



Preface

The 1st International Congress on Coastal Research (ICCR 2020), held in Al Hoceima, Morocco (06-09 July 2021), was initially scheduled for 2020 but has been postponed due to the global COVID 19 pandemic. This first edition of a long series was attended by more than 150 scientists worldwide. A hundred communications (Conferences, oral communications, and posters) were presented, either in person or virtually. These were dispatched within six sessions covering the majority of Coastal topics.

The ICCR 2020 was a special occasion for those who develop coastal sciences in education, research, and professional development. It was an occasion to meet, listen, discuss, share information, and plan for the future. Indeed, a congress is an opportunity to discuss key points of scientific and professional policies and strategies, helping us to define how we should encourage responsible conduct in our political decisions, to promote marines and coastal sciences at the Moroccan level, and also establish personal contacts with colleagues from other parts of the world. The theme of this first edition was "Natural And Technological Risk Assessment Within Integrated Coastal Zone Management".

This Proceeding is a compilation of the most relevant communications presented in the congress. It provides an excellent overview of current coastal research, including but not limited to relevant aspects of geological sciences, biology (ecology and coastal marine ecosystems), geomorphology (physical geography), climate, littoral oceanography, coastal hydrogeology, environmental (resource) management, engineering, and remote sensing, is a reference platform for researchers, practitioners, and educators. It presents and discusses the most recent innovations, trends, concerns, and practical challenges encountered and solutions adopted in coastal environment sciences.

I want to express my deep gratitude to the Steering Committee and TPC members for dedicating their time to the organization of the conference. On behalf of the Steering Committee, I wish to thank Abdelmalek Essaadi University (Tetouan) and the Faculty of Sciences and Techniques of Al Hoceima for their support. We are also all very grateful to the National Center for Scientific and Technical Research, the Hassan II Academy of Sciences and Technologies, AGIR Association, Africa Geo-Services, Moroccan Committee of the International Association of Hydrogeologists, and Loukkos Hydraulic Basin Agency, that have kindly provided financial and logistical support in a challenging economic period.

I sincerely hope that the ICCR turned out to be a forum for excellent discussions that enabled new ideas to come about, promoting collaborative research. Finally, we wish to see you among us in the second edition (Tangier 2023) in better conditions.

Said El Moussaoui, Ph.D.
Publication-chair
1st International Congress on Coastal Research
(ICCR 2020)



Steering Committee

Pr. Hinde CHERKAOUI DEKKAKI

Vice President of Scientific Research & Cooperation Abdelmalek Essaadi University, Morocco

Pr. Mohammed BAKKALI

Dean of the Faculty of Sciences and Techniques of Al Hoceima Abdelmalek Essaadi University, Morocco

Pr. Hajar EL TALIBI

Faculty of Sciences and Techniques of Al-Hoceima Abdelmalek Essaadi University, Morocco

Pr. Said EL MOUSSAOUI

Abdelmalek Essaadi University, Morocco

Pr. Issam ETEBAAI

Faculty of Sciences and Techniques of Al-Hoceima Abdelmalek Essaadi University, Morocco

Pr. Lahcen BENAABIDATE

Faculty of Sciences and Techniques of Fez Sidi Mohamed Ben Abdellah University, Morocco

Mr. Nour Eddine EL KADDOURI

Faculty of Legal, Economic and Social Sciences Abdelmalek Essaadi University, Morocco

Pr. Hassan AMHAMDI

Faculty of Sciences and Techniques of Al-Hoceima Abdelmalek Essaadi University, Morocco

Pr. Najat AMARJOUF

Faculty of Sciences and Techniques of Al-Hoceima Abdelmalek Essaadi University, Morocco

Pr. Mohammed HASSANI ZERROUK

Faculty of Sciences and Techniques of Al-Hoceima Abdelmalek Essaadi University, Morocco

Pr. Yassine EZZOUBI

Faculty of Sciences and Techniques of Al-Hoceima Abdelmalek Essaadi University, Morocco

Mr. Houssine NIBANI

AGIR Association, Al Hoceima – Morocco



Technical Program Committee

A

Pr. ABOUMARIA Khadija

Abdelmalek Essaadi University Tangier, Morocco

Pr. AMARJOUF Najat

Abdelmalek Essaadi Üniversity Al Hoceima, Morocco

Pr. AMHAMDI Hassan

Abdelmalek Essaadi University Al Hoceima Morocco

Pr. AMRAOUI Fouad

Hassan II University Casablanca, Morocco

B

Pr. BENAABIDATE Lahcen

Sidi Mohamed Ben Abdellah University Fez, Morocco

Dr. BENAZZOUZ Omar

University of Aveiro Aveiro, Portugal

Pr. BRIAK Hamza

Mohammed VI Polytechnic University Benguerir, Morocco

\mathbf{C}

Pr. CHERKKAOUI DEKKAKI Hinde

Abdelmalek Essaadi University Al Hoceima, Morocco

D

Pr. DEBIECHE Taha Hocine

Benyahia University Jijel, Algeria

F

Ech-charrat Mohammed Rida

Abdelmalek Essaadi University Tetouan, Morocco

Pr. EL AMRANI Namira

Hassan the first University Settat, Morocco

Pr. EL HAJRI Aimad

Cadi Ayyad University Marrakech, Morocco

Pr. EL MOUSSAOUI Said

Abdelmalek Essaadi University Al Hoceima, Morocco

Pr. EL OUARGHI Hossain

Abdelmalek Essaadi University Al Hoceima, Morocco

Pr. EL TALIBI Hajar

Abdelmalek Essaadi University Al Hoceima, Morocco

Pr. ETEBAAI Issam

Abdelmalek Essaadi University Al Hoceima, Morocco

Pr. EZZOUBI Yassine

Abdelmalek Essaadi University Al Hoceima, Morocco

F

Pr. FAOUZI Mohamed

Moahmmed V University Rabat, Morocco

H

Pr. HAIDA Souad

Ibn-Tofail University Kenitra, Morocco

Pr. HAMED Younes

University of Gafsa Gafsa, Tunisia

Dr. HOUSSA Rachida

National Fisheries Research Institute Casablanca, Morocco

I

Pr. ISAAD Jalal

Abdelmalek Essaadi University Al Hoceima, Morocco

J

Dr. JARRAYA HORRICHE

Faten

Water Research and Technology Center Soliman, Tunisia

Pr. JOUNAID Halima

Faculty of Sciences of Ain Chok Hassan II University Casablanca, Morocco

L

Dr. LALILTI Anas

Abdelmalek Essaadi University Tangier, Morocco

\mathbf{M}

Pr. MHAMMDI Nadia

Mohammed V University Rabat, Morocco

Pr. MOURABIT Taoufik

Abdelmalek Essaadi University Tangier, Morocco

O

Dr. OMIRA Rachid

Instituto Português do Mar e da Atmosfera Lisboa, Portugal

R

Pr. ROSSI Abdelhamid

Abdelmalek Essaadi University Tangier, Morocco

\mathbf{T}

Pr. TAHAYT Abdelilah

Abdelmalek Essaadi University Tangier, Morocco