



Smithsonian Institution

# NATIONAL MUSEUM *of* NATURAL HISTORY

Archiving of OCS Invertebrate Specimens and Genomic  
Tissue Samples

NMNH, Department of Invertebrate Zoology

April 2018 SAML Annual Meeting







Smithsonian  
*National Museum of Natural History*

Department of Invertebrate Zoology

[invertebrates.si.edu](http://invertebrates.si.edu)



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## Department of Invertebrate Zoology Collections

50 Million Specimens

129,000 + unique taxa  
representing 60 Phyla  
in 4 Kingdoms

Types: primary types of 40,000 + species



Smithsonian

### Collection Physical Size

MSC Pod 5: **18.1 linear miles** of shelving and **95** steel tanks

MSC Pod 2: 250 cases with 2,500 drawers

NHB: 1,700 cases with 14,000 drawers

} 2.3 acres of dry specimen storage

And approximately 500,000 glass slides





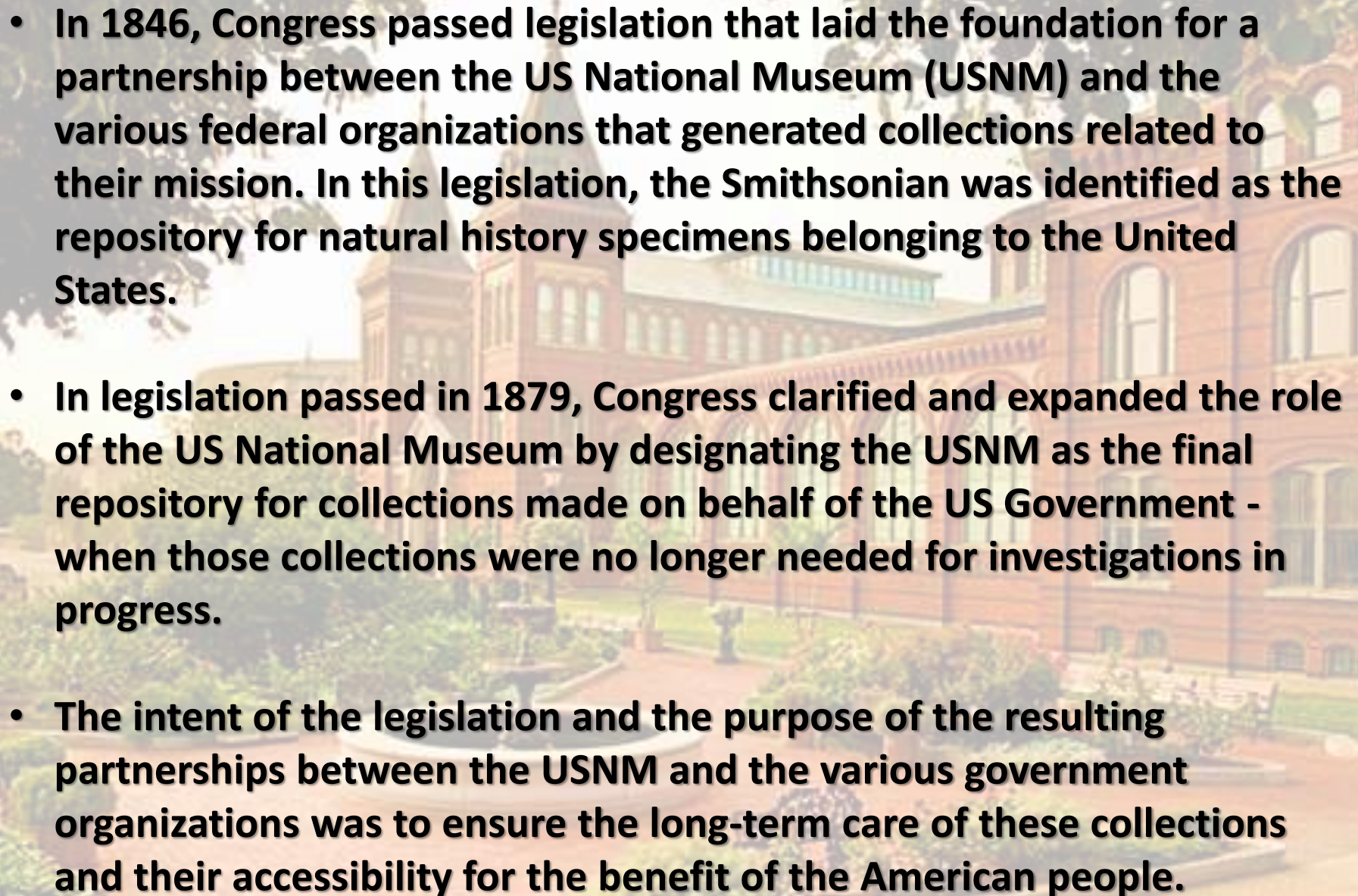










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- **In 1846, Congress passed legislation that laid the foundation for a partnership between the US National Museum (USNM) and the various federal organizations that generated collections related to their mission. In this legislation, the Smithsonian was identified as the repository for natural history specimens belonging to the United States.**
  - **In legislation passed in 1879, Congress clarified and expanded the role of the US National Museum by designating the USNM as the final repository for collections made on behalf of the US Government - when those collections were no longer needed for investigations in progress.**
  - **The intent of the legislation and the purpose of the resulting partnerships between the USNM and the various government organizations was to ensure the long-term care of these collections and their accessibility for the benefit of the American people.**



**For over 35 years, the Department of Invertebrate Zoology has collaborated with the Bureau of Ocean Management (BOEM).**



NMNH's Department of Invertebrate Zoology provides professional collection management services for the long-term curation of marine invertebrate specimens taken during the environmental baseline surveys of various oil and gas lease sites on the US East and Gulf Coasts, and the US West and Alaskan Coasts



Project-related lots cataloged for each region since October 1, 1979.

**Alaska**

Program	Date of Study	Approx. lot number
ANIMIDA	2013-2017	70
ESSNA	1982	100
FEWCB	1982-1983	50
OCSEAP	1980s	1,350
TFLTC	2012-2017	25

**Atlantic**

Program	Date of Study	Approx. lot number
ASLAR	19184-1985	25,100
ATCAN	2012-2013	15
BIMP	1981-1984	49,000
CABP	1975-1977	22,000
CASPS	1979-1982	100
LMRS	1980-1981	20,500
NEEB	1977	18,500
POSP	1986-1987	14,250
SABP	1977	21,750
SAHBS	1978	50

**Pacific**

Program	Date of Study	Approx. lot number
BHC	2010-2012	450
CAMP	1983-1988	550
CARP	1987	600
MARINe	2014	15
SOCAL	1975-1978	1,775

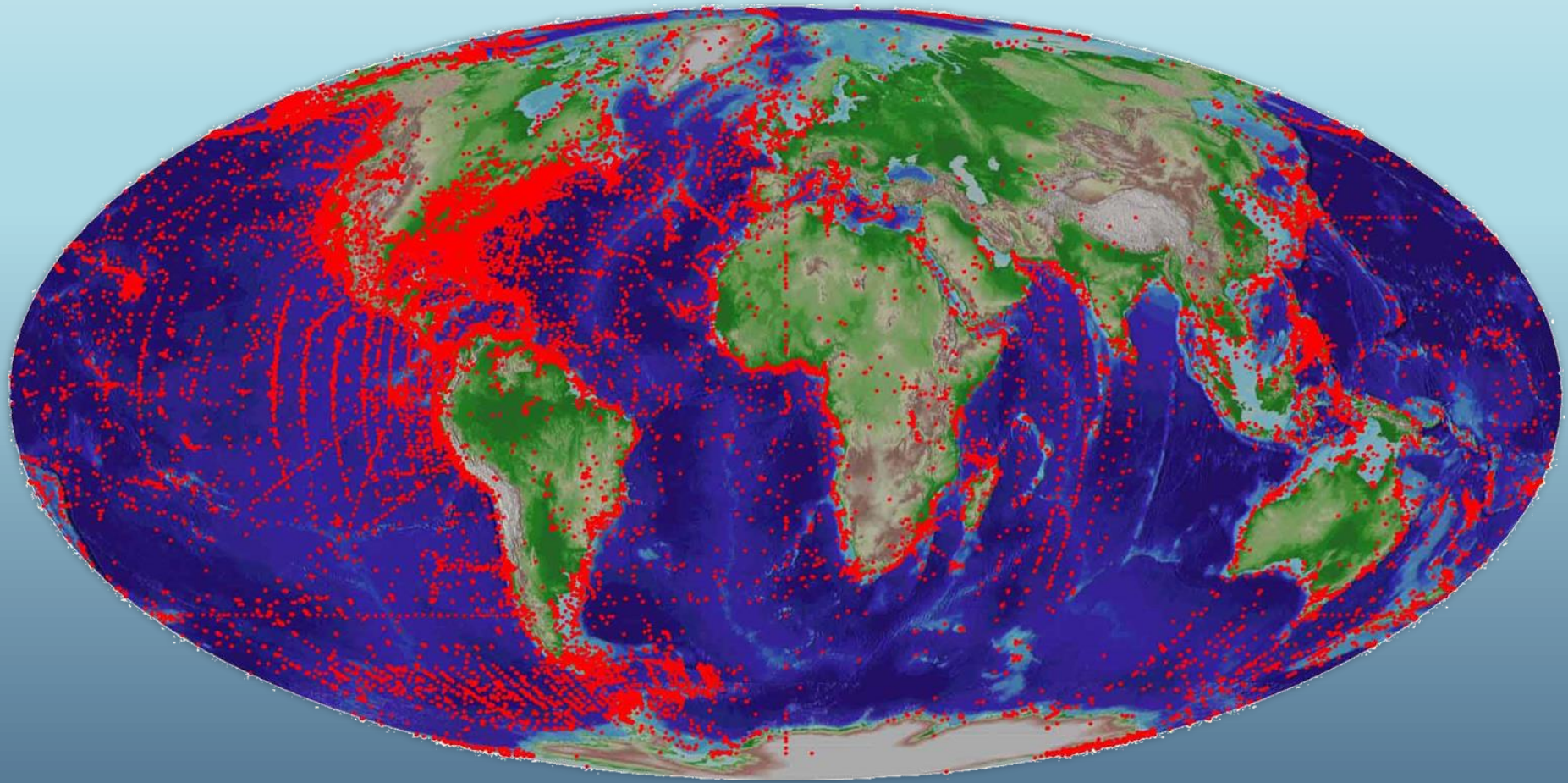
**Gulf of Mexico**

Program	Date of Study	Approx. lot number
CAIMP	1996-1997	750
CGPS	1978-1979	7,750
CHEMO	1991-2007	1,750
DeepWrecks	2004	10
DGoMB	2001-2002	1,000
IXTOC	1979-1980	100
LOPH	2004	175
MAFLA	1975-1978	26,250
MAMES	1987-1989	20
MAPTEM	1996-1999	100
NGOMCS	1983-1986	12,100
PSBF	2011-2013	5
SOFLA	1980-1985	30,250
STOCS	1975-1977	25,100
SWAPS	2009-2010	450
USGS CHEMO	2003-2007	700
USGS LOPH	2004-2012	1,500

Over 280,000 lots cataloged

Unique taxa in BOEM collection – 8,359  
 Annelida, Crustacea, Cnidaria,  
 Echinodermata, Mollusca, Porifera





IZ collections are world-wide with extensive representation, primarily from the BOEM program, in the Gulf of Mexico and the US east coast



# BOEM Types – 1,512 lots; 352 new species

196 - Annelida

107 - Arthropoda

2 - Chordata

12 - Cnidaria

6 - Echinodermata

2 - Kinorhyncha

16 - Mollusca

11 - Porifera

*Hesiocaeca methanicola* Desbruyères & Toulmond, 1998

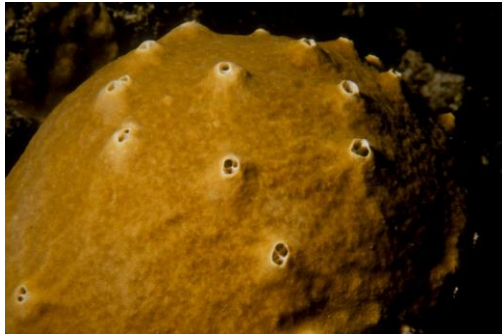




# Giant squid collected in the Gulf of Mexico, August 2009







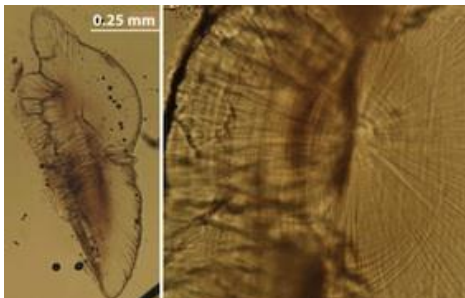
Isotopic Analysis:  
Sponge Metabolism

Squid: eye size correlation  
to water depth



Galatheid Crab  
Morphology, Life  
History, and Parasites

Reproduction and  
Development of  
Cnidaria



Squid Life History  
Strategies: Statolith  
Study







- Specimens available for loan, scientific visit
- Support for hazmat shipments for PIs (donation of material)
- Searchable online catalog; results downloaded as spreadsheet or interactive map; linked to GeoESPIS

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### Search the Department of Invertebrate Zoology Collections

Invertebrate Zoology Collections | Keyword Search | **Search by Field** | Help | Feedback

**Search by Field**

Identification | Collection | Location | Preparation | GenBank & Other Numbers | USNPC

Catalog Number - USNM:

Phylum:

Class:

Order:

Family:

Scientific Name:

Common Name:

Type Status:

Identified By:

Genetic Samples:

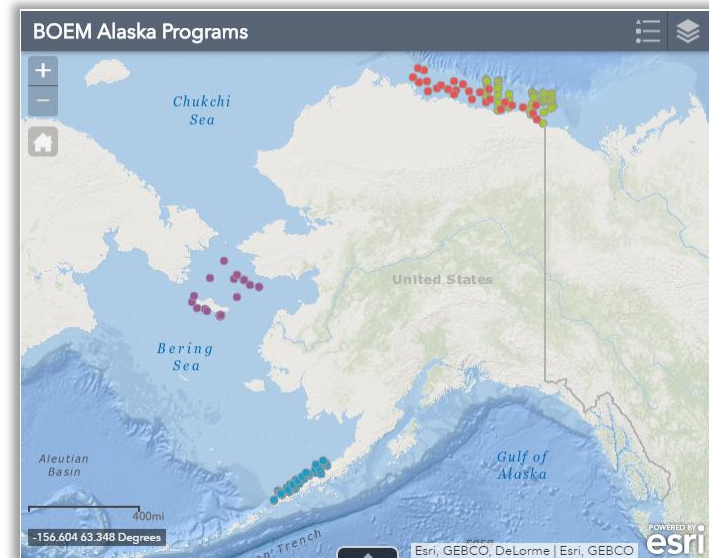
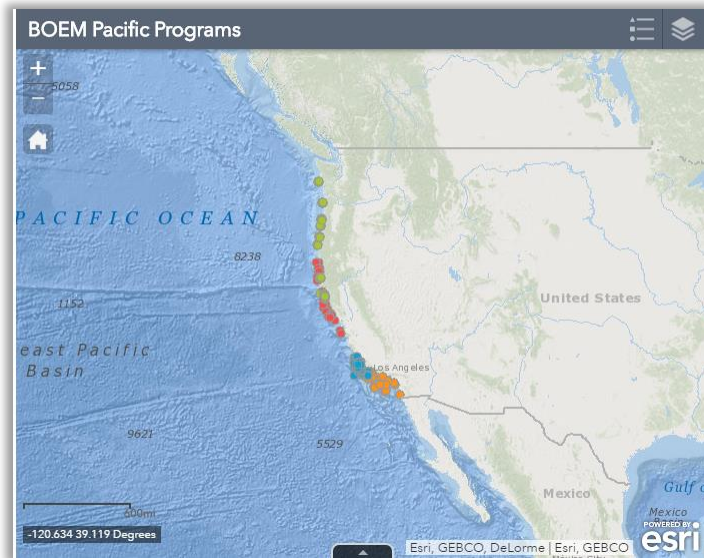
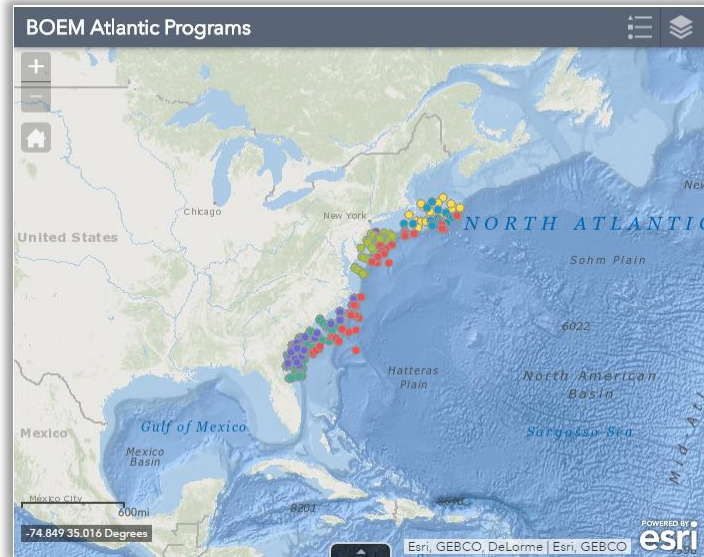
Only Records With:  Images  Type Specimens

Records/Page to Display:  5  10  20  50  100

Data current as of 29 Mar 2018: 1,821,150 total records

NMNH Data Access Policy

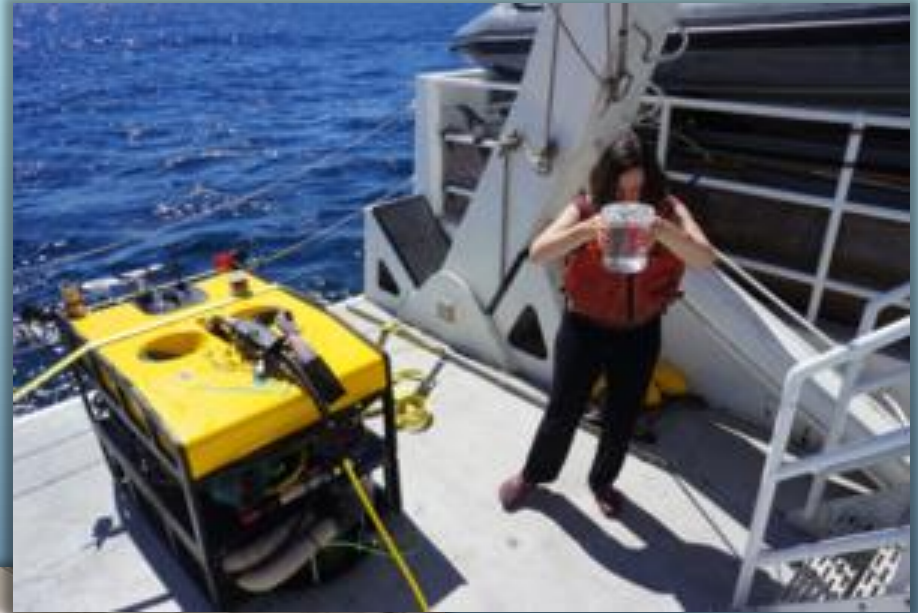
# BOEM Maps: A geospatial tour of 40 years of collection



<http://invertebrates.si.edu/boem/maps.html>



- In 2017, expansion of partnership to include barcoding of vouchers and collection of genomic tissue samples (fresh-frozen, 95% EtOH, or DMSO)



# Family

SI NMNH BOEM  
Programs  
(928)

928

567

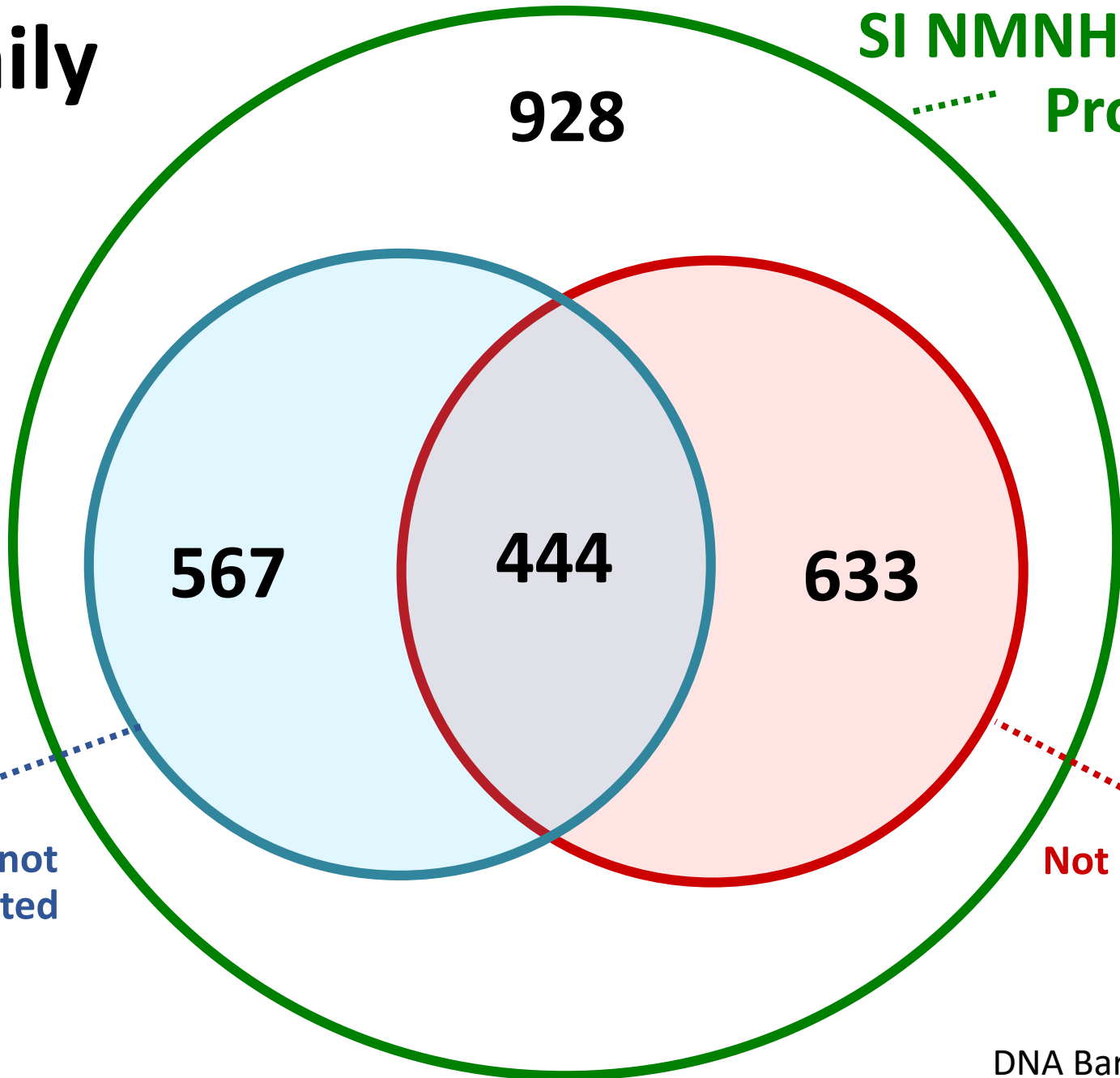
444

633

Families not  
represented  
in GGBN  
(567)

Not in GenBank  
(633)

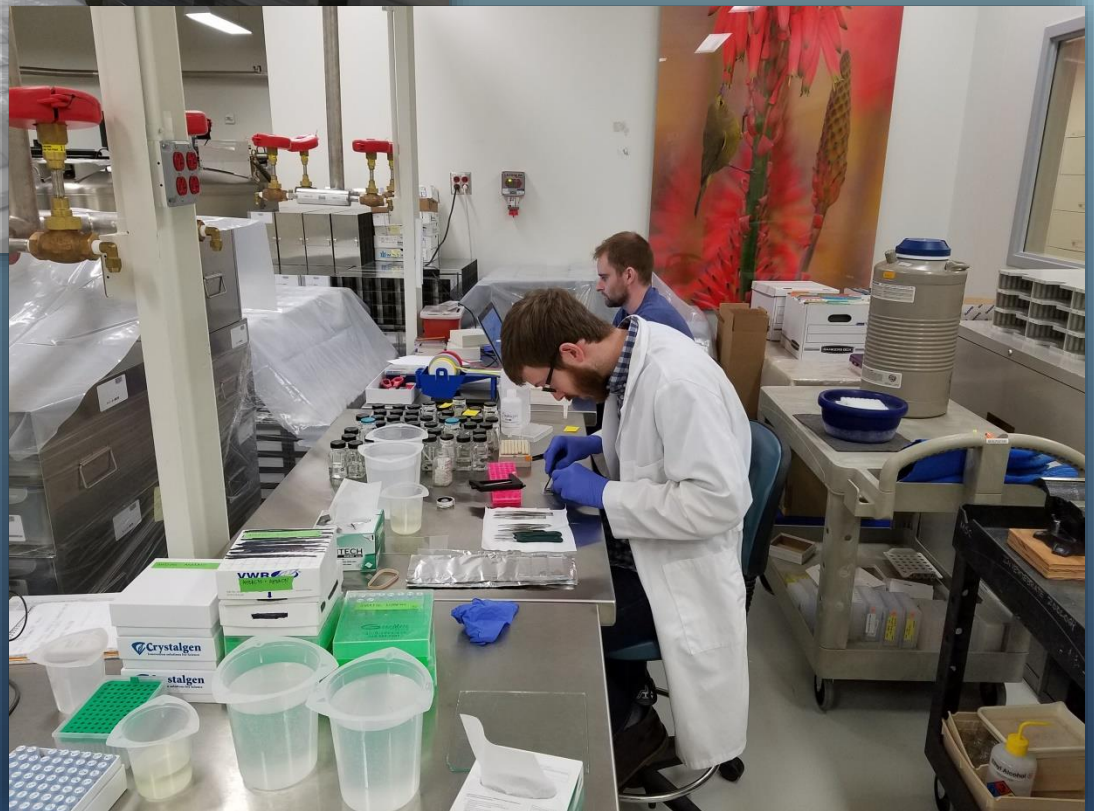
DNA Barcoding

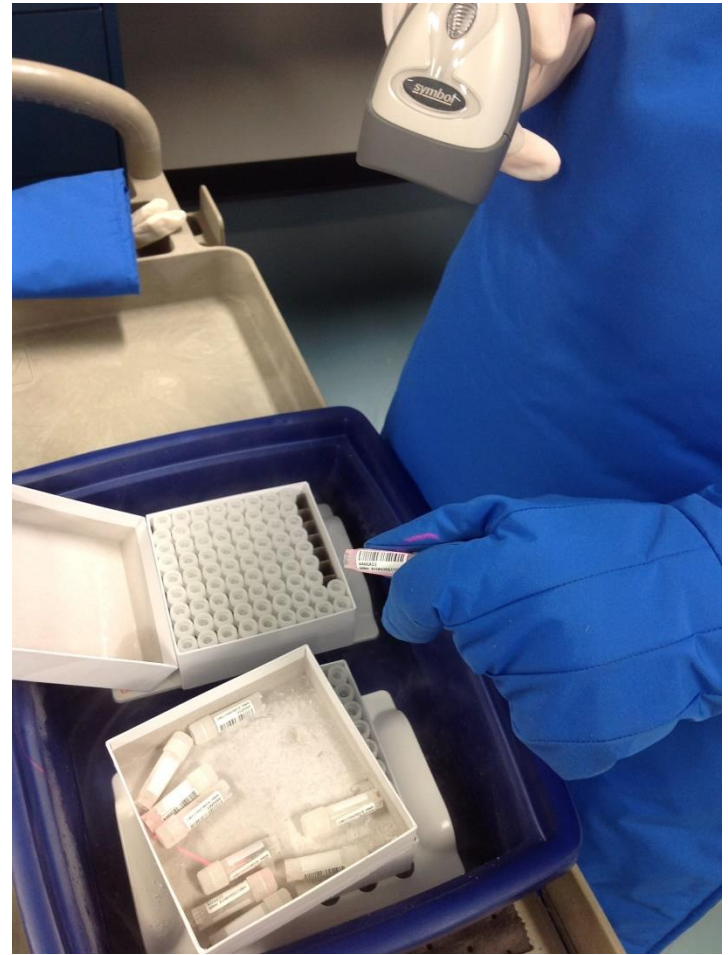
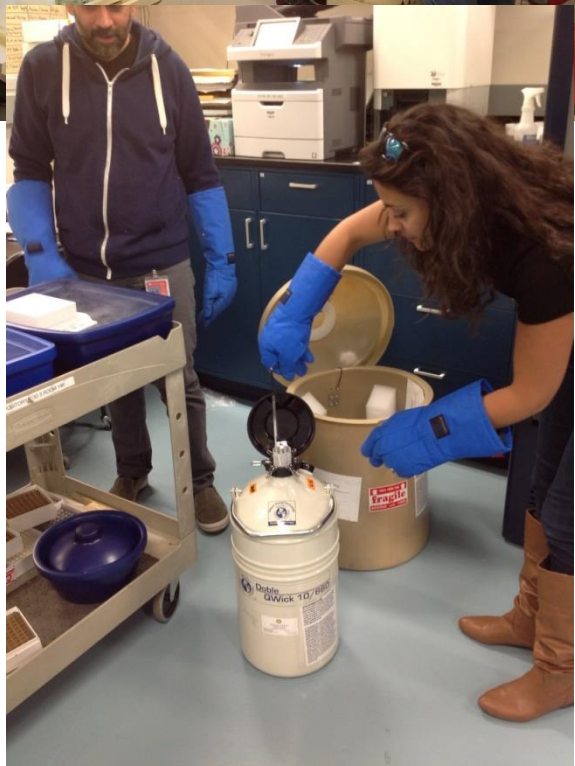






## Sampling BOEM collections at NMNH





<http://invertebrates.si.edu/boem/docs.htm>





## **NMNH Biorepository**

- 20 liquid nitrogen freezers  
(-190°C & -150°C)
- 58 mechanical freezers  
(-80°C & -30°C)

# SAML Partnership?



- Anyone have vouchers collected as part of BOEM funded research?
- Would SAML collectively, or individual SAML members, be interested in collaborating?
- Are there particular taxonomic groups of interest for barcoding?
- Invert Zoology courses?



# Smithsonian Institution Department of Invertebrate Zoology

<http://invertebrates.si.edu>

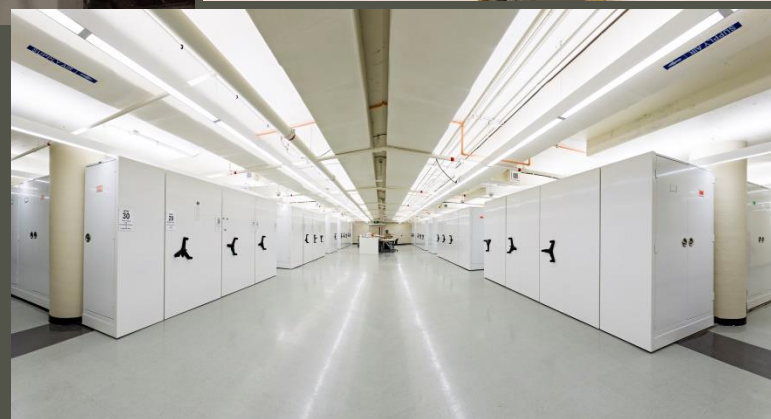
BOEM Genomic Project <http://invertebrates.si.edu/boem/docs.htm>

Questions?

Contact – William Moser, Acting Collection Manager [moserw@si.edu](mailto:moserw@si.edu)

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