



OCEAN SOLUTIONS

UN Ocean Decade Action #39

Understanding multiple stressors on coastal ecosystems — delivering science-based solutions for people, nature and the blue economy

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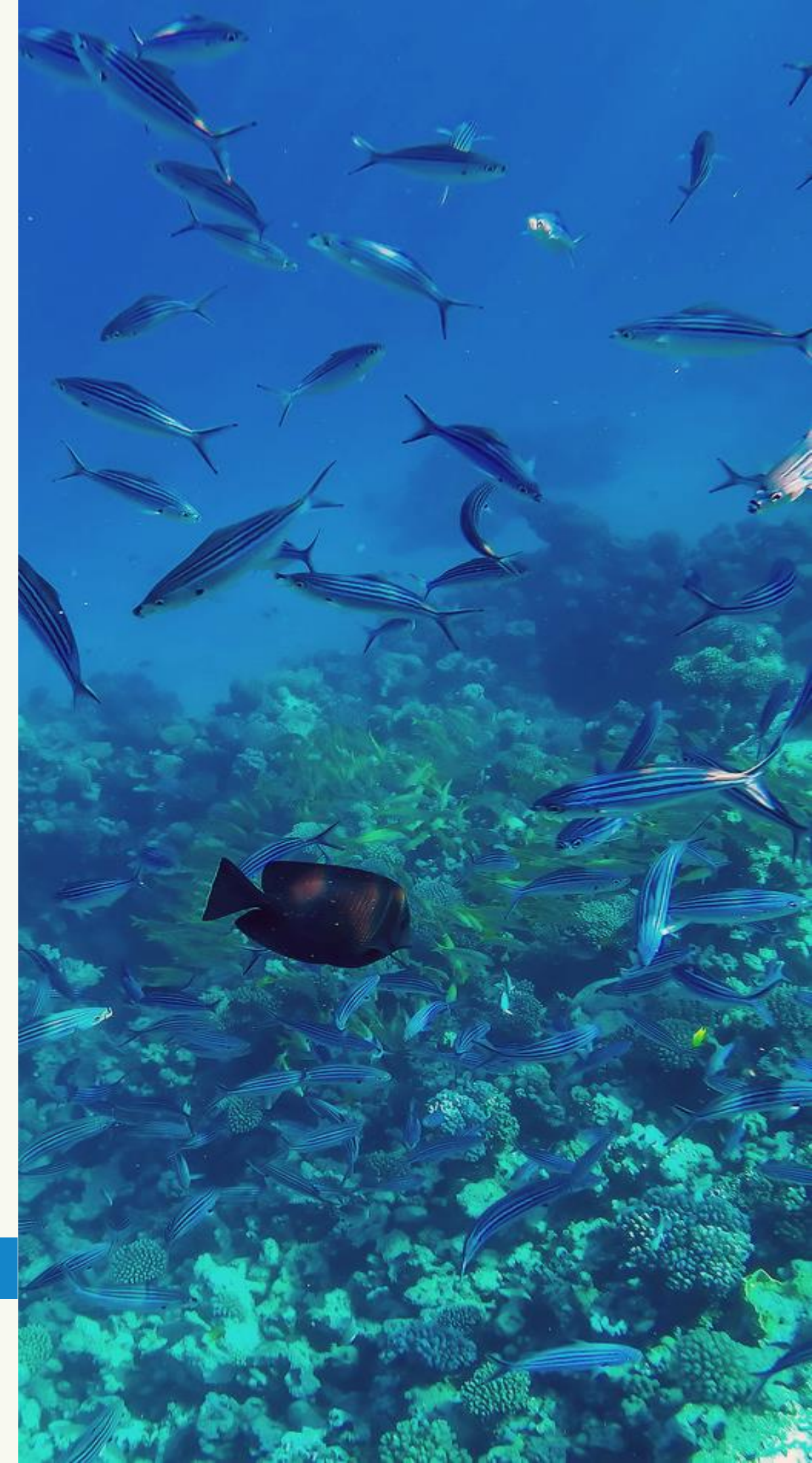
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Sixteenth Intergovernmental Session of the
IOC Sub-Commission for the Western Pacific (WESTPAC-XVI)
Hangzhou, China, 10-12 November 2026

Summary Outline



1. **Justification** and project/WG duration
2. Project/WG **objectives**
3. **Major activities and outputs** (particular those accomplished during 2025-2026)
4. **Anticipated activities and outputs** in 2027
5. **Biennial workplan and budget** for 2028-2029, structured around the IOC HLOs
6. **Strategic recommendations** for future development



1. Justification and project/WG duration

Endorsed by UNESCO-IOC (January 2025) · Lead: CEMACS, Universiti Sains Malaysia · Duration: 2025–2030

Why OCEAN SOLUTIONS?

Western Pacific coastlines are among the world's most productive — and most pressured — marine environments.

Climate change, acidification, eutrophication, hypoxia, HABs, sedimentation, pollution, habitat loss and coastal development **are hitting these ecosystems all at once.**

Managing one stressor at a time has repeatedly fallen short. **UN39 combines science, stakeholders, regional cooperation, nature-based solutions and policy translation in one framework.**

6

partner countries

MY · TH · ID · PH · VN · CN

6

pilot sites

one shared regional framework

2025

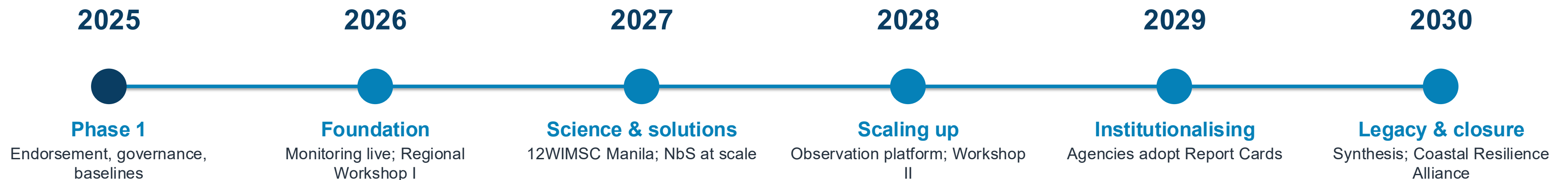
IOC endorsement

Decade Action via IOC-
WESTPAC

5 yrs

execution framework

2026–2030, to Decade close



2. Project/WG objectives

Six objectives anchor the work — each tied to a measurable 2026–2030 target

1 Multi-Stressor Science

Understand how stressors compound through joint fieldwork, remote sensing and modelling.

Target: Joint OA dataset publication across 6 countries (2027); 5-Year Synthesis Report (2030)

2 Monitoring & Early Warning

Build one standardised, shared monitoring network across all six pilot sites.

Target: Harmonised protocol adopted by 6 countries; observation platform fully operational (2029)

3 Nature-Based Solutions

Restore mangroves, seagrass, oyster reefs and wetlands; scale what works.

Target: NbS at scale in 3 countries (2027); 2+ new sites per country (2029)

4 Science-Policy Integration

Turn Report Cards and research into governance that national agencies adopt.

Target: Report Card methodology adopted by 3 national agencies (2029)

5 Capacity & Ocean Literacy

Train the next generation of ocean professionals and engage coastal communities.

Target: Regional Training Workshops I & II; Youth Ocean Ambassadors from 2028

6 Sustainable Blue Economy

Value ecosystem services and build climate-resilient economic pathways.

Target: Blue carbon financing pilots in Malaysia and Indonesia (2029)

3. Major Activities and Outputs

Phase 1 (2025–2026) built the foundation — status as of August 2026

- ✓ **Endorsed as UN Ocean Decade Action #39**
UNESCO-IOC, January 2025; anchored in IOC-WESTPAC
- ✓ **Governance in place**
Steering Committee and Technical Working Groups underway
- ✓ **Baseline assessments completed**
Penang, Upper Gulf of Thailand, Jiulong Estuary, Pari Island
- ✓ **Middle Bank Urban Marine Sanctuary designated**
Penang — multi-agency coordination committee in place
- ✓ **Regional webinar series launching**
'Healthy Ocean, Resilient Communities'
- ✓ **12WIMSC workshop session accepted**
Manila, April 2027

Country / site	Focus	Year 1 (2026) activities
Malaysia — Straits of Penang	Urban marine sanctuary; seagrass & oyster ecosystems	Zoning; oyster reef expansion; water-quality network
Thailand — Upper Gulf	Eutrophication; HABs; hypoxia	Sensor array; HAB early-warning pilot
China — Jiulong Estuary, Xiamen	Nutrient enrichment; GHG emissions	Floating wetland trials; GHG flux measurements
Indonesia — Pari Island, Jakarta Bay	Seagrass & mangrove restoration; tourism	Health survey; community stewardship MoU
Philippines — Bolinao & Manila Bay	Aquaculture-driven eutrophication	HAB monitoring protocol; nutrient budget study
Vietnam — coastal sites (VAST / IOO)	Coastal vulnerability; OA monitoring	OA station set-up; ECOP mentorship

4. Anticipated activities and outputs in 2027

Year 2 — delivering science, nature-based solutions and policy integration

HIGHLIGHT

12WIMSC, Manila April 2027

OCEAN SOLUTIONS scientific session at the 12th WESTPAC International Marine Science Conference — the programme's highest-profile early moment

Priorities

- ▶ Host the UN39 workshop at 12WIMSC (April 2027)
- ▶ Scale NbS to full size in Malaysia, Indonesia and China
- ▶ Publish Report Cards for Thailand and the Philippines
- ▶ Convene Regional Policy Dialogue I
- ▶ Submit first peer-reviewed papers

Key deliverables

- ▶ 12WIMSC proceedings and Regional Action Roadmap 2027–2030
- ▶ Ecosystem Health Report Cards V1 (TH, PH)
- ▶ NbS running at scale across 3 countries
- ▶ Policy recommendations to national authorities
- ▶ Joint publication on harmonised OA dataset (6 countries)

Site-level work in 2027

Malaysia

Penang

NbS demo; ecosystem valuation; policy integration

Thailand

Upper Gulf

Report Card V1; nutrient loading study

China

Jiulong Estuary

Mangrove restoration; comparative HAB study

Indonesia

Pari Island

Seagrass rehabilitation; tourism impact study

Philippines

Bolinao & Manila Bay

12WIMSC co-convening; Report Card pilot

Vietnam

VAST / IOO sites

Vulnerability index; comparative OA dataset

5. Biennial Workplan for 2028-2029

UN39 within the IOC HLOs — one primary home, two secondary links and a Decade Action line

HLO 1

Healthy ocean & ecosystem services

PRIMARY

Obj. 1–3: multi-stressor science, monitoring, NbS

ER 1.2 → activity 1.2.3

HLO 2

Warning systems & hazard preparedness

No UN39 entry

HLO 3

Climate resilience & mitigation

SECONDARY

Blue carbon inventory & financing pilot

ER 3.1 → activity 3.1.3

HLO 4

Services for the sustainable ocean economy

SECONDARY

Report Cards; blue economy valuation (Obj. 4 & 6)

ER 4.2 → activity 4.2.3

HLO 5

Foresight on emerging issues

No UN39 entry

Decade

UN Ocean Decade regional contributions

DECADE ACTION

WESTPAC coordination & liaison for UN39

ER D.1 → activity D.1.3

Funding model: the science and restoration work under HLO 1, 3 and 4 is funded from UN39's own programme budget (CEMACS/USM, partner institutions, competitive grants, philanthropy). **The only request to WESTPAC is USD 40,000 for coordination in 2028–2029, under the Decade Action line.**

5. Biennial Workplan for 2028-2029

•Detailed workplan entries (1 of 2) — HLO 1 and HLO 3 · Y1 = 2028, Y2 = 2029

No.	Activity / Output Description	Expected Result / Output	Y1- 1st H	Y1- 2 nd H	Y2- 1st H	Y2- 2 nd H	IOC RP Budget (USD)	XB Required (USD)	Lead Responsibility
HLO 1 — HEALTHY OCEAN AND SUSTAINED OCEAN ECOSYSTEM SERVICES									
Expected Result 1.2 (Sub-obj. 1.2 + 1.3): Scientific knowledge for ecosystem management developed and ecosystem-based management applied									
1.2.3	UN39 (OCEAN SOLUTIONS): advance multi-stressor science and nature-based / ecosystem-based solutions across six Western Pacific pilot sites	NbS scaled to 12+ new sites; Ecosystem Health Report Cards adopted by 3 national agencies; observation platform fully operational	●	●	●	●	—	—	CEMACS (MY); TIO (CN); DMCR (TH); MSI-UP / BFAR (PH); BRIN (ID); IOO-VAST (VN)
HLO 3 — RESILIENCE TO CLIMATE CHANGE AND CONTRIBUTION TO ITS MITIGATION									
Expected Result 3.1 (Sub-obj. 3.1 + 3.2): Regional ocean-climate observations, data and scientific knowledge enhanced									
3.1.3	UN39 (OCEAN SOLUTIONS): blue carbon inventory and financing pilot (mangrove & seagrass)	Blue carbon financing pilots launched in Malaysia and Indonesia; first funding agreement(s) signed		●	●	●	—	—	CEMACS (MY); BRIN (ID)

— = delivered through UN39's own programme budget; no separate WESTPAC RP/XB draw. ● = active in that half-year.

5. Biennial Workplan for 2028-2029

•Detailed workplan entries (2 of 2) — HLO 4 and Decade Actions · Y1 = 2028, Y2 = 2029

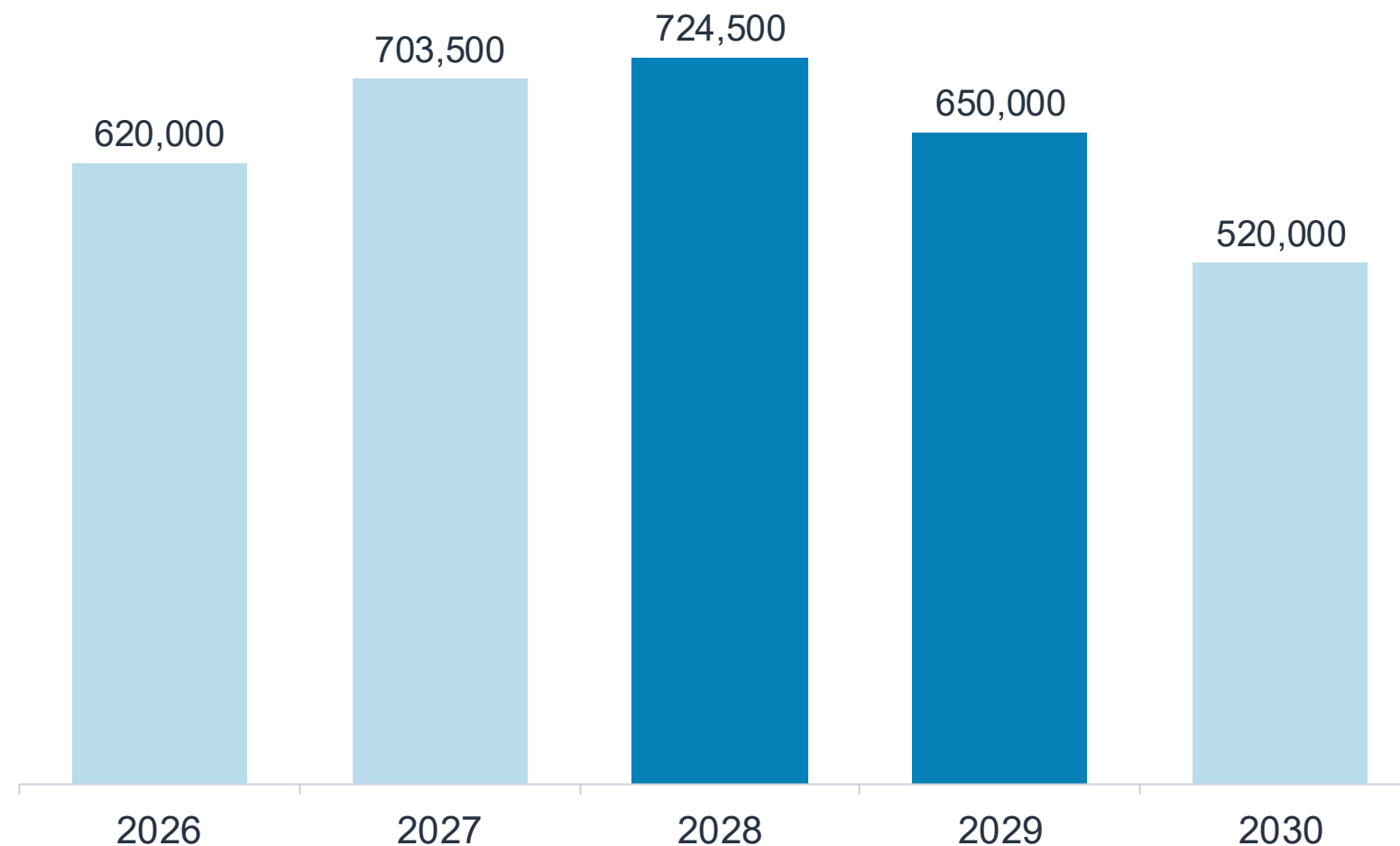
No.	Activity / Output Description	Expected Result / Output	Y1- 1st H	Y1- 2 nd H	Y2- 1st H	Y2- 2 nd H	IOC RP Budget (USD)	XB Required (USD)	Lead Responsibility
HLO 4 — SCIENTIFICALLY FOUNDED SERVICES FOR THE SUSTAINABLE OCEAN ECONOMY									
Expected Result 4.2 (Sub-obj. 4.3): Knowledge-based sustainable ocean planning and management tools developed and applied									
4.2.3	UN39 (OCEAN SOLUTIONS): institutionalise Ecosystem Health Report Cards and science-policy tools within national agencies	Report Card methodology adopted by DMCR (Thailand), BFAR (Philippines) and Penang state authorities (Malaysia)	●	●	●		—	—	DMCR (TH); BFAR (PH); Malaysia state authorities
UN OCEAN DECADE (2021-2030) — REGIONAL CONTRIBUTIONS AND DECADE ACTIONS									
Expected Result D.1: Regional Decade Actions endorsed and implemented									
D.1.3	Coordinate WESTPAC support to UN39: Secretariat liaison, Decade Coordination Office support, coordination of WESTPAC-linked events (Policy Dialogue II, Training School II follow-up, WESTPAC-XVI reporting)	WESTPAC liaison sustained; UN39 milestones reported to WESTPAC sessions and the IOC Decade Coordination Unit	●	●	●	●	20,000	20,000	IOC-WESTPAC Secretariat / Decade Coord. Office (CEMACS contrib.)

— = delivered through UN39's own programme budget; no separate WESTPAC RP/XB draw. ● = active in that half-year.

5. Biennial Workplan for 2028-2029

Budget 2028–2029: a modest WESTPAC request, leveraged by the full UN39 programme budget

UN39 total programme budget, all sources (USD)



Dark bars = 2028–2029 biennium. Indicative figures; in-kind contributions additional.

HLO / component	RP (USD)	XB (USD)	Total (USD)
HLO 1 — Healthy ocean & ecosystem services	—	—	—
HLO 3 — Resilience to climate change	—	—	—
HLO 4 — Sustainable ocean economy	—	—	—
Ocean Decade contributions (D.1.3)	20,000	20,000	40,000

USD 40,000

WESTPAC request, 2028–2029

RP 20,000 + XB 20,000 —
coordination & liaison only

USD 1.37 M

**UN39 own-source budget,
2028–2029**

Science, NbS, monitoring, capacity —
not drawn from WESTPAC

6. Strategic recommendations for future development

Key insights, lessons learned and recommendations for enhancing impact and visibility

LESSONS LEARNED

- ▶ Managing one stressor at a time has repeatedly fallen short — integrated, multi-stressor science is essential
- ▶ Early co-design with national agencies beats late handover
- ▶ IOC-WESTPAC's neutral umbrella keeps six-country collaboration on track

1 Institutionalise early

MoUs with national agencies by 2028; phased handover of monitoring and Report Cards to DMCR, BFAR, Penang State, BRIN and VAST through 2030

2 Diversify and secure financing

4+ funding streams and a rolling 6-month reserve; blue carbon financing; post-2030 commitments from 3+ governments

3 Replicate what works

Scale the Middle Bank Urban Marine Sanctuary model and proven NbS beyond the six original pilot sites

4 Invest in ECOPs and communities

ECOPs co-lead Technical Working Groups from 2029; Youth Ocean Ambassadors, citizen science, local-language outreach

5 Raise visibility

12WIMSC session (Manila, April 2027), webinar series, Report Cards, policy briefs and open data via the observation platform

6 Build a post-Decade legacy

Launch a Regional Coastal Resilience Alliance (2030); feed the 5-Year Synthesis into the Decade's closing review