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Project Kick-Off Workshop

IOC EU ECHO NEAMTWS

17 & 20 December 2021

Strengthening the Resilience of Coastal Communities in the North East Atlantic, Mediterranean Region to the Impact of Tsunamis and Other Sea Level-Related Coastal Hazards Project

Egypt/ Prof. Amr Zakaria Hamouda

President of the National Institute of Oceanography and Fisheries

NIOF

INTRODUCTION / BACKGROUND INFORMATION

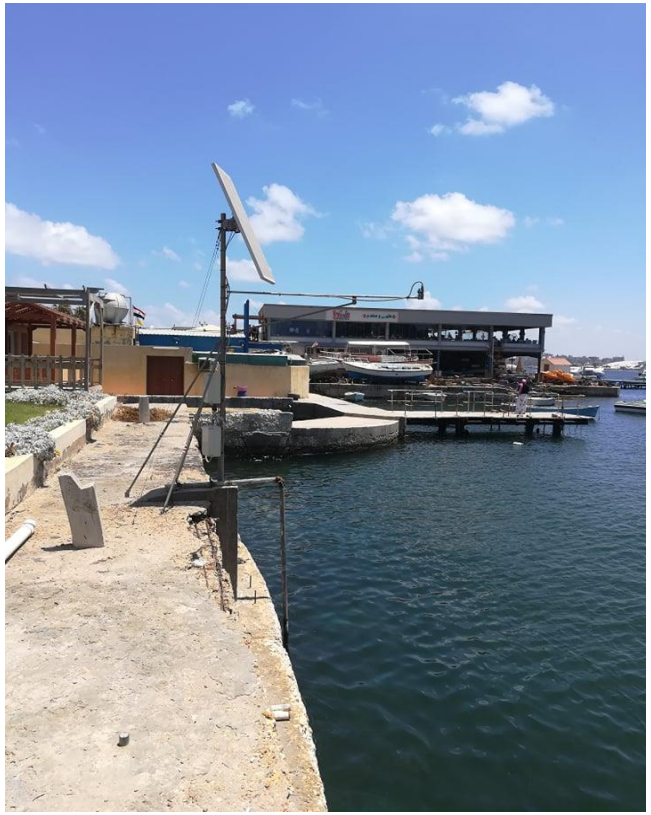
- *In-country liaison/focal point for the project:*
- ***National Institute of Oceanography and Fisheries (Prof. Amr Hamouda)***
- ***Ministry of High Education and Scientific Research***
- ***Egypt***

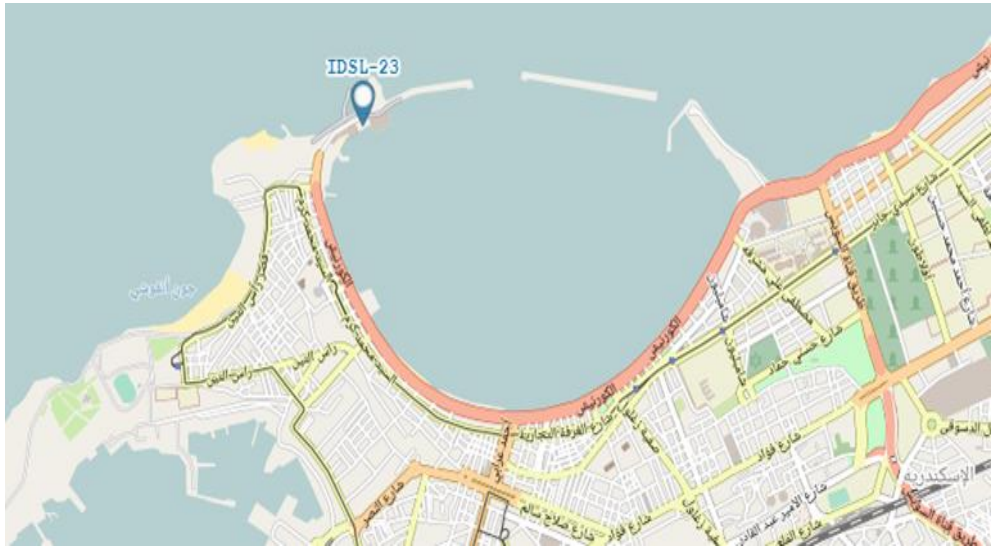
- *National stakeholders and partners that you envisage for this project:*
- ***Alexandria Governorate – Alexandria Tourism Authority – Alexandria Hotels and Restaurants associations***

- *Potential national contributions:*
- **Information and Decision Support Center,**
- **Crisis and Disaster Management Sector, and Risk Reduction**
- **The Egyptian General Authority for the Protection of the Beaches**
- **Urban Authority**

INTRODUCTION / BACKGROUND INFORMATION

The IDSL-JRC tide gauge has been installed since May 2018 at the NIOF platform in Alexandria. This device is one of the tsunami early warning system network in NEAM area.





Tide Gauge position-NIOF platform
(IDSL-23)
31.212396 N / 29.884913 E

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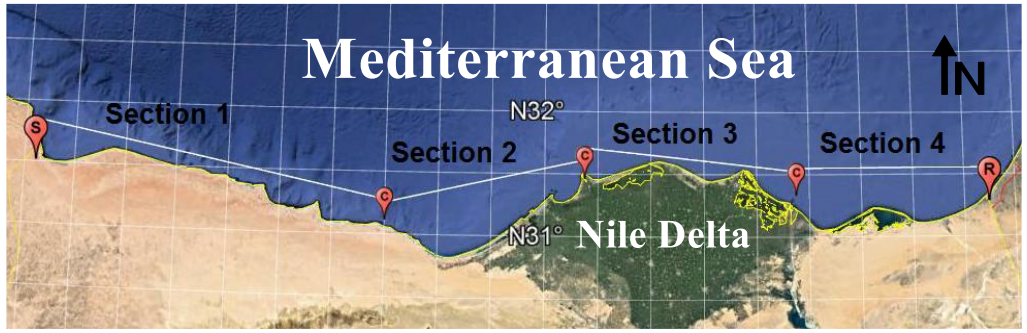
COMMUNITY COASTAL SEA LEVEL HAZARD EARLY WARNING AND MITIGATION SYSTEM CONTEXT/ STATUS (CON'T)

(i) Risk Knowledge and Communication Strategies

- Hourly sea level records from six tide gauges distributed over the Egyptian Mediterranean coast. These gauges were deployed at Port Said (PS), Burullus new harbour (BR), Abu-Qir Bay (AQ), Alexandria Western Harbour (AWH), Sidi Abdel-Rahman (SAR) and Mersa Matrouh (MM), from east to west, respectively.
- The periods of data are different for each location, with the longest records (30 years) at AWH and the shortest records (4 years) at MM.



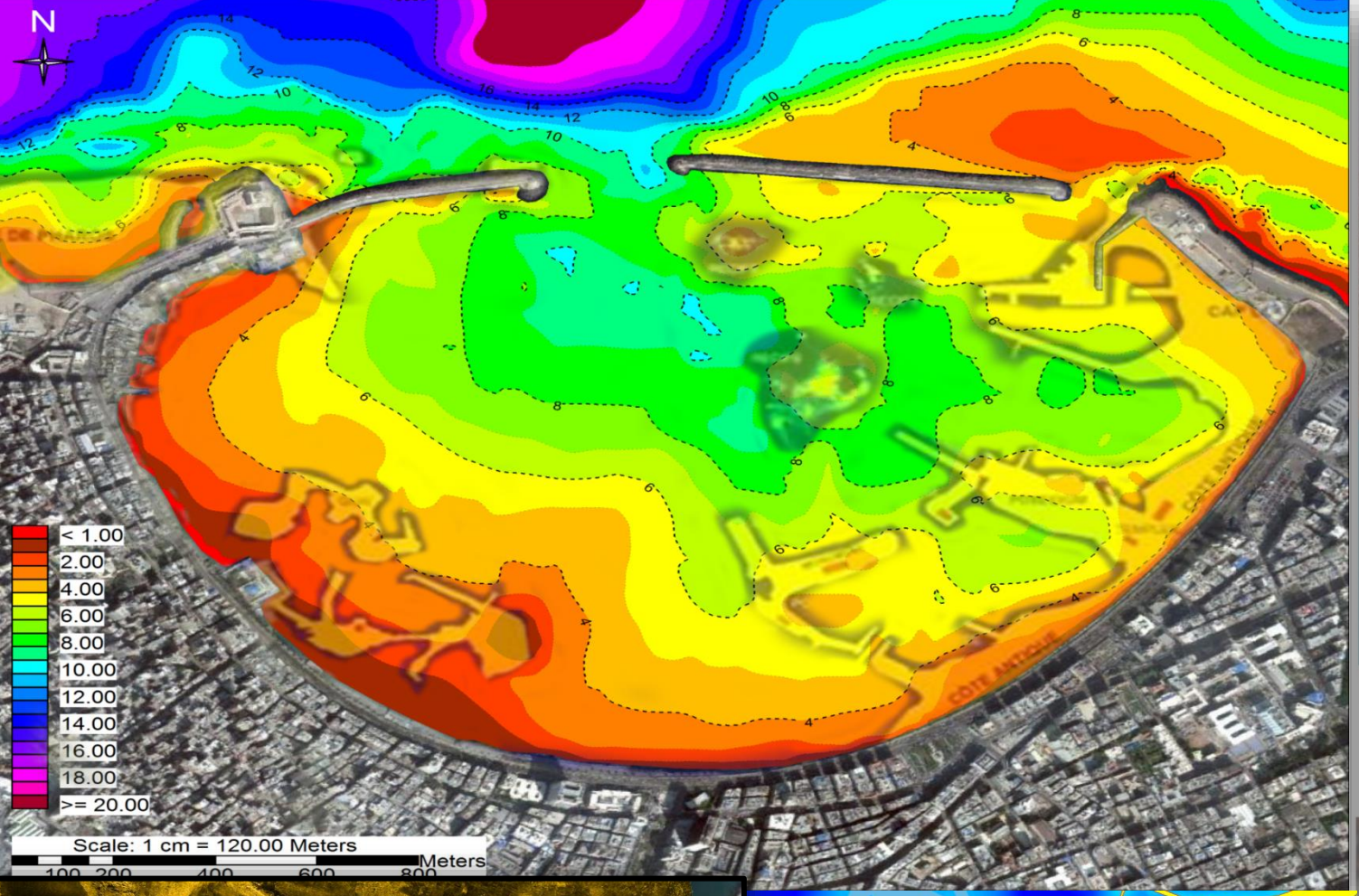
		PROVIDE AN IDEA OF EXISTING KNOWLEDGE ETC, ON SEA LEVEL COASTAL HAZARD RISK PERCEPTIONS AND COMMUNICATION STRATEGIES WITHIN THE LOCAL COMMUNITY [none/lacking/some]	NEEDS
I	Tsunami	NIOF Support the Tsunami early warning center establishment 2020	Update and transfer the recent application awareness system to increase the awareness information for public society
1	Storm Surge	seasonal storm surges during the Autumn and winter season	
2	Sea Level Rise	The sea level along the Egyptian Mediterranean coast is rising with an overall rate of 3.4 mm/yr.	Need More Equipment's (Tide

INTRODUCTION / BACKGROUND INFORMATION

- Egypt is potentially one of the most vulnerable countries to the effects sea level rise (SLR) due to climate change. Due to its relatively low elevation, coastal zone in the Nile River Delta (NRD) is comparatively vulnerable to the impact of SLR.
- Though the Nile River Delta region covers around 5% of the entire territory of Egypt, the expected impacts of SLR on the coastal areas within this region should be a matter of concern for the country for a two main reasons:

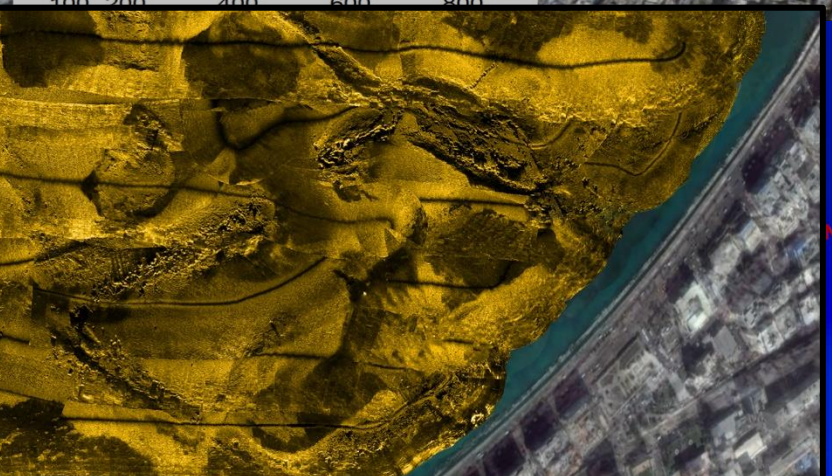
i) It is estimated that roughly 43% of Egypt's population live along the coastlines of the country, mostly in the Nile River Delta between Alexandria and Port Said,

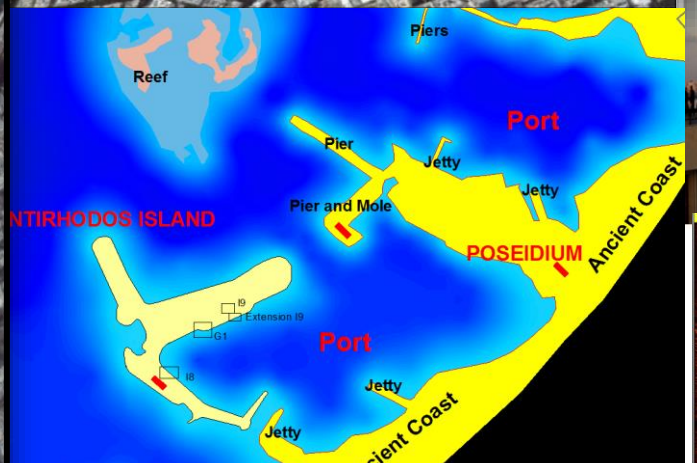
ii) Nearly 70% of the economic activities in the country, including tourism, agriculture, manufacturing and service sectors take place within this region.

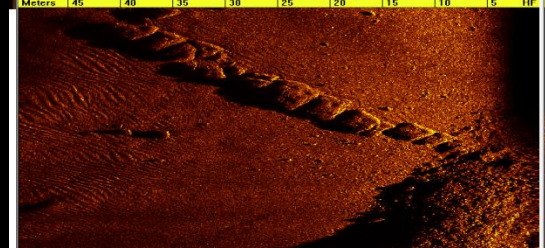


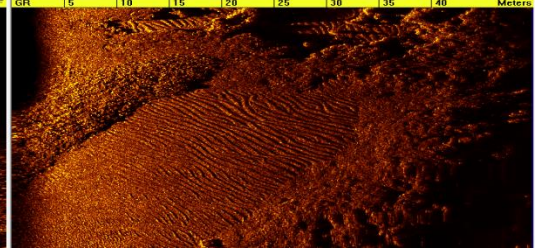
شكل(٥-١٠). منظور حديث لواجهة الاسكندرية القديمة من قبل جوديو وأهم مايلفت النظر انه يختلف عن وصف سترابون وكذلك الخرائط القديمة من حيث موقع انتيرودس الذى امكن تحديده الى الغرب من شبه جزيرة تيمونيوم على عكس ما وصف قديما بأنه الى الشرق.
(Source:Goddio,2002)

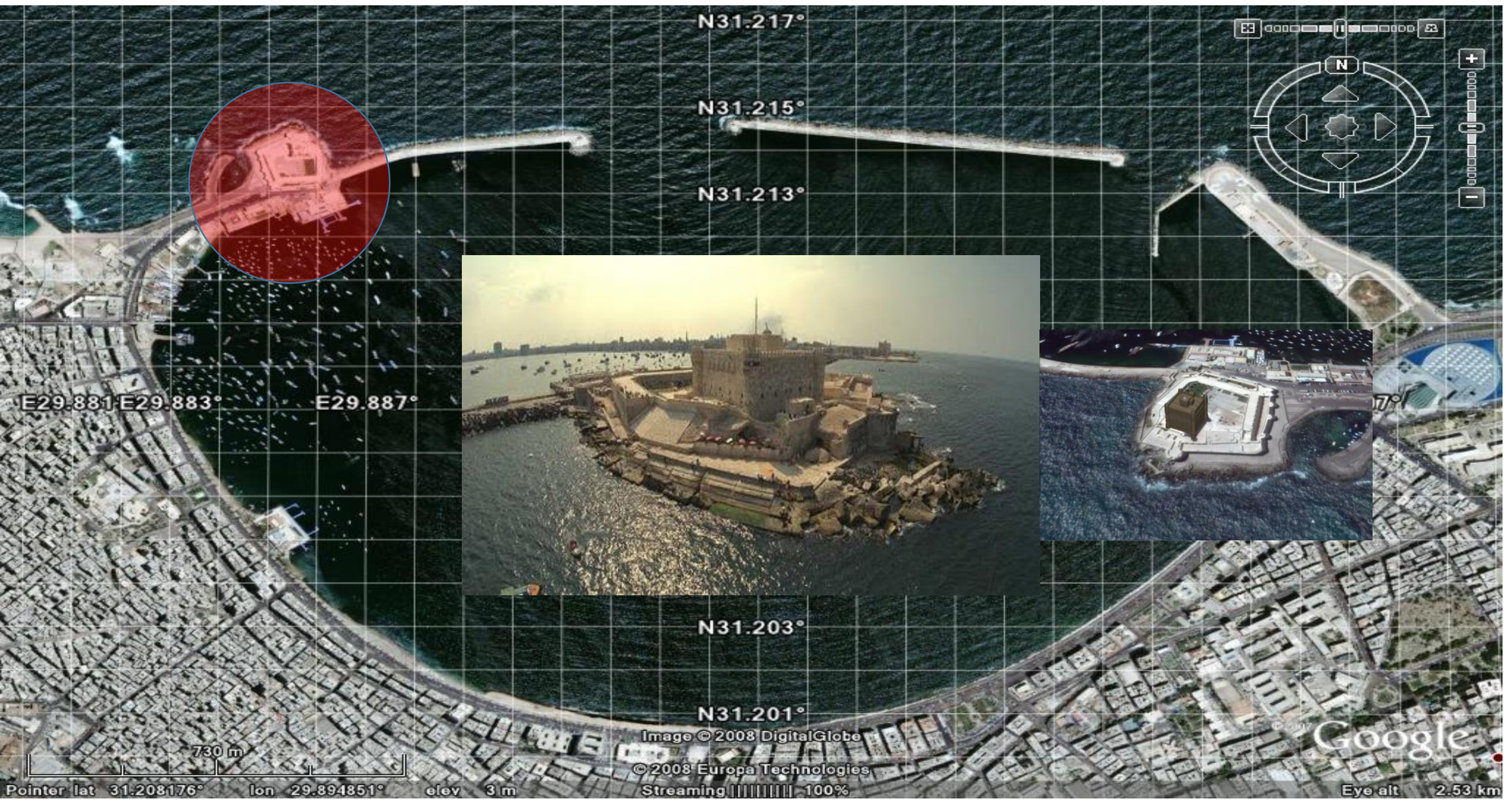
شكل(٥-١١). واجهة حديثة للميناء الشرقى بالإسكندرية
(Source:Goggleearth,2009)










N31.217°
N31.215°
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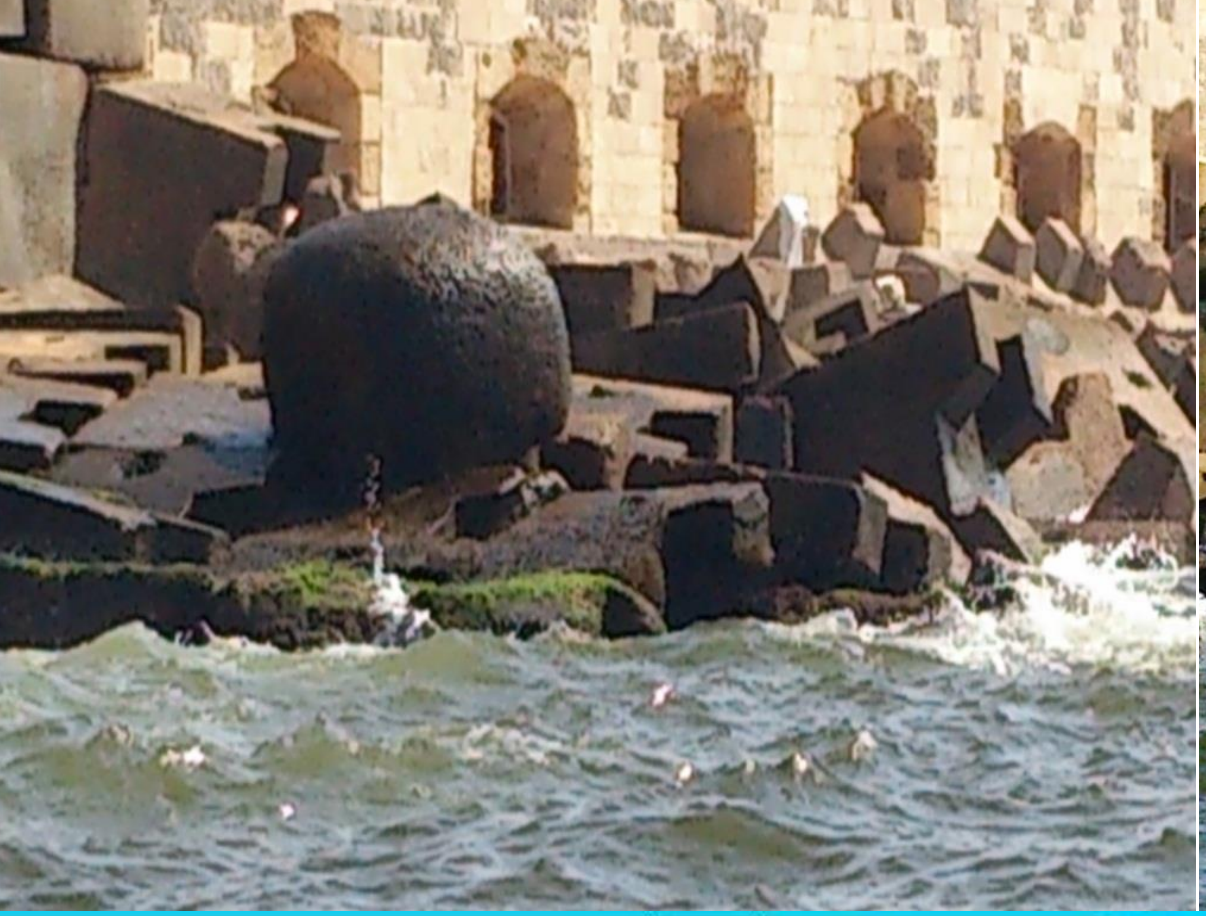
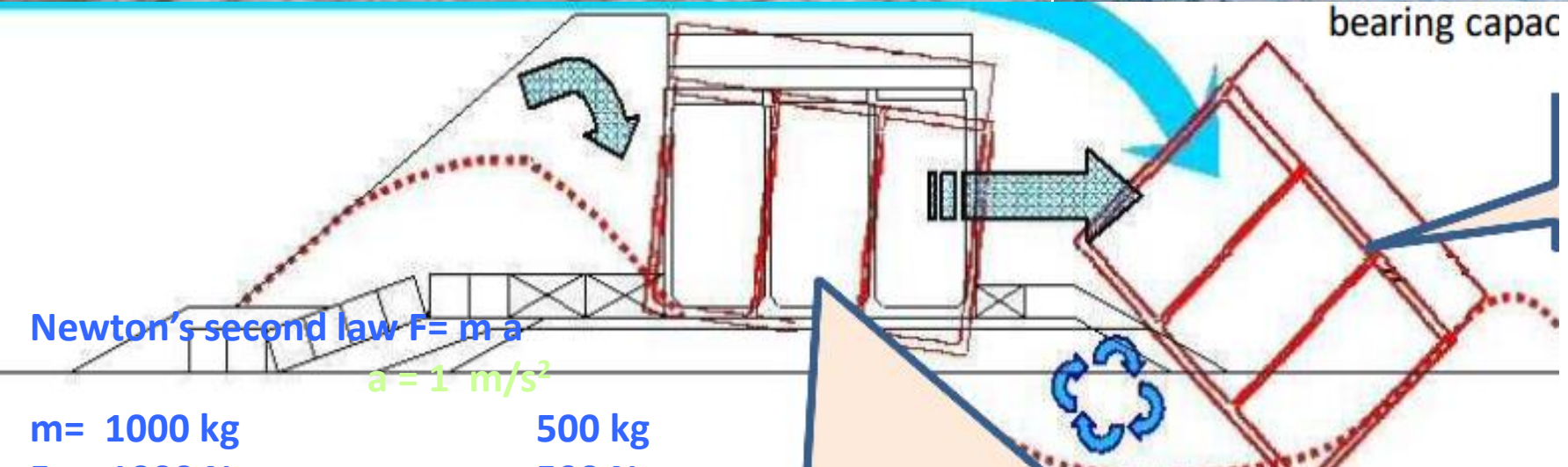
E29.881
E29.883°
E29.887°
7°
N31.203°
N31.201°
730 m
Image © 2008 DigitalGlobe
© 2008 Europa Technologies
Streaming 100%
Google
Pointer lat 31.208176° lon 29.894851° elev 3 m
Eye alt 2.53 km





Newton's second law F= m a

a = 1 m/s^2

m= 1000 kg

500 kg

(1) Sliding and overturning

The design of a breakwater's upright section must be stable against sliding and overturning (Fig. 4.26), and to accomplish this, safety factors against sliding and overturning must be greater than 1.2. In most cases, sliding is more severe than overturning, especially when the breakwater crown is relatively low. The safety factor against sliding due to wave action, SF_s, is defined as follows:

$$SF_s = \mu(W_0 - U) / P \qquad (4.36)$$

where μ denotes the coefficient of (static) friction between the upright section and rubble mound, W_0 the weight of the upright section per unit extension in still water, U the total uplift force per unit extension, and P the total horizontal wave force per unit extension calculated by Eqs. (4.17) to (4.27). μ between a concrete slab and rubble stones is usually

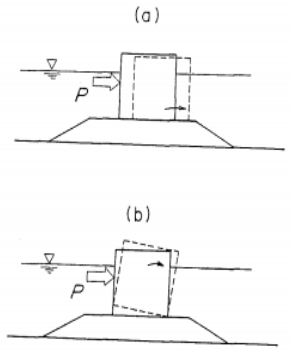


Fig. 4.26 Sliding and overturning of upright section

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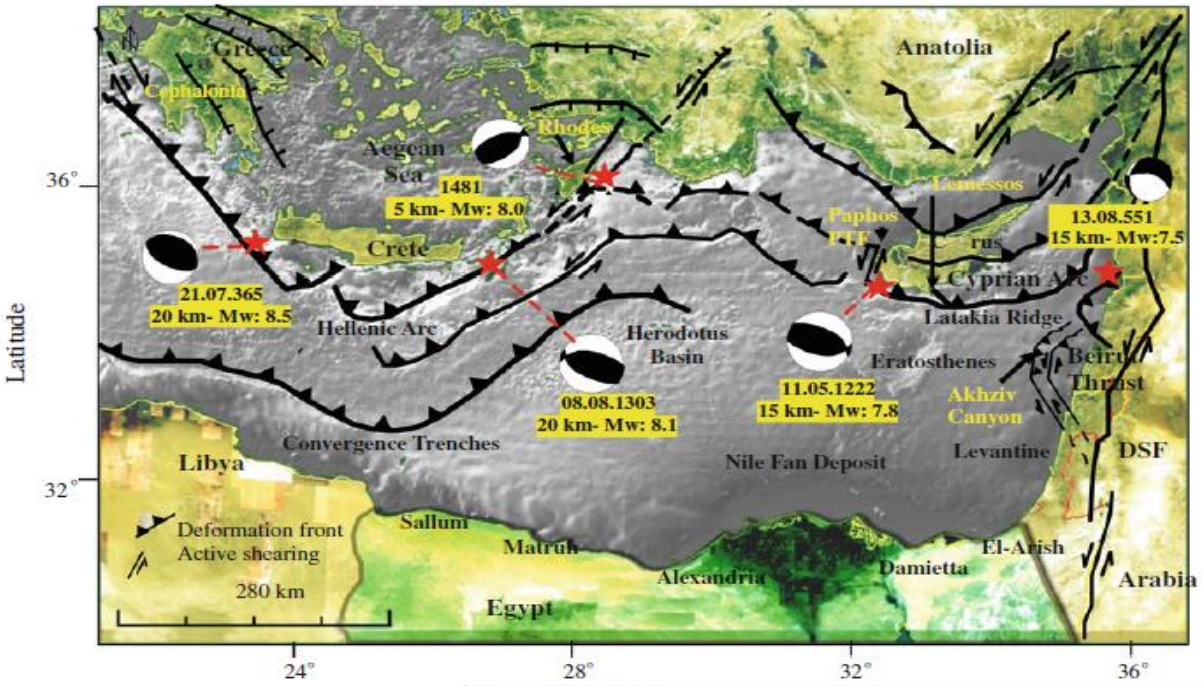

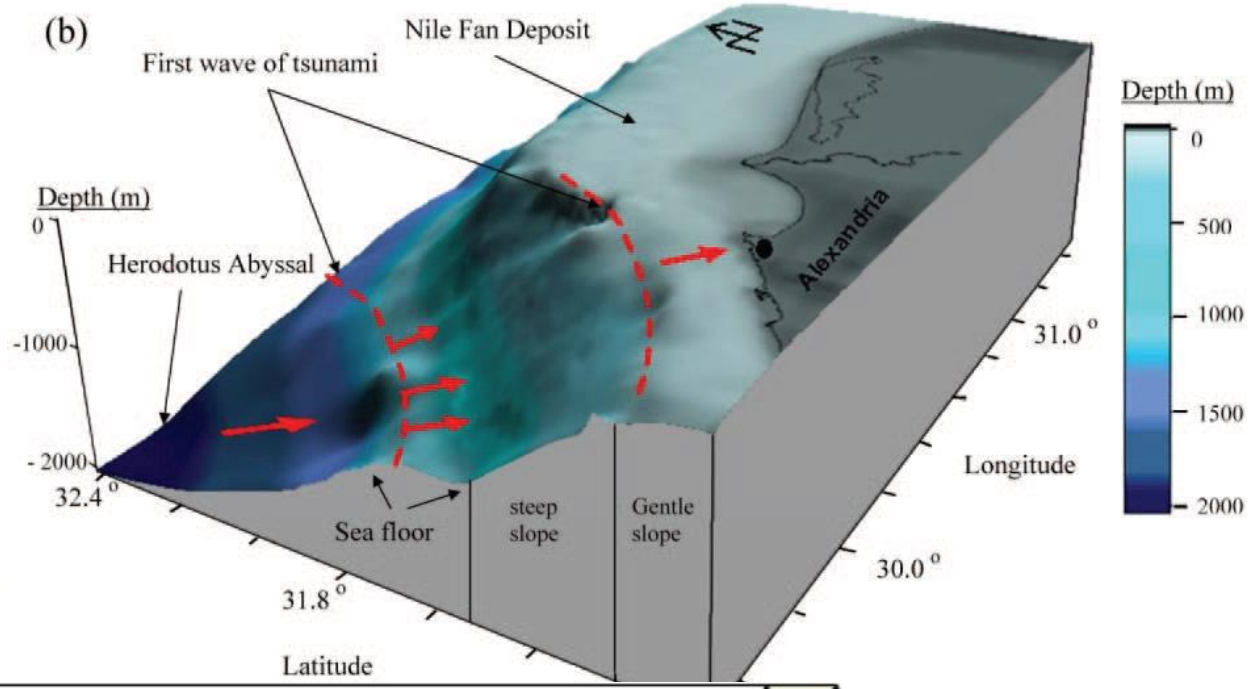

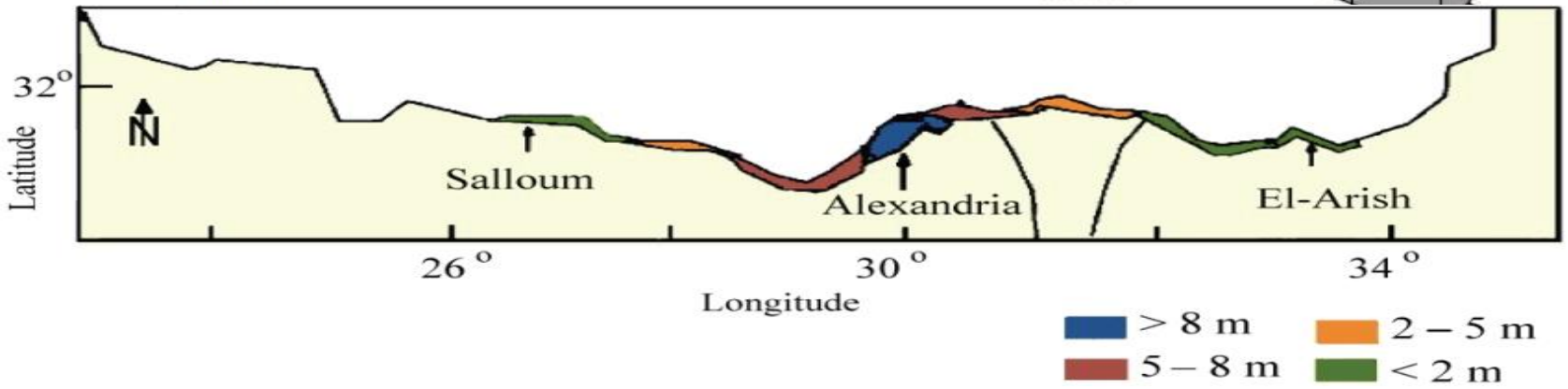

COMMUNITY COASTAL SEA LEVEL HAZARD EARLY WARNING AND MITIGATION SYSTEM CONTEXT/ STATUS (CON'T)

The National Institute of Oceanography and Fisheries as the focal point of IOC in Egypt has organized several activities on the occasion of the world tsunami awareness day 2021.

1. Distributing informative flyers of the tsunami description, awareness and safety rules to citizens in various neighborhoods of Alexandria;
2. Organizing public seminars in different social clubs and community associations;
3. TV interviews, press articles, Interventions on social media
4. Organizing high level scientific international workshop.

This is based on the role of the institute, not only for research, but also for its role in raising awareness and serving the community.

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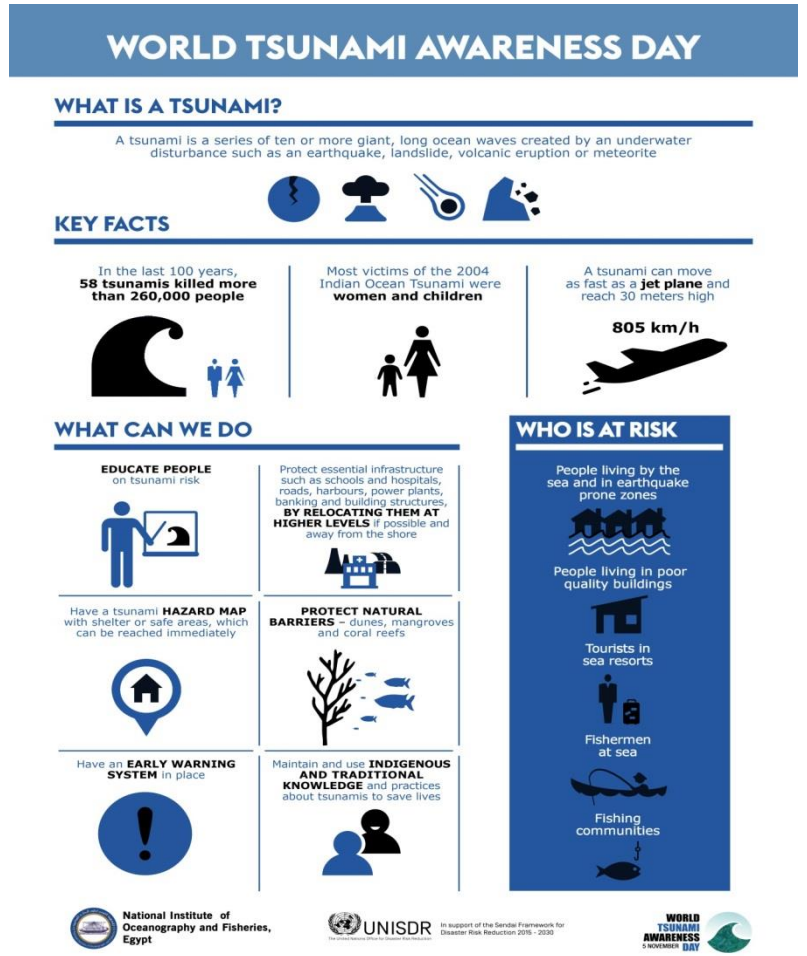
COMMUNITY COASTAL SEA LEVEL HAZARD EARLY WARNING AND MITIGATION SYSTEM CONTEXT/ STATUS (CON'T)

Information Brochure by NIOF (Arabic and English)



COMMUNITY COASTAL SEA LEVEL HAZARD EARLY WARNING AND MITIGATION SYSTEM CONTEXT/ STATUS (CON'T)

(ii) Early Warning and Mitigation System Status

- *NIOF is the focal point for the TWS in Egypt. We had one Tide gauge for NEAM-TWS.* – receive warning messages from NEAM-TWS - send the warning messages to the different stakeholders
- ***The national strategy to protect the northern Egyptian coasts from potential tsunami risks aims to:***

1. *Increasing the flexibility of the northern Egyptian coasts sufficiently in dealing with potential tsunami waves and their effects on different sectors.*
2. *Laying out the general framework for the executive plans and sectoral programmes.*
3. *Raising societal awareness by introducing the phenomenon in its probabilistic framework without underestimating or exaggerating.*

		PROVIDE AN IDEA OF EXISTING CAPACITY/CAPABILITY WITHIN THE LOCAL COMMUNITY [Non-existence/ lacking/ available]	NEEDS
I	Detection	Not existing locally in Egypt	Required
1	Monitoring (e.g. IDSL)	Available one Tide gauge under the NEAM Early warning system in addition to other 6 tide gauges distributed along the Egyptian Mediterranean Coast	Required more tide gauges that connected directly for the TWS.
2	Warning / Forecast	Not existing locally in Egypt – receive warning messages from NEAM-TWS	Required
3	Communication & Dessimination	NIOF as the focal point of TWS in Egypt send the warning messages to the different stakeholders	Need more technical support for faster communication
4	Preparedness and Response	Egypt had established The national strategy to protect the northern Egyptian coasts from potential tsunami waves	Need regular updates

COMMUNITY COASTAL SEA LEVEL HAZARD EARLY WARNING AND MITIGATION SYSTEM CONTEXT/ STATUS (CON'T)

(iii) Status / Elements of Tsunami Ready in the proposed/nominated community site?

- ***The national strategy to protect the northern Egyptian coasts from potential tsunami risks***
- *In order to achieve the above-mentioned goals, it is necessary to work on two main axes - in addition to the system of monitoring and early warning of tsunami waves and in parallel at the same time - which are:*
- ***A - The first axis:*** *Flexible interventions: This axis includes a group of operations and interventions, including:• Building a culture of "safety first" and raising community awareness, taking into account the possibility of the tsunami phenomenon.• Community participation at all levels (governmental, popular, non-governmental and civil society).*
- ***B - The second axis:*** *Physical interventions: This axis includes a set of structural or engineering procedures and interventions to protect the northern Egyptian coasts.*

	UNESCO IOC TSUNAMI READY INDICATORS	PROVIDE AN IDEA OF EXISTING CAPACITY AT THE NOMINATED COMMUNITY [NONE/ ONGOING/ ACHIEVED]
I	ASSESSMENT (ASSESS)	
1	ASSESS-1. Tsunami hazard zones are mapped and designated	Achieved
2	ASSESS-2. The number of people at risk in the tsunami hazard zone is estimated	Achieved
3	ASSESS-3. Economic, infrastructural, political, and social resources are identified	Achieved
II	PREPAREDNESS (PREP)	
4	PREP-1. Easily understood tsunami evacuation maps are approved	Ongoing
5	PREP-2. Tsunami information is publicly displayed	Achieved
6	PREP-2. Outreach and public awareness and education resources are available and distributed	Achieved
7	PREP-3. Outreach or educational activities are held at least three times a year	Achieved
8	PREP-4: A community tsunami exercise is conducted at least every two years	Achieved
III	RESPONSE (RESP)	
9	RESP-1. A community tsunami emergency response plan (ERP) is approved	None
10	RESP-2. The capacity to manage emergency response operations during a tsunami is in place	None
11	RESP-3. Redundant and reliable means to timely receive 24-hour official tsunami alerts are in place	None
12	RESP-4. Redundant and reliable means to timely disseminate 24-hour official tsunami alerts to the public are in place	None

MATCHING NEEDS

- *We need a lot of support in all relevant activities*

	UNESCO IOC TSUNAMI READY INDICATORS	PROVIDE AN IDEA OF EXISTING CAPACITY AT THE NOMINATED COMMUNITY [NONE/ ONGOING/ ACHIEVED]	NEEDS
I	ASSESSMENT (ASSESS)		
1	ASSESS-1. Tsunami hazard zones are mapped and designated	Achieved	
2	ASSESS-2. The number of people at risk in the tsunami hazard zone is estimated	Achieved	Require continuous updates
3	ASSESS-3. Economic, infrastructural, political, and social resources are identified	Achieved	Require continuous updates
II	PREPAREDNESS (PREP)		
4	PREP-1. Easily understood tsunami evacuation maps are approved	Ongoing	Required advance evacuation maps
5	PREP-2. Tsunami information is publicly displayed	Achieved	
6	PREP-2. Outreach and public awareness and education resources are available and distributed	Achieved	Recent education resource program for school students
7	PREP-3. Outreach or educational activities are held at least three times a year	Achieved	
8	PREP-4: A community tsunami exercise is conducted at least every two years	Achieved	
III	RESPONSE (RESP)		
9	RESP-1. A community tsunami emergency response plan (ERP) is approved	None	Required support in this issue
10	RESP-2. The capacity to manage emergency response operations during a tsunami is in place	None	Required support in this issue
11	RESP-3. Redundant and reliable means to timely receive 24-hour official tsunami alerts are in place	None	Required support in this issue
12	RESP-4. Redundant and reliable means to timely disseminate 24-hour official tsunami alerts to the public are in place	None	Required support in this issue


Thank you