

2023 – Meeting Report

IGCP Project number and Title: IGCP Project number and Title: IGCP 740 Paleo-tsunami in Western Makran subduction zone.

1. MEETING(S):

Date: June – November 2023

Place: Iran, India, Oman and Pakistan

Itinerary:

The following field trips, international meetings and workshops haven conducted during 2023. Following a summary has been presented:

1) Investigation of paleo-tsunami Sediments in the Eastern onshore Makran

For the extension propose of the project location to cover the east Makran, a number of online meetings was held to discuss potential past tsunami location in this part. Geomorphology and coastal configuration play a vital role during tsunami events, as it is understood that different coastal geomorphic units respond differently to a tsunami hazard. So, understanding the response mechanism of coastal geomorphic features to paleo-tsunami events helps identify with higher preservation potential.

It is planned to investigate three types of sediments in the eastern Makran as potential site for paleo-tsunami:

- 1- Coarse sediments (boulders),
- 2- Medium sediments (e.g., sand layers, ...),
- 3- Fine sediments (foraminifera, sponges, and ostracods in the fine sediments, ...).

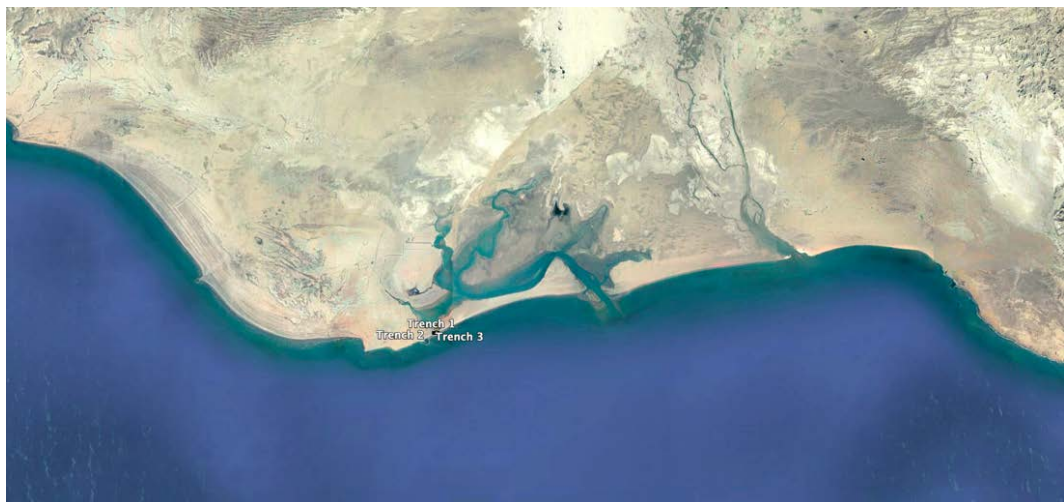


Proposed site for tsunami/ paleotsunami sediments investigations in the Eastern onshore Makran.



High-resolution satellite image of a coastal lake in the Eastern onshore Makran.

- 2) Field work and test trenching:** This field work was carried out as a test and educational proposes where 4 students also took part during this field work. The total duration was three days and total of three locations being visited and 10 samples from different depths were taken.



Visited locations shown on the map.



Sample locations



Example of samples location after trenching.





Sample locations



Bring this fieldwork after some study 3 trenches being dogged and being sampled. The samples are now under the analysis.

3) The online course title: Sedimentology and Paleo-tsunamis: Unraveling Earth's Past Disasters

We are happy to share the success of the recently concluded course on "Sedimentology and Paleo-tsunamis," where young scientists investigated into the details of studying Earth's past disasters. The course, designed to enhance capacity and knowledge transfer.

Course Outline: Sedimentology and Paleo-tsunamis

- 1: Introduction to Sedimentology and Tsunamis
- 2: Geological Context and Fieldwork
- 3: Sedimentological Aspects of Tsunami Deposits
- 4: Modern Analytical Techniques
- 5: Case Studies and Real-world Applications
- 6: Collaborative Research Projects
- 7: Environmental Contexts for Paleo-tsunami Recognition
- 8: Diversity and Inclusion in Tsunami Research
- 9: Future Directions and Emerging Technologies

This course provides a comprehensive understanding of sedimentology and its application in unraveling the mysteries of paleo-tsunamis, blending theoretical knowledge with practical fieldwork and modern analytical techniques.

Achievements of Meetings and courses item 1-3

Participants engaged enthusiastically with interactive learning platforms, exploring virtual labs, attending webinars, and immersing themselves in online simulations. This dynamic approach significantly enriched their understanding of tsunami-related concepts. The incorporation of real-world case studies proved to be a highlight, allowing participants to witness the practical applications of tsunami research. Their engagement in group discussions showcased a deepened understanding of the subject matter and its real-world implications.

Outcome of Meetings item 1-3

Participants acquired comprehensive knowledge of sedimentology and its application in studying paleo-tsunamis. Practical skills gained through hands-on fieldwork and specialized workshops translated into tangible research capabilities. Attendees deepened their understanding of environmental contexts suitable for recognizing paleo-tsunamis. The course's resounding success serves as a testament to the commitment of both educators and participants in advancing knowledge and skills in the field of sedimentology and paleo-tsunamis.

4) Workshops: The first regional workshop after trenching for IGCP 740 West Makran Paleo-tsunami Investigation 30th Nov. 2023



**The first regional workshop after trenching for
IGCP 740 West Makran Paleo-tsunami Investigation
Tsunami and Earthquake Research Center -University of Hormozgan**
Date and Time: 30th of November 2023 9 AM UTC
Lectured by Dr. Siddharth P. Prizomwala, ISR, India
Chair Dr. Mohammad Mokhtari

Introduction

The MSZ is a vital component of the Northern Arabian Sea in terms of the hazards it can generate. In the historical past, it has generated several major earthquakes, some of which have also been associated with catastrophic landslides, such as the 1945 event. The hazard along the MSZ needs the urgent attention of seismologists, geophysicists, and geologists to unearth the remnants of past activity, so as to visualize the futuristic hazard it can generate. Such an exercise would aid the coastal communities of Iran, Pakistan, India, Oman, and UAE in better planning and managing the vital assets along the shorelines.

Proposed audience.

1. Scientists and faculty members
2. Doctoral and master's students
3. Community leaders, society representatives, Government and Non-Governmental Organization representatives.

Organizers:

TERC, University of Hormozgan, Contact persons: Dr. Mohammad Mokhtari and Dr. Mehdi Masoodi
UNESCO International Geoscience program (IGCP) secretariat

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Joining The Workshop using the following zoom link kindly provided by IGCP UNESCO

<https://us02web.zoom.us/j/81209108512?pwd=Z0NQeUlwOUhXMG1HZU5QTUpRdVhVZz09>

Meeting ID: 812 0910 8512

Password: 647296

Agenda:

Title	Time	Speaker
Opening Remarks IGCP's support for IGCP 740 project UNESCAP Project in NWIO and its importance	09-09:20	Dr. Özlem Adiyaman Lopes IGCP Director Ms. Nora Gale Programme Specialist/IOTWSM
IGCP 740 project a general review and challenges	09:20-09:30	Dr. Mohammad Mokhtari Chair of NWIO-WG-IOC/IGC, Leader of IGCP 740
Need for more palaeotsunami research along Iranian, Pakistani, and Indian shorelines: Hazard along MSZ	09:30-10:30	Dr. Siddharth Prizomwala ISR, India, and Co-Leader of the IGCP 740
Preliminary observations from the first field visit along the Iranian shoreline for extreme wave events	10:30-10:55	Dr. Chintan Vedpathak Institute of Seismological Research, India
Questions and discussion	10:55-11:30	All participants Dr. Medi Masoodi TERC and Co-Leader of the IGCP 740

Zoom 회의

Dr. Mohammad Mokhtari NWIO-WG의 회의를 보고 있습니다

Eunhee Lee (UNESCO) Nora Gale (UNESCO-IOC) Jörn Lauterjung (GFZ) Sobhi Nasir Bernardo Allaga

0:01:30 10:28 AM

Paleo-tsunami

- ❖ The zone's sole confirmed tsunami, in 1945, resulted from the rupture of less than a quarter of the subduction zone's length. The earthquake and tsunami potential of the rest is unknown. The Paleo-tsunami studies will throw light on such important unknown factors.
- ❖ Paleo-tsunami is on the high priority list of the works to be conducted at MSZ. Especially the recent PTHA development for the MSZ has again requested these data in order to possibly cover the lacking events for recurrence period dating.
- ❖ The proposed project will investigate the relationship between great earthquakes and associated tsunamis in Makran subduction zone, the duration of the tsunami recurrence.

The project procedure

- Collection of field historical data from published and unpublished archives for the region.
- Site selection for monitoring
- Development of Standard Operating Procedure
- Thinking and design of the system
- Installation & deployment of sensors in the location
- Design of Geotechnical analysis of selected samples from location
- Investigation of results & final report

No Notes.

Slide 3 of 7

Zoom 회의

Chintan Vedpathak의 회의를 보고 있습니다

Eunhee Lee (UNESCO) Dr. Mohammad Mokhtari... siddharth prizo... Ocal Necmioglu... Amin Rashidi Chintan Vedpathak

Preliminary observations from the first field visit along the Iranian shoreline for extreme wave events

Dr. Chintan Vedpathak
Project Scientist
Institute of Seismological Research, Gandhinagar

IGCP 740: Western Makran paleo-tsunami investigation

참가자(24)

- Eunhee Lee (UNESCO)
- Chintan Vedpathak
- siddharth prizo...
- IOC/TSR Denis CHANG SENG
- Amin Rashidi
- Bernardo Allaga
- Chinmoyee Borgohain
- Christian Haberland GFZ Germa...
- Dr. Mohammad Mokhtari NWIO

UNESCO IGCP meeting

Ocal from IOC has a question.

Thank you Siddharth for a wonderful presentation.

STUDYING TSUNAMI SEDIMENT



Remote Sensing

Satellite and aerial images can provide a bird's-eye view of the effects of a tsunami over a large area, and can help identify areas where tsunami sediment is likely to be found. This can be particularly useful in areas that are difficult to access.

1

Sampling Techniques

Techniques to collect and analyze tsunami sediment, including coring, sieving, and chemical analysis. These methods can provide information about the sediment's composition, age, and location.



2



Micropaleontology

By examining microfossils in tsunami sediment, scientists can learn more about the timing and magnitude of past tsunamis, and can even identify tsunamis from thousands of years ago. This can be particularly useful in areas where there are no written records of tsunamis.

3

Geochemical Analysis

By analyzing the chemical composition of tsunami sediment, scientists can learn more about the source of the sediment, and can track the movement of water and debris during the tsunami. This can provide insights into the nature of the tsunami, and can help with hazard assessment.



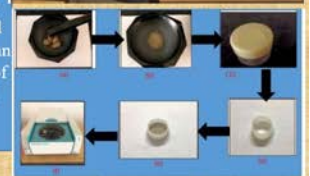
4



Dating Method (OSL)

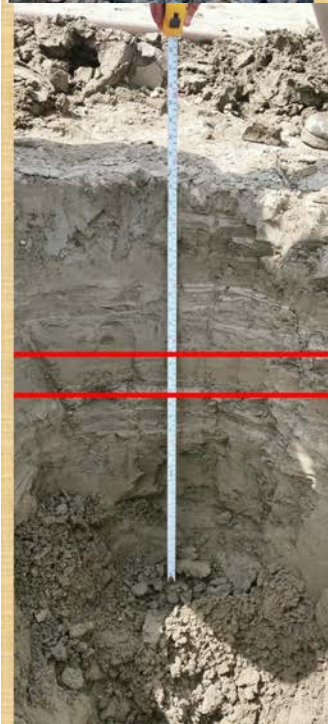
To obtain Chronological Event

5



SITE 1 GABRIK

- Depth of trench- 80 cm
- Sand layer from top 28 cm and thickness 7cm
- Collected 2 OSL samples
- 10 samples for Geochemical



Zoom 회의

기록 중...

Zoom Meeting

참가자(16)

참가자 찾기

EL Eunhee Lee (UNL (호스트, 나))
 DM Dr. Mohammad Mokhtari NWIO-...
 SP siddharth prizomwala
 CV Chintan Vedpathak
 ID IOC/TSR Denis CHANG SENG
 AR Amin Rashidi
 CB Chinmoyee Borgohain
 DM Dr. Mokhtari
 GH Ghazala Naeem
 KG Katsuchihiro Goda
 N Nisarg
 ON Ocal Necmioglu (UNESCO/IOC)
 OA Ozlem Adiyaman Lopes (UNESC...
 PM PAKISTAN Mr. Ameer Hyder (Dir...
 UP Utikarsh Pandey
 WP WORK PC

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 siddharth prizomwala
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 Ghazala Naeem
 Amin Rashidi
 PAKISTAN Mr. Ameer Hyder (Director NWIO)
 Chintan Vedpathak
 Ghazala Naeem
 IOC/TSR Denis CHANG SENG
 Utikarsh Pandey
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Dr. Mokhtari
 Nisarg
 Chinmoyee Borg...
 Katsuchihiro Goda

Dr. Mokhtari
 Nisarg
 Chinmoyee Borgohain
 Katsuchihiro Goda

기록 중...
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 공유
 종료

초대
 모두 음소거
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