Archaea composition in the Northern Gulf of Mexico

Cynthia Kane
Mentor: Dr. Richard Snyder
Location: Pensacola, Florida

About me

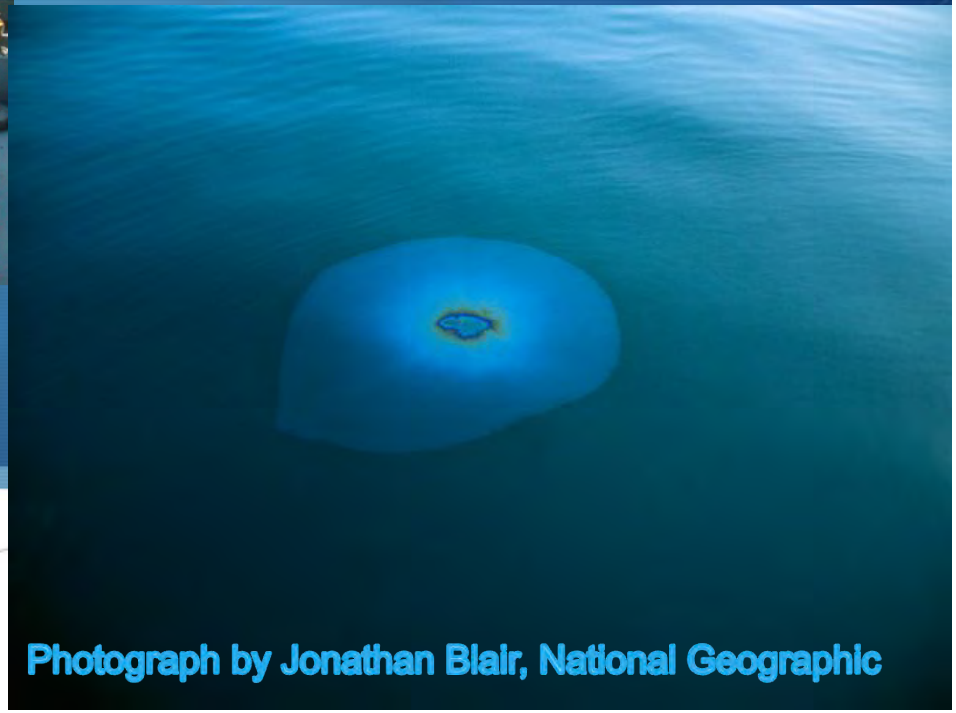
- Barnard College
- Rising Junior
- Biology Major

About Dr. Snyder

- Research Interests: Microbial and Macro Ecology, Pollution and Water Quality, Oceanography
- Current Research: Microbial oceanography in the NE Gulf of Mexico, coastal plant community analysis

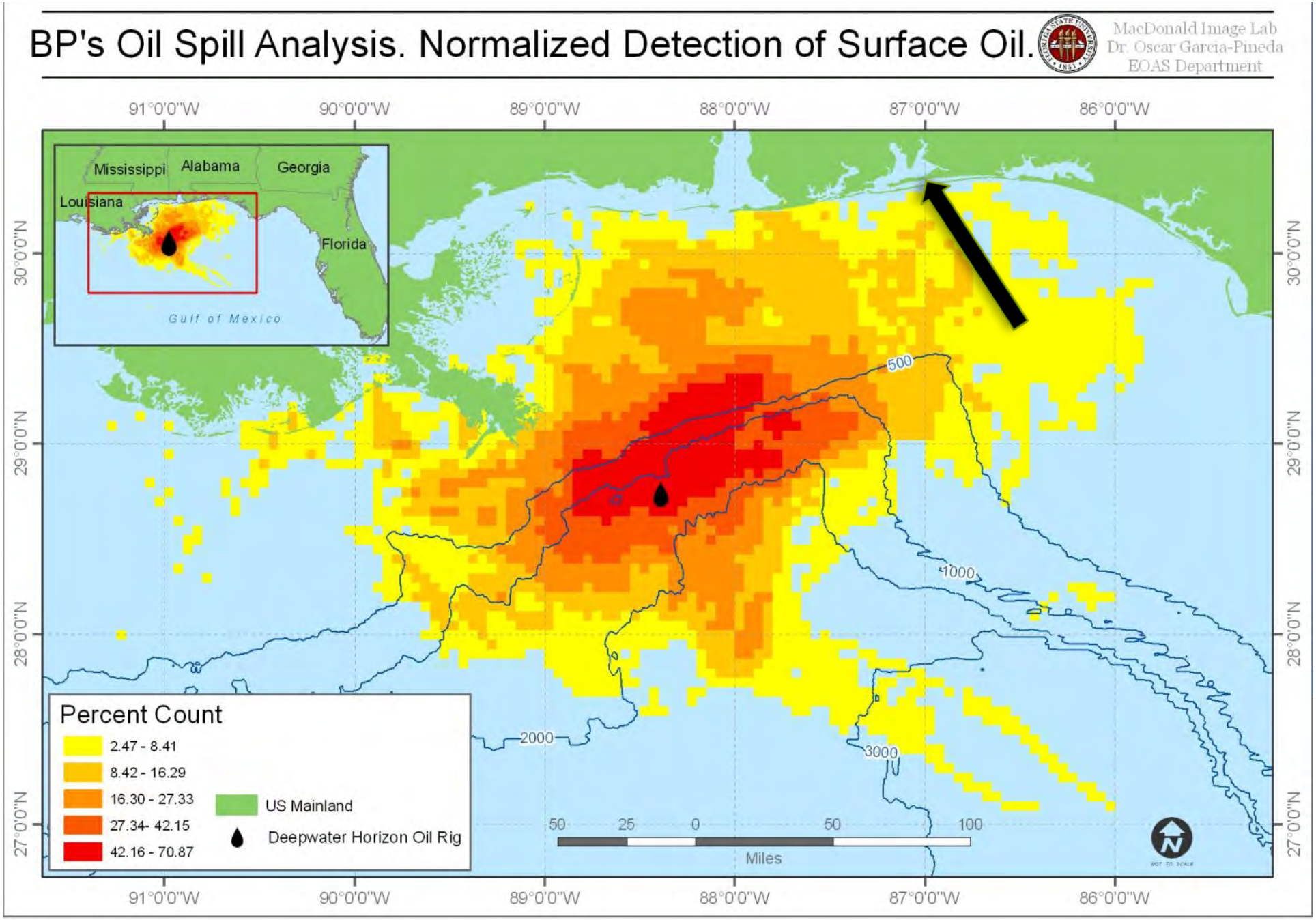
BP Oil Spill

R/V Bellows 15-18 June 2010
Photo credit:
Captain Larry Braun, R/V Bellows



BP's Oil Spill Analysis. Normalized Detection of Surface Oil.

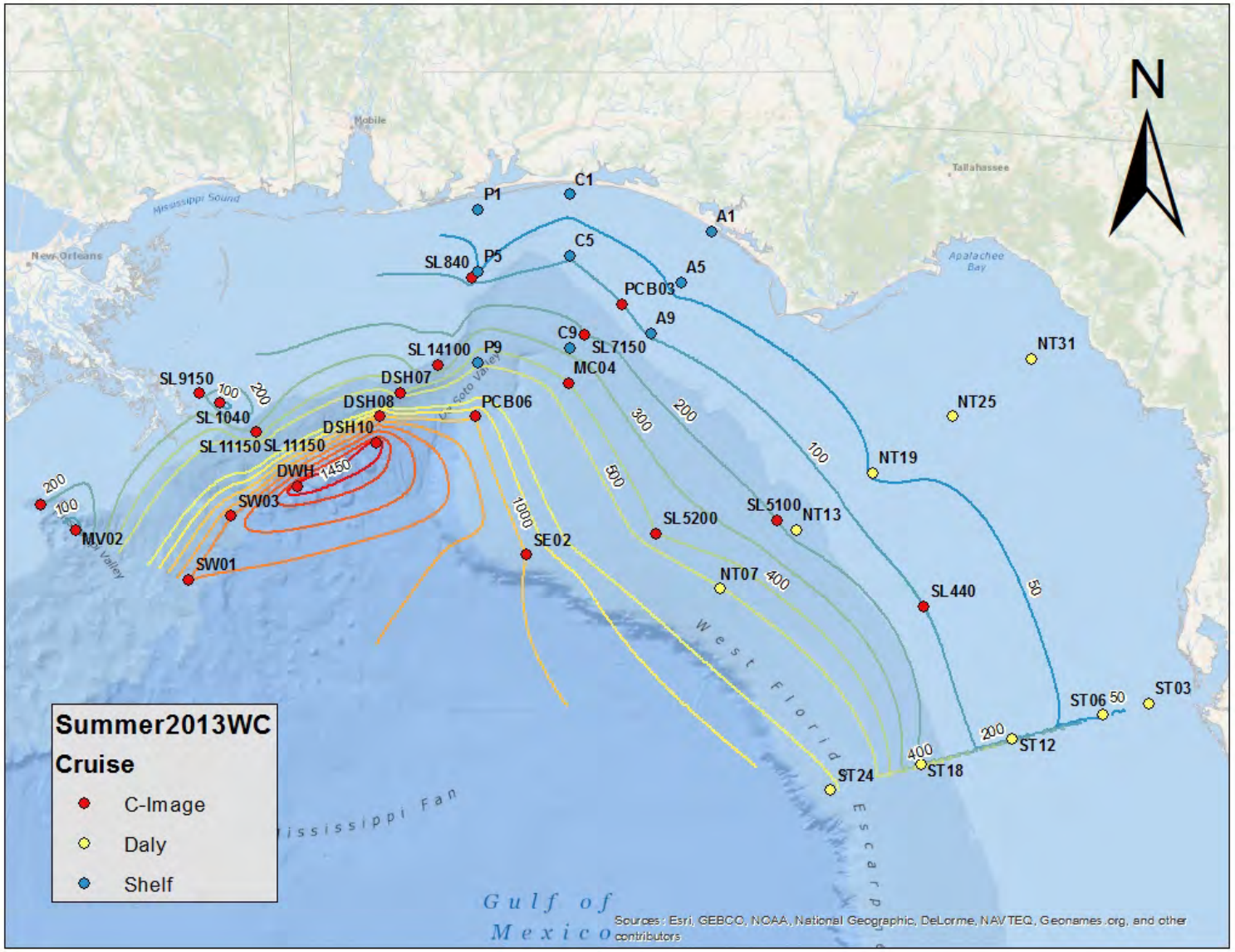
MacDonald Image Lab
Dr. Oscar Garcia-Pineda
EOAS Department



Projection: WGS_1984
Date: September 10, 2010

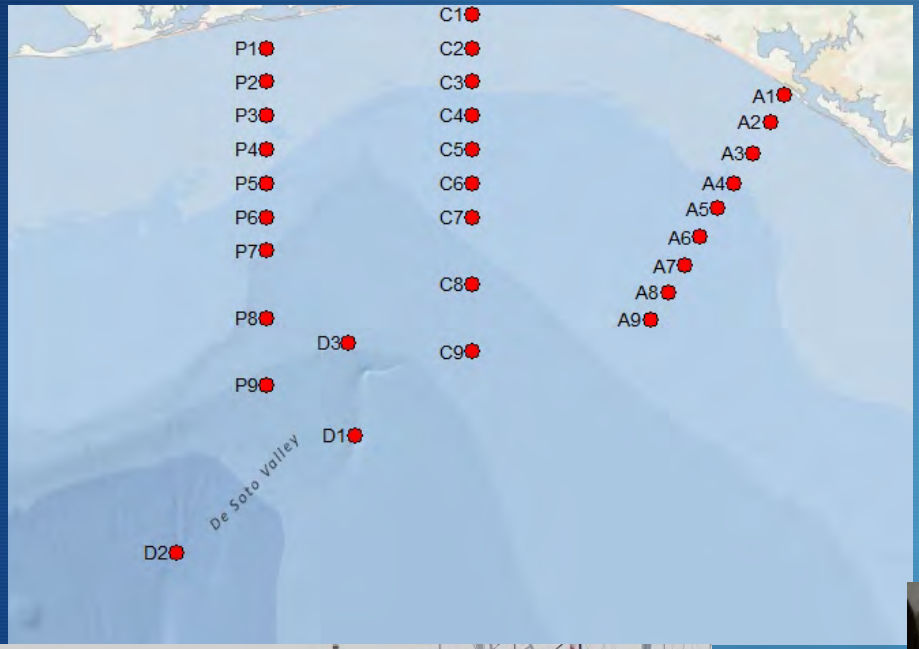
Source: TCNNA
32 Envisat ASAR frames

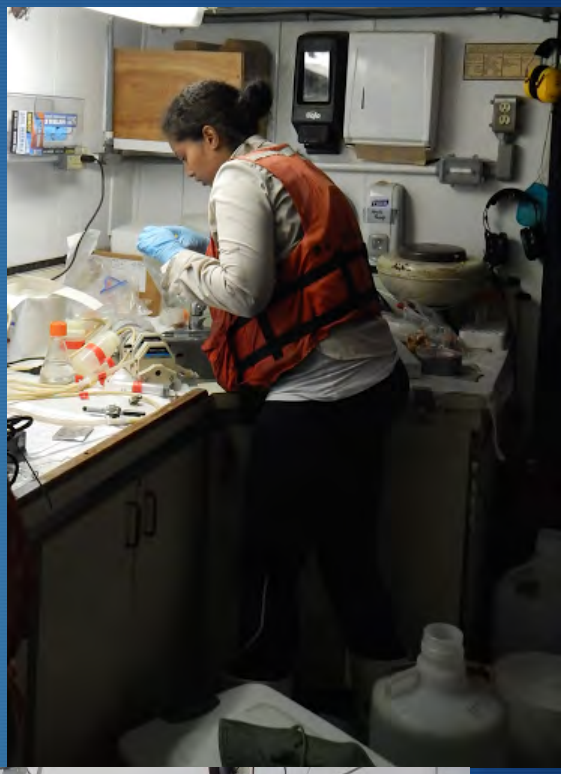
Sampling Locations

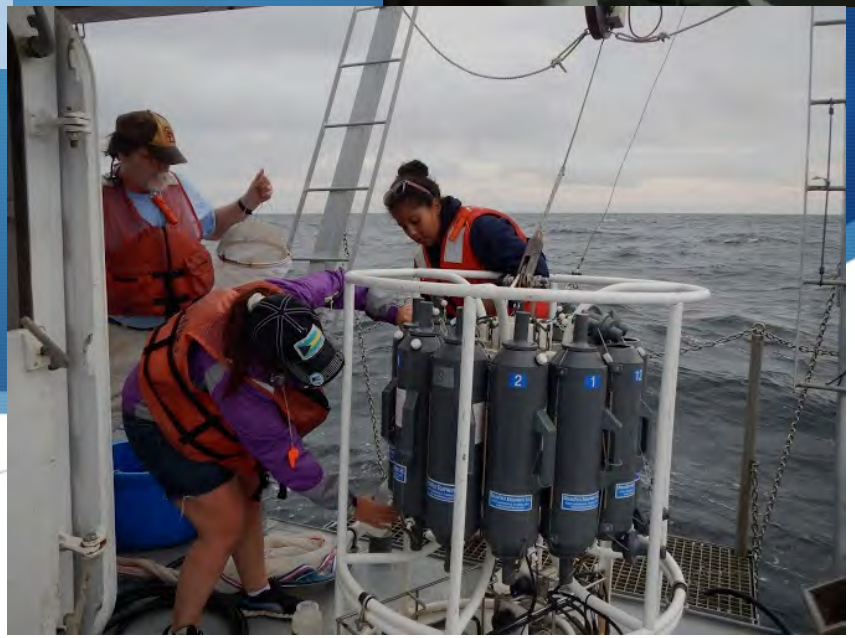


Water over sediment (core) collection

Research Cruise



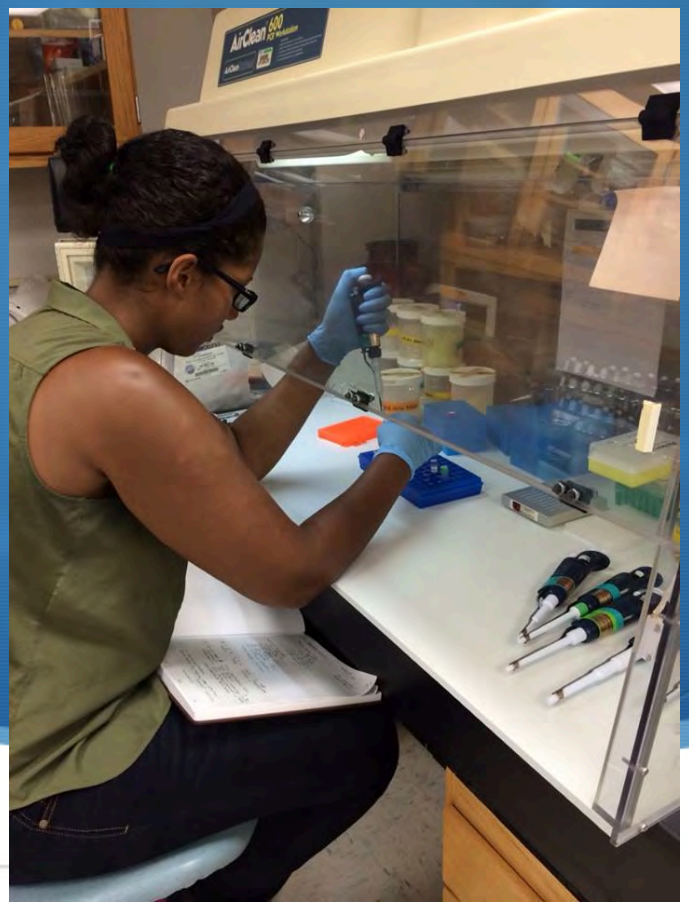




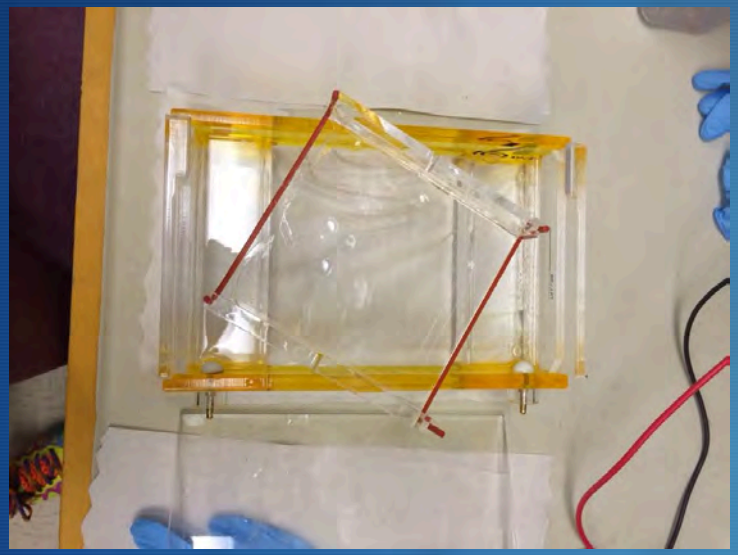
My project

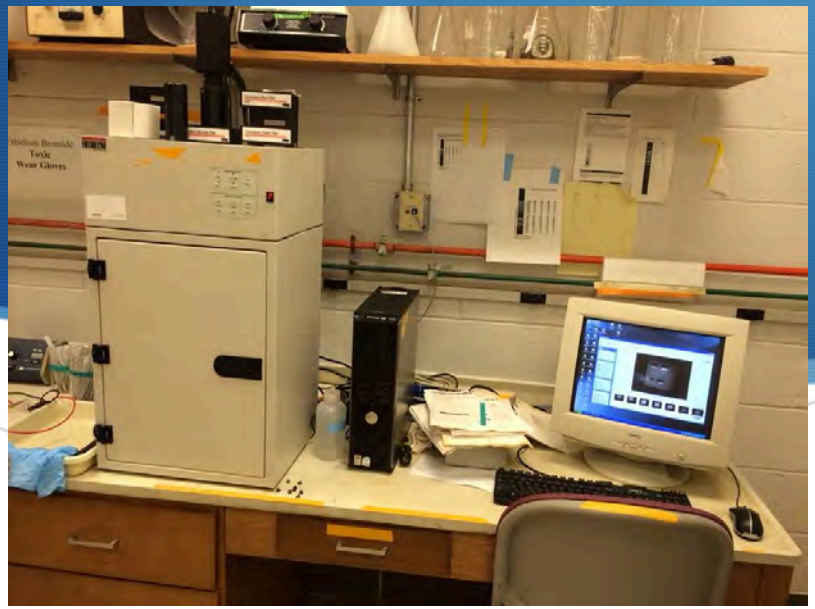
- Archaea
- Examining water over core samples for types of Archaea present
- Molecular techniques including PCR, gel electrophoresis, clone libraries, and DNA sequencing

Polymerase Chain Reaction (PCR)



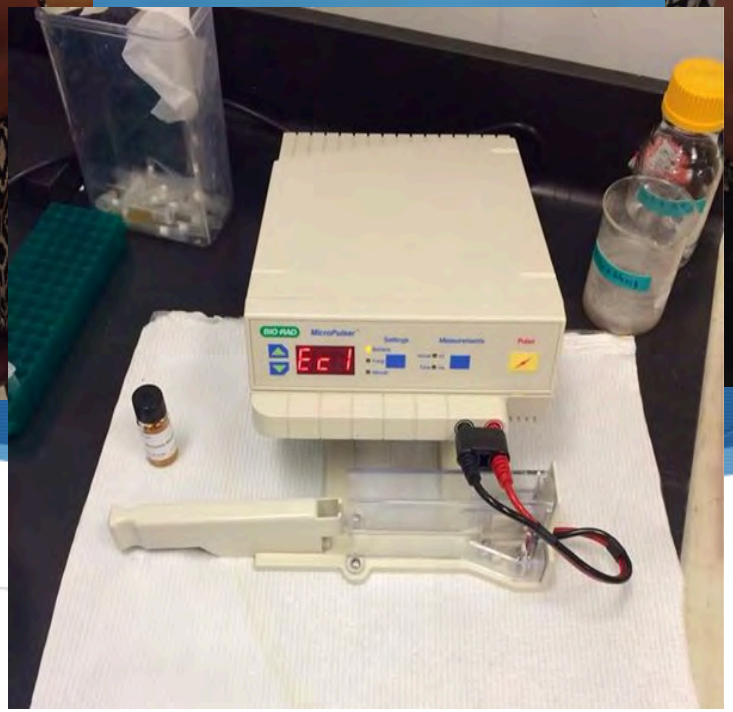
Gel Electrophoresis



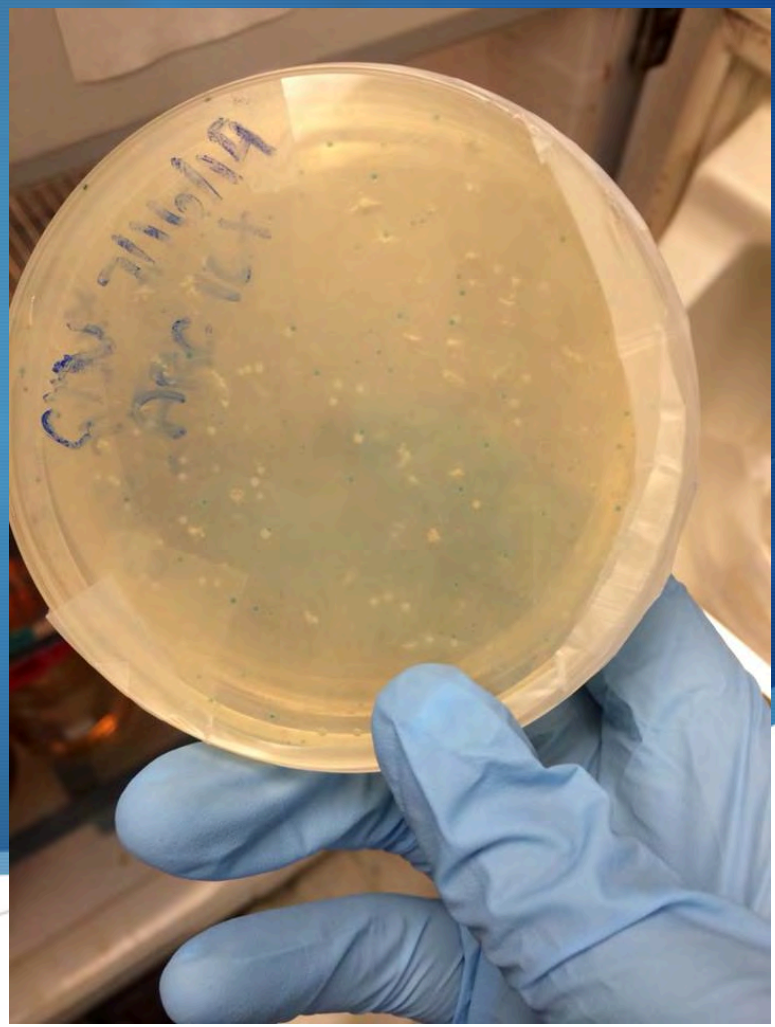


DNA purification

Cloning & Transformation Reactions

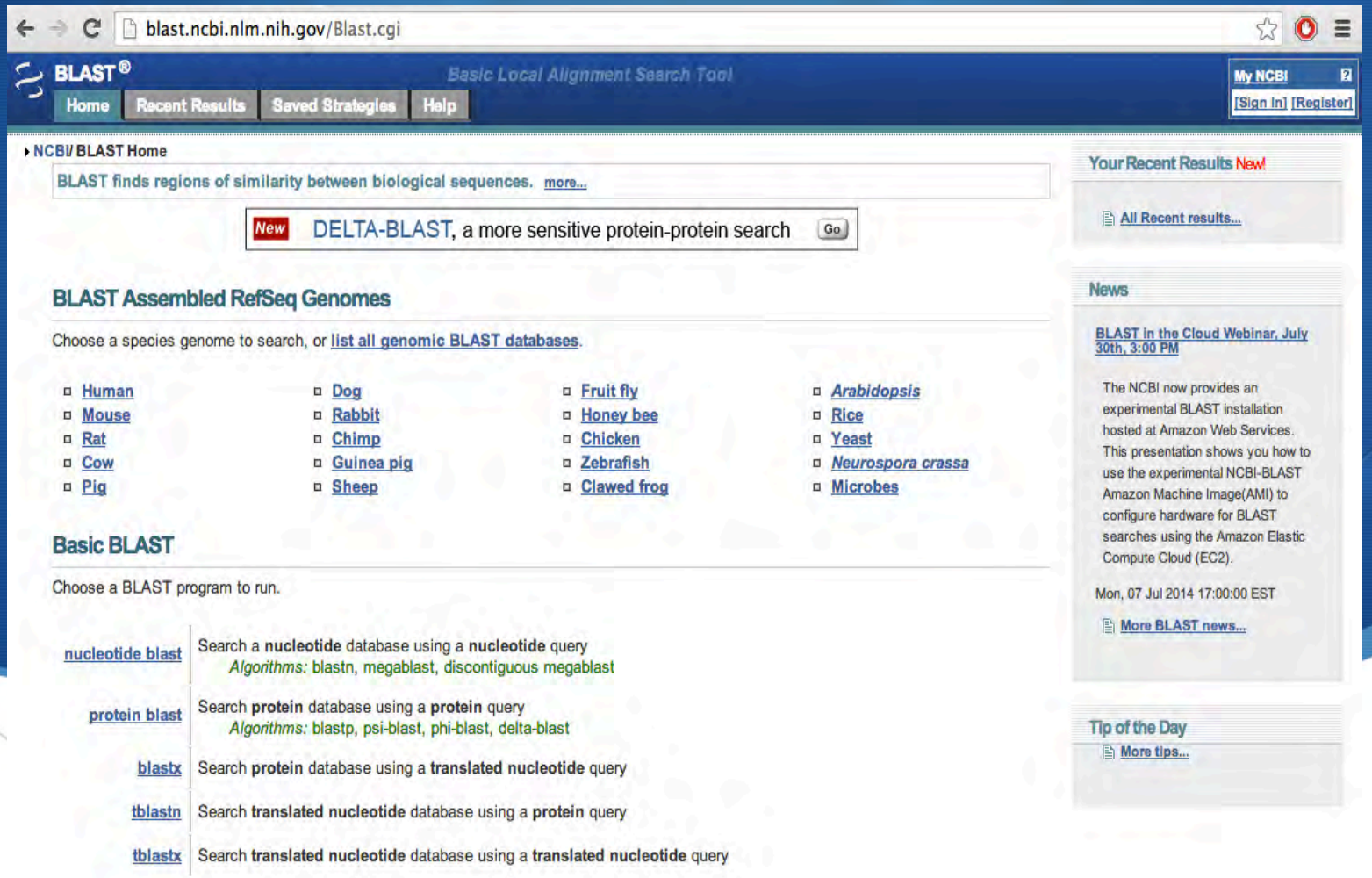


Clone Library



Final Incubation

Sequence Analysis



Results & Conclusions

- Ran 38 PCR reactions, extracted 21 samples, created 2 clone libraries
- Waiting for sequencing results to come back, continuing analysis of samples
- Included as author in paper when published

Skills

- How to properly use a pipette (how to calibrate it, the correct way to adjust the volume, how much/how little each pipette could hold, etc.)
- How to use the Thermocycler (used for PCR), including how to program it
- How to purify DNA using a Qiagen kit
- How to prepare agar and pour gel plates for the clone libraries
- How to analyze the clones after incubation
- How to interpret the results from the DNA sequencing

Concepts

- Properties of DNA (denaturation temperature, pH range, etc)
- The components of the Master Mix and their functions
- The purpose of using ethidium bromide in the gel for electrophoresis
- The mechanism behind the Qiagen kit buffers
- How/why of the cloning reaction (the vectors, shocking the cells, the LB media used)

Challenges

- Learning how to use all the equipment/finding my way around the three different labs that were used
- Learning how to look critically at and not be discouraged by unsuccessful experiments

Internship Experience

- Field experience (ship board operations, oceanographic sampling)
- Valuable lab skills and an understanding of the proper way to work in a lab (the do's and don'ts)
- First hand experience of the field of microbiology

Acknowledgements

- NOAA-NGI Diversity Internship
- Deep-C Consortium
- Dr. Richard Snyder
- Joe Moss
- Dr. Wade Jeffrey