NOAA FISHERIES

National Marine Fisheries Service (NMFS/Fisheries)

Building Bridges for Indian Ocean Rim Marine Scientists Across the "Big Data Geoscience" and Cloud –computing Divide

Dec 12, 2023

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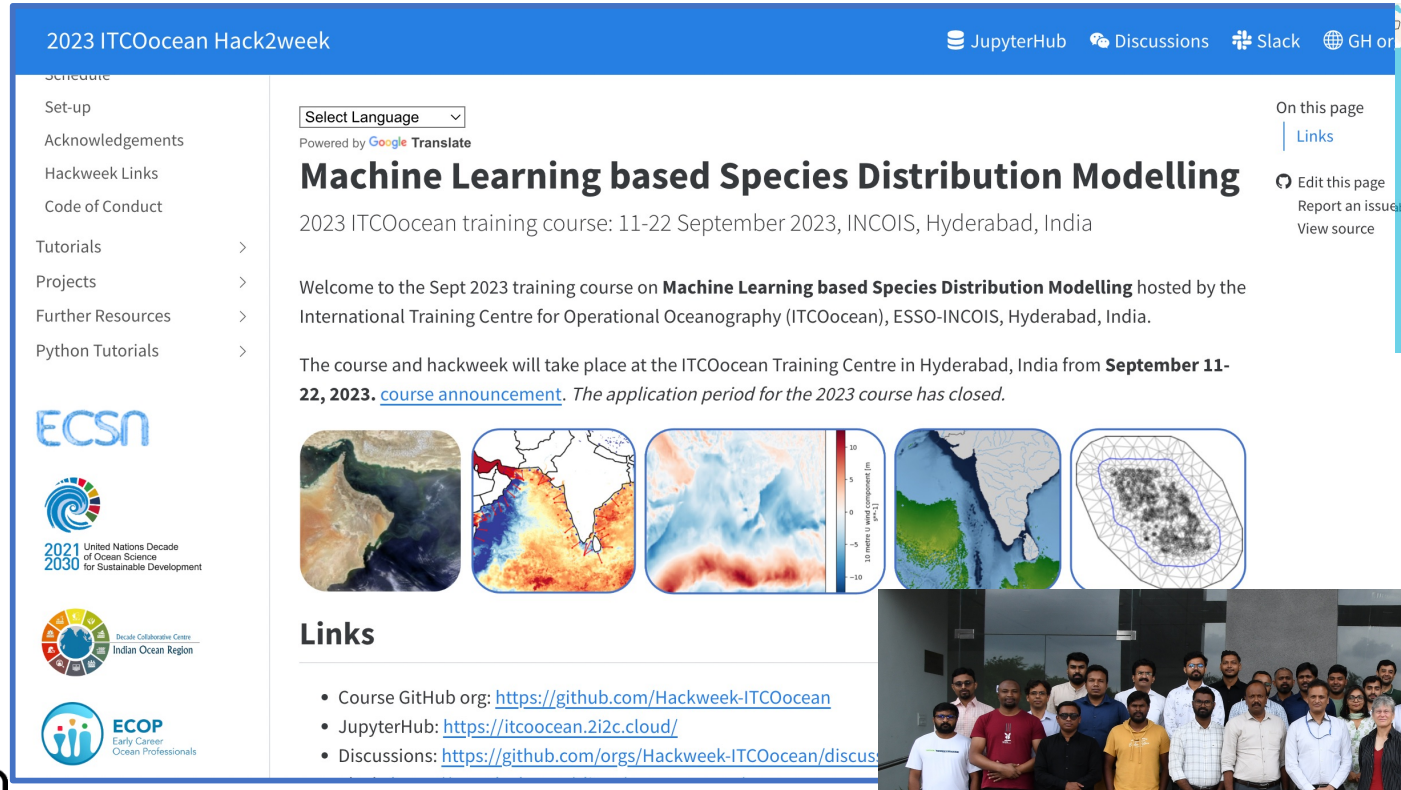
INCOIS

ITCOocean Hack2Week

https://hackweek-itcoocean.github.io/2023-Hackbook/

DEVISING EARLY-CAREER CAPACITY DEVELOPMENT-INDOCN (DECCAD-IO)



https://oceanhackweek.org

Building tech bridges starts with people bridges

2014-2019
MoES-NOAA
Fisheries
Collaboration

Eli Sourav Maity **Nimit** Smitha BR

Vera Trainer, NOAA
(now UW) project lead

Cara Wilson, NOAA Fisheries
satellite data training courses

ITCOocean Hack2Week 2023

INCOIS Director
Srinivasa Kumar

Nimit **Eli** **Udaya**

Swarnali Majumder

Aditi Modi

Sourav Maity

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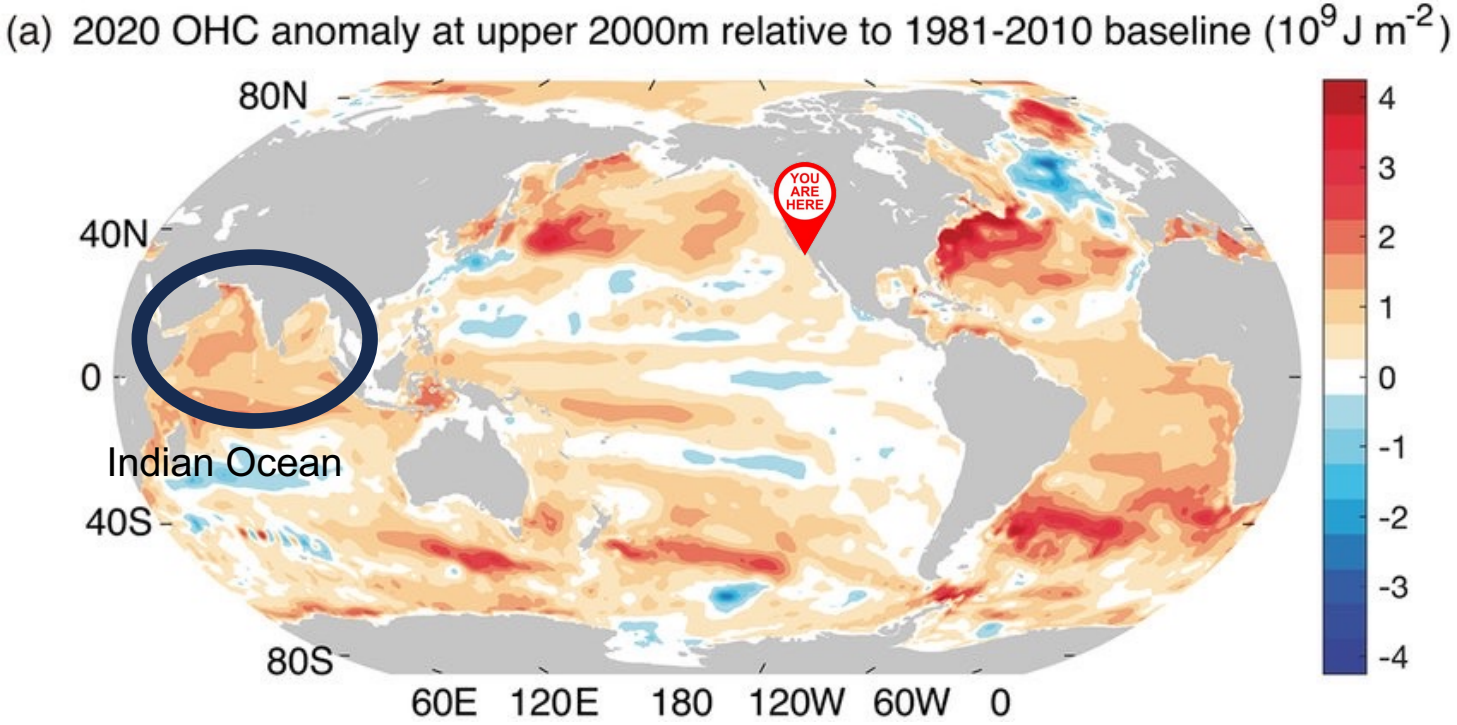
Ocean climate change has happened and will continue



Many projected impacts on global fisheries

Cheng, L. J., and Coauthors, 2021: Upper ocean temperatures hit record high in 2020. Adv. Atmos. Sci., 38(4), 523−530, https://doi.org/10.1007/s00376-021-0447-x.

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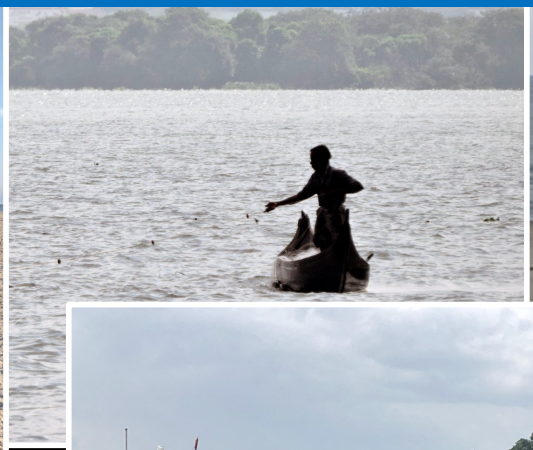
Artisanal and coastal fisheries are more impacted

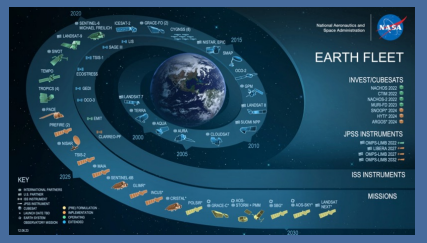


People depend on fish for food

the impacts are exacerbated by a disparity in available resources

the disparity extends to Indian Ocean Rim scientists – the people who will lead the science and innovations

Young scientists are missing out a crucial area of advancement in earth sciences in the era of “big data”: training in geospatial tools and large collaborative communities.



Example: NASA but not only NASA

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

Decade Collaborative Centre Indian Ocean Region

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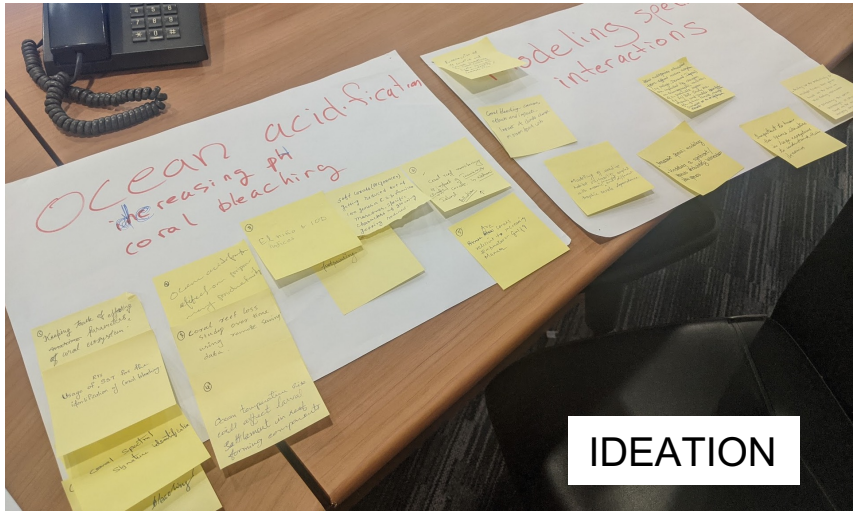


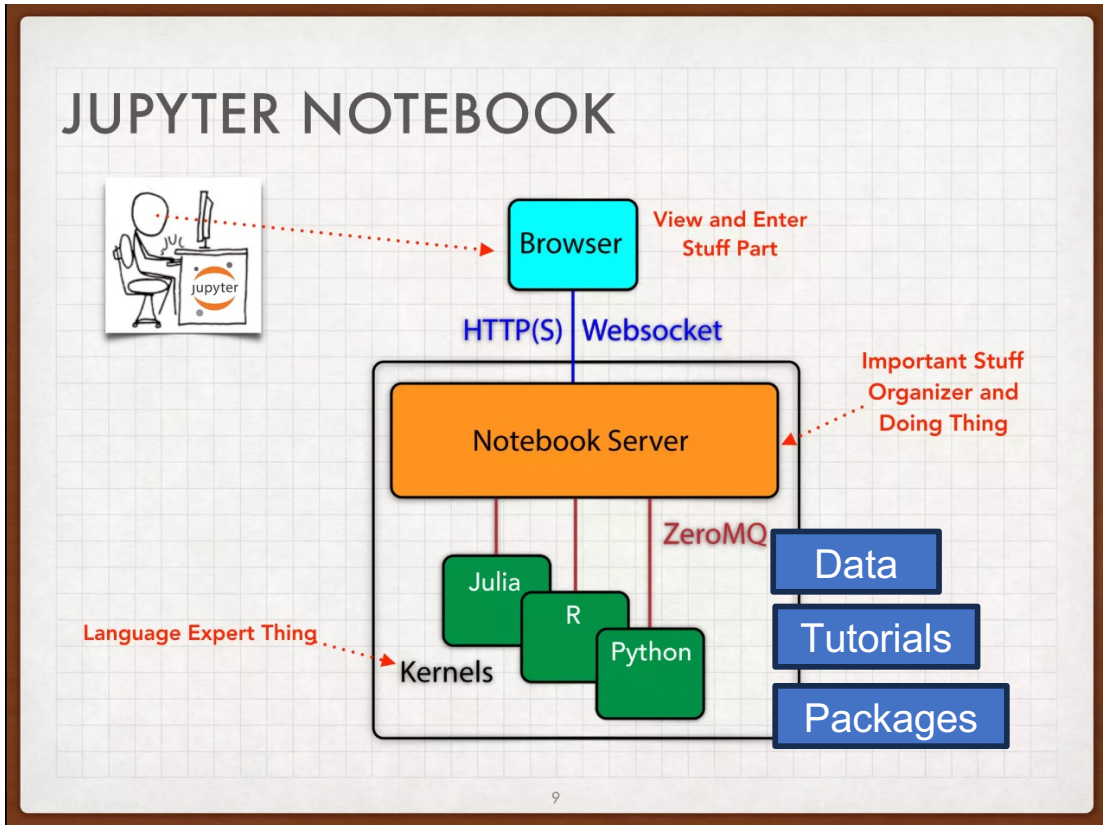
IDEATION

PITCHING

TEAM WORK

FINAL PRESENTATION

JupyterHub computing environment



SnowEx Hackweek

CryoCloud

ICESat-2 Hackweek 2022

NASA

openscapes

Ocean HW

[JupyterHub Thing Explainer]

The 2i2c JupyterHub for ITCOocean
INCOIS
Operated by: 2i2c | Funded by: ESIP | Designed by: 2i2c
Log in to continue
Welcome to the ITCOocean 2i2c JupyterHub.
This is a pilot service running on open source infrastructure. See the 2i2c Pilot documentation for usage and deployment information.
jupyter
RStudio

Challenges that were hindrances but not barriers

None of the participants had experience with Jupyter notebooks much less JupyterHubs	The platform is fairly intuitive and they helped each other.
Few of the participants had experience with Git or GitHub	We minimized that aspect by using a shared drive for the hack week.
Many of the participants had little coding experience	That was difficult. The few coders were stretched very thin and worked with multiple groups. *Need more coders and more intro coding workshops*
Not many had experience with remote-sensing data	That was also difficult. The virtual helpers were critical. *Need more templates for the coders.*

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Barriers that we learned

Visas! None of the African applicants were able to get visas.	• *Run workshop in E Africa* • *Develop 'sister' workshops* • *Much longer lead times*
Participants (and instructors) need travel funds. Cost was ca $300-400 but that's might be 2 months grad salary	• *Put in grants for travel funds* • *Find philanthropic organizations* • *Hybrid options*
Sustaining communities: JupyterHubs on local infrastructure	• *Need to come early and set-up local JupyterHubs on local servers*
Internet speed was a barrier. Even though we were at INCOIS, the local IT gave participants highly limited internet. Most hot-spotted in.	This needs to work on cellphone speed internet. • *Test everything on throttled internet!*

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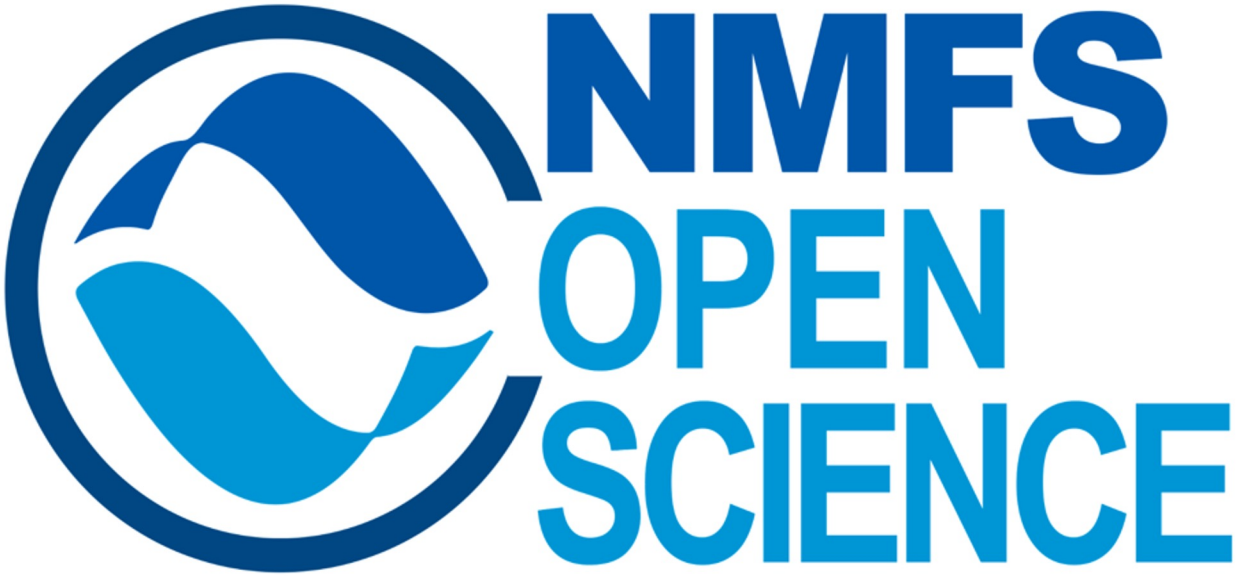
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