#### FROM CELLULAR TO GLOBAL : USING MERCURY STABLE ISOTOPES TO UNDERSTAND MERCURY CYCLING AND SOURCES

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### The Complexity of Hg Cycling



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#### Hg Isotopes

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#### Blum et al. 2014

The Application of Hg Isotopes

# Methylation and Hg Uptake in Anaerobic Bacteria

Ecosystem Application Hg Sources and Cycling using Biota

Comparison of Hg Sources between Fisheries



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# Applying Hg Isotopes to Field Studies



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# Ecosystem- Applying Hg Isotopes





# **Ecosystem-Applying Hg Isotopes**





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C/N isotopes indicate that Jewelfish are utilizing a more benthic diet. This diet is also tied to more depleted  $\delta^{202}$ Hg and less  $\Delta^{199}$  Hg source

# **Ecosystem-Applying Hg Isotopes**



Contraction of the second seco

**202** 

# **Ecosystem-Applying Hg Isotopes**





#### Large Scale Ecosystem Comparisons



<u>Global Fisheries Study</u> 13 Freshwater food webs 4 continents >100 genera

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Janssen et al. in prep

Future and Uses for Hg Stable Isotopes

Application to source tracking and monitoring of mercury

Use of large scale studies to aid in modeling and prediction of Hg sources in field sites

Tracer to understand fundamental pathways and transformations in the Hg cycle





**Ecosystem-Applying Hg Isotopes** 





**\_202** 



Geobacter (PCA)- IRON

Hg isotope composition changes intracellularly with time and organism and is likely linked to variations in methylation we see across taxa

Preliminary Data- Yuwei "Cindy" Wang