

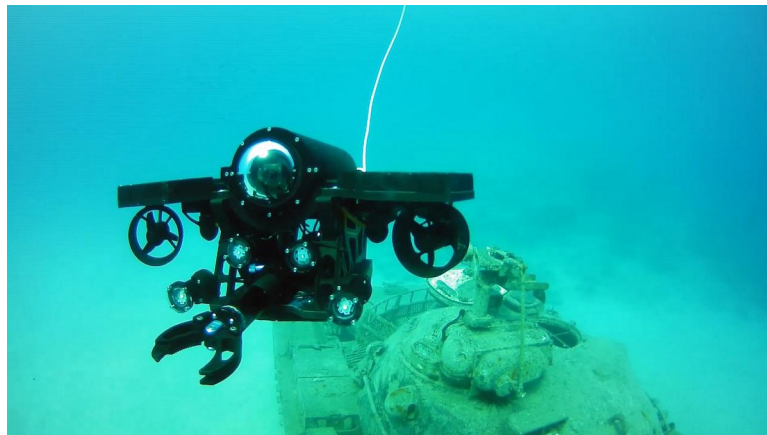
14.3.4 - Does your university as a body work directly (research and/or engagement with industries) on technologies or practices that enable marine industry to minimise or prevent damage to aquatic ecosystems?

ASOIU recognises that sustainable development of the marine, coastal and freshwater sectors require not only academic knowledge but applied technologies and industry partnerships that actively reduce harm to aquatic ecosystems. By integrating engineering, water-resources and ecological specialties, the university ensures it plays a direct role in the development of tools and practices designed to minimise damage from industry, infrastructure or maritime operations.

1. Technology Development: Under-water/Surface Drone for Aquatic Monitoring

At ASOIU, one of the key technology-driven initiatives is the development of a water drone system (surface and/or underwater) designed to monitor aquatic ecosystems, detect pollution, habitat degradation or intrusive industrial activity, and thereby support industry in adopting less harmful practices.

- ❖ The drone technology is engineered with sensors to measure parameters such as turbidity, dissolved oxygen, pH, conductivity, and visual cameras to record flora/fauna condition.
- ❖ By enabling more frequent, less intrusive, and more spatially-extensive monitoring than traditional diver- or boat-based methods, the system supports early detection of ecosystem stress or damage and therefore helps marine industry or coastal operations take preventive or corrective action.



- ❖ Similar research in water-drones has been shown to enable eco-monitoring and support environmental management.
- ❖ At ASOIU, this effort involves student-research, faculty-led prototyping and collaboration with relevant maritime or water industry partners.



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2. Engagement with Industry & Stakeholders

ASOIU works directly with relevant industry stakeholders (marine construction companies, aquaculture operators, coastal infrastructure firms, water utilities) to transition from monitoring technologies into active preventive practices:

- Industry partners are provided with data and insights from drone-based monitoring to adjust design or operation practices (for example, reducing sediment disturbance during dredging, minimising chemical effluent discharges, avoiding habitat destruction).
- Training programmes and demonstration events allow company staff and regulatory agencies to use the drone data and integrate it into environmental-management protocols, ecological-risk assessments and remediation plans.
- The university's Sustainable Development Center and Research Laboratories support pilot deployments of the drone system in coastal or riverine zones, which serve as live testbeds for industry-academic cooperation and for validating both technology and practice.

3. Institutional Strategy & Impact

ASOIU's institutional strategic plan for sustainability explicitly mentions the development of innovative monitoring and remediation technologies for water-ecosystem protection, and the use of such tools to support sustainable industry. For example:

- ✓ The university's Sustainability Projects portal lists technology demonstrations, including unmanned vehicles and monitoring platforms.

- ✓ ASOIU's Sustainability Partnerships portfolio indicates collaboration with industry, government and regional stakeholders, enabling knowledge transfer from academic prototypes to industrial application.
- ✓ Through the drone programme, measurable outcomes include:
 - ✚ Reduced frequency and severity of ecosystem incidents in partner sites (e.g., fewer habitat disruptions, faster remediation).
 - ✚ Enhanced industry compliance with aquatic ecosystem protection guidance and regulatory frameworks.
 - ✚ Increased capacity of local industries and regulators to adopt monitoring-based management rather than purely reactive remediation.

Conclusion

ASOIU, as a university body, actively works on technology development (such as water-drones) and industry engagement to enable marine/coastal/freshwater sector operations that minimise damage to aquatic ecosystems. This demonstrates clear alignment with Indicator 14.3.4 - the university both generates applied tools and supports their uptake by industry for ecological protection.