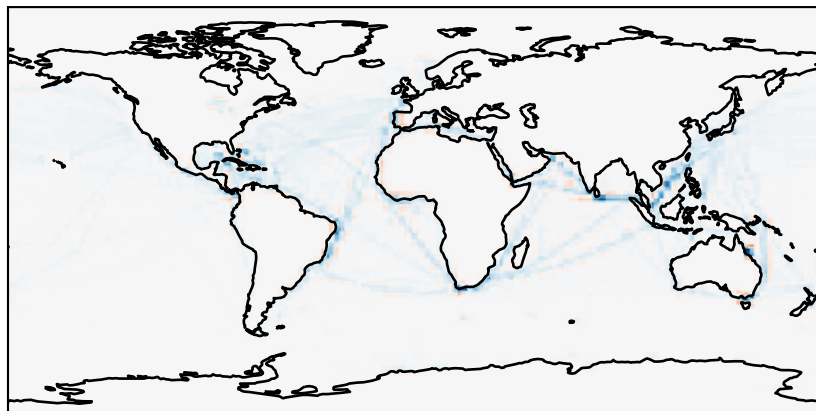
GCHP\_13.0.0 (Ref)  
c48



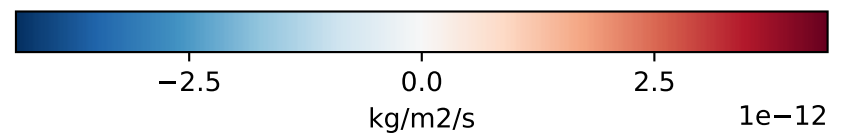
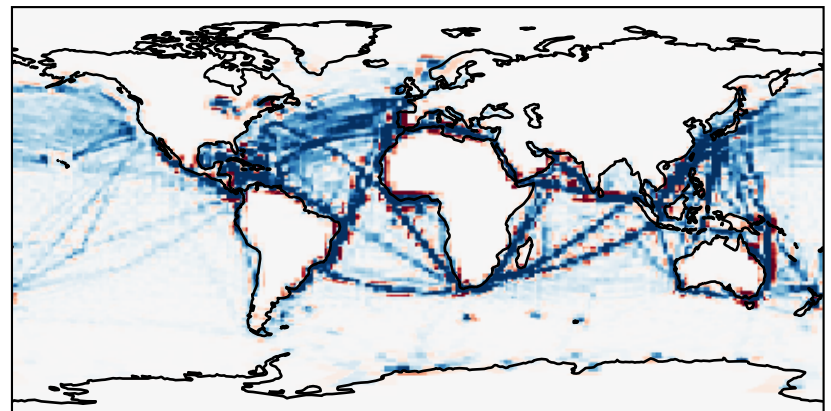
GCHP\_14.0.0 (Dev)  
c24



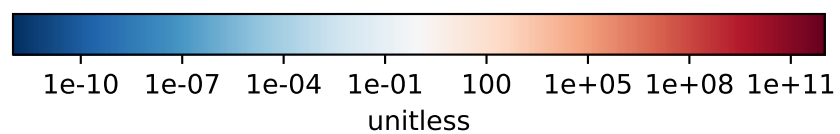
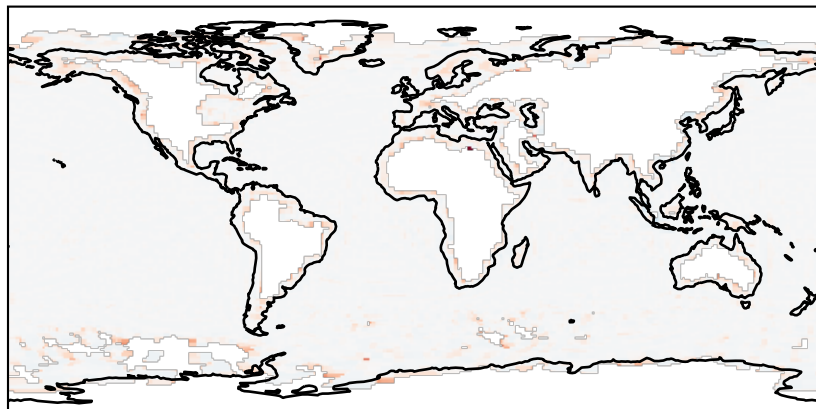
Difference (1x1.25)  
Dev - Ref, Dynamic Range



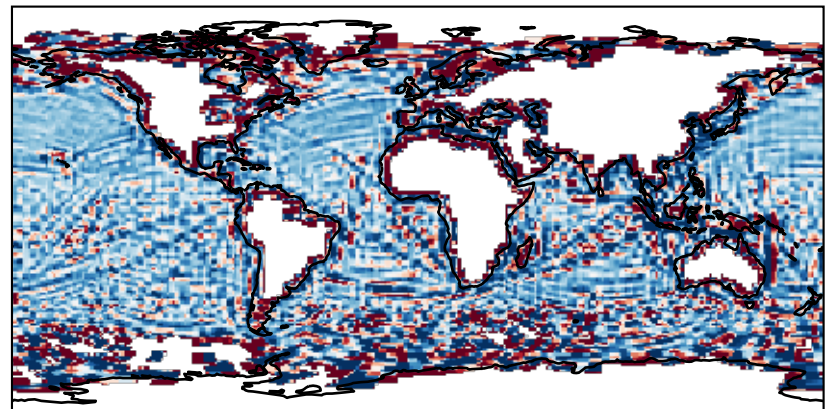
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range

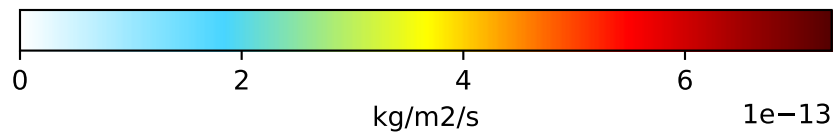
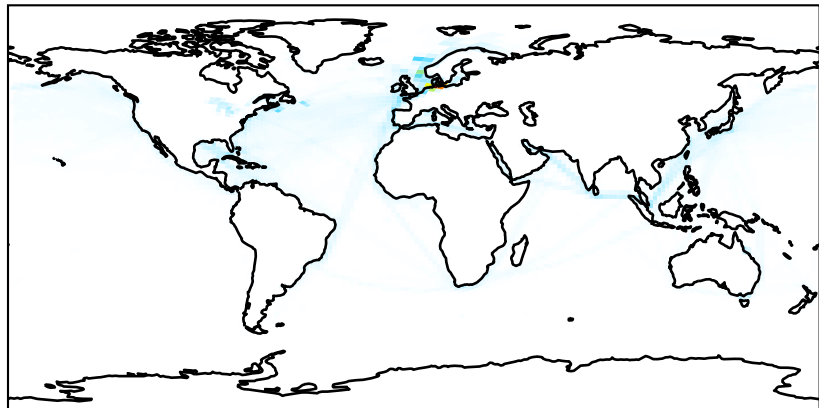


Ratio (1x1.25)  
Dev/Ref, Fixed Range

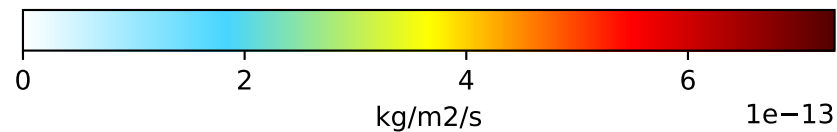


# EmisOCPI\_Ship (Oct2019)

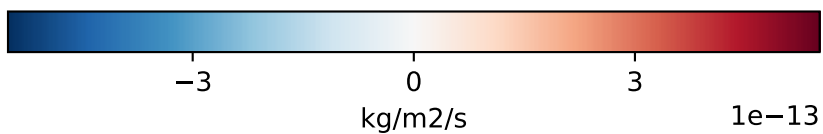
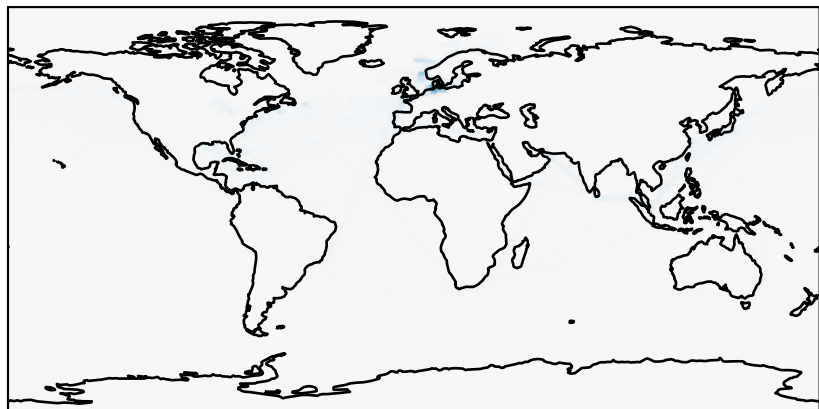
GCHP\_13.0.0 (Ref)  
c48



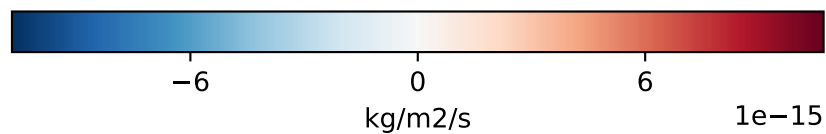
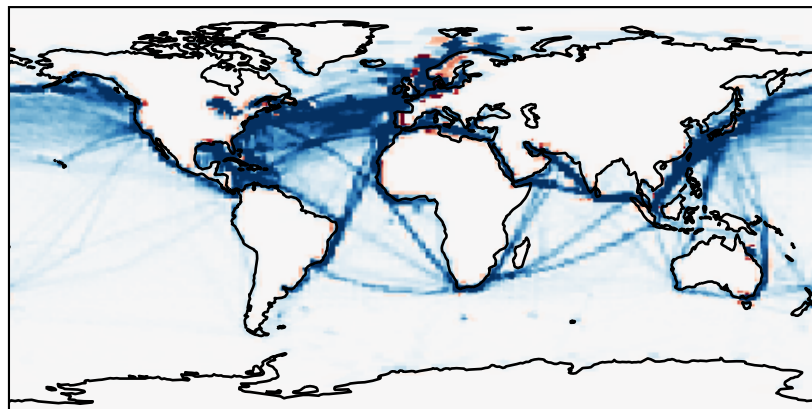
GCHP\_13.0.0 (Dev)  
c24



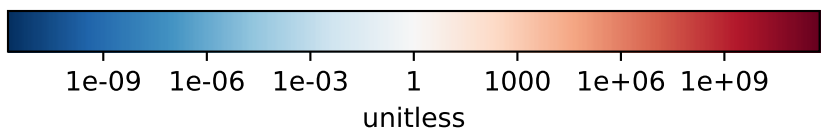
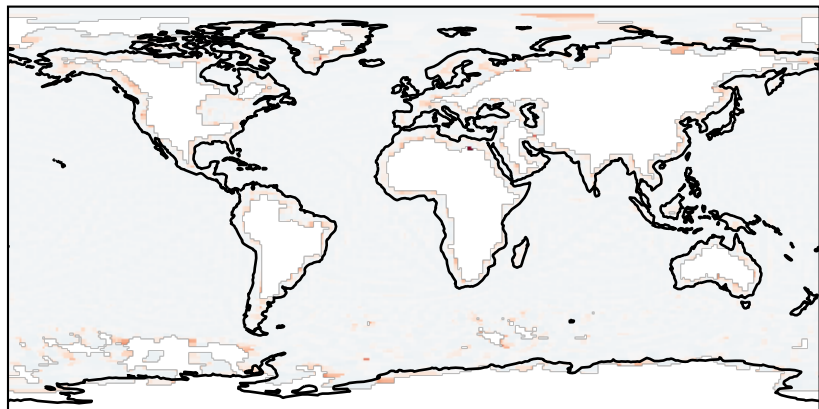
Difference (1x1.25)  
Dev - Ref, Dynamic Range



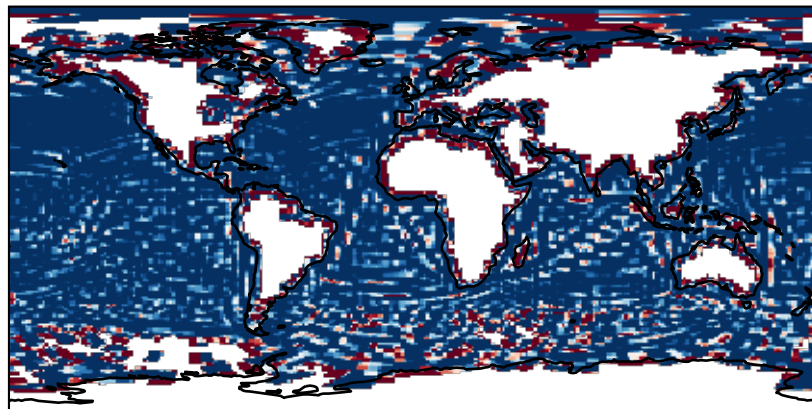
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range

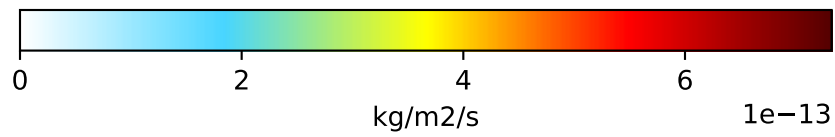
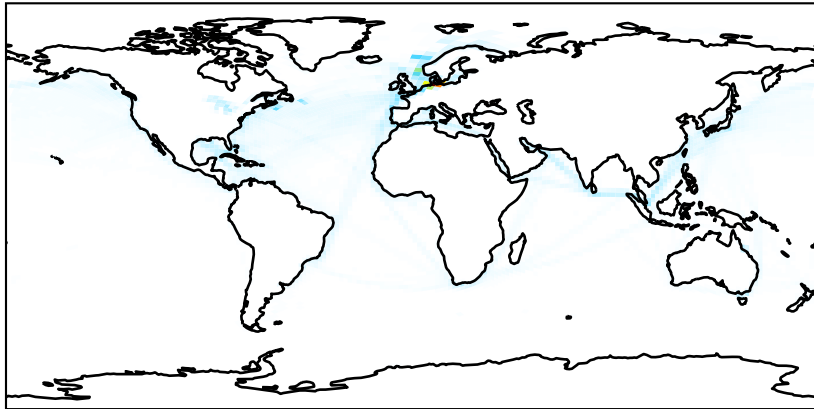


Ratio (1x1.25)  
Dev/Ref, Fixed Range

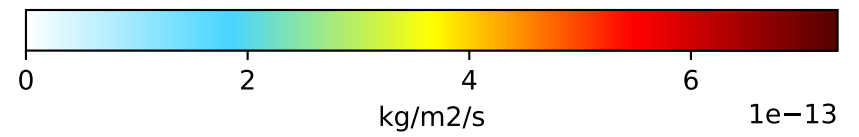


# EmisOCPO\_Ship (Oct2019)

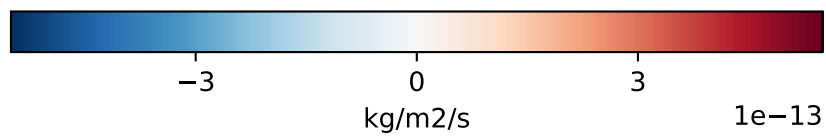
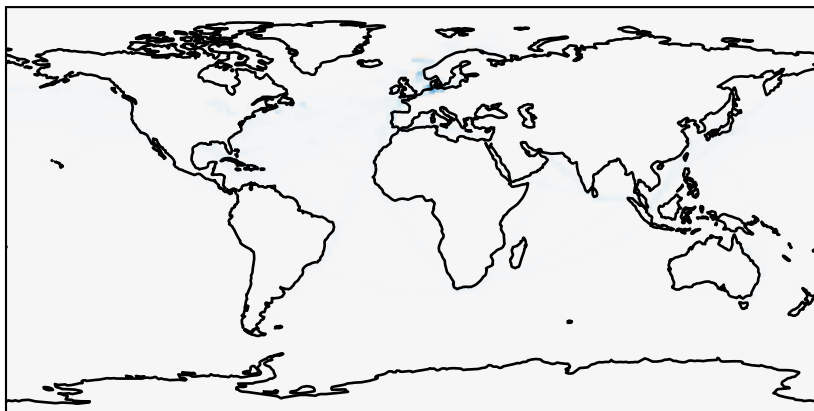
GCHP\_13.0.0 (Ref)  
c48



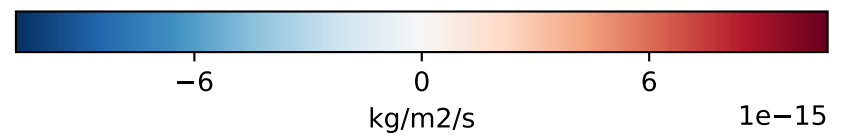
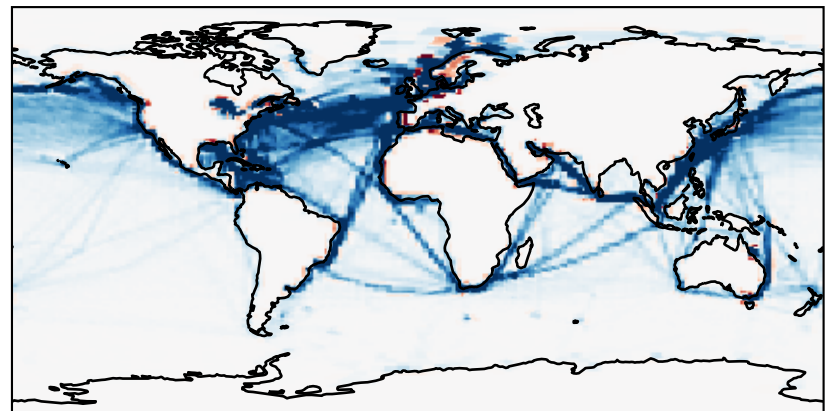
GCHP\_13.0.0 (Dev)  
c24



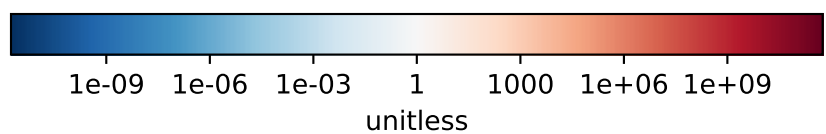
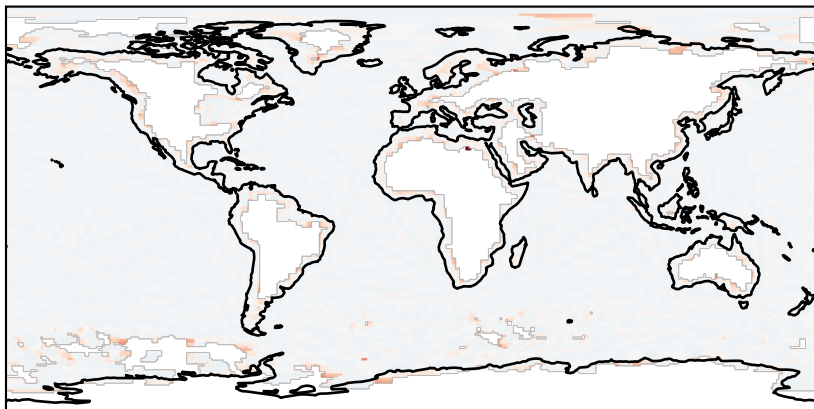
Difference (1x1.25)  
Dev - Ref, Dynamic Range



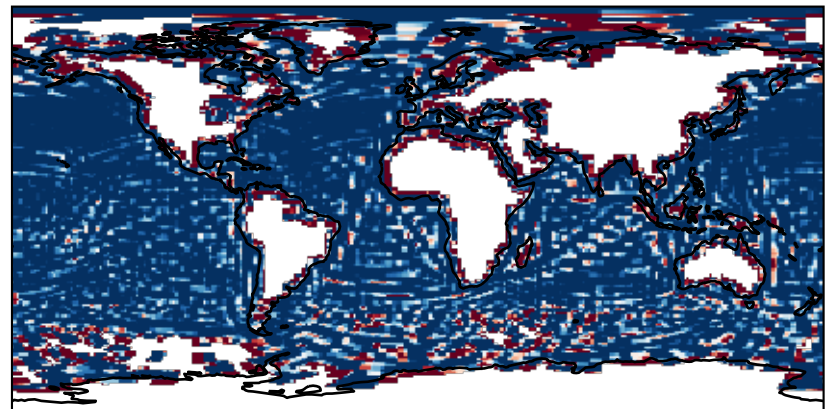
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range

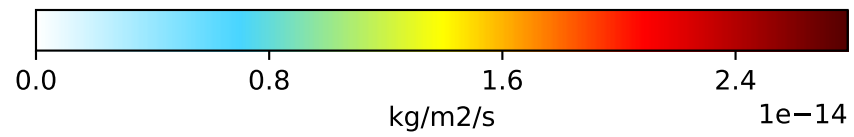
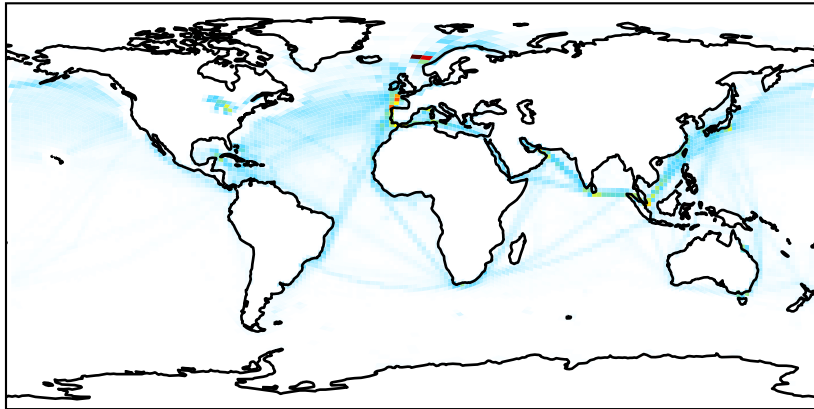


Ratio (1x1.25)  
Dev/Ref, Fixed Range

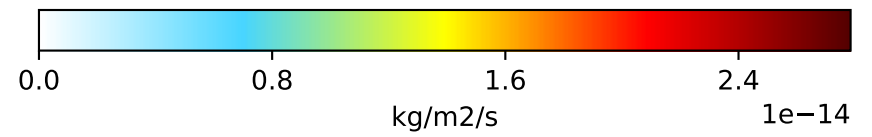
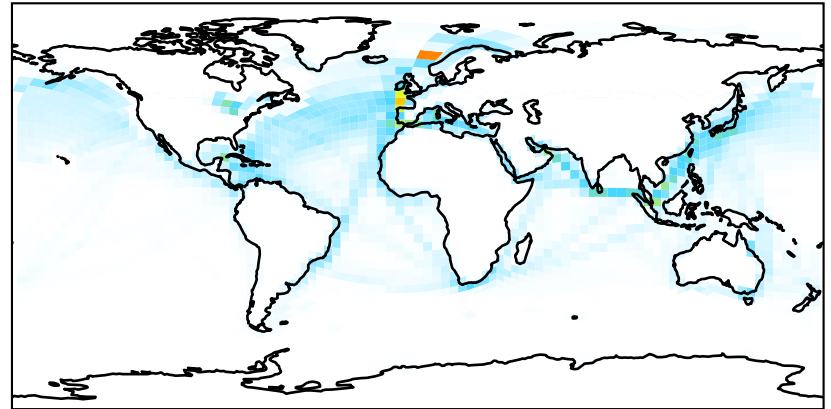


# EmispFe\_Ship (Oct2019)

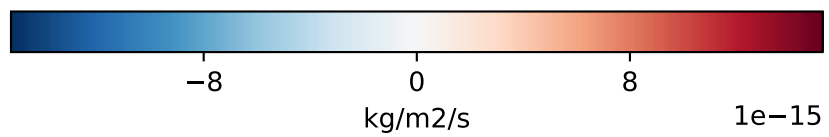
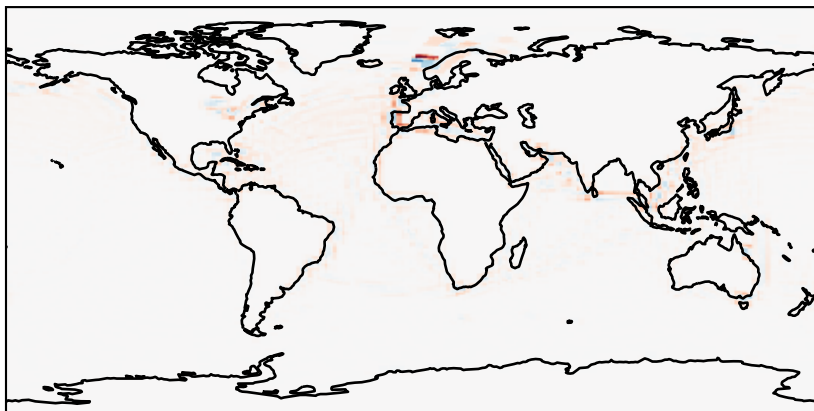
GCHP\_13.0.0 (Ref)  
c48



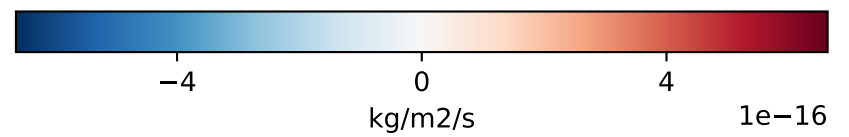
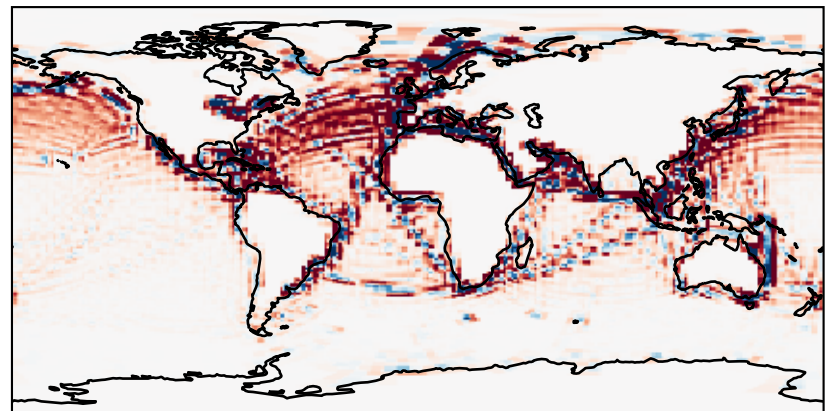
GCHP\_14.0.0 (Dev)  
c24



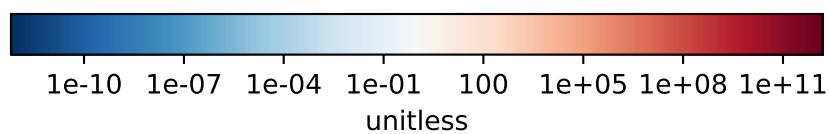
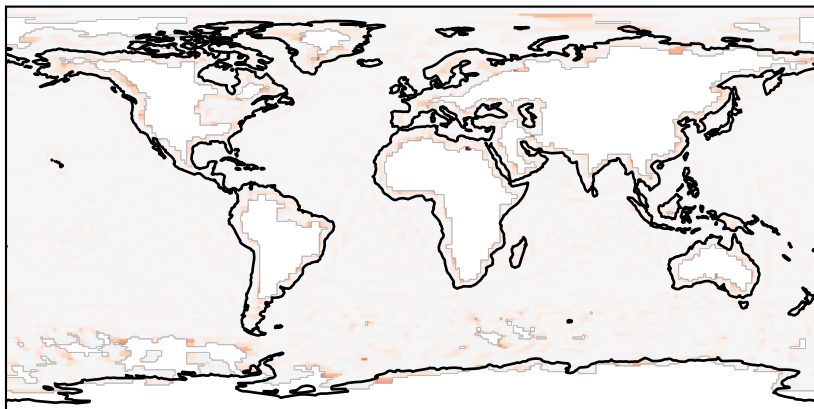
Difference (1x1.25)  
Dev - Ref, Dynamic Range



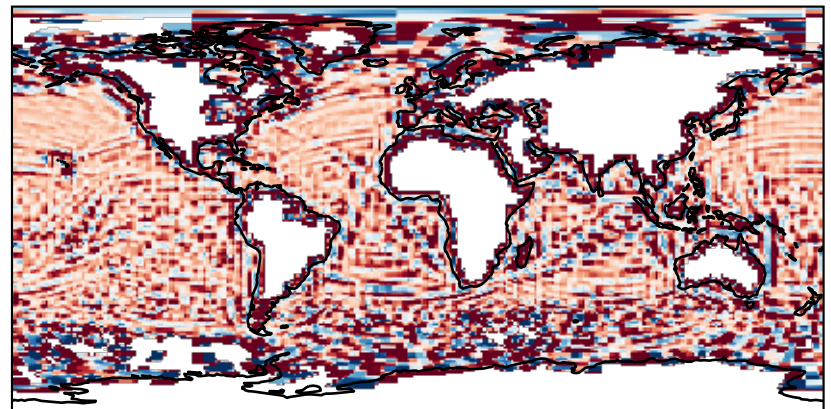
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range



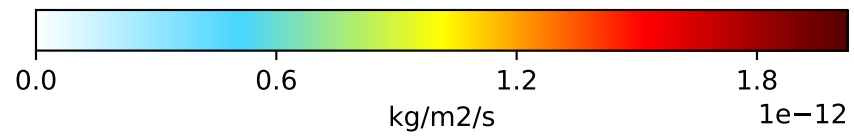
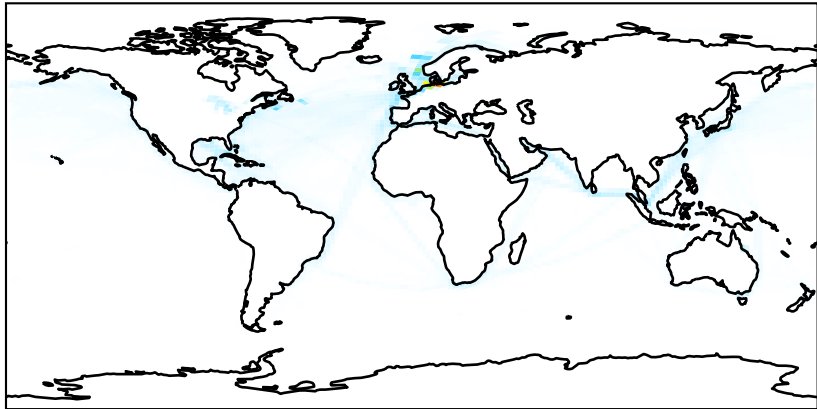
Ratio (1x1.25)  
Dev/Ref, Fixed Range



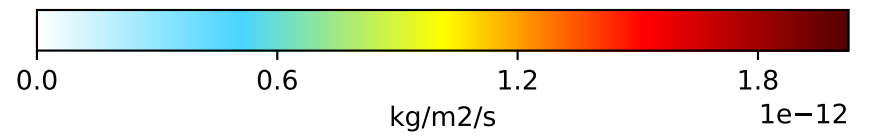


# EmisPRPE\_Ship (Oct2019)

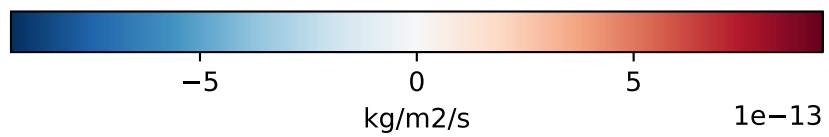
GCHP\_13.0.0 (Ref)  
c48



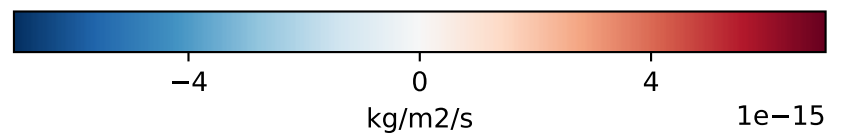
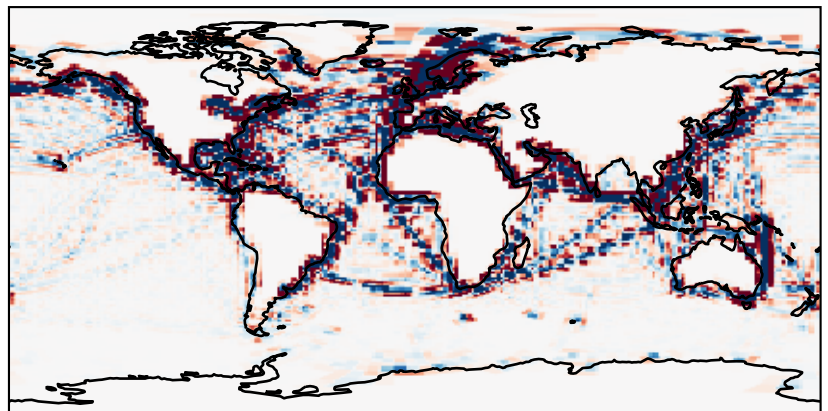
GCHP\_14.0.0 (Dev)  
c24



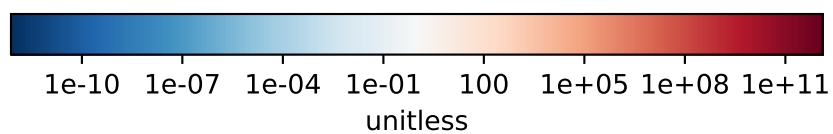
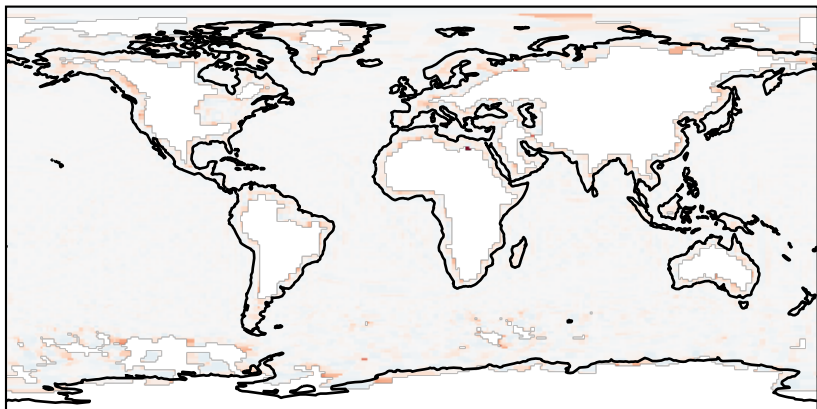
Difference (1x1.25)  
Dev - Ref, Dynamic Range



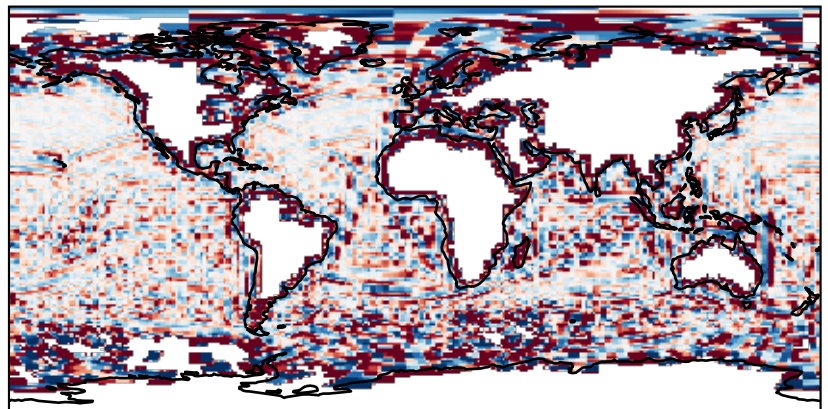
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range

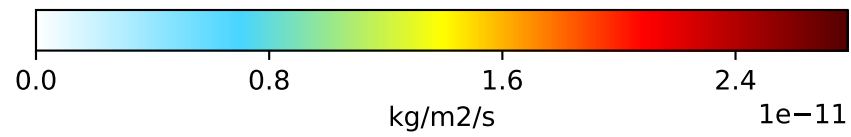
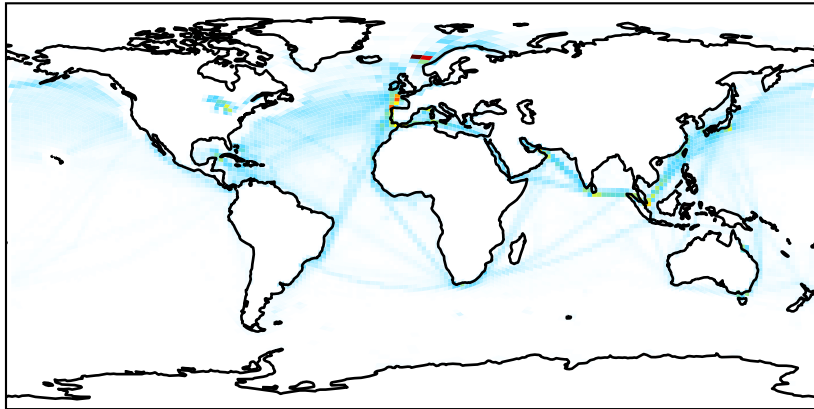


Ratio (1x1.25)  
Dev/Ref, Fixed Range

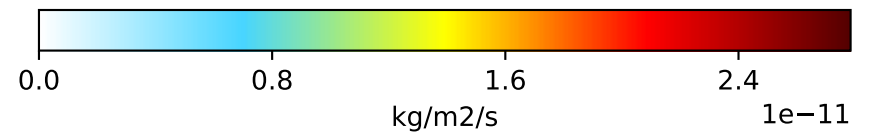
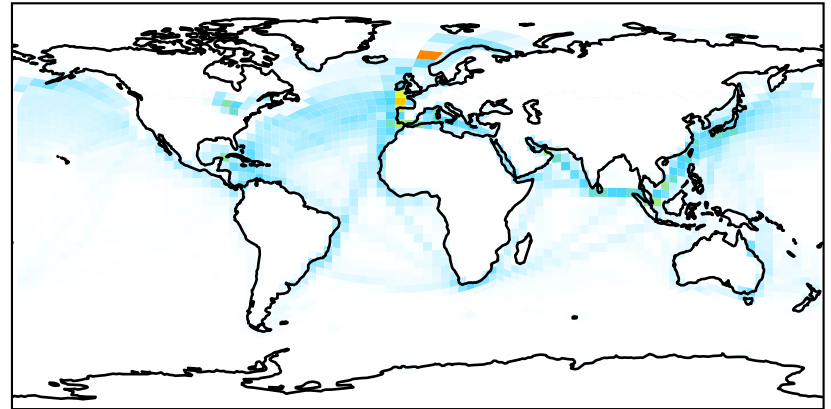


# EmisSO2\_Ship (Oct2019)

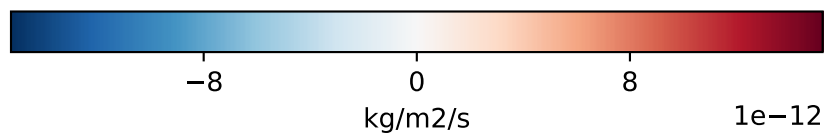
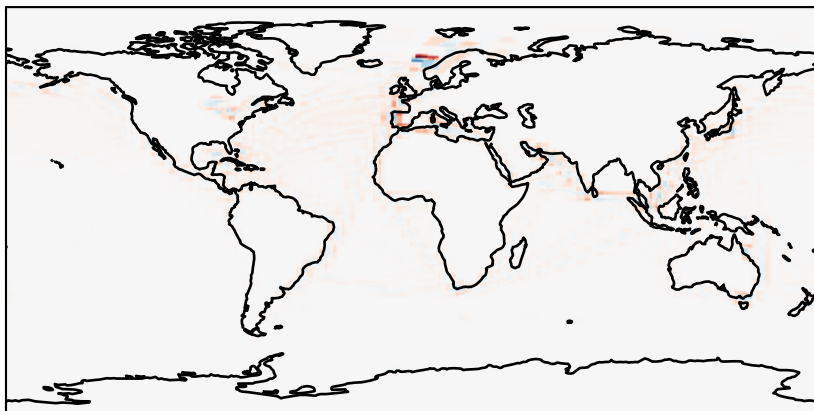
GCHP\_13.0.0 (Ref)  
c48



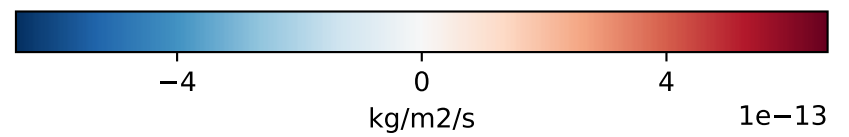
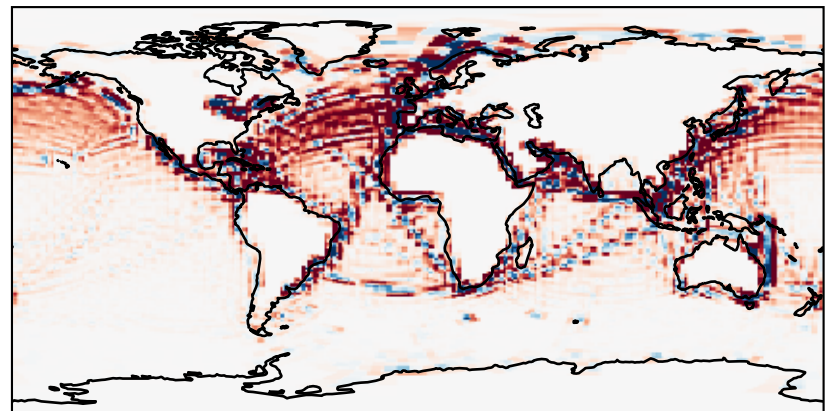
GCHP\_14.0.0 (Dev)  
c24



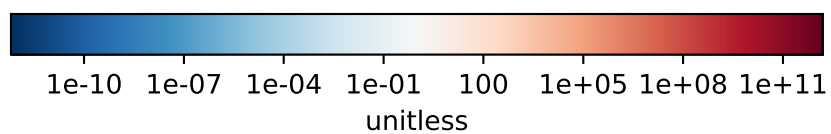
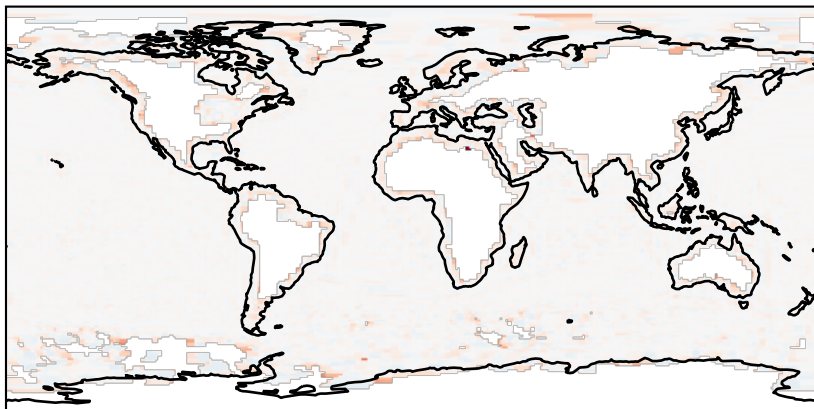
Difference (1x1.25)  
Dev - Ref, Dynamic Range



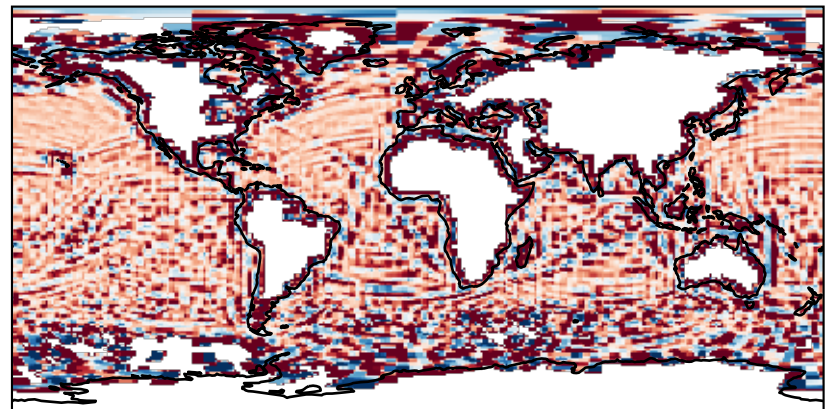
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range

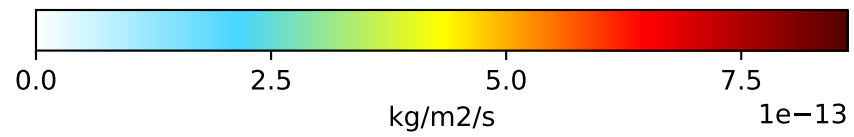
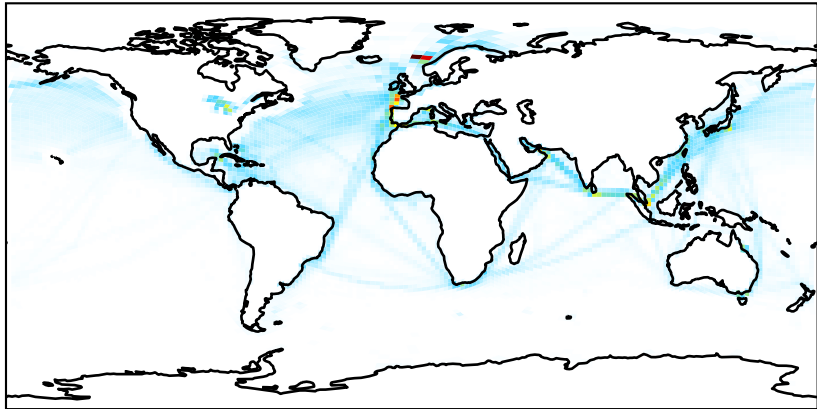


Ratio (1x1.25)  
Dev/Ref, Fixed Range

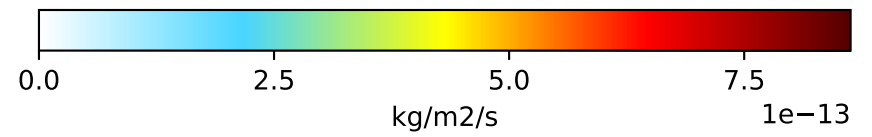
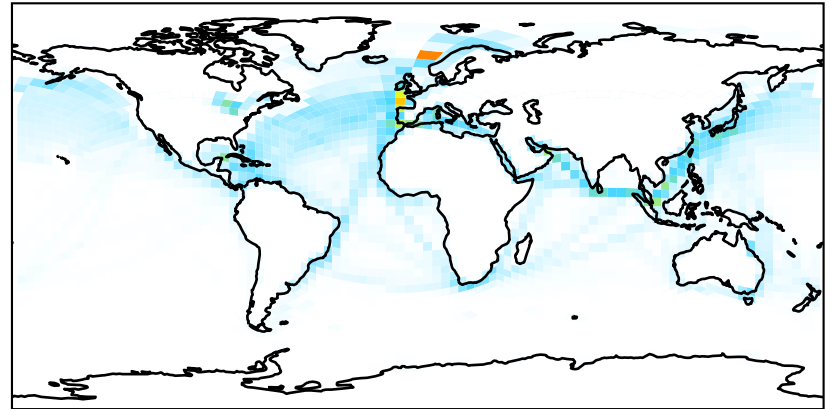


# EmisSO4\_Ship (Oct2019)

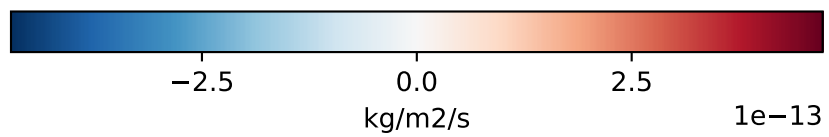
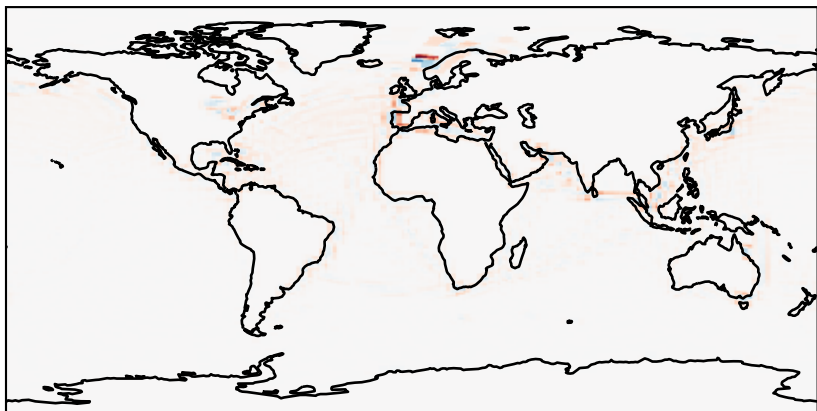
GCHP\_13.0.0 (Ref)  
c48



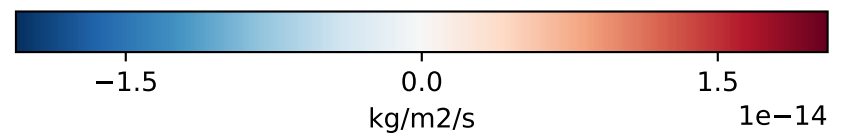
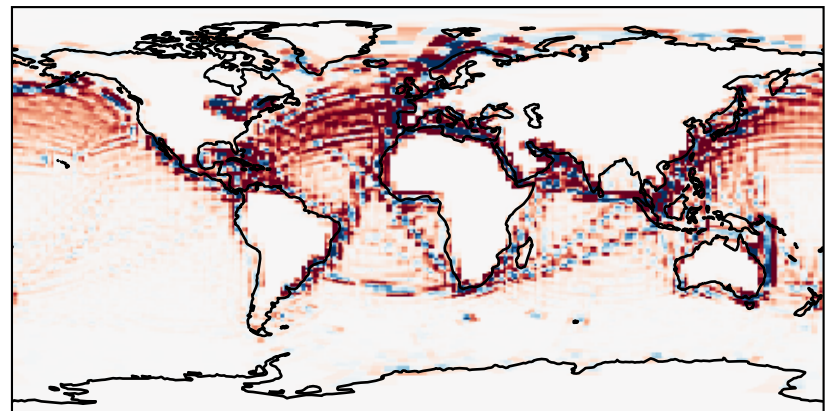
GCHP\_14.0.0 (Dev)  
c24



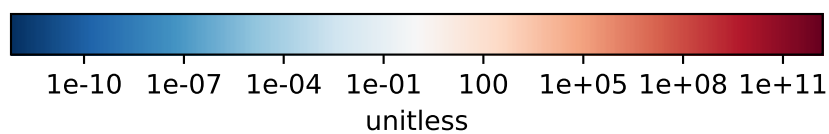
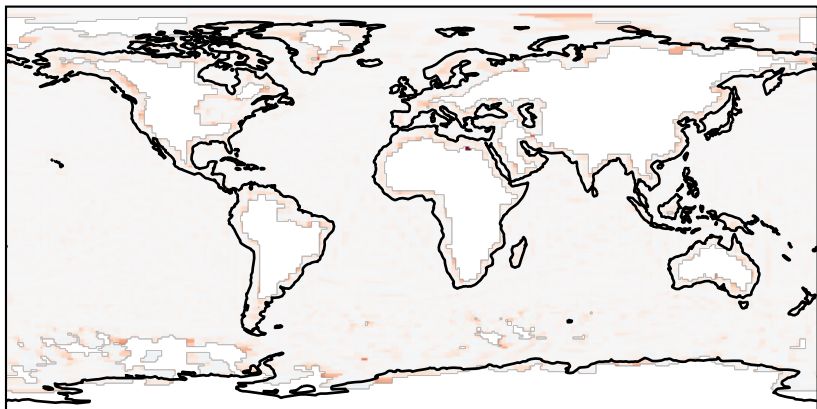
Difference (1x1.25)  
Dev - Ref, Dynamic Range



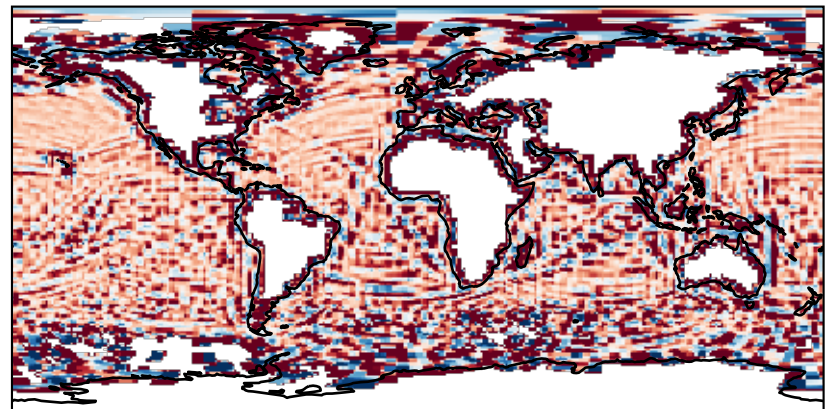
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range

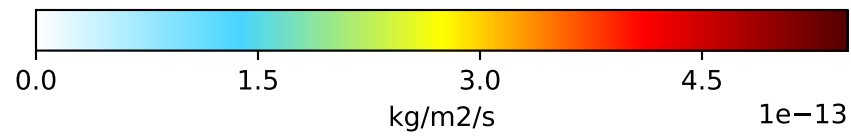
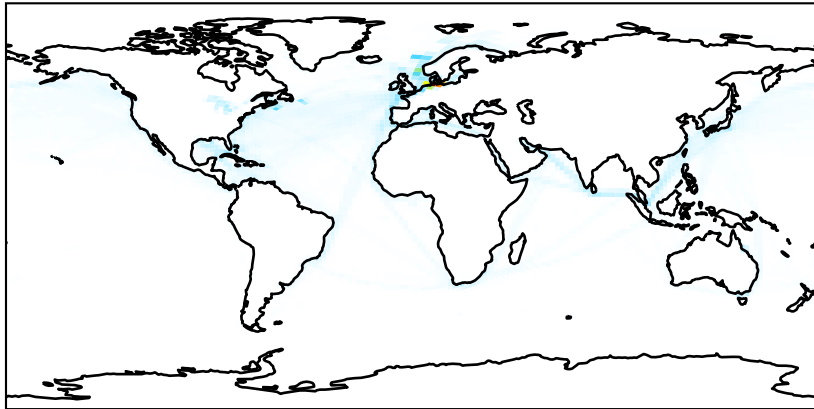


Ratio (1x1.25)  
Dev/Ref, Fixed Range

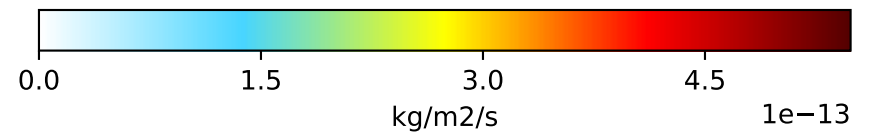
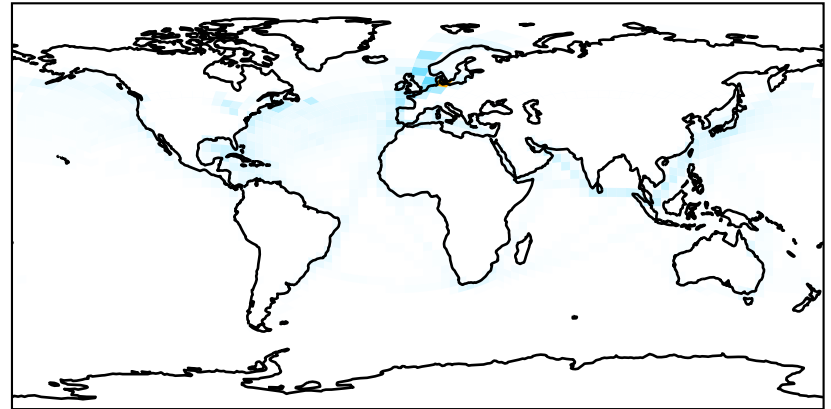


# EmisSOAP\_Ship (Oct2019)

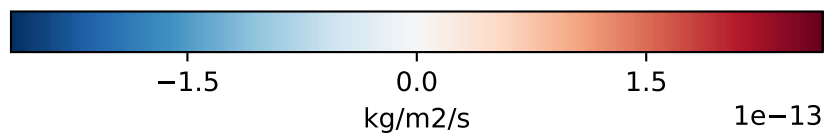
GCHP\_13.0.0 (Ref)  
c48



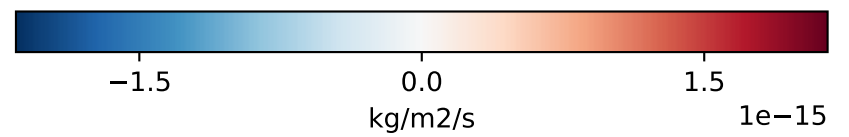
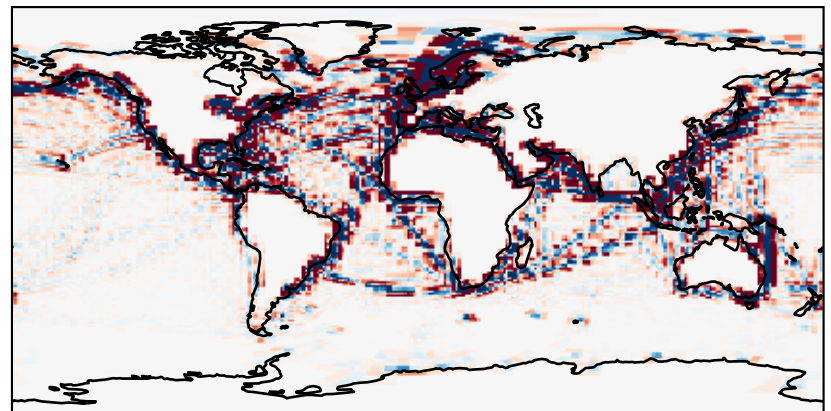
GCHP\_14.0.0 (Dev)  
c24



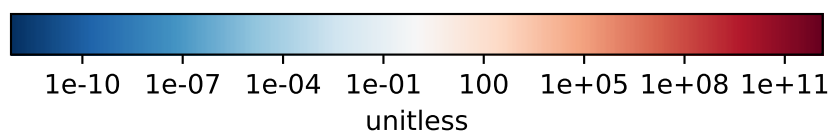
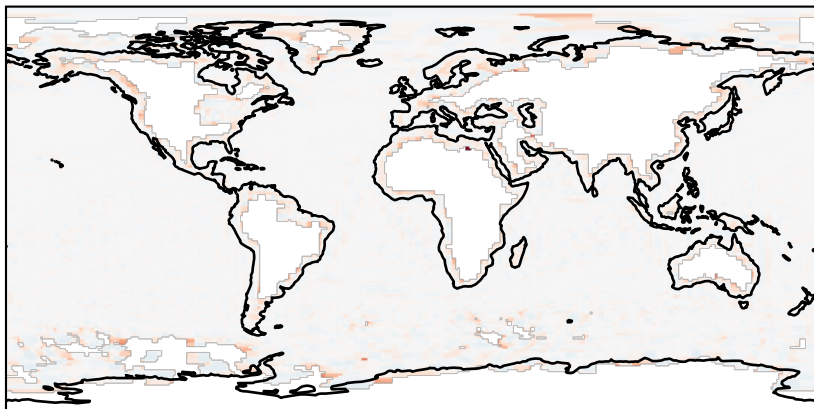
Difference (1x1.25)  
Dev - Ref, Dynamic Range



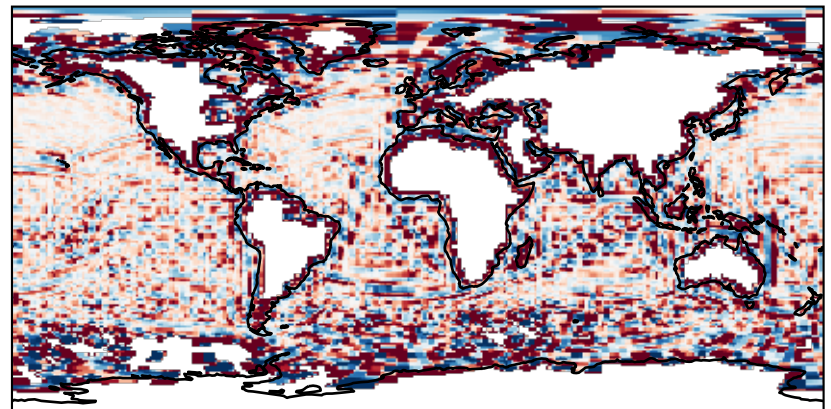
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range

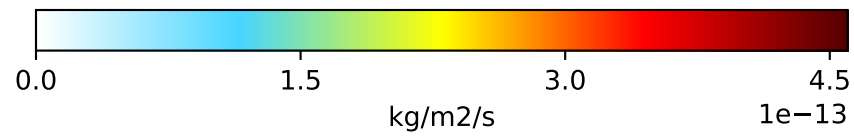
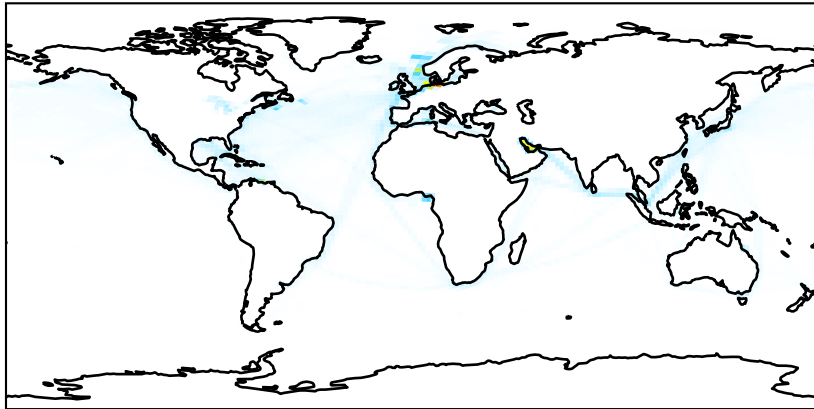


Ratio (1x1.25)  
Dev/Ref, Fixed Range

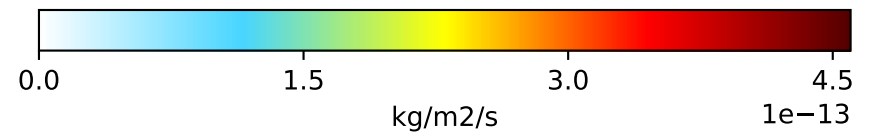
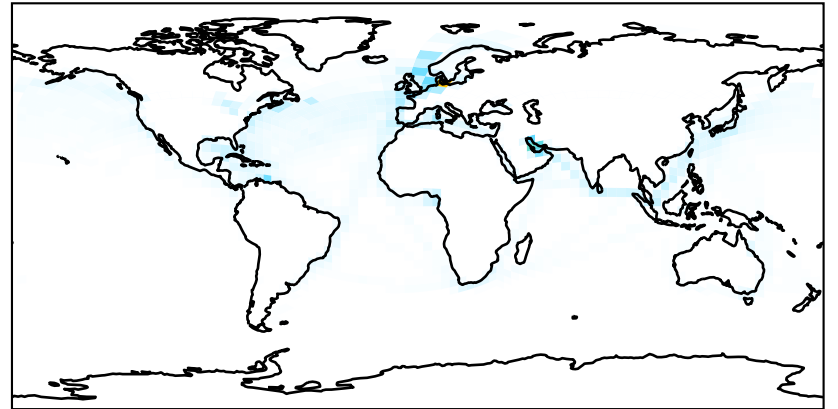


# EmisTOLU\_Ship (Oct2019)

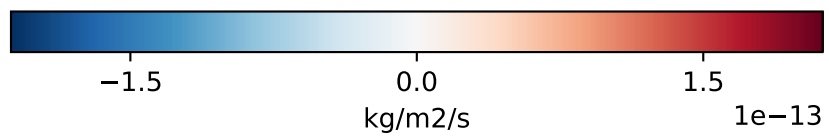
GCHP\_13.0.0 (Ref)  
c48



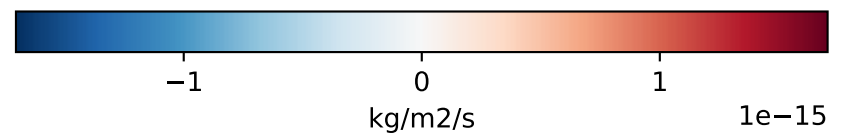
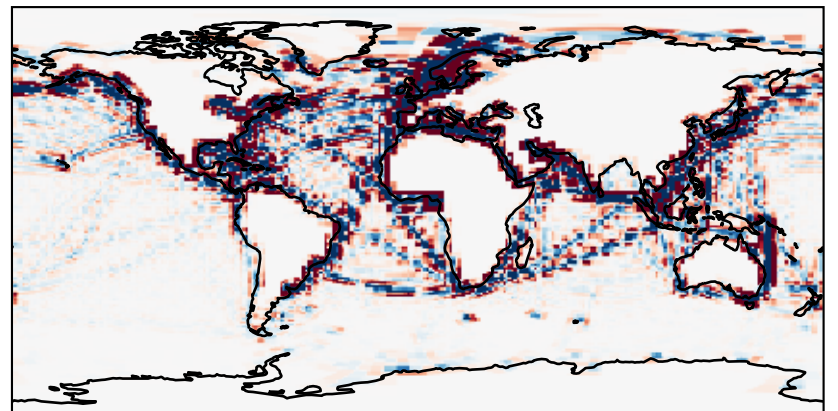
GCHP\_14.0.0 (Dev)  
c24



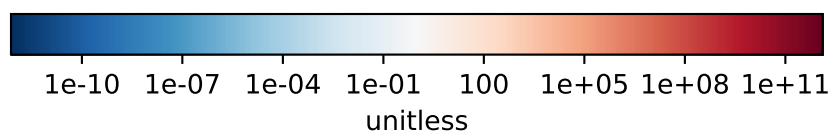
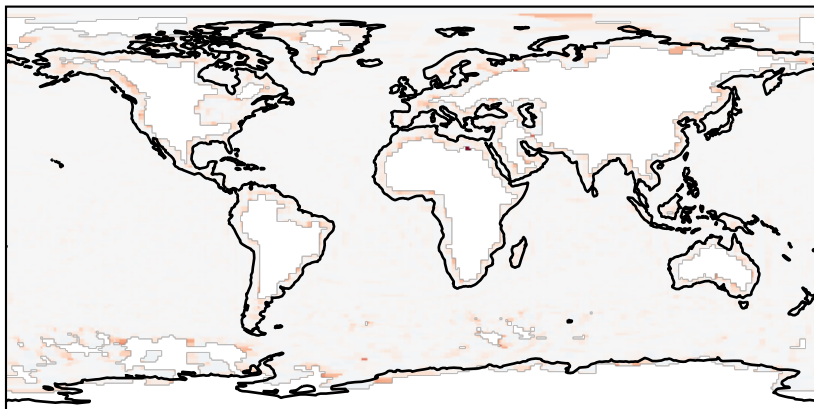
Difference (1x1.25)  
Dev - Ref, Dynamic Range



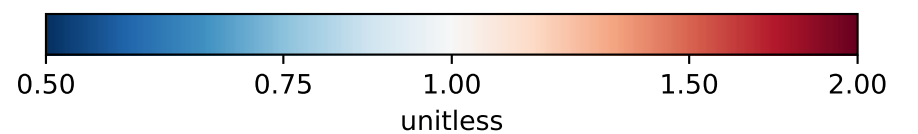
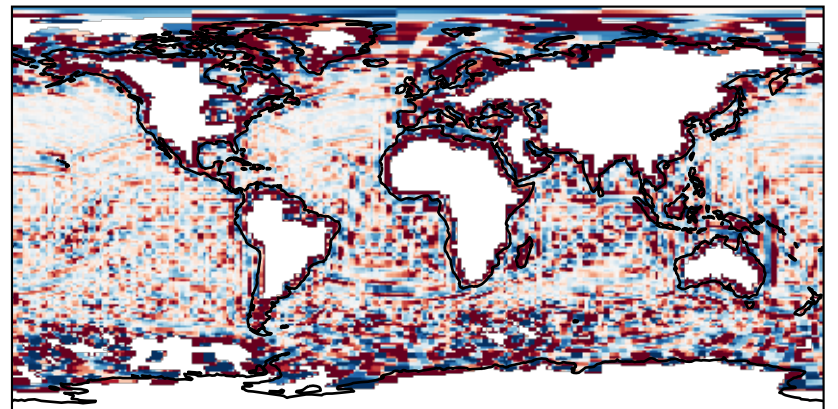
Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range

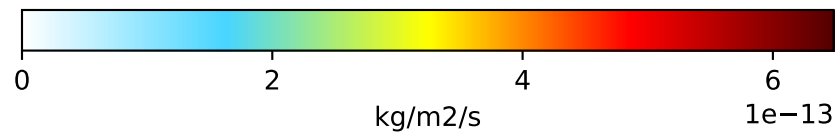
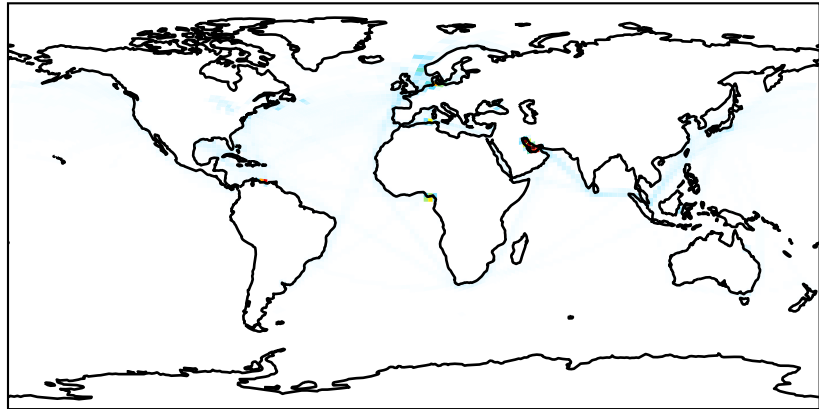


Ratio (1x1.25)  
Dev/Ref, Fixed Range

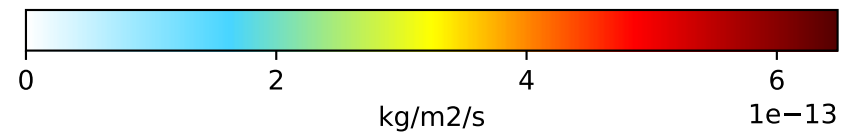
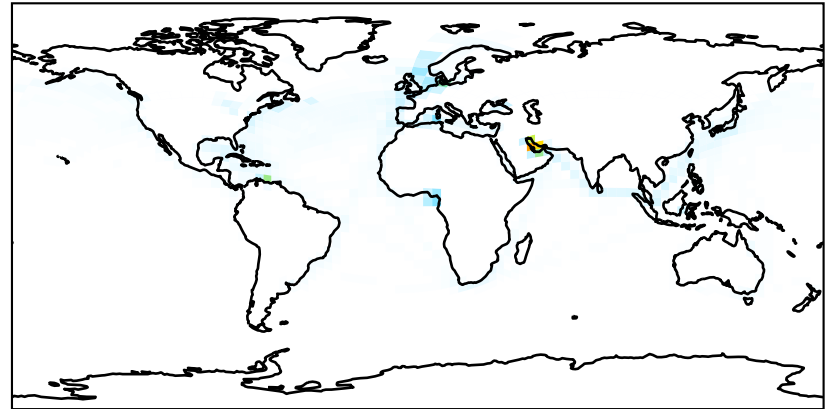


# EmisXYLE\_Ship (Oct2019)

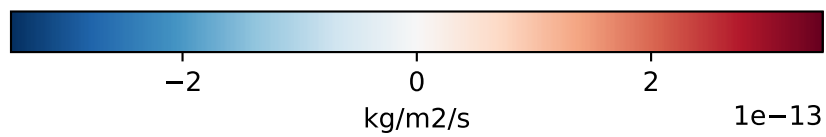
GCHP\_13.0.0 (Ref)  
c48



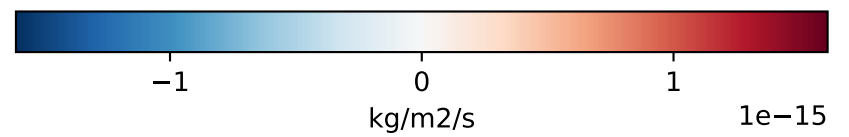
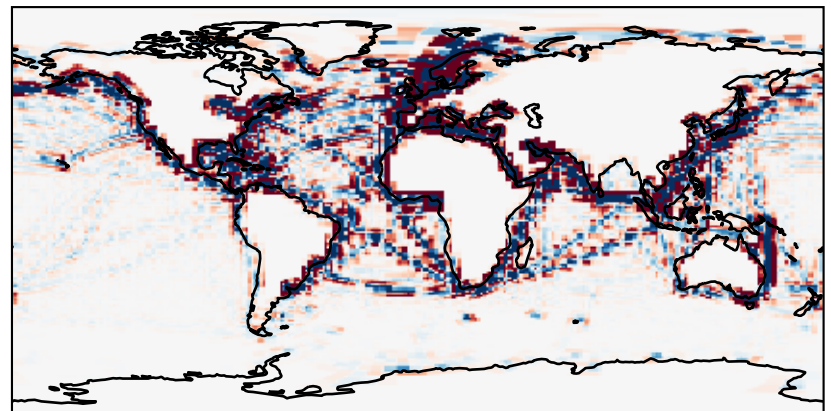
GCHP\_14.0.0 (Dev)  
c24



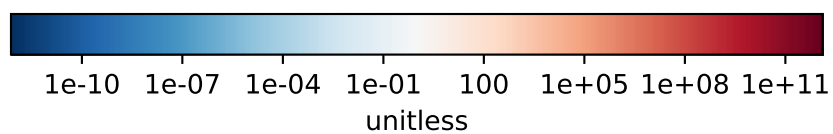
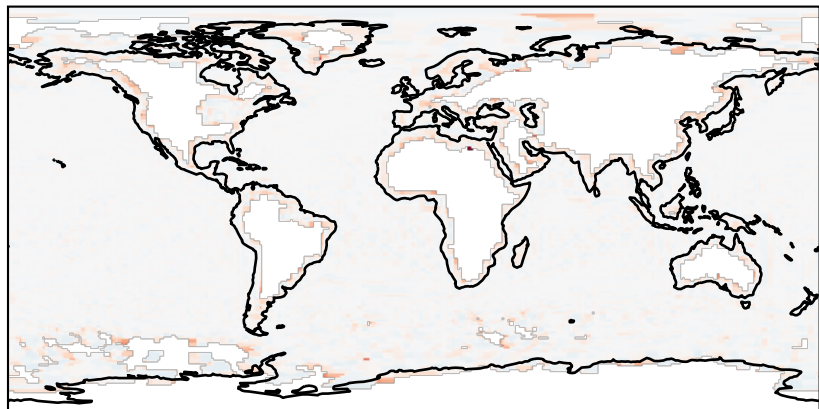
Difference (1x1.25)  
Dev - Ref, Dynamic Range



Difference (1x1.25)  
Dev - Ref, Restricted Range [5%,95%]



Ratio (1x1.25)  
Dev/Ref, Dynamic Range



Ratio (1x1.25)  
Dev/Ref, Fixed Range

