Documenting Marine Biodiversity through Digitization of Invertebrate Collections

DigIn

UNIVERSITY OF MIAMI
ROSENSTIEL
SCHOOL of MARINE &
ATMOSPHERIC SCIENCE
U

BISHOP MUSEUM

MUSEUM OF
NATURAL
HISTORY

ASU
Biodiversity
Knowledge
Integration
Center
Arizona State
University

CSUDH
CALIFORNIA STATE UNIVERSITY, DOMINGUEZ HILLS

SANTA BARBARA
MUSEUM
of
NATURAL
HISTORY

150 YEARS AMERICAN MUSEUM
of NATURAL HISTORY

NORTH
CAROLINA
Museum of
Natural Sciences

SCRIPPS INSTITUTION OF
OCEANOGRAPHY
UC San Diego

FM
FLORIDA
MUSEUM®

Q-quatics

CALIFORNIA
ACADEMY OF
SCIENCES

FIELD.
MUSEUM

The Academy of
Natural Sciences
of Drexel University

ALABAMA
MUSEUM
OF NATURAL HISTORY

FLORIDA FISH AND WILDLIFE
CONSERVATION COMMISSION

Museum of Natural History
UNIVERSITY OF COLORADO BOULDER

NATURAL
HISTORY
MUSEUM
LOS ANGELES COUNTY

VIMS | WILLIAM & MARY
VIRGINIA INSTITUTE OF MARINE SCIENCE

MUSEUM OF COMPARATIVE ZOOLOGY

HARVARD UNIVERSITY

IRLON
Indian River Lagoon Observatory
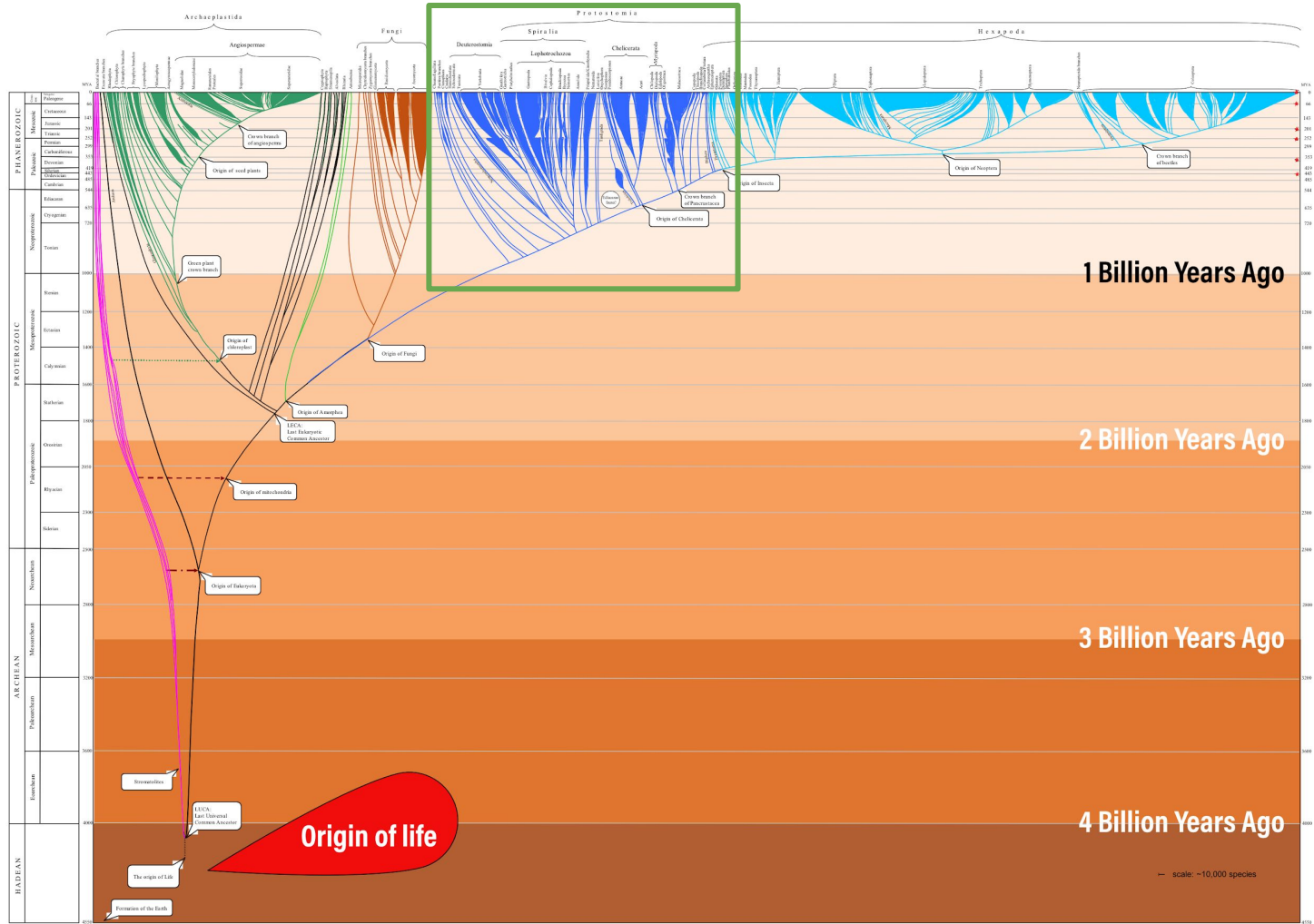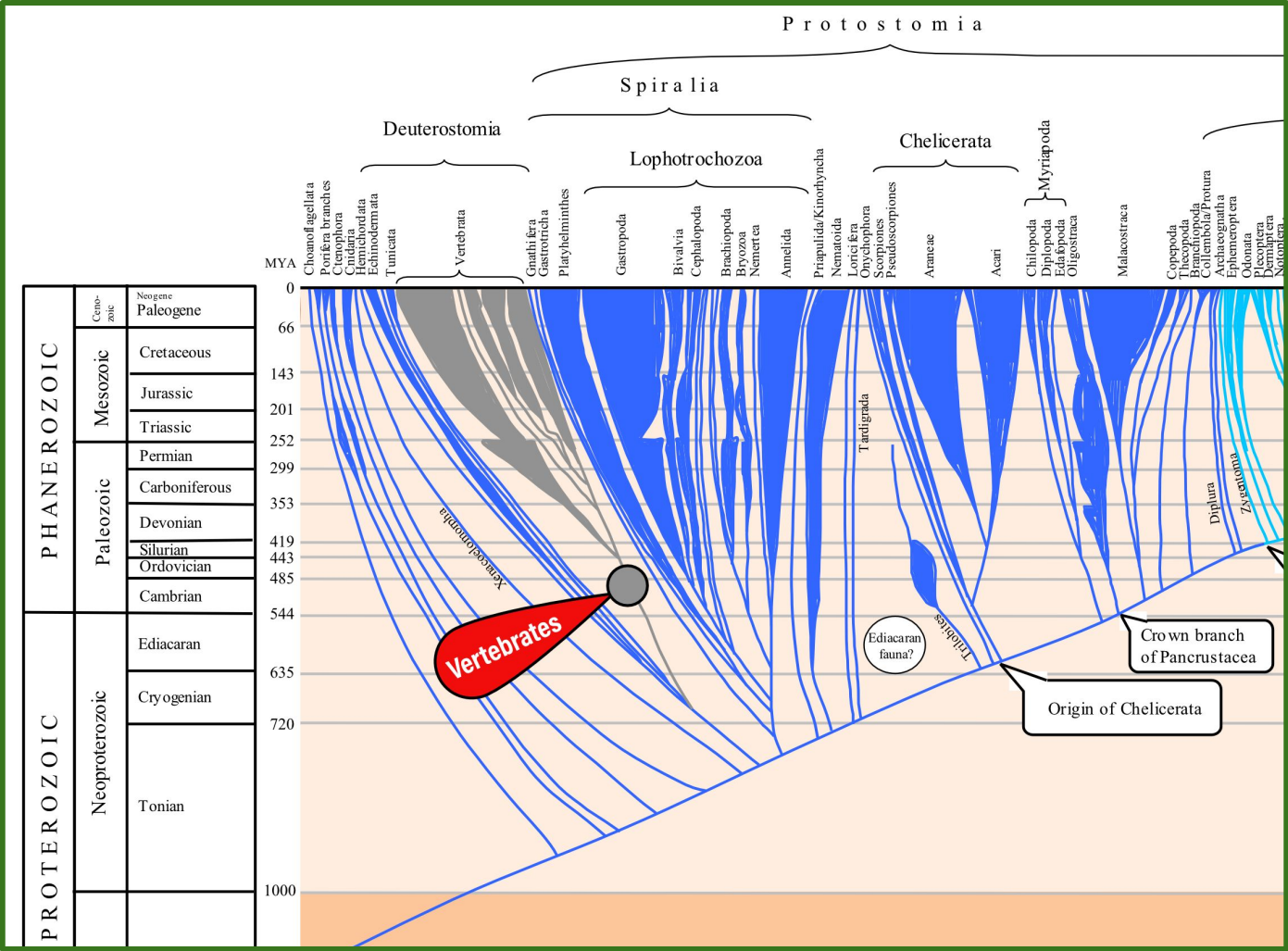Network of Environmental Sensors

HARBOR BRANCH
FLORIDA ATLANTIC UNIVERSITY®

Yale PEABODY MUSEUM
OF NATURAL HISTORY
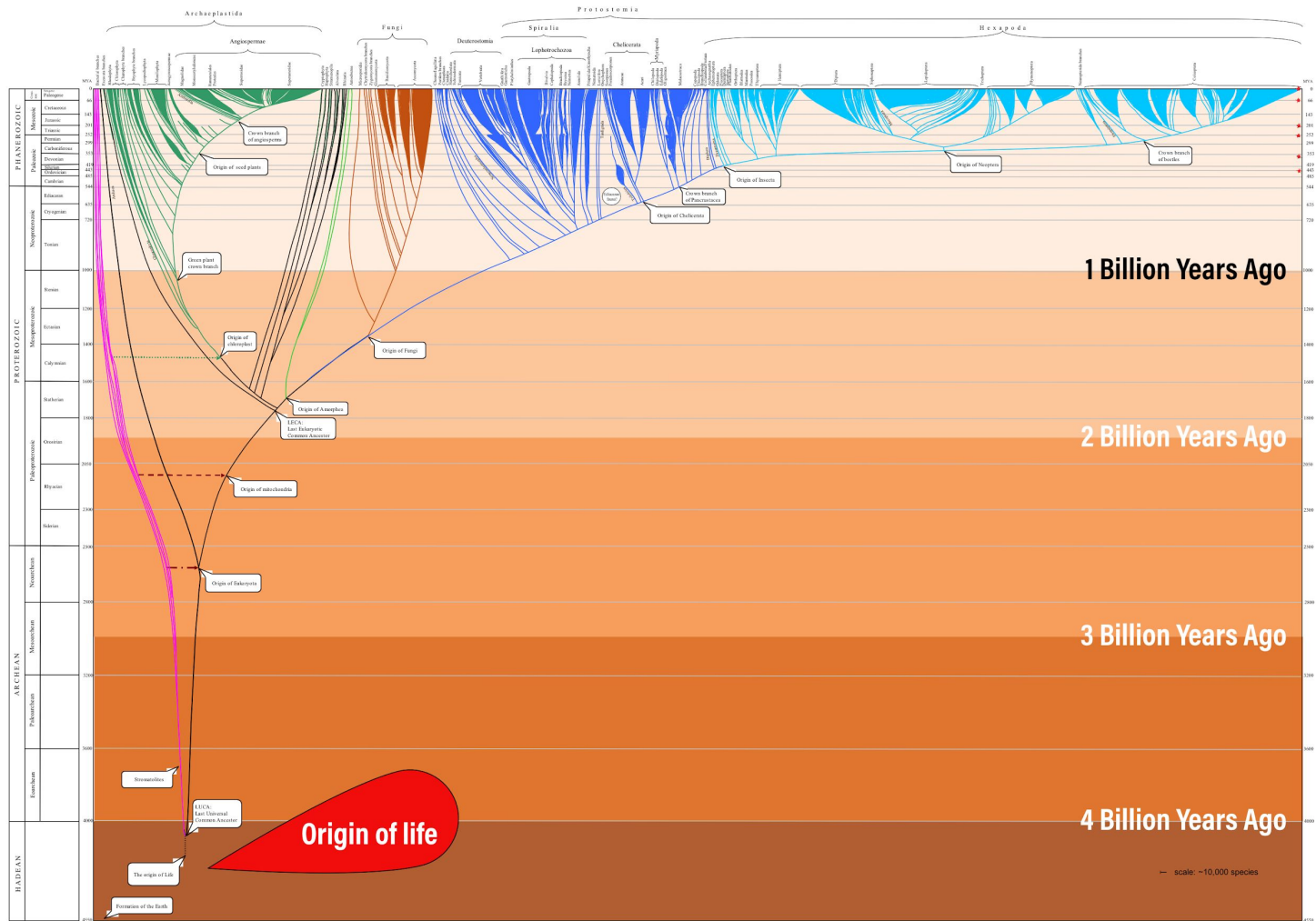
Core rationale

More than double the number of digitized specimen lots of non-molluscan marine invertebrates in North America

Reconstruct communities sampled in the past

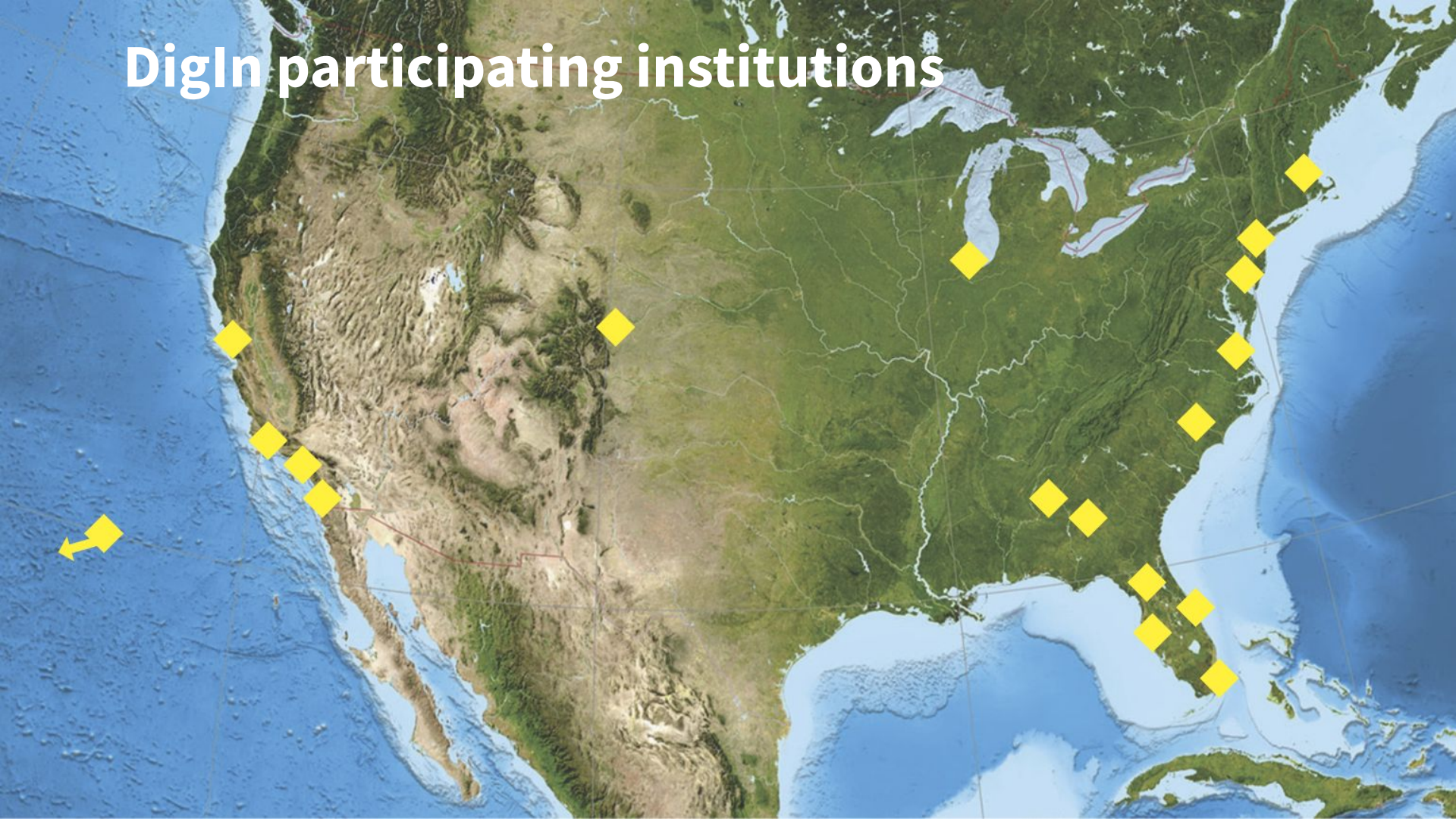Biogeographic distributional patterns in time and space

Biodiversity synthesis linking extended specimen data

Nomenclatural standardization, facilitating taxonomic resolution

Unifying the collections community with best practices and training

DigIn participating institutions

Participating Institutions

Academy of Natural Sciences, Philadelphia, PA
American Museum of Natural History, New York, NY
Museum of Comparative Zoology, Harvard University, Cambridge, MA
Virginia Institute of Marine Science, College of William & Mary, Gloucester Point, VA
Yale University Peabody Museum of Natural History, Boston, MA *[subaward]*
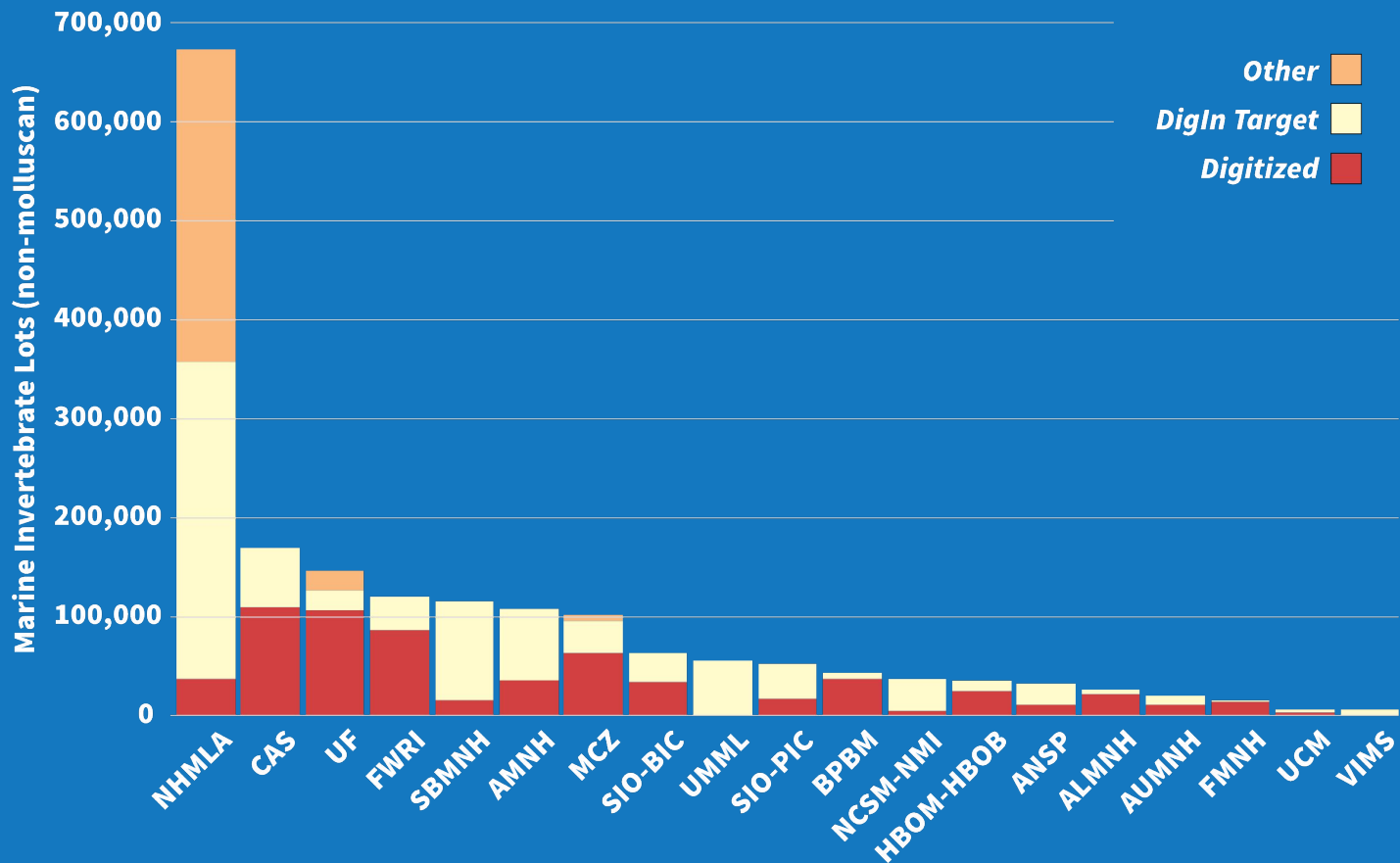
Auburn University, Auburn, AL
Fish and Wildlife Research Institute, St. Petersburg, FL
Harbor Branch Oceanographic Institute, Florida Atlantic University, Fort Pierce, FL
North Carolina Museum of Natural Sciences, Raleigh, NC
Rosenstiel School of Marine & Atmospheric Science, University of Miami, Miami, FL
University of Alabama, Tuscaloosa, AL
University of Florida, Gainesville, FL

Field Museum of Natural History, Chicago, IL *[subaward]*
University of Colorado, Boulder, CO

Arizona State University, Tempe, AZ *[subaward]*
Bishop Museum, Honolulu, HI
California Academy of Sciences, San Francisco, CA
Natural History Museum of Los Angeles County, Los Angeles, CA *[lead]*
Q-Quatics, Laguna, Philippines *[subaward]*
Santa Barbara Museum of Natural History, Santa Barbara, CA
Scripps Institution of Oceanography, University of California San Diego, CA

Institutional holdings

Marine Invertebrate Lots (non-molluscan)

Legend:
- Other
- DigIn Target
- Digitized

Categories: NHMLA, CAS, UF, FWRI, SBMNH, AMNH, MCZ, SIO-BIC, UMML, SIO-PIC, BPBM, NCSM-NMI, HBOM-HBOB, ANSP, ALMNH, AUMNH, FMNH, UCM, VIMS

Key challenge for DigIn: Workflow diversity

Marshalling existing digitized records — diversity of sources and platforms

Expedition station data — cross-collection, cross-institutional
   Shared centralized resource for all collections

Georeferencing — extension and adaptation of terrestrial approaches

Specimen data
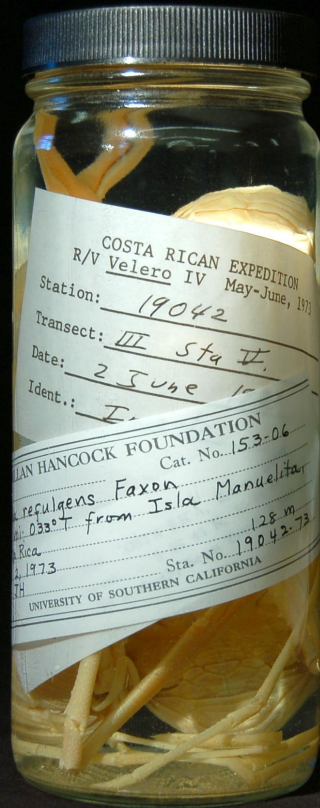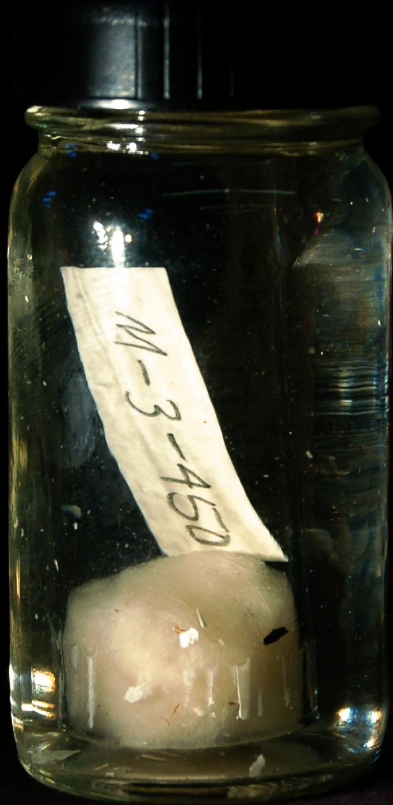   *Data capture from paper/cards — transcription and OCR*
   Linking existing specimen images (minimal new specimen imaging)
   Linking existing genetic/tissue data
   Nomenclatural reconciliation (based primarily on WoRMS)

Multiple workflows to capture data from specimen containers

DigIn broader impacts

STEM educators and curatorial sustainability
Cal State University Dominguez Hills — pilot with local teachers
Develop museum/college partnerships nationwide

Virtual field experiences — co-created by science leads and educators
Combining geospatial data, underwater imagery, and specimen data
Focus on Channel Islands, Strait of Juan de Fuca, and Florida Keys

Public engagement in data transcription
Local and remote participation in specimen data acquisition

DigIn goals and objectives summary

Digitize and disseminate **835,000 lots**, representing **7,500,000** specimens.

Mobilize and disseminate an additional **210,000 lots** that are digitized.

Georeference **175,000 station records**.

Mobilize or create **464,000 images** of specimens and type specimens.

Reconcile nomenclature across collections.

Link extended specimen data to GenBank, BOLD, and GGBN.

Disseminate through diverse aggregators, including iDigBio.

Develop and disseminate best practices for field-to-digitization workflows.

Co-create lessons with K-16 educators that build from and add to our digital products.

Integrate undergraduate training, public engagement, and online participation.

Unite the marine collections community with a sustainable digitization ecosystem.

DigIn
Participants