Let there be Light: Marine Oil Snow formation and its associated Bacterial Communities.

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## Why is this important?

- Steady increase from 73 to above 100 million barrels per day since 2010
- Forecast to stay above 100 million barrels per day throughout 2023 and 2024
- 35% rise in volume of oil from 2.5 to 3.3 billion barrels per year in need of transport

World liquid fuels production and consumption balance million barrels per day



#### **Marine Oil Snow**



## **Chemical Dispersion**

Reduction of interfacial tension between oil and water

Increased bioavailability of oil

#### Enhanced biodegradation



#### So, what is the problem?



#### **Experimental Design**



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#### Microcosms:

- 400ml natural seawater
- 40ul 100ppm NGS-NS crude oil (100 ppm)
- 2ul Corexit 9500 chemical dispersant



#### **Experimental Design**



Roller table set up underneath powerful Heliospectra lighting system



Marine Oil Snow Flocs from Oil treatment under natural light conditions

#### **Results: MOS "Bacterial Hotspots"**



#### **Results: Community Composition**



#### **Results: Community Composition**



#### **Results: Genera of Interest**







O = Oil, O + D = Oil and Dispersant, D = Dispersant Only, S = Seawater Control

### **Results: Dry weight**



#### **Marine Oil Snow Formation**



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#### **Marine Oil Snow Formation**



Marine Oil Snow grow in Oil treatment



Marine Oil Snow grow in Oil and Dispersant treatment

# Thank you for listening!





#### **References**

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