Goal 6 – Clean Water and Sanitation

Our Aim

Expand local & international collaboration and capacity-building support to communities in water- and sanitation-related activities and programs, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies as well as wise agriculture.

Last Year Recorded

World wide: 208

Arab Country: 51-60

Egypt: 7

Our Progress through 20/21

Teaching:

❖ Water, Energy and Environmental Programs

M.Sc. in Renewable and environmental energy:

https://aast.edu/en/colleges/coe/alex/dept/programtemp.php?program_id=245&unit_id=74

M.Sc. in Water Resources Engineering:

https://aast.edu/en/colleges/coe/alex/dept/programtemp.php?program_id=240&unit_id=62

❖ Water-related graduation projects 2020

- **Graduation Projects of Mechanical Engineering Department- Alexandria Campus**

https://aast.edu/en/colleges/coe/alex/dept/contenttemp.php?page_id=5300011

Irrigation system combined with solar panel

Desalination power and hydrogen production using fuel cell

Graphical waterfalls

Improving the productivity of solar still water desalination

Design and economic feasibility of a solar powered atmospheric air water generator

- **Graduation Projects of Construction & Building Department- Alexandria Campus**

https://aast.edu/en/colleges/coe/alex/dept/contenttemp.php?page_id=6200029#Fall%202020-2021

Remote Sensing Applications in Water Resources

- **Graduation Projects of Mechanical Department- Smart Village Campus**

https://aast.edu/en/colleges/coe/smartvillage/dept/contenttemp.php?page_id=43500011

Design and control of a smart Aquaponic System

❖ Student Trips

A Field Visit to the New Abu Qir Steam Power Station (2021)

A site visit to the 1300MW New Abu-Qir Steam Power Station has been organized by the College of Maritime Transport for students in the Electrical Machines course. The New Abu-Qir station is the largest steam power station in Egypt that relies on sea water desalination for electricity power generation. Students were able to understand the entire generation process and how the wastewater is being returned back to sea according to the environmental regulations of the Egyptian Law

❖ Competitions

1- **1st Place in Enactus AAST Portsaid &Food and Agriculture Organization of the United Nations (FAO)**

Enactus AAST Port Said team won first place in the Enactus FAO Food and Agriculture Organization of the United Nations (FAO) competition conducted by the United Nations. The Enactus team competed against the Enactus teams of Tunisia, Egypt and Morocco. The presentation was about their MycoTech project which includes mycobrick and mycopottian, and will be presented in the UAE on February 24-25 at Dubai Expo 2020

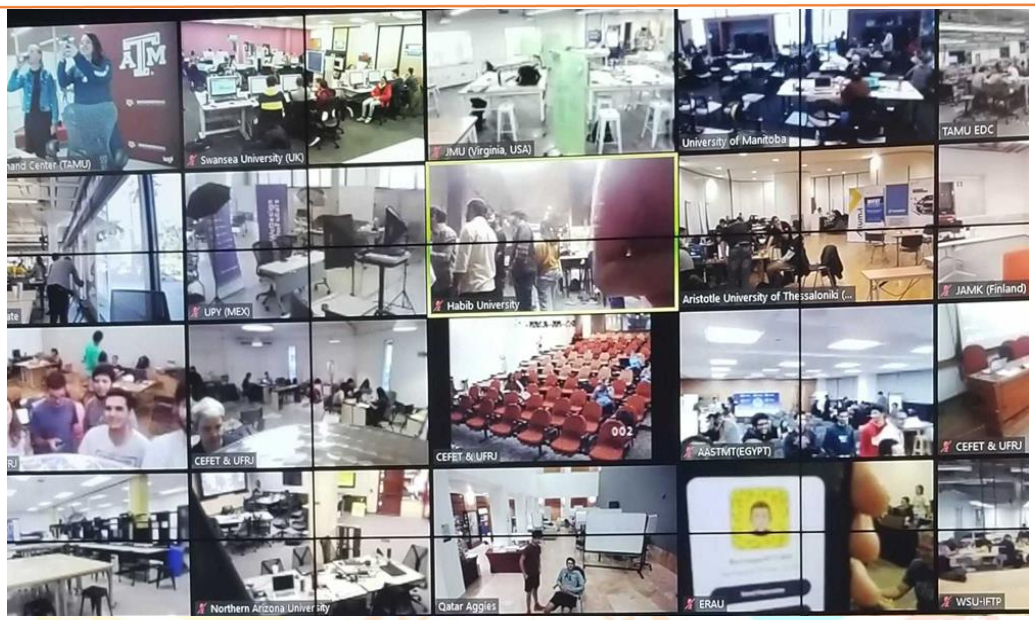
Initiatives:

1- Invent for the Planet Event:

Invent for the Planet global challenge has been held in AASTMT Smart Village Campus February 2020 for the second time after 2018. Invent for the Planet is hosted by Texas A&M University and it is a 48-hour intensive design competition, which took place at more than 30 universities around the world. Students developed solutions for major issues facing society that have arisen as our world continues to modernize and become more populated. Over the course of two days, students at each campus formed teams, developed a plan and prototype, created a business plan and pitched it to a panel of judges.

These students' activities and challenges cultivate the ability of the students to communicate and work effectively in teams and also to teach students how to analyze and implement interdisciplinary engineering projects.

https://aast.edu/en/colleges/coe/smartvillage/dept/contenttemp.php?page_id=52900026



Picture of the command center video wall where all universities had a livestream of their local competitions.

2- February 2020: AASTIANS go Green" Campaign at AASTMT Smart Village Campus

Within the Arab Academy for Science, Technology and Maritime Transport (AASTMT) social responsibility, as well as, AASTMT and the Egyptian Ministry of Local Development "Protocol Of Cooperation" on organizing the planning and implementation of the campaign AASTMT Green that was held on Wednesday 21- 1- 2020, the activities of "AASTIANS go Green" campaign has been started on Monday 10- 2- 2020, at AASTMT Smart Village Campus, in the presence of H.E Prof. Dr. Ismail Abdel Ghafar Ismail - AASTMT President, Prof. Dr. Mona Fouad - AASTMT Smart Village Campus Academic Dean, and Prof. Dr. Enas Barsoum - Advisor to AASTMT President for Student Affairs.

https://aast.edu/en/sites/port_saeid/news.php?unit=1&event=4120&event_type=1&language=1

3- March 2020: ASTMT Smart Village Campus Marathon of "AASTians go Green" Campaign

With the achievement of "Egypt Vision 2030" sustainable development goals, as in keeping with the Arab Academy for Science, Technology and Maritime Transport (AASTMT) social responsibility, as well as, AASTMT and the Egyptian Ministry of Local Development "Protocol Of Cooperation" on organizing the planning and implementation of "AASTians go Green" campaign that was held in January 2020, AASTMT organized a Marathon on Thursday 5- 3- 2020, at AASTMT Smart Village Campus, under the patronage of H.E Mr. Ahmed Aboul Gheit - Secretary General of the League of Arab States, H.E Major General Mahmoud Shaarawy – Egyptian Minister of Local Development, H.E Prof. Dr. Ashraf Sobhy - Egyptian Minister of Youth and Sports, and H.E Prof. Dr. Yasmine Fouad - Egyptian Minister of Environment.

https://aast.edu/en/sites/port_saeid/news.php?unit=1&event=4160&event_type=1&language=1

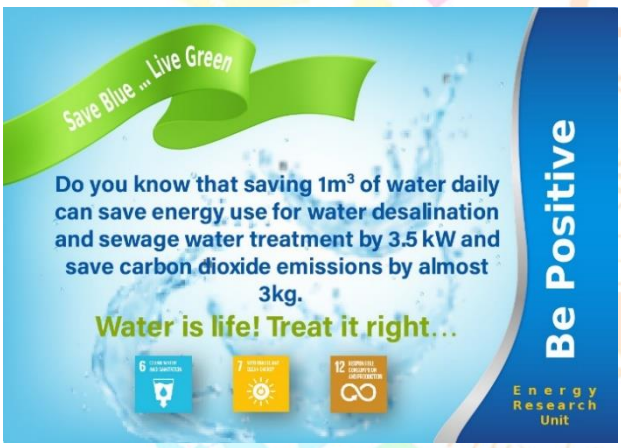
https://aast.edu/en/sites/port_saeid/news.php?unit=1&event=4161&event_type=1&language=1

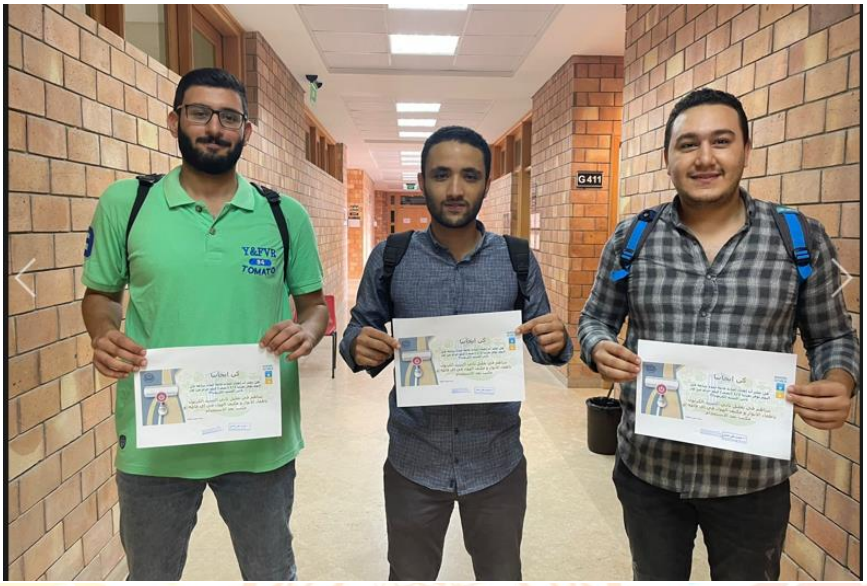
4- February 2021: Energy Research unit announces the foundation of NET ZERO Emission Community to spread green energy awareness and encourages energy conservation initiatives.

5- June 2021: Environment Day Initiative by Energy Research Unit

In concern of realizing and activating sustainable developments goals, the energy research unit in AAST, Abukir announces the environment day initiative which will take place on Monday the 20th of June, 2021 as demonstrated in the poster below

6- Awareness campaigns for energy conservation initiated by Energy Research Unit





7- November 2021: SDG Awareness session on November 2021

https://aast.edu/en/news.php?unit_id=656&language=1&page=33&event=469&get_event_type=1

An introductory session on entrepreneurship to raise awareness of the sustainable development goals

An introductory session on the field of entrepreneurship to encourage and educate students about the goals of sustainable development through active participation in the Enactus competition, which is interested in encouraging and educating university youth to find new ideas that help in sustainable development

PUBLISHED ON: MONDAY,01 NOV 2021 **TAGS:** SUSTAINABLE, EDUCATING, ENCOURAGING

Research: **8 Funded Research projects which includes:**

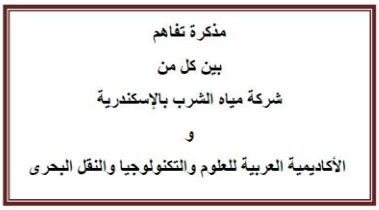
- MAIA TAQA (2019- present): http://www.enicbcmed.eu/projects/maia-taqa
- An Innovative Solar Powered Water Desalination System using Fiber Membranes (Solar-Water): http://www.aast.edu/en/scientific-research/contenttemp.php?page_id=47300104
- Knowledge exchange in sustainable Fisheries management and Aquaculture in the Mediterranean region: http://www.aast.edu/en/scientific-research/contenttemp.php?page_id=47300106
- Smart Autonomous Iot Agricultural Monitoring System: https://aast.edu/en/scientific-research/projects/project.php?uid=352&proj_id=1
- Mediterranean Quadruple Helix Approach to Digitalization: https://www.enicbcmed.eu/projects/med-quad
- Smart Wireless Sensor Network to Detect and Purifate Water Salinity and Pollution for Agriculture Irrigation: http://www.aast.edu/en/scientific-research/contenttemp.php?page_id=47300104
- Monitoring, Assessment and Innovative Treatment Technology to Enhance Groundwater Quality For Irrigation Toward Climate Change Adaptation: https://aast.edu/en/scientific-research/projects/project.php?uid=409&proj_id=1

Public Engagement:

- Alexandria Sewage Company Signs Contract with the Productivity & Quality Institute
- The Drinking Water Alexandria Company Obtains ISO 26000 with the help of The Productivity & Quality Institute of AAST

1- **The Arab Academy for Science, Technology and Maritime Transport signs an MOU with Alexandria Company for Drinking Water**

The MOU aims to find the appropriate framework through which the joint cooperation between the company and the AAST in the field of training technical consultations and joint scientific research takes place



2- The Arab Academy for Science, Technology and Maritime Transport, Sharjah Branch, launches a partnership with the Ministry of Climate Change and Environment

The Arab Academy for Science, Technology and Maritime Transport, Sharjah Branch, signed a memorandum of understanding with the Ministry of Climate Change and Environment in the United Arab Emirates, to employ all its academic capabilities and the expertise of its educational cadres in order to serve and develop the protection of the marine environment and align the activities of the shipping sector with work requirements in order to meet the challenge of climate change And strengthening the protection of the delicate ecological balance in the waters of the Arabian Gulf and the Arabian Sea, which the UAE overlooks.

Abdul Ghaffar also explained: “We have vowed ourselves in the Sharjah branch of the Academy to be the first to respond to the call of His Highness Sheikh Mohamed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the Armed Forces, who was launched at the 2015 government summit, declaring the need to secure Drinking water in the UAE is for future generations after the oil depletion, in an area devoid of rivers and fresh water resources, thus protecting the marine environment and keeping its water free from chemical or biological pollution represents the biggest challenge, as well as developing and owning the latest desalination technologies at the lowest operational costs. Employing clean marine energy and its sustainable resources is one of our top priorities as a national educational institution.”

3- TWT (Tanmeya wa Tatweer) Project by AAST Entrepreneurship Center in Collaboration with Academy of Scientific Research & Technology & Funded by the Danish Arab Partnership Program and managed by the African Development Bank

TWT Project objective is to enhance and support the entrepreneurship ecosystem in Egypt to Enable empowerment of existing and potential entrepreneurs, particularly youth and women, to establish, manage and operate successful innovation-driven businesses in 3 priority sectors:1. Agribusiness 2. Clean and Green 3.Creative Industries, with a focus on handicrafts and performing arts. This will be achieved by supporting the implementation of incubation programs, giving focus to disenfranchised areas such as Upper Egypt and New Valley, as well as to women and youth. TWT have helped 50 graduated startups and conducted about 60 training sessions

4- Protocol Signing between The Arab Academy for Science, Technology and Maritime Transport and The Drinking Water and Sanitation Company in Aswan

Within the framework of the AASTMT`s role in developing the industry and engineering sectors in the South-Valley, the College of Engineering and Technology-South Valley Branch organized on Thursday 06/10/2021 the first meeting of the Advisory Council for Industry in the South Valley Branch (Aswan) and that In the presence of the President of the Syndicate of Engineers in Aswan, chairmen of companies` boards of directors, and directors of sectors of a number of different bodies in Upper Egypt.
Prof. Dr. Mohamed Fahmy Shehadeh, Dean of the Faculty of Engineering and Technology, presented the capabilities of the Faculty of Engineering and Technology in Aswan, and the heads of educational departments gave an overview of the available capabilities and the expertise available in each department. Then the council witnessed a series of discussion sessions and opportunities for industry support, consultations and mutual training with industrialists in the South-Valley. Some companies provided more than 100 training opportunities in the south of the valley. The council also included the signing of a cooperation protocol between the Arab Academy for Science, Technology and Maritime Transport and a water company Drinking and sanitation in Aswan.

5- Protocol Signing between The Arab Academy for Science, Technology and Maritime Transport and The Drinking Water and Sanitation Company in Matrouh

Prof. Dr. Mustafa Hussein - Director of the Arab Academy branch in El Alamein - and Dr. Suhair Al-Halfawi - Advisor to the President of the Academy for material and logistical affairs - received a delegation headed by Dr. Eng. Khaled Ibrahim Gabr - Chairman of the Board of Directors of the Drinking Water and Sanitation Company - in Marsa Matrouh Governorate. In order to sign a cooperation protocol between the two parties to provide training, advisory and postgraduate services.

Publications:

1. **Renewable Energy and Sustainable Development (RESD) journal**

http://apc.aast.edu/ojs/index.php/RESD

The journal is **financially supported by the Arab Academy for Science, Technology and Maritime Transport** in order to maintain quality open-access source of research papers on renewable energy and sustainable development.

The RESD journal is a biannual international peer-reviewed journal featuring open-access and free charge fees. It presents a global forum for dissemination of research articles, case studies and reviews focusing on all aspects of renewable energy and its role in sustainable development for authors and readers.

The journal aims to present to the international community important results of work in the fields of renewable energy and sustainable development research to help researchers, scientists, manufacturers, institutions, world agencies, societies to keep up with new developments in theory and applications. Experimental, computational and theoretical studies are all welcomed to RESD. The topics of focal interest to RESD include, but are not limited to, all aspects of wind energy, wave/tidal energy, solar energy, Hydropower, Geothermal Energy, Hydrogen & Fuel Cells as well as energy from biomass and biofuel. The Energy Savings and efficient energy is a major interest of the RESD journal. The integration of renewable energy technologies in electrical power networks and smart grids is another topic of interest to RESD.

❖ AASTMT Energy Consultancy

1. Energy Management Service of AASTMT Productivity and Quality Institute (PQI)

AASTMT PQI has a great role in supporting energy-efficient systems and offering energy management services by introducing the following;

- **ISO 50001 Energy management Systems Consultancy Service (EnMS)**

https://aast.edu/en/institutes/pqi/contenttemp_item.php?unit_item=342&page_id=34200027

The purpose of the EnMS is to enable organizations to establish or re-structured the systems and processes necessary to improve energy performance, including energy efficiency, use, consumption and reduce running cost. ISO 50001 (Energy Management System) is based on the ISO management system model familiar to more than a million organizations worldwide who implement standards such as ISO 9001 (quality management), ISO 14001 (environmental management), ISO 22000 (food safety), ISO/IEC 27001 (information security). ISO 50001 can be implemented individually or integrated with other management system standards.

Benefits of ISO 50001 Application:

- Improves existing management systems.
- Leverages existing continual improvement processes.
- Develops a baseline of energy use.
- Actively manages energy use and costs.
- Reduce emissions without a negative impact on operations.
- Continual improvement of energy use versus product output over time.
- Potential for savings to be used for emission credits.
- Improves maintenance process culture in all types of organization.
- Generates a new source of thinking in energy Consumption model.

- **Energy and Environmental Management courses**

Environmental Management System (EMS) and Energy Management System (EnMS) helps sustainable businesses and help to reduce an organization's impact on the environment while improving operating efficiency, controlling, and reducing your organization's energy consumption, which reflects on, reducing product manufacturing costs as energy costs rise. Thus, AASTMT offers the following courses

- **Environmental management training courses**

Environmental management courses focus on how to mitigate the adverse effects of business and industrial operations on the Earth's environment.

https://aast.edu/en/institutes/pqi/contenttemp_item.php?unit_item=343&page_id=34300113

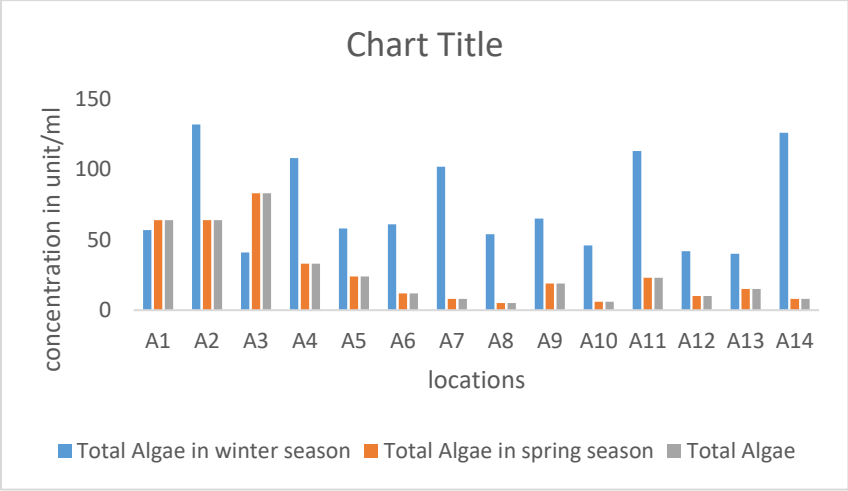
Case Study

Mention brief Details about one of the research or initiatives and then mention the output

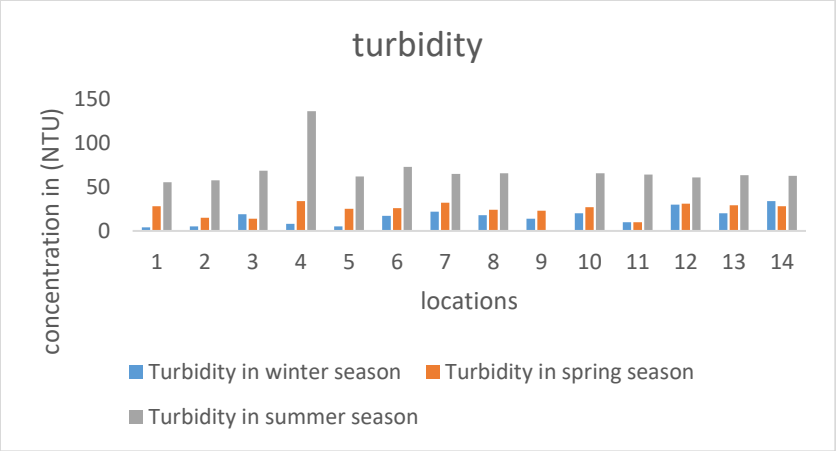
(note : try to add statistics for any of the above points)

"Monitoring, Assessment and Innovative Treatment Technology to Enhance Groundwater Quality for Irrigation toward Climate Change adaptation" Funded Project

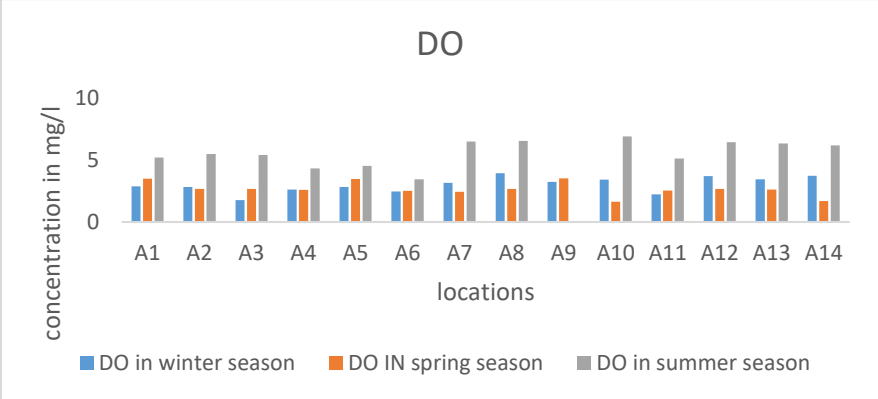
Increasing pollution in aquatic resources and climate changes are important concerns leading to deterioration of freshwater resources, which affects drinking, food industry, and irrigation. This has prompted concentrating on ground water as a potential option for drinking and irrigation, which must fulfil particular standards to attain the requisite quality, especially in arid places where ground water is the only source. A project in AASTMT -AbuQuir Campus has been established which intends to improve the irrigation and/or drinking quality of water from 13 borehole ground wells at Abu Qir Campus near the eastern shore of Alexandria City (Abu Qir Area). Physical, chemical, and biological water samples have been collected and analyzed to determine pollution status regionally and temporally (monthly for a year) and relate them to environmental and climatic conditions. Then, nanotechnology will improve water quality. The project has been fully funded by the AASTMT with sample of seasonal water samples and improvements which have started by taking readings in Summer, then Winter and followed by Spring.



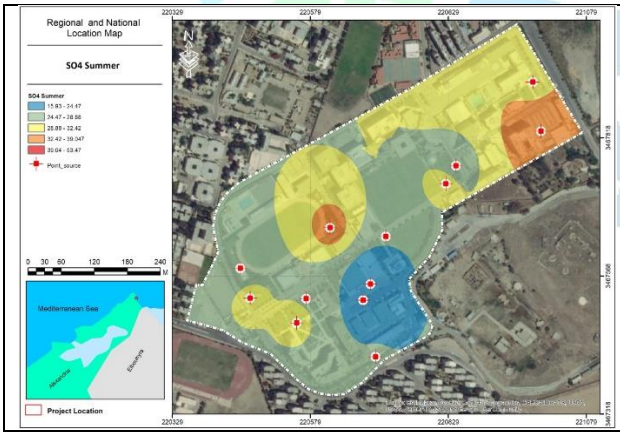
Sample of Total Algae concentration in three seasons

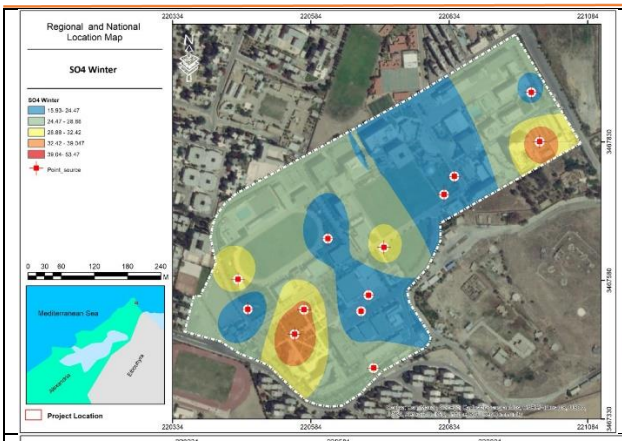
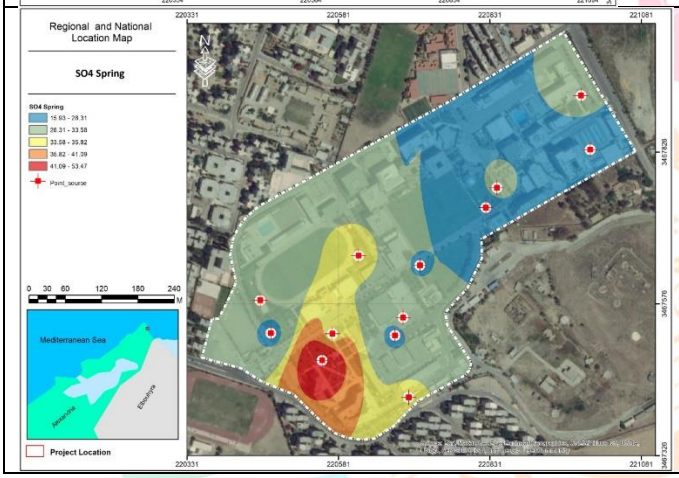


Sample of Turbidity Analysis in three seasons



Sample of Dissolved Oxygen Analysis in three seasons

	GIS Photos of SO4 in Summer

	GIS Photos of SO4 in winter
	GIS Photos of SO4 in Spring