IODP
INTERNATIONAL OCEAN DISCOVERY PROGRAM

U.S. SCIENCE SUPPORT PROGRAM

IODP Education & Outreach

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NSF Large Facilities Workshop, April 2-4 2019

International Ocean Discovery Program

JOIDES Resolution: has been drilling for the program since 1985

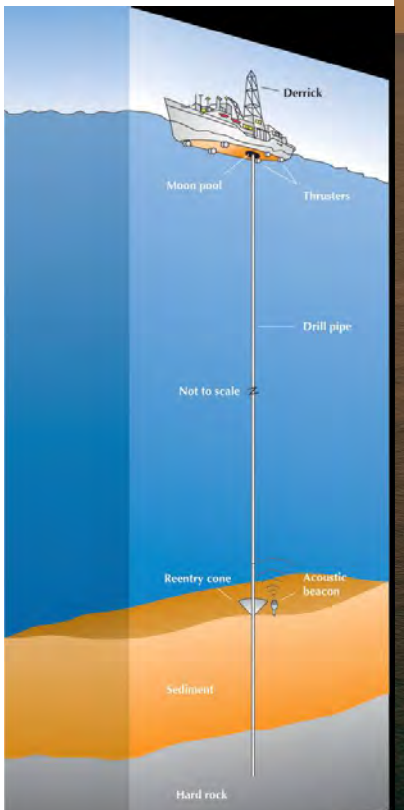
Length: 143 m (471 ft)

Dynamic positioning

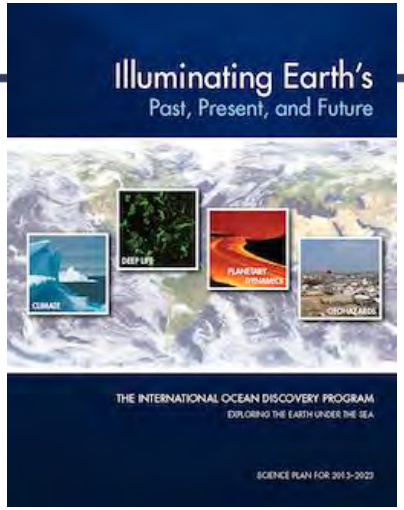
- 12 thrusters: 10 retract, 2 fixed

Shipboard complement

- Holds ~130 people including crew, scientists, technicians, drillers, support staff



Education & Outreach - Overview

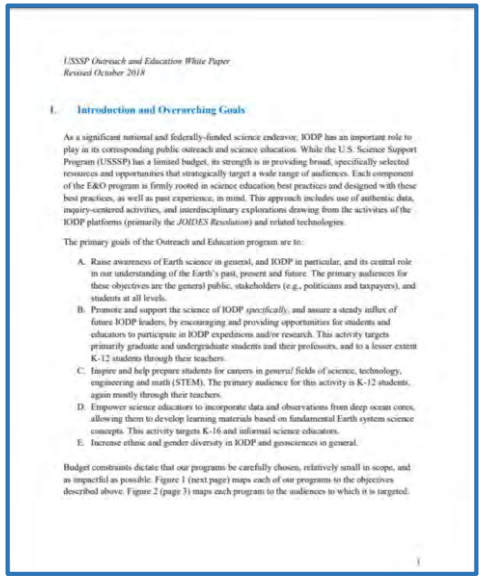


- **IODP Science Plan E&O Goals:**
  - Training the next generation of scientists
  - Fostering stewardship of the planet
  - Informing and inspiring the public

- **Challenges**
  - Limited budget
  - Diverse community priorities: Be all things or focus on a limited number?

- **E&O plan is a coherent, strategically constructed program, it leverages small amounts of funding**

- **Summarized in E&O White Paper, with goal of making objectives, processes and metrics clear to the community**



USSSP Outreach and Education White Paper
Revised October 2018

I. Introduction and Overarching Goals

As a significant national and federally-funded science endeavor, IODP has an important role to play in its corresponding public outreach and science education. While the U.S. Science Support Program (USSSP) has a limited budget, its strength is in providing broad, specifically selected resources and opportunities that strategically target a wide range of audiences. Each component of the E&O program is firmly rooted in science education best practices and designed with these best practices, as well as past experience, in mind. This approach includes use of authentic data, inquiry-centered activities, and interdisciplinary explorations drawing from the activities of the IODP platforms (primarily the *JOIDES Resolution*) and related technologies.

The primary goals of the Outreach and Education program are to:

A. Raise awareness of Earth science in general, and IODP in particular, and its central role in our understanding of the Earth's past, present and future. The primary audiences for these objectives are the general public, stakeholders (e.g., politicians and taxpayers), and students at all levels.

B. Promote and support the science of IODP *specifically*, and assure a steady influx of future IODP leaders, by encouraging and providing opportunities for students and educators to participate in IODP expeditions and/or research. This activity targets primarily graduate and undergraduate students and their professors, and to a lesser extent K-12 students through their teachers.

C. Inspire and help prepare students for careers in *general* fields of science, technology, engineering and math (STEM). The primary audience for this activity is K-12 students, again mostly through their teachers.

D. Empower science educators to incorporate data and observations from deep ocean cores, allowing them to develop learning materials based on fundamental Earth system science concepts. This activity targets K-16 and informal science educators.

E. Increase ethnic and gender diversity in IODP and geosciences in general.

Budget constraints dictate that our programs be carefully chosen, relatively small in scope, and as impactful as possible. Figure 1 (next page) maps each of our programs to the objectives described above. Figure 2 (page 3) maps each program to the audiences to which it is targeted.

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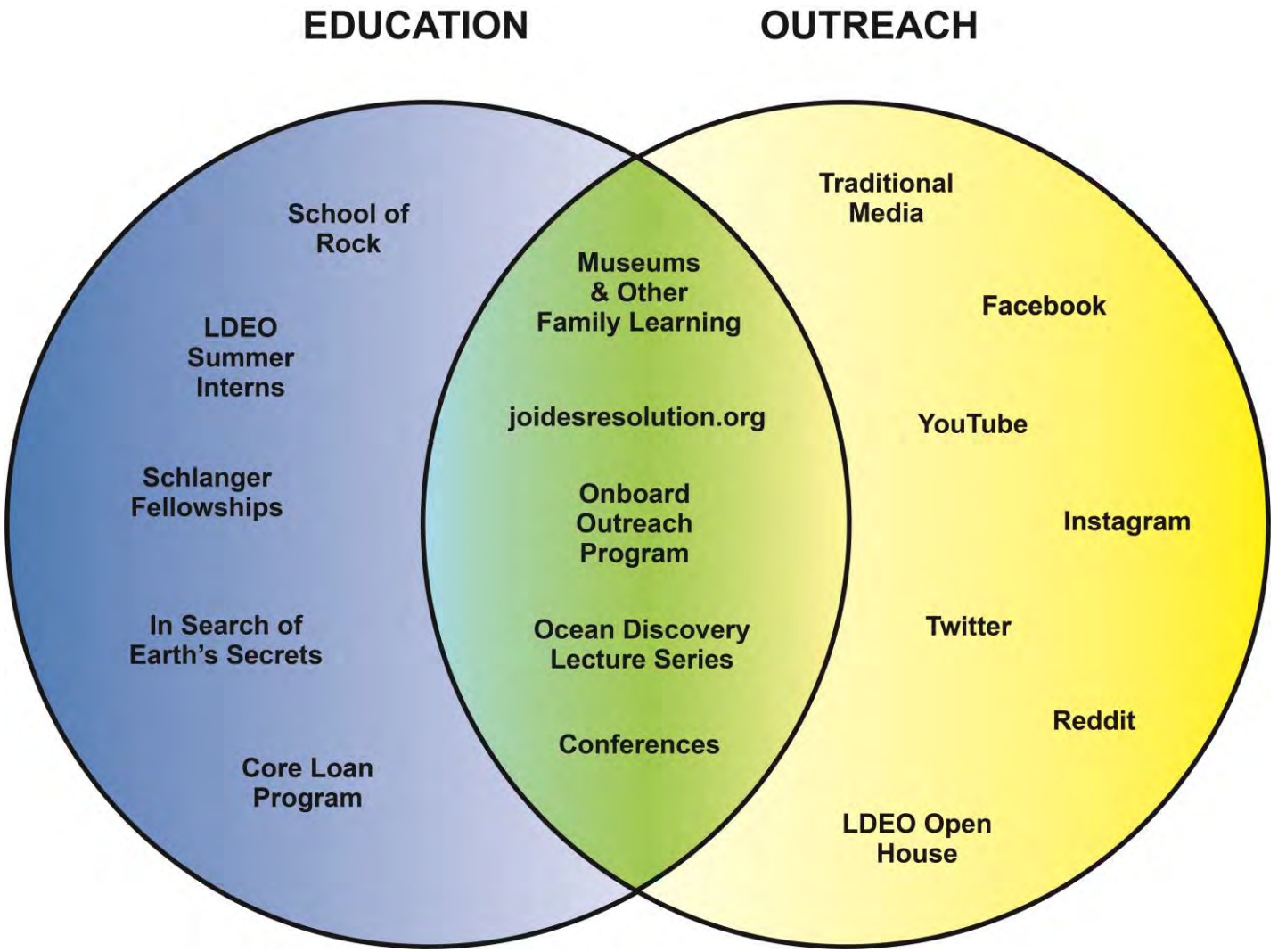
Education & Outreach - Overview



Education & Outreach - Aims

- Raise awareness of Earth science in general, and IODP in particular, and its central role in our understanding of the Earth's past, present and future.
- Promote and support the science of IODP *specifically*, and assure a steady influx of future IODP leaders, by encouraging and providing opportunities for students and educators to participate in IODP expeditions and/or research.
- Inspire and help prepare students for careers in *general* fields of science, technology, engineering and math (STEM).
- Empower science educators to incorporate data and observations from deep ocean cores and exploration tools, including facilitating and developing learning programs and materials based on fundamental Earth system science concepts.
- Increase ethnic and gender diversity in IODP and geosciences in general.

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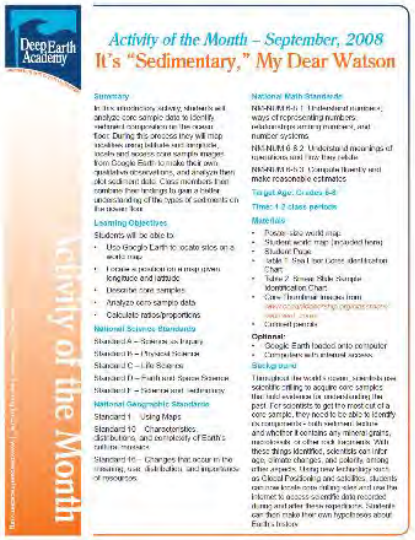
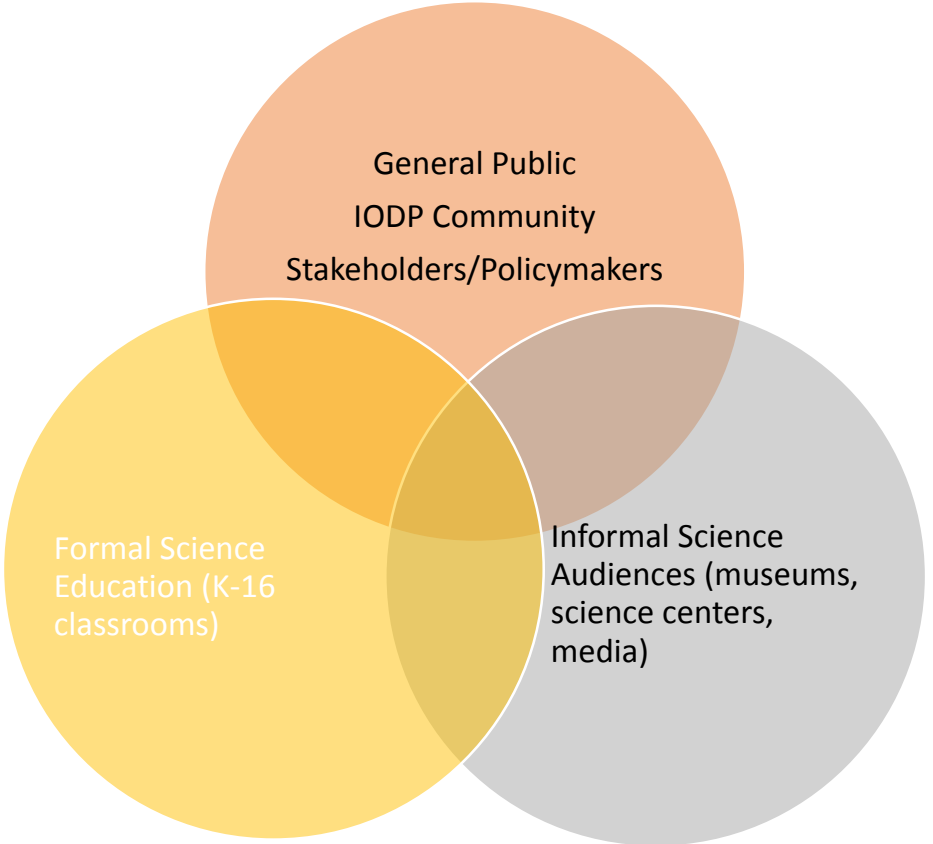
The communities we serve…


Deep Earth Academy

Activity of the Month – September, 2008

It's "Sedimentary," My Dear Watson

Activity of the Month



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Education & Outreach - Overview

E&O Programs Mapped to Goals

	Raise awareness of IODP	Promote/ support IODP science	Inspire/ promote STEM learning	Utilize IODP data in classrooms	Increase Diversity
Onboard Outreach Program	✔	✔	✔	✔	✔
Ocean Discovery Lecture Series		✔			
School of Rock		✔	✔	✔	✔
Schlanger Fellowship Program		✔			
LDEO Summer Intern Program		✔			✔
AMNH Collaborations	✔	✔	✔	✔	✔
JOIDESresolution.org	✔	✔	✔	✔	
Social Media	✔	✔	✔	✔	
Community Update / Ocean Discovery Newsletter	✔	✔			
Conferences	✔	✔	✔	✔	✔
LDEO Open House	✔	✔	✔		
In Search of Earth's Secrets Exhibit	✔	✔	✔		✔
Port Call Outreach & Press Releases	✔	✔			
Core Loan Program	✔	✔	✔	✔	

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Education & Outreach - Overview

E&O Programs Mapped to Audiences

	K-12 Students	K-12/Informal Educators	General Public	Undergraduate	IODP Community/ Undergraduate Instructors	Stakeholders/ Policy Makers
Onboard Outreach Program	✔	✔	✔	✔	✔	✔
Ocean Discovery Lecture Series		✔	✔	✔	✔	
School of Rock	✔	✔		✔		
Schlanger Fellowship Program					✔	
LDEO Summer Intern Program				✔		
AMNH Collaborations	✔	✔	✔			
JOIDESresolution.org	✔	✔	✔	✔	✔	✔
Social Media	✔	✔	✔	✔	✔	✔
Community Update / Ocean Discovery Newsletter	✔	✔	✔	✔	✔	✔
Conferences		✔		✔	✔	
LDEO Open House		✔	✔			✔
In Search of Earth's Secrets Exhibit	✔	✔	✔	✔	✔	✔
Port Call Outreach & Press Releases	✔		✔	✔		✔
Core Loan Program	✔	✔		✔	✔	

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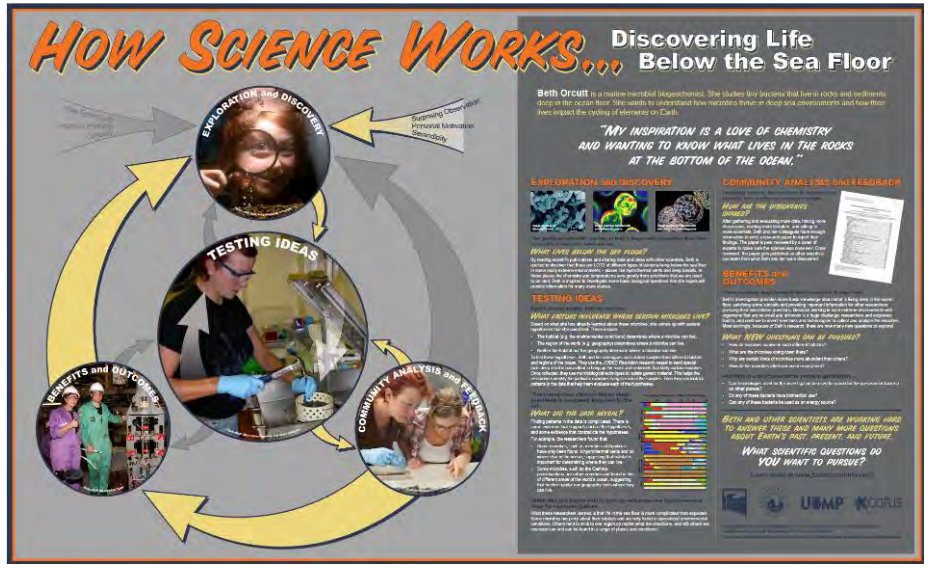
Evidence-based programming

- All programs based on research and best practices in science education and professional development
- Advisory input from scientists, educators and program staff have been sought along the way for ALL programs
- Metrics collected as formative and summative evaluation throughout



Assessments and Evaluation

- USSSP does not have an external evaluator dedicated to its E&O programs, however, it is continually soliciting feedback from its users and advisors,
- Assessments conducted through online surveys, web analytics, in-person surveys, and informal discussions
- Starting now, our advisory board membership includes an “outside” (i.e., non-IODP based) *ex-officio* member with expertise in outreach and education
- Conducting continuous, long-term and wide-ranging external evaluations would be the gold standard, relying on the research literature and best practices in the field is an appropriate and widely accepted strategy in a resource-limited environment.

Onboard Outreach Program

Key Audiences: general public, science students and educators at all levels

Goals:

- Share the science stories of IODP expeditions to shore-based non-technical audiences in creative ways and raise general awareness of IODP science among students, teachers, families and the general public.

- Create synergistic relationships and projects between scientists and outreach personnel that lead to meaningful broader impacts for IODP science.

- Provide unique opportunities for education and outreach professionals to participate in IODP expeditions.

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School of Rock

Since 2005, the School of Rock Program has aimed to:

- provide educators with increased knowledge of IODP, Earth science, and ocean drilling processes, while highlighting related STEM careers.
- assist educators in becoming familiar with how IODP Earth science research relates to education standards and societal relevance
- create a cadre of ambassadors for IODP throughout the education community

The program:

- Capitalizes on *JOIDES Resolution* transits, tie-ups
- Provides participants the opportunity to work intensively with scientists, staff and educators
- If the drilling vessel is unavailable, SOR events are held elsewhere, with partners as appropriate
- Curricula vary from year to year
- Participants collaborate or work individually on educational products or programs
- Experiences disseminated through: teacher workshops, public lectures, presentations and demonstrations in classrooms or science/education conferences, social media, journal publications, or multi-media/internet-based products.

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In Search of Earth's Secrets

In Search of Earth's Secrets: A Pop-Up Science Encounter is a 5-year initiative through NSF's Advancing Informal Science Learning (AISL) program (i.e., NOT facility funding)

- **Goals**
  - Increase access to and awareness of ocean/earth science and careers especially in disadvantaged communities, by bringing the activities, exhibits and scientists themselves to non-traditional venues .
  - Create a sustainable model for STEM learning in informal environments.
  - Increase interest in the scientific drilling and research activities of the *JOIDES Resolution* among the general public.
  - Foster partnerships between educators and scientists that lead to broader dissemination of scientists' research.

Conference presence

USSSP maintains a presence at both science and education conferences:

- AGU
- GSA
- NSTA
- NMEA
- Regional conferences
- SACNAS

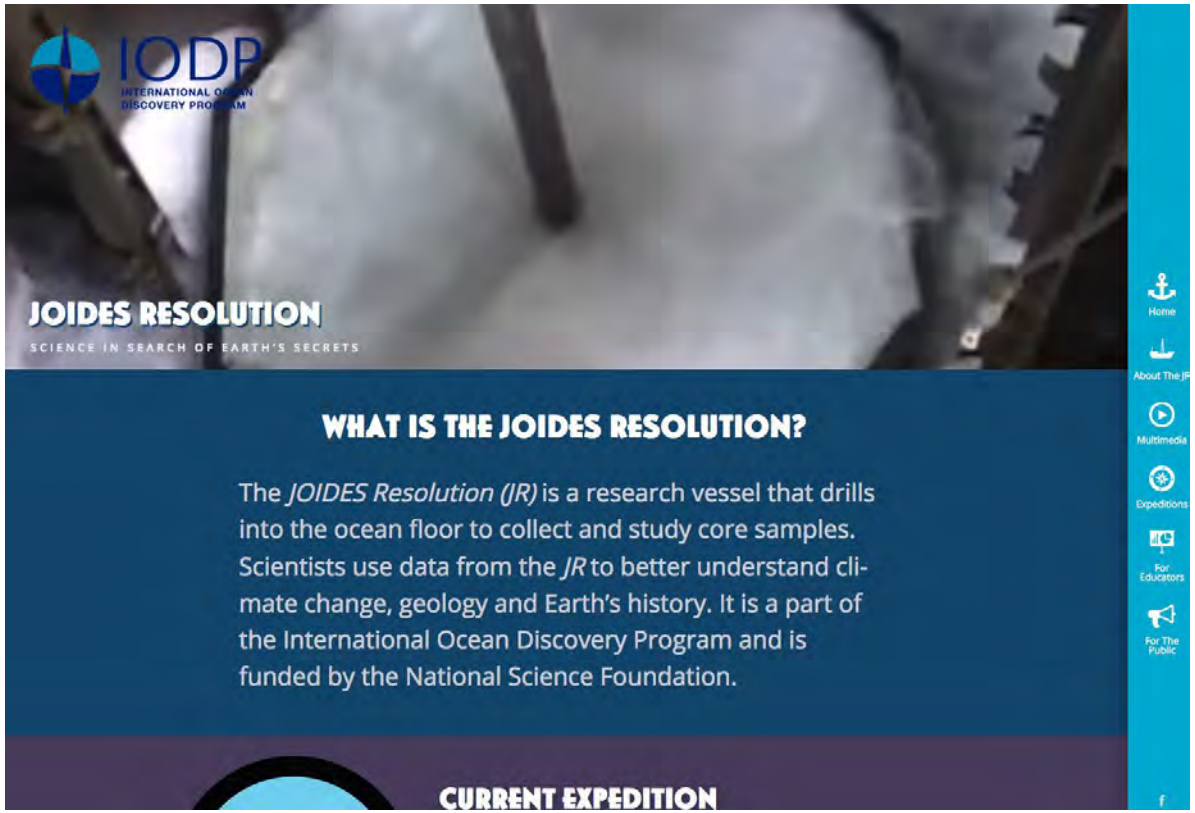
These allow us to reach different segments of our audiences in targeted outreach.

Joidesresolution.org

Key Audiences: General public, K-12, informal science

Goals:

- Raise awareness of IODP
- Promote and support IODP science
- Inspire and promote STEM learning
- Utilize IODP data in classrooms
- Traffic averages around 120,000 page visits and 30,000 users per year.
- Primary users: from United States but analytics show that the site is accessed from populations in virtually every country in the world



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