



# Transforming our relationship with nature is key to a sustainable future



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## PROJECTS

### 1. Greenhouse Gas emission Report

GHG Report of UTM of the year 2022 and Baseline year 2016

<http://www.utm.rnu.tn/utm/fr/politiques--utm-ghg-emission-report>

<http://www.utm.rnu.tn/utm/fr/politiques--emmission-carbon>

### Sustainability Policy

Sustainability is the balance between the economy, equity, and the environment.

The UTM approach is to ensure the development of our activities without compromising the quality of life of current and future generations by acting in an economically, environmentally, and socially responsible manner. Our ambition is to adopt the ESG principles to develop a sustainable and eco-friendly campus that ensures efficient use of materials, space, and energy, respect, and promotes the well-being of the employees and students on the campus. Our approach is to focus on three main pillars: operation, awareness, and research.

### 2. Med-EcoSuRe project from 2019 to 2023





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## Partnership

Role	Name of the organisation	Country
Lead beneficiary	Mediterranean Renewable Energy Centre	Tunisia
Partner 1	University of Tunis El Manar	Tunisia
Partner 2	University of Florence – Department of Architecture	Italy
Partner 3	University of Seville - Thermothechnics Group at Thermal Energy Engineering Department	Spain
Partner 4	An-Najah National University - Energy Research Centre	Palestine
Partner 5	Naples Agency for Energy and Environment	Italy
Partner 6	Spanish association for the internationalization and innovation of solar companies	Spain

The Med-EcoSuRe project offers an innovative approach to the definition and diffusion of cost-effective energy renovation within university buildings, with the perspective of extending results to the whole public buildings sector in the long term. A Mediterranean cross-border living lab - bringing together researchers, building managers, companies, public organisations, and students - will be established to develop energy efficiency and renewable energy solutions as well as retrofitting schemes to be implemented in 9 university buildings. The final aim behind the project is to turn university managers into active players contributing to the co-creation and experimentation of emerging ideas, breakthrough scenarios and innovative concepts. <https://www.enicbmed.eu/projects/med-ecosure>.

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### 3. MAR2PROTECT

The project aims to provide a holistic approach to prevent groundwater contamination from the impacts of climate change and global change.

The core of the innovative Managed Aquifer Recharge is the Decision Support System which incorporate technological and societal engagement information using an Artificial Intelligence-based evaluation to improve groundwater quality and quantity.

The Tunisian partner, ISSBAT (UTM), defines the objective of the project as to implement an effective tertiary treatment to minimize the introduction of pollutants in the aquifer. The aquifers studied are located in the Cap Bon Peninsula in Tunisia.

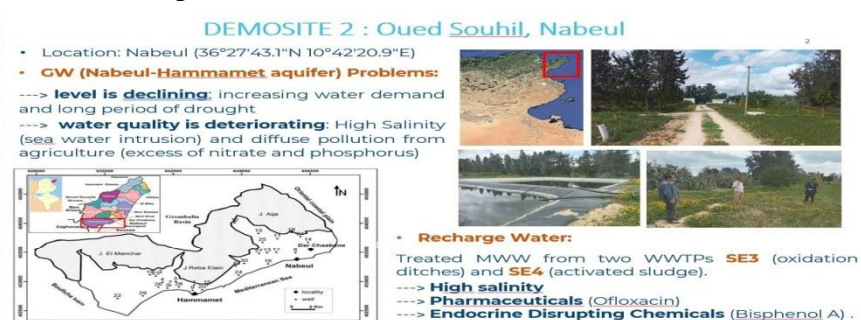


Figure 1. Location map of Hammamet Nabeul shallow aquifer and groundwater sampling positions.



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### 4. Implementing of photovoltaic panels at ENIT, September 2023



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### 5. Tunisian-Bavarian Hub for Green Hydrogen

Implementation of Tunisian-Bavarian hub for green hydrogen in ENIT (UTM), as part of the project

#### RESEARCH ACTIVITIES

H2Vert.TUN, May 2023

Green hydrogen is produced by electrolysis of water from renewable energy. Its main assets are zero greenhouse gas emissions, being a totally clean energy, which is an asset for the decarbonisation of industry in Tunisia, and its flexibility, as it can be stored and distributed on demand, which is an asset for the export market.

<https://www.giz.de/en/worldwide/109268.html>

The hub, launched Wednesday, is a platform of exchange and training intended to promote research and develop top-notch technologies in connection to green hydrogen. Scaled-up scientific and technological cooperation is an additional target along with the stepped-up exchange of experiences and partnerships. The hub also offers training and skill-building opportunities for professionals.

<https://www.tap.info.tn/en/Portal-Economy/16307007-first>



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**International Congress « Artificial Intelligence Role & Climate Change Impact »,**  
 3rd edition of the international congress “ISEE Geomatics” held  
 October 30th, 2023,  
<https://2023.isee-geomatics.com/>

**TOPICS**  
**GEOMATICS and AI.**  
 1. Smart solutions for sustainable water, soil and air management  
 2. Geospatial data for Sustainable Development of agricultural resources.  
 3. Assessment Approaches for land use, land cover (Agriculture)  
 4. Monitoring environment and climate change indicators  
 5. Natural Resources and Environment management  
**SPATIOTEMPORAL MONITORING AND 3D MAPPING**  
 1. Real Time monitoring and embedded system  
 2. 3D Survey and Mapping  
 3. Geodesign and Urban 3D  
 4. Solar land Modelling  
 5. Building Information Modelling for Sustainable Development  
**HERITAGE AGAINST CLIMATE CHANGE**  
 1. Augmented reality for heritage simulation  
 2. Climate change impact on heritage  
 3. Digital photogrammetry and rebuilding the monument  
 4. Revitalized Tourism  
 5. WEB-GIS applications

**KEYNOTES**  
 • Michel Kasser  
 ◦ Geomatic Industry Survey.  
 • Yacine Bouroubi  
 ◦ Artificial Intelligence and Big EO data applications: case studies  
 • Michel Boko  
 ◦ Contemporary Climate Change: factors and Impacts  
 • Pierre Grossenmeyer  
 ◦ Architectural photogrammetry and applications of heritage documentation  
 • Faouzi Ghorbel  
 ◦ Geometric Statistics: Methods and applications

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 📍 Hammamet - TUNISIA

**3rd EDITION**  
**TIMELINE GEOMATICS!**  
**ARTIFICIAL INTELLIGENCE**  
**ROLE & CLIMATE CHANGE**  
**IMPACT**  
**CONGRESS CHAIRS:**  
 Nosmen REBAI (ATG, ENIT/Université Tunis El Manar)  
 Mohamed MASTER (Université Mohamed V de Rabat)

**Conference AIM AND OBJECTIVES**  
 I SEE GEOMATICS 2023 will bring together researchers, research scholars, experts, and policy makers to share their research, and experiences and discuss recent advances in Geomatics Methods and applications to social, cultural Heritage city, Geonik, Energy, Georesources, and new Geomatic Industry Surveys. The conference will cover many aspects related to Modeling with Intelligent Systems applications grouped into three main topics below. Indeed, the colloquium will provide a space to discuss the results of the digital Web mapping research thematic and fundamental applications. It will also offer the opportunity for a national and international debate of experts.  
 • To emphasize the Public, Private, and NGO Partnership and  
 • To develop new incoming works on AI methods and applications, with consideration of climate change impact, and broadcasting of the Copernicus Geospatial data for the wide public « OPEN DATA ».

**CONFERENCE VENUE**  
 The I SEE GEOMATICS 2023 will take place in Hammamet, a coastal city located in the Northwest of Tunisia. The town is very famous for its lush white sandy beach and tourist resort. At the city center stand the old Medina and the historic fort of Hammamet.

**ABOUT THE ORGANIZERS**  
 The Tunisian Association of Geomatics (ATG) in partnership with the Research Laboratories of Engineering Geotechnics and Geonik (LRIGD) in ENIT, in addition, the University of Tunis El Manar (UTM), and High school of Engineering of Tunis (ENIT) are pleased to organize the third International Congress of I SEE GEOMATICS 2023, from 30th October to 1st November 2023 in Hammamet-Tunisia.

**KEY DATES**  
 July 10th, 2023: Deadline for Abstract submission  
 July 31st, 2023: Acceptance notification  
 Sept. 15th, 2023: Deadline for registration & 2nd circular  
 October 1st 2023: Scientific program & 3rd circular



**Conference « New data for the management of our resources »**  
 National conference held at ENIT in November 2023. The theme of the first session is the management of energy resources.



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11-11-2023  
10:30 AM  
ENIT-AMPHI  
LATIRI

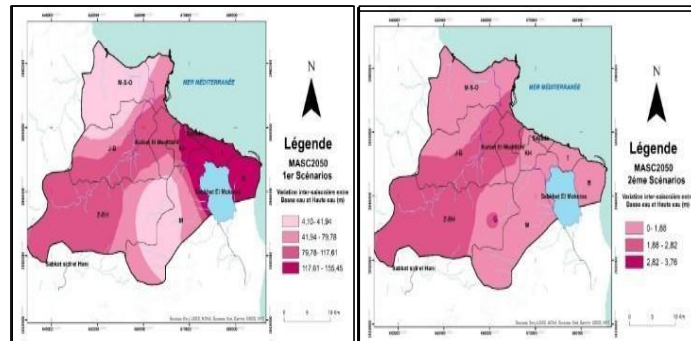
Cycle de rencontres réseau  
« Nouvelles données pour la gestion de nos ressources »  
Donne #1 : Energies

EXPERTS PANELISTES

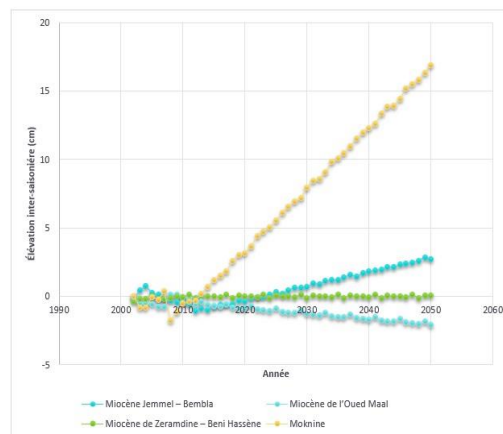
- Mr Belhassen Chiboub  
Chef de programme énergie au Ministère de l'Industrie, des mines et de l'énergie
- Mr Chibeb Bouden  
Professeur à l'École Nationale d'ingénieurs de Tunis, ancien ministre de l'Enseignement supérieur et de la recherche scientifique
- Mme Afef Chachi  
Directrice de l'Observatoire National de l'énergie et des mines

Association des Diplômés de l'École Nationale d'ingénieurs de Tunis

PhD & Master Research  
Climate Impact on Marine Intrusion.



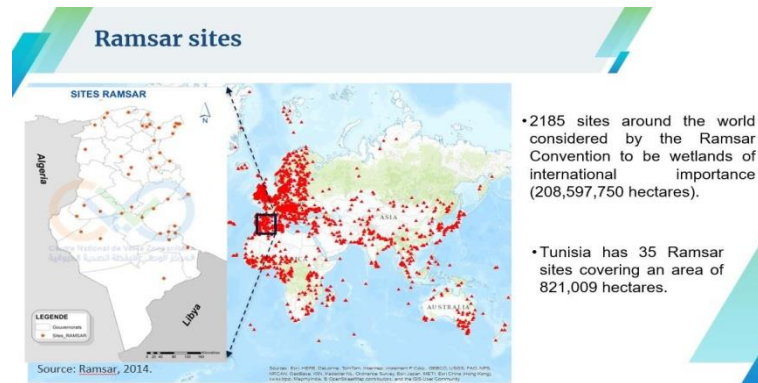
Confirm results of global climate model established by IPCC (IPCC 2021).



Assessing the impact of climate change on Lake of Ichkel, a natural reserve



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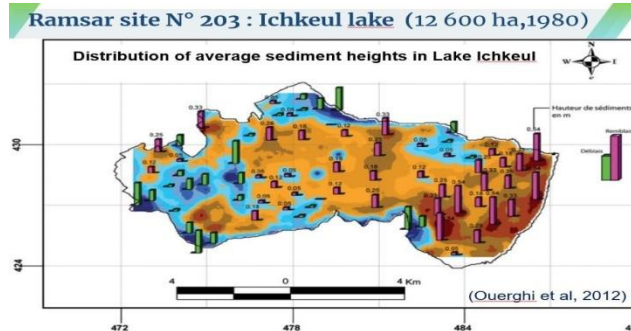


The research focuses on quantitatively assessing the impact of climate change on the functioning of Lake Ichkeul, an 8500-hectare (85 km<sup>2</sup>) ecosystem in northern Tunisia. Utilizing the MOHYB hydrodynamic model, a 1D numerical approach, the study investigates the role of lagoon exchange through the Tinja river, including the influence of tides, in controlling salinity and preventing drought occurrences in the Ichkeul lagoon. The model incorporates relevant environmental parameters, such as water inflow, wind stress, evaporation rates, precipitation, river inputs, water temperature, air temperature, and tidal variations, to simulate the hydrodynamic behavior of the lagoon. The hydrodynamics of Lake Ichkeul are influenced by the inflow of fresh continental water during winter and saltwater inflow from the Bizerte Lake during summer. Additionally, the model considers the impact of tides on controlling the flow of salt into the lagoon. By incorporating these dynamics, the study accurately captures the complex behavior of the lagoon and its response to changing environmental conditions.

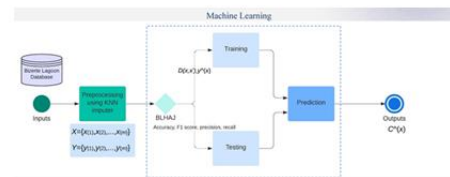
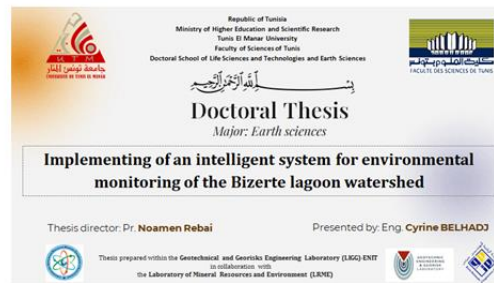




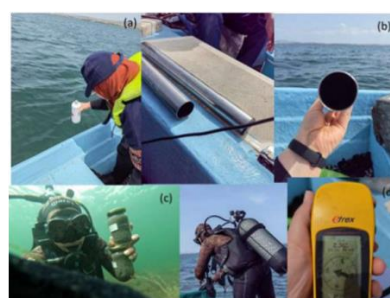
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## Intelligent system for Environmental monitoring



This thesis project aims to develop intelligent systems for environmental monitoring and contamination risk assessment in the Bizerte Lagoon, a region facing significant anthropogenic pressures. By leveraging advanced technologies such as the BLHAJ2030 model for water quality and the OP-LSTM model for predicting sediment contaminants, the goal is to effectively manage pollution levels. The proposed intelligent system integrates AI for real-time contaminant monitoring, based on 22 years of geochemical historical data (2002-2023). The methodology combines geochemical analyses, AI modeling, and Geographic Information System (GIS) tools to evaluate contamination risks and groundwater recharge potential in the region surrounding the Bizerte Lagoon.





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## 6. INNOVATIONCOMPETITION

- **Shelleco-Marathon**

ENITECOCAR participated in the international competition "Shell Eco-Marathon" on June 30th, 2022, and ranked 18th worldwide with a score of 222 KM/L.



- **National Competition INJAZ Tunisia 14th edition "The Entrepreneurs of the Future".**

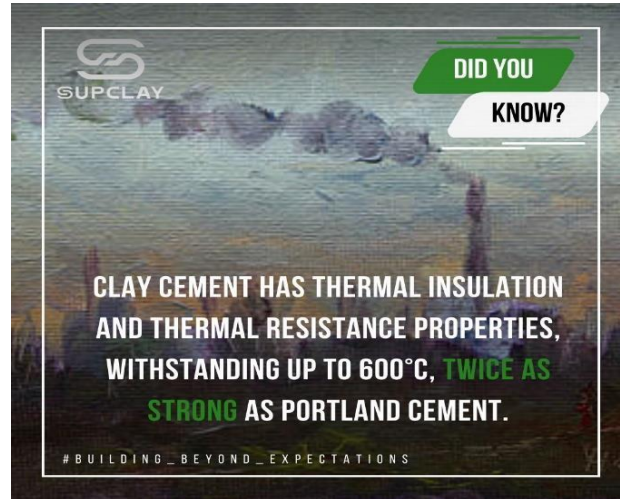
The team Supclay won the Best Young Company Award for their product, Clay-based cement, an environmentally friendly alternative to Portland cement. They will be representing Tunisia at the regional competition in November in Qatar.







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## 7. TRAINING

### Training IA, Climate Change & Geomatics



Training for the application of IA in studying Climate Change & Geomatics, held November 2nd, 2023, in the context of the international congress of the same thematic.



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## WORKSHOPS

- **Workshop GREECON**

“GREECON” workshop for ecological construction, organized in ENIT (UTM) by Civil engineering club, 3Zeros club, and IEEE ENIT branch, February 2nd, 2023.

<https://www.facebook.com/ENITunis/posts/pfbid0x4t3aZNPC7Zqtp34vgmEg5Uafpc9wxQgAp6rjK3fHukgosaGoBRneLzC5JEBkmZml>



- **Workshop IA, Climate Change & Geomatics**

As part of the international congress “ISEE Geomatics” held October 30th, 2023. Professionals and Researchers animated different workshops in the theme of Geomatics and Climate Change.

<https://2023.isee-geomatics.com/preprogram/>.

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## Workshops: 30th October

Monday, 30 October workshops related to the themes of the Congress are organized on a half-day.

- WS 1:** Artificial Intelligence role in Geomatics
- WS 2:** Climate change between science and politic
- WS 3:** Local Climate Modelling (LCM)
- WS 4:** Geospatial data for Sustainable Development
- WS 5:** LiDAR 3D mapping and survey
- WS 6:** Copernicus and RS data
- WS 7:** Geomatic and Entrepreneurship: AI & OD for sustainable development

## 8. FIELDWORK



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Field visits (monitoring and survey of climate change impact) for students of Civil Engineering department of ENIT (UTM) to Korba, Nabeul (2023)

Management of littoral to climate resilience  
Observation of “Ganivelle” to reduce the vulnerability of the beach of Korba-Tunisia.



Ganivelle: wooden fences set up to preserve the dunes.



The Ganivellesisa research project, which aims to prevent the dispersal of the beach sand. The Ganivelles preserve the dune ridge by forming embryonic dunes that won't be dispersed by storms or other environmental phenomena due to climate change.





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## 9. CLUB ACTIVITIES

Launched in October 2022, this club is present in 17 universities and is dedicated to promoting the 3Zero initiative: Zero exclusion, Zero carbon, Zero poverty. The club aims to create a sustainable campus by working towards the achievement of the Sustainable Development Goals (SDGs).





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