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Media Release – FOR IMMEDIATE RELEASE

South Atlantic Transect

The International Ocean Discovery Program (IODP) South Atlantic Transect scientific drilling project comprises two expeditions that will investigate the western flank of the southern Mid Atlantic Ridge – Expedition 390 (April 7 – June 7) and Expedition 393 (June 7 – August 7). Together these expeditions, carrying 52 international scientists, will investigate the history of hydrothermal interactions between the cooling ocean crust and the overlying ocean, the presence, diversity and activities of microbial communities that live deep beneath the seafloor, and recover sediment records of climate change and ocean circulation patterns in the Atlantic Ocean.

MORE INFORMATION:
About the expeditions - IODP JRSO • Expeditions • South Atlantic Transect (iodp.tamu.edu)
About IODP - www.iodp.org

BACKGROUND:
IODP Expeditions 390 and 393, the "South Atlantic Transect" will recover deep geologic core samples from six sites on 7-, 15-, 31-, 49-, and 61-million-year-old ocean crust that formed at 31°S on the Mid-Atlantic Ridge and has been transported progressively westwards as a result of seafloor spreading from the mid-ocean ridge. These sites will fill critical gaps in the sampling of in situ ocean crust with regards to crustal age, spreading rate, hydrothermal and geochemical processes, and the evolution of the biosphere in this geological setting. Previous engineering operations during the pandemic have installed reentry cones and casing at most sites that will aid deep drilling into the igneous ocean crust and to establish legacy boreholes for future scientific investigations. The first team of international scientists will leave the port of Cape Town onboard the research drilling vessel *JOIDES Resolution* on 12 April 2022.

Led by Co-Chief scientists Rosalind M. Coggon (University of Southampton, UK) and Jason B. Sylvan (Texas A&M University, USA) for Expedition 390, and Damon A. H. Teagle (University of Southampton, UK) and Julia Reece (Texas A&M University, USA) for Expedition 393, the scientists of this combined effort will sample sediments and igneous rocks from six drill sites on the western flank of the southern Mid Atlantic Ridge, in water depths ranging from 3,000 – 5,000 m. Sampling ocean crust along an age transect will enable scientists

to quantify the physical, chemical, and biological changes to the ocean crust as it ages and investigate how these changes both record and influence long-term changes in ocean and planetary conditions. Sediment cores that span both space and time will allow scientists to investigate the responses of Atlantic Ocean circulations patterns and Earth's climate system to rapid environmental change – including through past intervals of elevated atmospheric CO_2.

Dr Coggon said *"I am thrilled to finally be in Cape Town ready to board the JR for the first of the 'South Atlantic Transect' expeditions – after a near-decade long effort to bring them to fruition. It is exhilarating to follow the path of the scientific ocean drilling pioneers who explored the South Atlantic over 50 years ago to prove that seafloor spreading along the mid-ocean ridges produces new oceanic crust. That crust forms the basins that hold the oceans – but it is not simply an inert container for the seawater. Our strategy of drilling along a crustal age transect has been designed to investigate how seawater and the rocks that hold it interact – contribute to and record changes to the long-term evolution of our planet and allowing life to thrive deep beneath the seafloor."*

A sentiment that was strongly echoed by Associate Professor Sylvan when he said " *it is incredible to see it finally happening after all the preliminary work, pandemic-related delays, and shuffling of personnel. But here we are, sailing with scientists from all over the world and asking exciting questions about changes in Earth's environment during the last 61 million years*."

Science to illuminate Earth's secrets

Despite more than 50 years of scientific ocean drilling, major gaps remain in observations of the evolving Earth system, such as drill cores of ocean crust of different ages and formed at contrasting spreading rates, virtually unexplored biogeographic microbial provinces, and continuous high–sedimentation rate samples of key times in Earth's climate, changing ocean chemistry, or magnetic field history. Transects of drill holes that sample both the sediment cover and the uppermost oceanic crust in a particular ocean basin can provide essential knowledge of how interconnected processes have evolved over Earth's history and responded to changes in drivers such as atmospheric CO_2 concentrations, oceanic gateways, or major ocean currents. Transects that sample tens of millions of years of ocean crust formed at the same mid-ocean ridge can provide important information about the duration of hydrothermal exchange. However, sampling both the sediment and the underlying basaltic basement in a specific ocean region has rarely been undertaken in such a systematic manner as this combined operation proposes.

Assistant Professor Reece elaborates further saying "*The two expeditions are critical for our understanding of the interconnected Earth system such as the relationships between lithosphere, hydrosphere, atmosphere, and biosphere. Drilling in this very systematic way along a transect perpendicular to the mid-ocean ridge axis allows us to investigate how the oceanic crust and everything around it changes as it cools, sinks, and ages over millions of years. By studying these sediments and igneous rocks that record environmental conditions and rapid climate change in the past, we will be able to better predict our planet's future, including how subseafloor life, ocean circulation patterns, climate, etc. may respond to further anthropogenic influences*."

The expedition is conducted by the *JOIDES Resolution* Science Operator (JRSO) as part of the IODP. The IODP is a multidecadal, international research program supported by 22 nations, with the goal of exploring Earth's history and structure recorded in seafloor sediments and rocks, and monitoring sub-seafloor environments.

Expeditions 390 and 393 will sail with a total of 52 scientists from 10 countries, with expertise in a range of geoscience disciplines.

Professor Teagle emphasized the challenges that all marine research programs have faced over the last two years, praising the people who keep pushing to keep the research ships active, saying "*Marine science and getting research ships to sea has been very challenging during the pandemic. The science teams of IODP Expeditions 390 and 393 are extremely grateful to the crew of the JR and TAMU techs for their engineering achievements on IODP 390C and 395E that will allow us to concentrate on scientific coring and logging over the next 4 months*"

While at sea, the scientists will split, describe, and analyze the sediment and rock cores, which will then be made available to non-expedition scientists after a one-year moratorium. Data from these core samples will be used by scientists all over the world. The *JOIDES Resolution* team can provide personalized ship-to-shore live broadcasts to school, community, museum groups and media. Interested parties should contact thejoidesresolution@gmail.com for more information.

Get involved:
Twitter - @TheJR
Instagram - joides_resolution
Facebook - JOIDES Resolution

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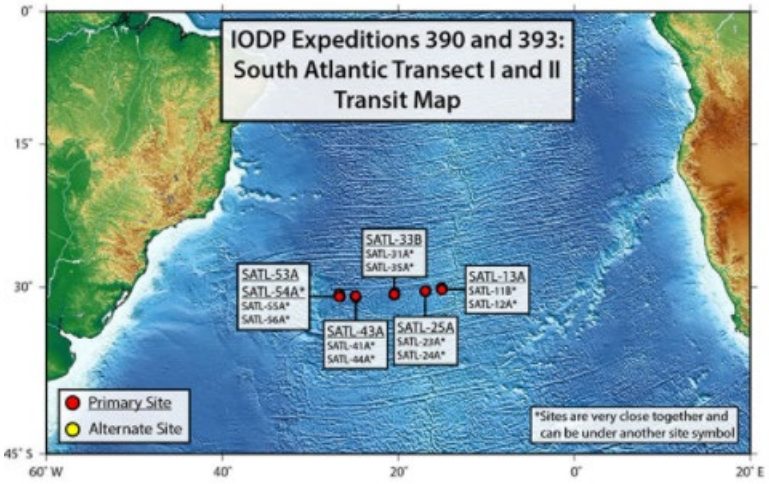
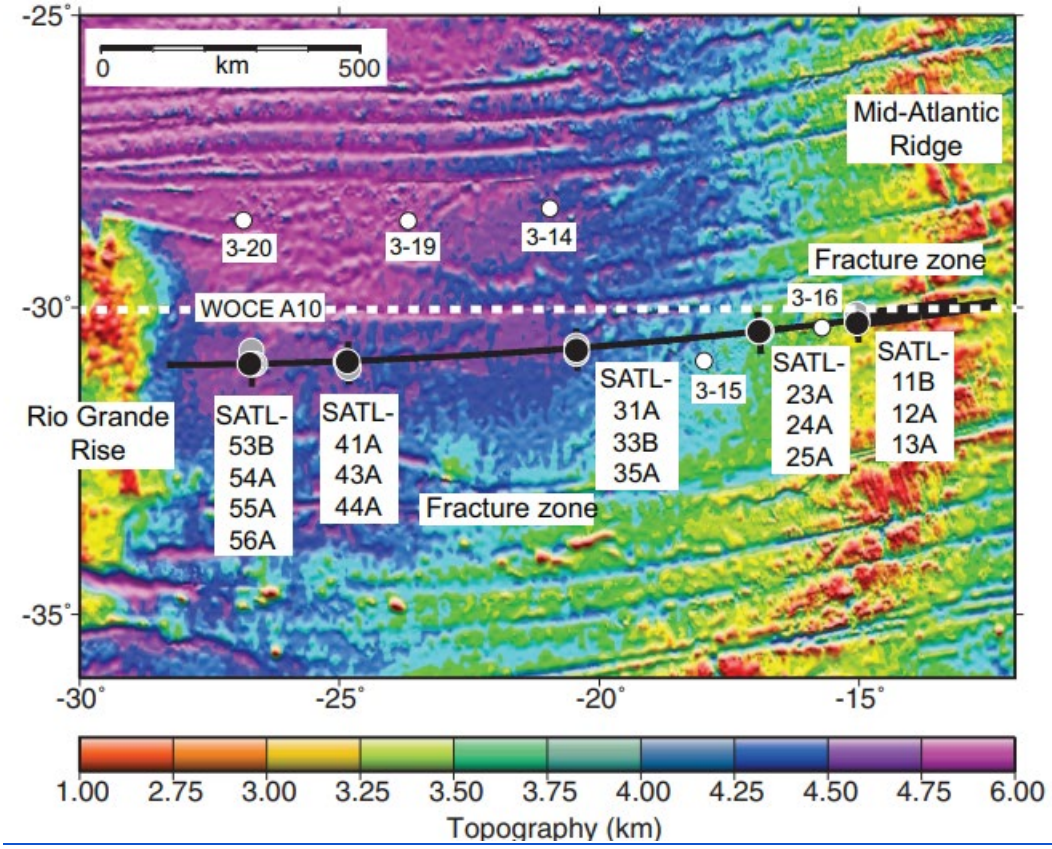

IODP Expeditions 390 and 393:
South Atlantic Transect I and II
Transit Map
SATL-33B
SATL-31A*
SATL-35A*
SATL-53A
SATL-54A*
SATL-55A*
SATL-56A*
SATL-13A
SATL-11B*
SATL-12A*
SATL-43A
SATL-41A*
SATL-44A*
SATL-25A
SATL-23A*
SATL-24A*
Primary Site
Alternate Site
*Sites are very close together and can be under another site symbol
0°
15°
30°
45° S
60° W
40°
20°
0°
20° E


-25°
0
km
500
Mid-Atlantic
Ridge
3-20
3-19
3-14
Fracture zone
-30°
WOCE A10
3-16
Rio Grande
Rise
SATL-
53B
54A
55A
56A
SATL-
41A
43A
44A
Fracture zone
SATL-
31A
33B
35A
3-15
SATL-
23A
24A
25A
SATL-
11B
12A
13A
-35°
-30°
-25°
-20°
-15°
1.00
2.75
3.00
3.25
3.50
3.75
4.00
4.25
4.50
4.75
6.00
Topography (km)