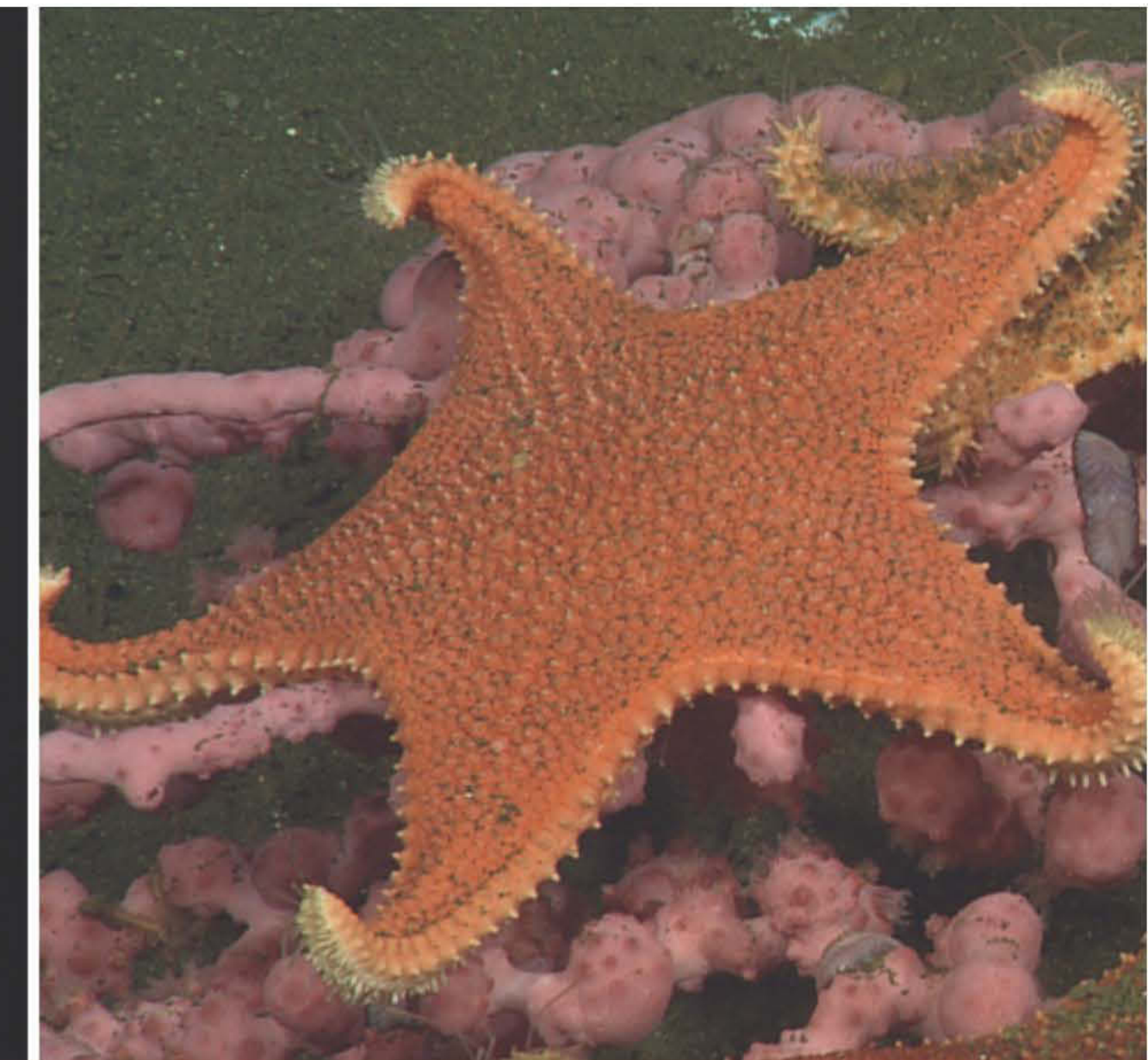
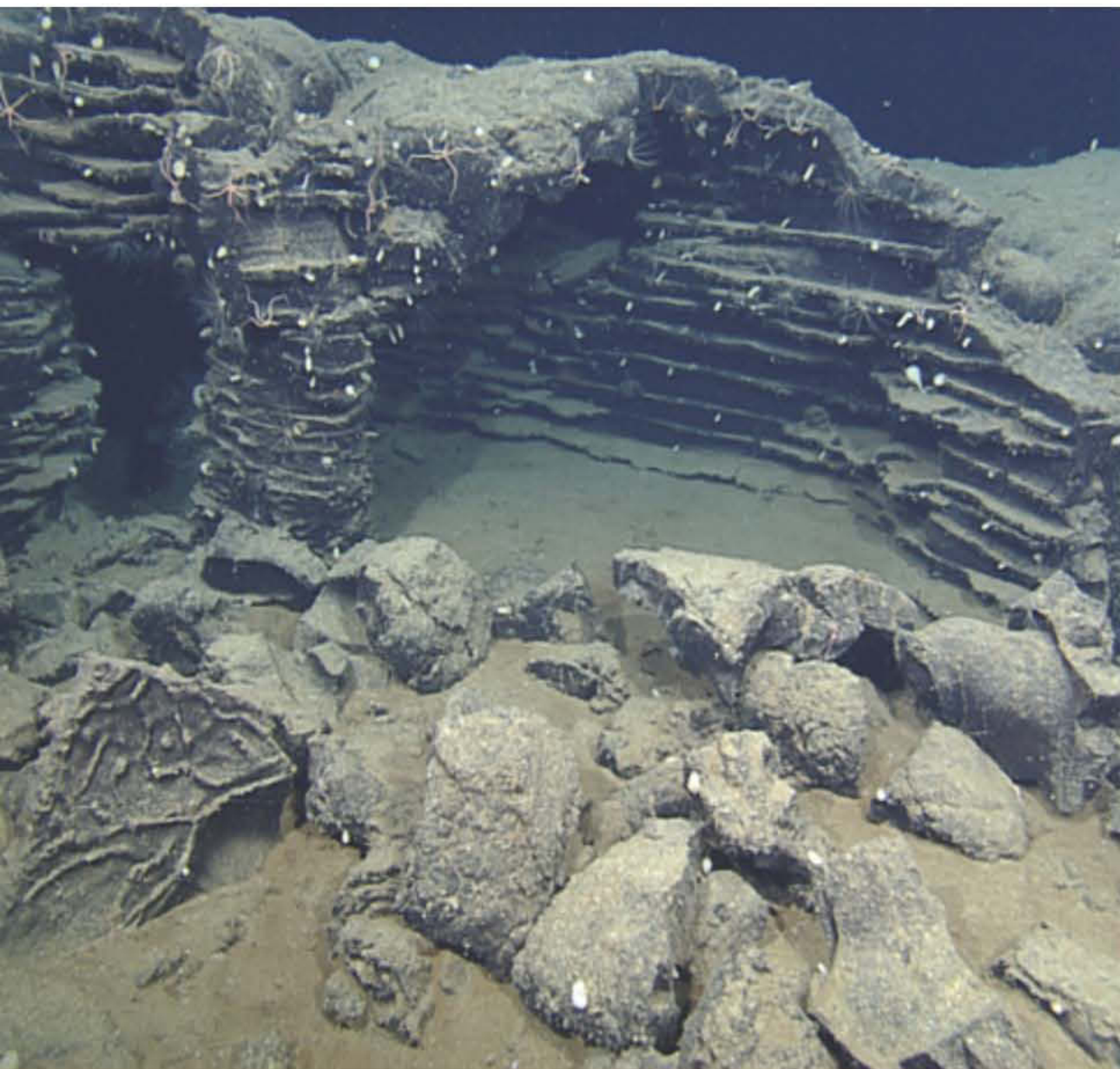


**Marine  
Imaging  
Workshop  
Kiel  
2017**



**Building an information-rich  
marine imagery database**



*Linda Kuhnz*  
*Monterey Bay Aquarium Research Institute*





# Journey

**1996**  
*Early VIMS and  
VICKI*

**2015**  
*Deep-Sea Guide  
(web-based)*



**1988**  
*First ROV dive;  
rudimentary  
annotation*



**2005**  
*Video Annotation and  
Reference System  
(VARs)*



**Today**  
*5.3 million  
observations in  
VARs database*

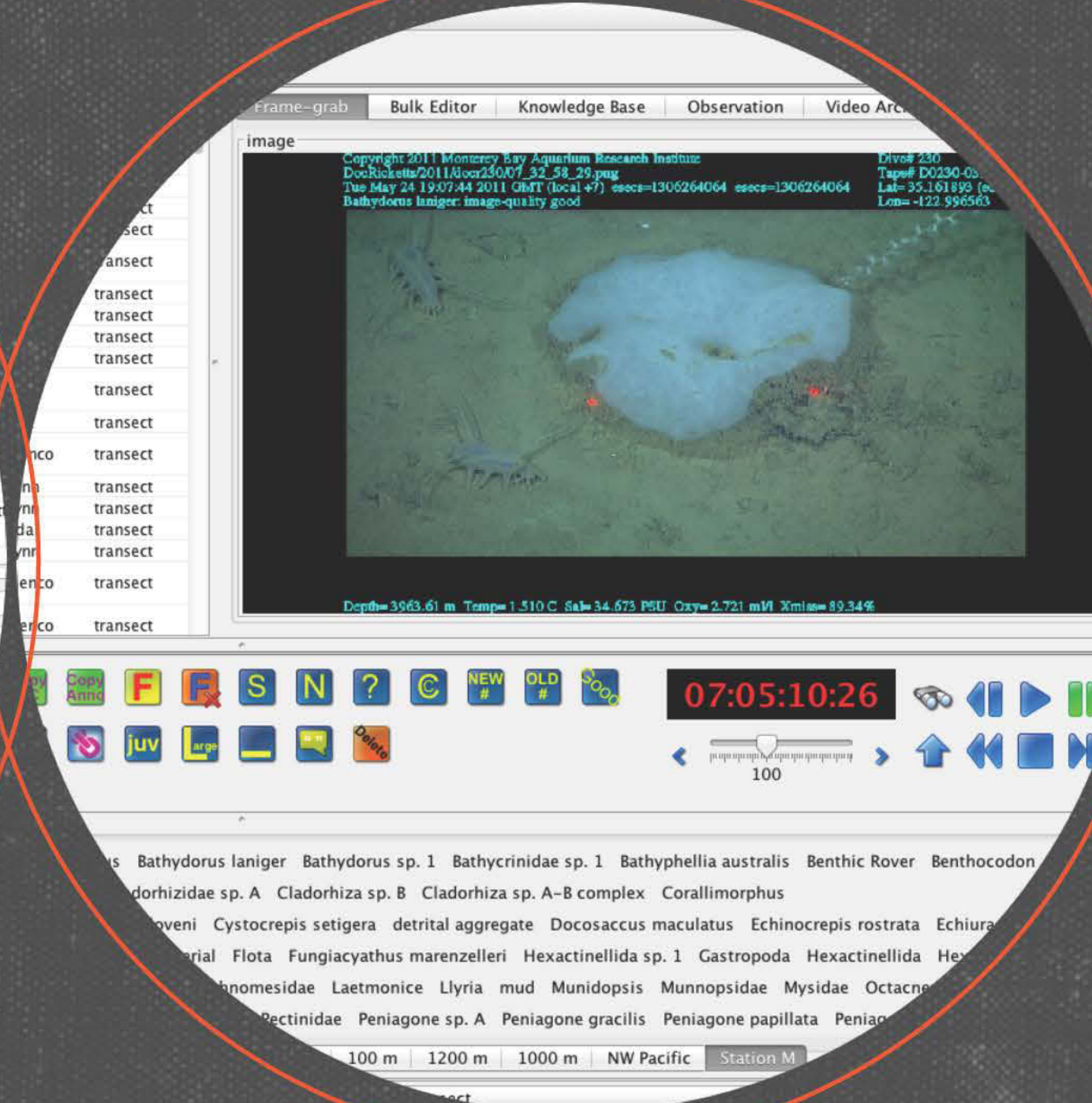
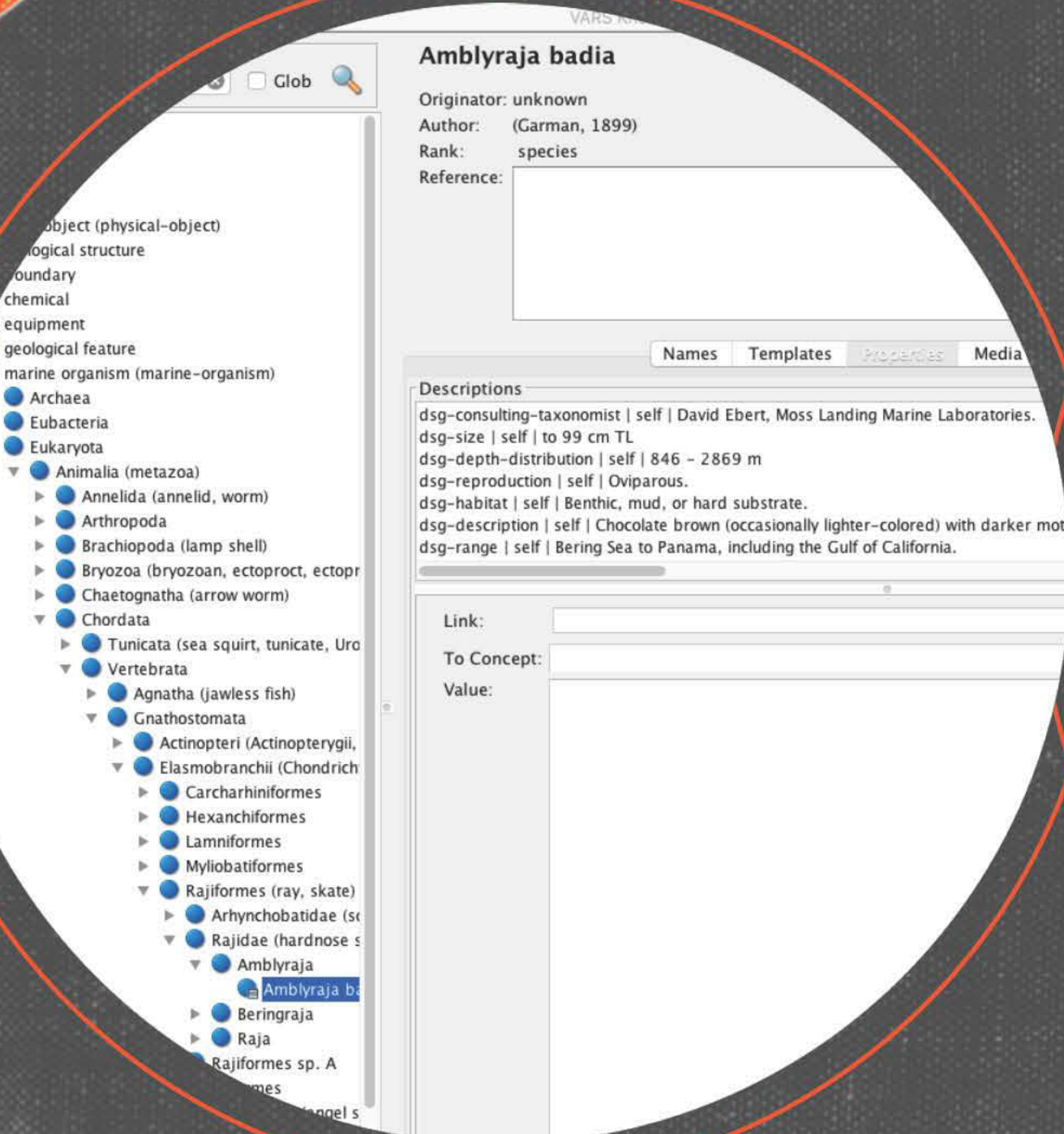




**VARS**  
components

# Knowledgebase

# Query



## Annotation

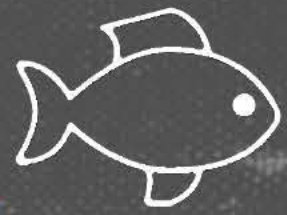


Open source  
software

# Open source software



What to  
keep track  
of?



Taxonomic  
name changes



Data  
quality

# m<sup>-2</sup>

Quantitative  
data



Field of  
view



Embargoed  
data



References

Ability to  
document  
information  
at the  
appropriate  
level



## Term or Object level



### ***Hierarchical Structure***

Taxonomic tree, name changes, common names, retain synonyms



### ***Descriptions***

Shape, color, behavior, habitat, geographic and depth range, compare and contrast with other taxa



### ***Images***

Typical, close-up, male, female, juvenile, specific features, measurement directions

### ***Placeholder names***

*Known new species* = sp. A  
*currently unidentified morphotype* = sp. 1



### ***Species complexes***

Organisms that cannot be distinguished in imagery



### ***Level of confidence***

Publications, taxonomic consultants, molecular work; modifiers (certain, provisional, unconfirmed)





Individual  
annotation  
level



***Level of confidence***

Maybe, likely, distant; track observer



***Sample collection***

Sample number, collection method,  
good in situ image



***Behavior***

Eating, burrowing, inking, etc.

***Habitat***

Consistently document throughout  
dive, individual-specific



***Quantitative***

Transect designations, use of identify  
reference #'s, population quantity



***Size or area***

Linear measurements, polygons





# Deep-Sea Guide

## *Bathyraja spinosissima*

Alternate names: Pacific white skate, white skate  
Author: (Beebe and Tee-van, 1941)



Immature male.

MBARI 2011: D264-08HD

[Click here for a larger image.](#)



1

2

[Next](#)

### Description

**General:** Large; uniform white to light-medium gray. Snout extends beyond indented pectoral fins. May have slightly darker margins, and alar thorns are evident in some darker-colored males. Note the thick base of the tail (compare to *B. abyssicola*). Claspers may appear white-tipped in darker males.

**Size:** to 150 cm TL.

**Reproduction:** Oviparous; young born from within a leathery eggcase.

### Geographic Information

**Published depth range:** 800 - 2938 m

**Ocean range (global):** Waldport, Oregon to Isla Cocos, Costa Rica and the Galapagos Islands.

**Habitat description:** Benthic. Demersal over hard substrate (lava, seamounts).

### Taxonomy:

Eukaryota (superkingdom)  
  Animalia (kingdom)  
    Chordata (phylum)  
      Vertebrata (subphylum)  
        Gnathostomata (superclass)  
          Elasmobranchii (class)  
            Rajiformes (order)  
              Arhynchobatidae (family)  
                *Bathyraja* (genus)  
                  *Bathyraja spinosissima* (species)

### Media

[Phylogenetic Image Gallery](#)

[Data Products](#)

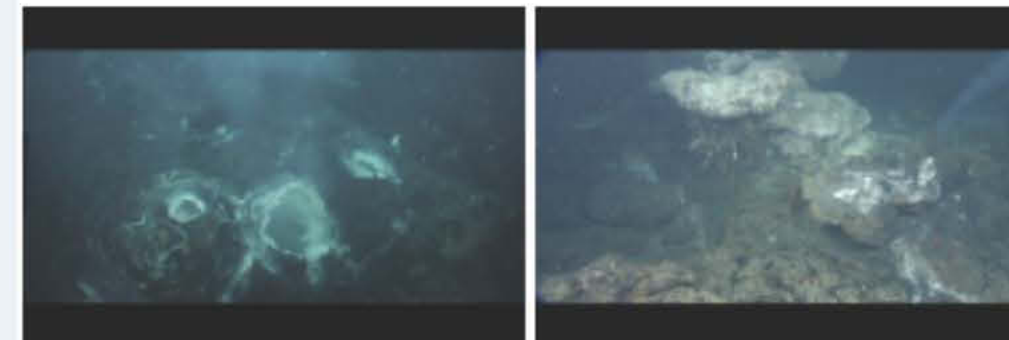
[Annotated Images](#)

## Image for the group geological feature

### geological feature

#### geological morphology

##### hydrothermal vent



##### black smoker



##### clear shimmering vent



##### white smoker





**TEAM**



*Nancy Jacobsen  
Stout*



*Linda Kuhn*



*Lonny Lundsten*



*Brian Schlining*



*Kyra Schlining*



*Susan von Thun*



[www.mbari.org](http://www.mbari.org)  
[lkuhn@mbari.org](mailto:lkuhn@mbari.org)



Examples:



## Scotoplanes sp. A

Originator: linda

Author:

Rank: species

Reference:

Names

## Templates

## Properties

Media

## History

### Descriptions

dsg-depth-distribution | self | Generally less than 1600 m.

dsg-description | self | Compare with *Scotoplanes globosa*. This species is ultra-white with body wall annulations often clearly visible; annu

internal-video-lab-only-comment | self | This is a new species (confirmed through molecular comparison) that will be described in the fut

dsg-habitat | self | Benthic.

is-bioluminescent | self | bioluminescent

dsg-reference | self | Barry, J.P., J.R. Taylor, L.A. Kuhnz, and A.P. De Vogelaere (2016). Symbiosis between the holothurian *Scotoplanes* s

Link:

To Concept: self

self

Value:

Compare with *Scotoplanes globosa*. This species is ultra-white with body wall annulations often clearly visible; annulations are less pronounced at deeper depths. Lateral papillae relatively short.



Search

Q loligo

×

Glob

▶ Nephtheidae

▶ Calaxonia

▶ Holaxonia

▶ Scleraxonia

▶ Stolonifera

▶ Pennatulacea (sea pansy, sea pen)

Hydrozoa (hydralike animal, hydroid, hydrozoan)

Medusae (jelly, unidentified from Hydrozoa or Scyphozoa)

Scyphozoa (cup animal, jellyfish)

nophora (comb jelly)

inodermata (echinoderm)

nichordata

Iusca

Aplacophora

Bivalvia (bivalve, clam, pelecypoda)

Cephalopoda

● Coleoidea

▼ ● Decapodiformes

▶ ● Sepiolida

▼ ● Teuthoidea (Decapoda 2, squid, Teuthida, Theudoidea)

▼ ● Myopsida

▼ ● Loliginidae

▼ ● Doryteuthis (Loligo)

● Doryteuthis opalescens (California market squid, Loligo opalescens)

▶ ● Oegopsida

▶ ● Pholidoteuthidae

▼ ● Octopodiformes (octobranchia)

▼ ● Octopoda

▼ ● Cirrata (Cirrina)

▼ ● Cirroteuthidae

▼ ● Cirroteuthis

● Cirroteuthis muelleri

▼ ● Cirrothauma

● Cirrothauma murrayi

● Cirrothauma sp. 1

▼ ● Opisthoteuthidae

▼ ● Grimpoteuthis

● Grimpoteuthis bathynectes (Grimpoteuthis cf. bathynectes)

● Grimpoteuthis sp. 1

● Grimpoteuthis sp. 4

● Grimpoteuthis sp. 5

● Grimpoteuthis tuftsi

Doryteuthis opalescens

Originator: nodc

Author:

Rank: species

Reference:

Names

Templates

Properties

Media

History

Names

California market squid

Doryteuthis opalescens

Loligo opalescens

VARs - Edit an Existing Concept

Create/edit a concept. You must provide a name and select the parent concept. All other fields are optional.

Name:

Doryteuthis opalescens

Parent:

Doryteuthis

Author:

Berry, 1911

Nodc Code:

Rank Name:

species

Rank Level:

Name:

Doryteuthis opalescens

Author:

Type:

Primary

Common

Synonym

Former







## Sharing Data

All annotations  
or by specific  
region

Binned  
counts  
by depth  
range

Multiple types  
of graphs

Data  
downloadable  
(MatLab and  
other apps)

## Deep-Sea Guide Data Products

Normalized  
by ROV  
effort by  
depth

Raw data

Environmental  
and taxonomic  
data

Save as  
text or  
.kml

Descriptors  
by  
annotation

Links to  
frame  
grabs

## VARS Query Public Version