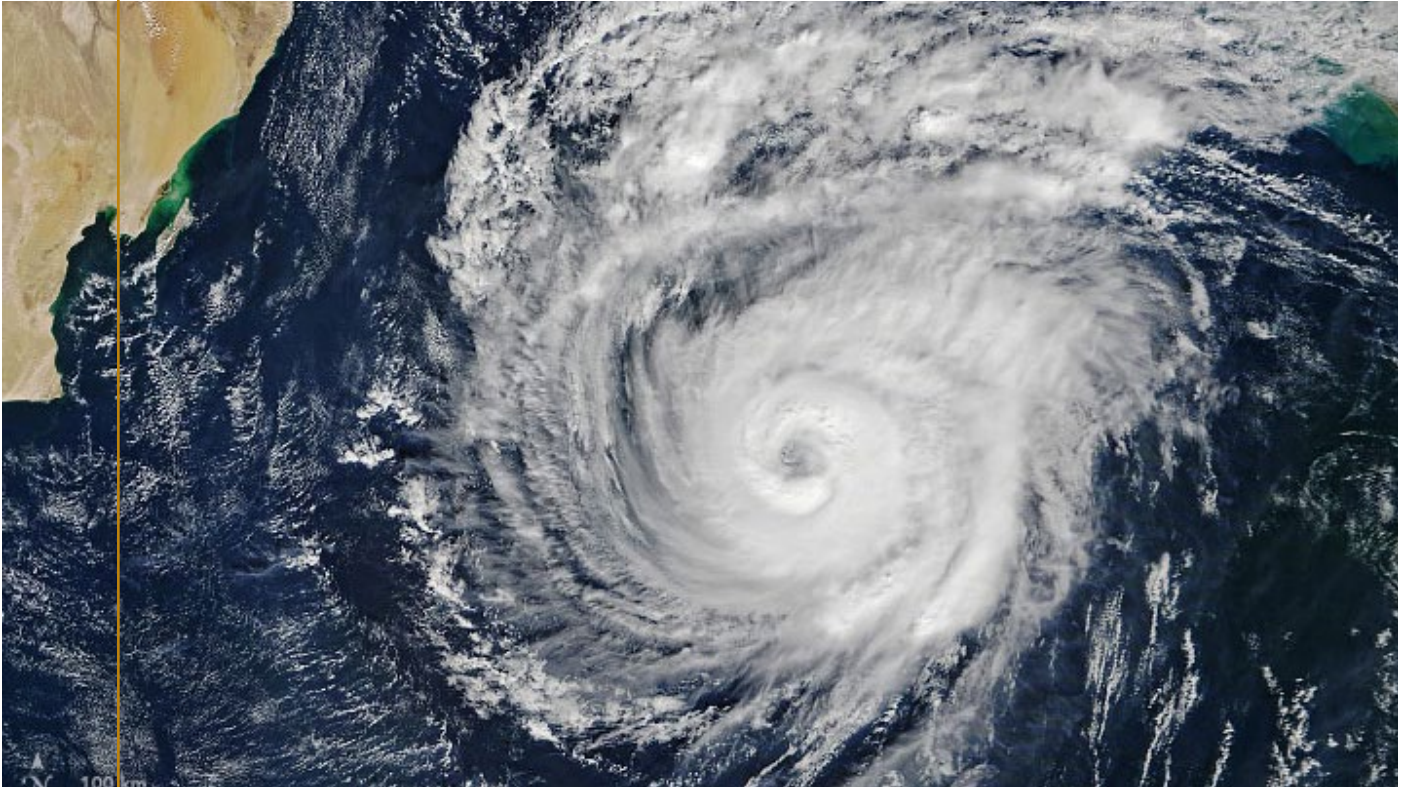




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Good Neighbours

Strengthening environmental security in the Indian Ocean region

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The authors



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Contents

05	Executive summary	
06	Introduction and Proposals	
10	Section 1: Environmental security challenges in the Indian Ocean region	
	1.1 Environmental security threats in the IOR	10
	1.2 Environmental threats and human security	14
	1.3 Existing mechanisms for responding to environmental security challenges in the IOR	18
21	Section 2: Indian Ocean Dialogue on Environmental Security	
	2.1 The case for IODES	21
	2.2 Regional coordination of responses to environmental security threats	22
26	Section 3: Indian Ocean Centre for Environmental Security	
	3.1 The case for IOCES	26
	3.2 The IOCES concept	28
	3.3 Vision and strategic objectives	31
	3.4 Institutional options and staffing	33
	3.5 Funding and budget	34

3.6 Location	34
3.7 Risk management	35
3.8 Concluding thoughts and next steps on IOCES	36

37

Annexes

Annex 1: Risk assessment matrix for the eastern Indian Ocean	37
Annex 2: International, regional and selected national institutions involved in Indian Ocean environmental security	38
Annex 3: IOCES—indicative curriculum: mainstream course	48
Annex 4: IOCES—indicative research agenda	50
Annex 5: Possible IOCES organisational structure and illustrative duty statements for key staff	50
Annex 6: SWOT analysis on IOCES	53
Annex 7: Indicative establishment and running costs for a stand-alone IOCES	54

58

Acronyms and abbreviations

59

Endnotes

Executive summary

- In coming years, the Indian Ocean region (IOR) will experience a significant number of security threats associated with climate change and the impact of other human activities on the natural environment.
- Those environmentally related issues may have a significant impact on the social, economic and political stability of the region. For many Indian Ocean states, those threats are higher security priorities than traditional state-based threats.
- Environmental security is now a central element in Australia's engagement with Pacific island countries. Similarly, the Australian Government should include environmental security as a key pillar in its engagement with Indian Ocean states.
- Currently, there are no effective mechanisms or structures in the IOR to facilitate cooperation on:
 - policy formulation on climate change and environmental security
 - mitigation of and response to different types of environmental security threats.
 - professional development and training of officials from national agencies with responsibilities for environmental security.
- As part of enhanced engagement on environmental security, the Australian Government should pursue the following initiatives:
 - Promote an Indian Ocean Dialogue on Environmental Security (IODES). IODES would be a regional multilateral mechanism that includes regular meetings at ministerial / senior officials level to develop shared perspectives and coordinate responses to selected environmental security threats.
 - Sponsor the establishment of an Indian Ocean Centre for Environmental Security (IOCES). IOCES would be a centre to provide professional development in environmental security to personnel from civil and military agencies of Indian Ocean states.

Introduction and Proposals

This report examines environmental security challenges in the Indian Ocean region (IOR) and the need for new mechanisms and arrangements to address environmental security threats.

It proposes that the Australian Government should include environmental security as a key pillar in its engagement with Indian Ocean states. This enhanced engagement on environmental security should include the following initiatives:

- Promote an Indian Ocean Dialogue on Environmental Security (IODES). This would be a regional multilateral mechanism at ministerial / senior officials level to develop shared perspectives and, potentially, coordinate responses to environmental security threats.
- Sponsor the establishment of an Indian Ocean Centre for Environmental Security (IOCES). This would be a centre to provide professional development in environmental security to personnel from civil and military agencies of Indian Ocean states.

This report is divided into three sections:

- Section 1 reviews environmental security challenges in the IOR.
- Section 2 explains why the IOR needs a regional cooperative mechanism such as an Indian Ocean Dialogue on Environmental Security.
- Section 3 makes the case for an Indian Ocean Centre for Environmental Security.

Environmental security challenges in the IOR

Section 1 analyses key environmental security challenges in the IOR and the potential impacts of those threats on the economic development, social and political stability and security of the region. It argues that, in coming years, the IOR will face a growing number of environmental security threats

driven by climate change and human activities. For many Indian Ocean states, those threats are of considerably more importance than traditional state-based threats and therefore should be a key element of Australia's engagement with those countries.

Indian Ocean Dialogue on Environmental Security (IODES)

Section 2 examines options for enhanced regional cooperation in respect of environmental security involving two key objectives/functions: the development of shared perspectives on environmental security risks and the coordination of responses to those risks. We argue that Australia should work with like-minded partners in the IOR to establish an Indian Ocean Dialogue on Environmental Security (IODES). This would begin as a regular (at least annual) meeting at senior officials level with the intention of developing it into a ministerial-level meeting.

The objectives of IODES would include:

- creating information-sharing networks on environmental security threats
- building shared perspectives on priority threats
- building relationships among civil and military agencies with responsibilities/capabilities for dealing with environmental security threats
- acting as a regional voice in addressing environmental threats at the global level
- identifying and promoting capacity building and training on mitigation and response among member states
- acting as a sponsor of mechanisms to coordinate regional responses to specified incidents.

Section 2 argues that there is also a need to establish specific regional mechanisms to coordinate responses to selected

environmental threats. IODES could provide a platform for Australia and its partners to work together to develop regional response arrangements for different types of environmental threats. These could initially include response mechanisms for:

- cyclones and other severe weather events (disaster response)
- the prevention and mitigation of oil spills and other shipping accidents.

Indian Ocean Centre for Environmental Security (IOCES)

Section 3 proposes that the Australian Government should sponsor the establishment of Indian Ocean Centre for Environmental Security (IOCES) which will be focused on professional education and research for the IOR. It argues that, currently, there is no institution in the region dedicated to advancing national environmental security capabilities through professional development and regional cooperation.

The report concludes that there would be considerable benefit to Australia in establishing a centre that would:

- be the premier resource and learning institution for the environmental security training needs of the countries of the Indian Ocean
- offer tailored environmental security training at middle and senior management levels and provide professional development for young leaders of agencies concerned with environmental security affairs in the Indian Ocean
- undertake collaborative applied research on current and projected environmental security and underpinning disciplines to support regional partners
- respond to the diverse environmental security needs of states with tailor-made support that engages with the environmental security challenges of each country
- be a credible and trusted regional source for environmental security expertise

- work in partnership with all stakeholders to ensure that diverse environmental security perspectives are fed into the centre's approaches
- facilitate and strengthen partnerships with other relevant regional and international environmental security networks, processes and institutions
- serve as a knowledge hub and information conduit, including for capacity development in environmental security across the Indian Ocean.

We propose that IOCES should be a centre that is independently administered and financed while also being loosely associated with or using the branding of the Indian Ocean Rim Association (IORA) (but would not be subject to the administrative oversight of IORA). It could also, perhaps, be associated with an Australian educational institution. It would receive its core funding from the Australian Government, although partner countries would be requested to contribute funding for particular courses or programs of IOCES or to sponsor participants at IOCES courses or events. This would allow the centre to set priorities and adhere to important values in research and collaboration of mutual beneficial interest to the centre's regional constituency, would demonstrate Australia's commitment to the region and would send a clear message that Australia faces challenges in environmental security similar those faced by its regional partners.

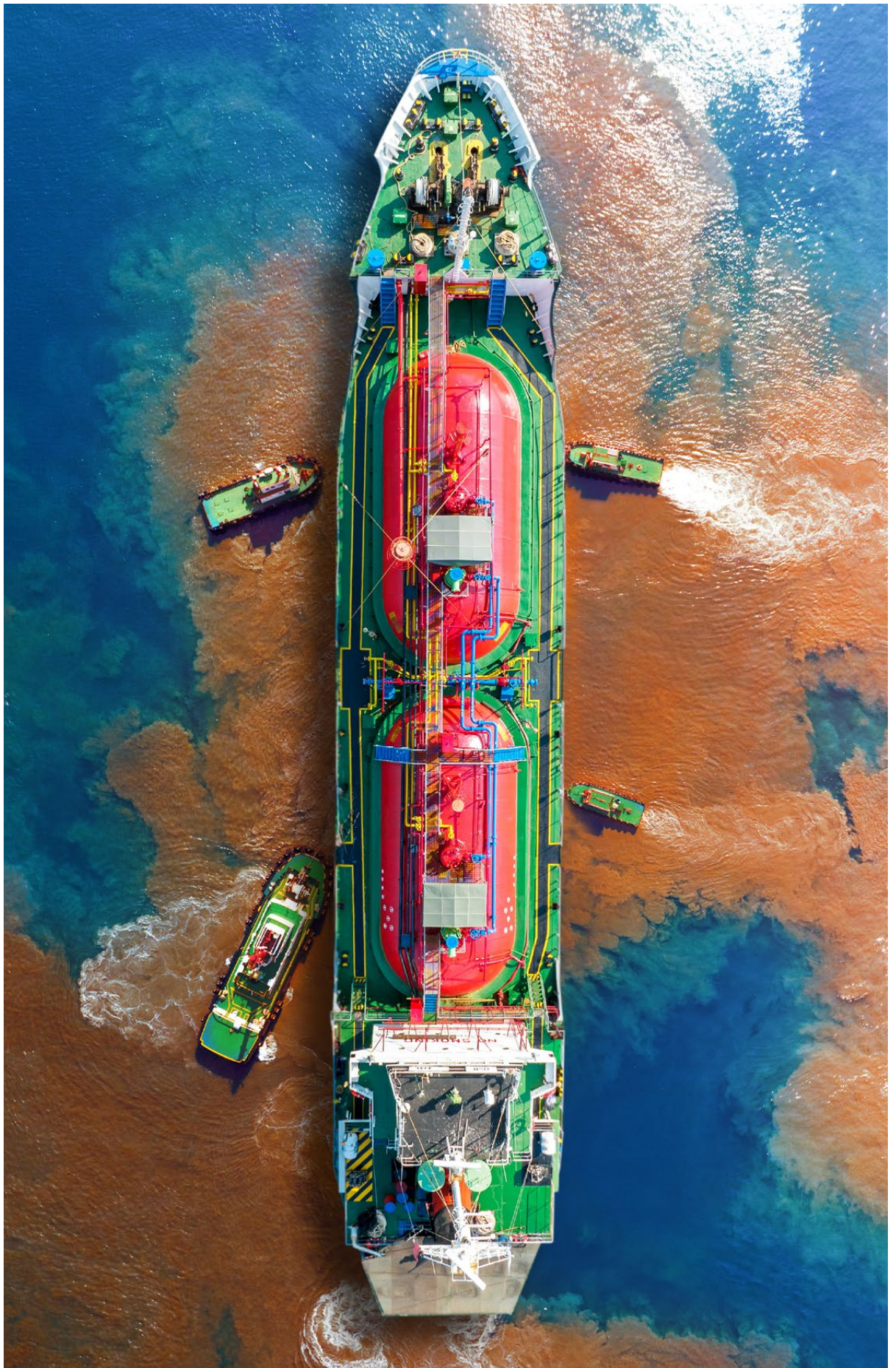
We argue that, ideally, IOCES would be located in Perth, Western Australia. That location would take natural advantage of many existing complementary networks to which Perth and Western Australia are already closely connected and would reinforce Perth's status as Australia's gateway to the Indian Ocean.

Potential benefits of these initiatives to Australia

We believe that Australia should pursue a comprehensive strategy for engagement with the IOR that includes environmental security as a key pillar. This approach, with IODES and IOCES at its core, would have the following benefits for Australia:

- These initiatives would be seen as a significant commitment to the IOR on key security issues that are of significant concern to most or all Indian Ocean states.
- They would be a valuable counter to concerns within the region that Australia's regional engagement is overly focused on China.
- IODES and IOCES would provide major networking opportunities for senior civil and military officials from Indian Ocean states and their Australian counterparts.
- IODES and IOCES would be tangible outcomes of Australia's leading role in supporting the marine ecology pillar of India's Indo-Pacific Oceans Initiative and provide further opportunities for the two countries to work together.
- IOCES would provide an opportunity to showcase Australian environmental science among IOR decision-makers.
- The role of IOCES as a regional knowledge hub would provide a focus for Australian expertise in environmental security with considerable potential benefits for addressing Australia's own environmental security concerns.
- IOCES would provide a vehicle for the building of relationships between existing and emerging decision-makers from Australia and the IOR and would foster ongoing friendships and collegial associations as those relationships mature at higher levels.
- The proposed location of IOCES in Perth would be an important step in reinforcing that city's reputation as a key Indian Ocean city for education and research.

David Brewster & Anthony Bergin
 Canberra
 February 2023



Pollution from an oil spill. Source: Shutterstock

Section 1: Environmental security challenges in the Indian Ocean region

In coming years, the IOR will experience a significant number of security threats associated with climate change and the impacts of human activities on the natural environment. They will include increased occurrence of severe weather events, rising sea levels (including the inundation of land upon which millions now live), environmental pressures on fish stocks, droughts jeopardising water security, floods leading to population displacement, and major shipping accidents. These environmentally related issues may have a significant impact on the social, economic and political stability of the region.

As is already well understood for the Pacific, for many Indian Ocean states¹ these threats are seen as higher security priorities than traditional state-based threats. Despite

growing competition among major powers, many Indian Ocean states are strongly focused on a range of environmental threats. We believe that efforts by Australia to better engage with Indian Ocean states should be focused on issues that are of most concern to individual Indian Ocean states, which should include a significant focus on environmental security.

This section includes the following parts:

- 1.1. Environmental security threats in the Indian Ocean
- 1.2. Environmental threats and human security
- 1.3. Existing mechanisms for responding to environmental security challenges in the Indian Ocean.

1.1 Environmental security threats in the IOR

Significant disruptions in the natural environment are likely to give rise to a range of security threats in the IOR in coming years. This part of the report examines how climate change and human activities can contribute to environmental security threats.

The *2022 Annual threat assessment of the US intelligence community* rated environmental security challenges as a key threat to US security, and similar observations can be made about Australia's security interests. The threat assessment commented:

We assess that climate change will increasingly exacerbate risks to US national security interests as the physical impacts increase and geopolitical tensions mount about how to respond to the challenge. Meanwhile, environmental degradation will increasingly intersect with and worsen climate

change effects in many countries, particularly low-income countries.²

Environmental security challenges encompass a wide range of threats connected with the natural environment. They include climate-change-related threats such as sea-level rise, severe weather events (such as cyclones and storm surges), severe 'oceanic weather' events (such as marine heatwaves), loss of primary producer habitats and organisms due to ocean heating (for example, coral bleaching) and worsening water chemistry (for example, acidification), with impacts on food security through extreme pressures on communities that rely on ocean ecosystems for food security. There will also be salinisation of freshwater sources and agricultural land and changing weather patterns (such as droughts and floods due to changes in seasonal monsoons). There

will be increased competition and possibly geopolitical conflict as countries compete for ocean food resources under diminishing productivity caused by climate-change effects in the ocean.

In addition to climate change, a range of environmental problems are associated with resource exploitation or other human activities, such as threats to fish stocks from unsustainable fishing practices, marine debris, changes in ocean currents or chemistry, trafficking in endangered species, and shipping accidents.

There is also growing interest within the region in the 'blue economy', with an emphasis on sustainable ocean development.³ A successful blue economy can be achieved only through the mitigation of various environmental security threats.

The IOR has long been an epicentre for a range of naturally occurring hazards, including climatological hazards (cyclones and droughts), geological and tectonic hazards (earthquakes and tsunamis) and hydrological hazards (such as floods and tidal surges). Along with the Pacific, the Indian Ocean experiences the most serious natural hazards in the world, but it is also one of the oceanic regions of the world that is least understood and has the least capacity to respond—this, despite the Indian Ocean being profoundly important in its role in global oceanic heat budgets and cycles under the changing climate. The impact of many natural hazards, such as cyclones, floods and earthquakes, is magnified by the relatively high population density of parts of the region and the growth of huge, dense, urban areas, particularly in coastal areas. In places such as Jakarta and Dhaka, this is being exacerbated by land subsidence due to water extraction.

The natural environment in the IOR is now being strongly affected by climate change and human interactions. This is likely to act as an impact multiplier, exacerbating existing human security threats, including socioeconomic, water, energy, food and health challenges that diminish resilience and increase the likelihood of conflict. As Robert Glasser, former head of the UN Office of Disaster Risk Reduction, has commented, as a consequence of climate change, we may now be entering the 'Era of Disasters', with profound implications for the way we organise ourselves.⁴

Tropical cyclones have long been a major source of death and destruction across the Indian Ocean. They may become even more destructive as a result of climate change, although there are still considerable uncertainties. The Intergovernmental Panel on Climate Change states that, while it is likely that the overall global frequency of tropical cyclones will either decrease or remain essentially unchanged, it is more likely than not that the frequency of the most intense storms will increase substantially in some ocean basins.⁵

Increased intensity of weather events may have the biggest impacts in two parts of the Indian Ocean. In the Bay of Bengal (India, Bangladesh, Myanmar), tropical cyclones have historically exacted near apocalyptic death tolls from the shallow farming and fishing settlements of the Ganges River delta and Deccan Plateau. According to the Indian Government, the intensity of extreme weather events is increasing in the Bay of Bengal and elsewhere in the northern Indian Ocean. In the southwest Indian Ocean⁶, countries such as Madagascar⁷ and Mozambique⁸ are also facing more frequent and severe weather events such as cyclones, floods and droughts. More generally around the Indian Ocean, the marine heatwave phenomenon is becoming increasingly understood as a major oceanic extreme related to the Earth's changing climate, and those events have associated extreme consequences for marine life, including fisheries.

The rise in sea levels associated with climate change could have a significant impact on many Indian Ocean states. Sea-level rise would be expected to lead to increases in the frequency and severity of floods, especially when combined with increases in the severity of storms and ground subsidence. Sea-level rise is projected to aggravate storm surges, flooding, erosion and other coastal hazards, resulting in significant losses of coastal ecosystems. An increase in sea level would also be expected to cause the intrusion of seawater and the salinisation of groundwater, which will challenge freshwater availability and reduce soil fertility.

Many states in the Indian Ocean rely heavily on fishing as a source of income and as a major source of animal protein. In 2014, according to the Food and Agriculture Organization, fish contributed 54% of

total animal protein in Indonesia, 56% in Bangladesh and 57% in Sri Lanka.⁹ Fishing is also a major contributor to employment. The decline in sustainable fish stocks due to both direct fishing pressures and ecosystem impacts from climate-change-related phenomena is therefore a major problem for economic and food security.

The threat to fish stocks comes from overexploitation through legal as well as illegal, unreported and unregulated (IUU) fishing by both local and extra-regional fishers. The Food and Agriculture Organization estimates that 90% of the commercial fish stocks that it tracks worldwide have been overfished or fully fished, and estimates that the proportion of illegal catch to reported catch in the Indian Ocean is among the highest of any region in the world.¹⁰ The problem of unsustainable fishing is likely to grow, driven by growing population, falling fish stocks and relatively weak enforcement arrangements.

Significant declines in fish stocks from overfishing are likely to be exacerbated, perhaps in some unpredictable ways, by climate change and other human impacts. This includes the impact on fish stocks from changes to oceanic currents, the occurrence of marine heatwaves, ocean acidification, coral bleaching, the development of hypoxic areas (where normal oxygen levels are depleted), and marine pollution (including plastics).

The Indian Ocean is reportedly the world's second most polluted ocean.¹¹ Ocean pollution results from waste from the general population, agricultural activities, shipping

and transportation, ocean exploration and other industries.¹² Marine pollution contributes to the destruction of marine habitats, loss of fish stocks and toxic impacts on animals of coral reefs. Fish-stock modelling that principally addresses the impact of legal and IUU fishing on stocks may be dramatically inaccurate.

Other human activities can also have major environmental impacts. Shipping accidents, particularly those involving oil and chemical spills, may be one of the biggest threats to the maritime environment of several island states. There are up to around 100,000 international shipping movements per annum through the northern and central Indian Ocean (based on shipping movements through Malacca Strait). Roughly one-third of these ships are very large crude carriers or other tankers carrying crude oil or other petroleum products. Together, tankers carry around 16 million barrels of crude and petroleum products per day between Hormuz and Malacca.¹³ The density of shipping traffic, particularly of tankers, makes the risk of a serious shipping incident very high.

The heavy reliance of Indian Ocean coastal states, particularly island states, on maritime-based tourism and fishing means that a major oil spill could have a devastating economic impact. It is not inconceivable that the sinking of a single supertanker could economically devastate large parts of the Indian Ocean (see box). Alone or in conjunction with other events, this could have significant indirect human-security consequences for local communities.

Recent shipping accidents in the Indian Ocean

In the past several years, the Indian Ocean has been the scene of several major shipping accidents. At the end of July 2020, the Japanese-owned bulk carrier MV *Wakashio* became stranded on a coral reef off the Mauritius coast. By 10 August, around 1,000 tonnes of fuel had spilled from the ship, threatening the Blue Bay Marine Park, which is one of the marine treasures of Mauritius and a sensitive ecological site. The oil spill was an environmental catastrophe for Mauritius with dire consequences for the country's economy and food security, public health, and the environment.¹⁴

The MV *Wakashio* oil-spill disaster demonstrated that weak regional and international security mechanisms prolonged spill management and mitigation, despite millions having been spent on capacity building.¹⁵ Although several countries (including France, India and Australia) provided assistance, a regional response appears to have been largely absent during the incident.

In September 2020, several months after the Mauritius incident, an explosion and fire occurred on board the supertanker MT *New Diamond* some 40 miles off Sri Lanka. The supertanker was disabled and drifting towards the Sri Lankan coast. It took a joint team from the Sri Lankan and Indian military and coastguards more than a week to put out the fire by air-dropping water and fire suppressants and to secure the cargo of some 270,000 tonnes of crude oil. It took several weeks more to place the vessel under tow.¹⁶

The potential impact of an oil spill of this size would probably have been disastrous for Sri Lanka and neighbouring countries. Local authorities commented that, if the ship had capsized, it would have been one of the worst marine environment disasters to occur, considering the amount of oil the vessel was carrying: 'We consider this an eye-opener for Sri Lanka and identify our need to strengthen its capacities to address major oil spills.'¹⁷

In May 2021, the container ship *X-Press Pearl* caught fire off the coast of Colombo in Sri Lanka. Sri Lankan authorities responded but were not able to suppress the fire. After burning for 12 days, the vessel sank as it was being towed to deeper waters, spilling some of its cargo of nitric acid and plastics, as well as bunker oil. Much of the cargo found its way to Sri Lanka's tourist beaches and shut down multiple fisheries. The incident was deemed the worst marine ecological disaster in Sri Lankan history.

There are also widespread concerns that a decaying supertanker, FSO *Safer*, moored off Yemen (currently under the control of Houthi rebels) may sink at any time, potentially spilling some 1.14 million barrels of crude oil into the Red Sea. If that occurs, it would be one of the largest oil spills in history and would be likely to devastate large parts of the western Indian Ocean.¹⁸

1.2 Environmental threats and human security

Environmental security threats have a direct impact on human security in many ways, including, for example:

- impacts on food security and livelihoods through the loss of marine resources and agricultural land or through drought
- large-scale population displacements and/or political instability due to things such as sea-level rise or extreme weather events
- conflicts within or between states driven by competition over scarce resources (fish, water, land)
- widespread health impacts linked to changes in the natural environment (such as loss of food or water and increases in disease).

These environmental issues are often assessed on a national basis, and their regional impacts remain poorly understood. Also poorly understood is the link between environmental security threats and traditional conflict.

These challenges combine to stress under-resourced national administrations and threaten livelihoods, food security, human health and wellbeing and the ecosystem services of many Indian Ocean states. With the added threat-multiplier of climate change, the threat of conflict over the control of environmental resources is likely to increase.

The security consequences of environmental developments are quite uncertain. It is common, for example, to connect climate change or sea-level rise with the potential for large-scale population displacement, but the potential consequences of that for the region are not yet clear. According to the Intergovernmental Panel on Climate Change, it is widely established that extreme weather events displace populations in the short term because of their loss of housing or because of economic disruption.

However, only a proportion of displacement leads to more permanent migration.¹⁹ The UN International Strategy for Disaster Reduction states that 'due to the multidimensional and complex dynamics of migration and displacement, quantitative projections of future trends have low confidence levels,

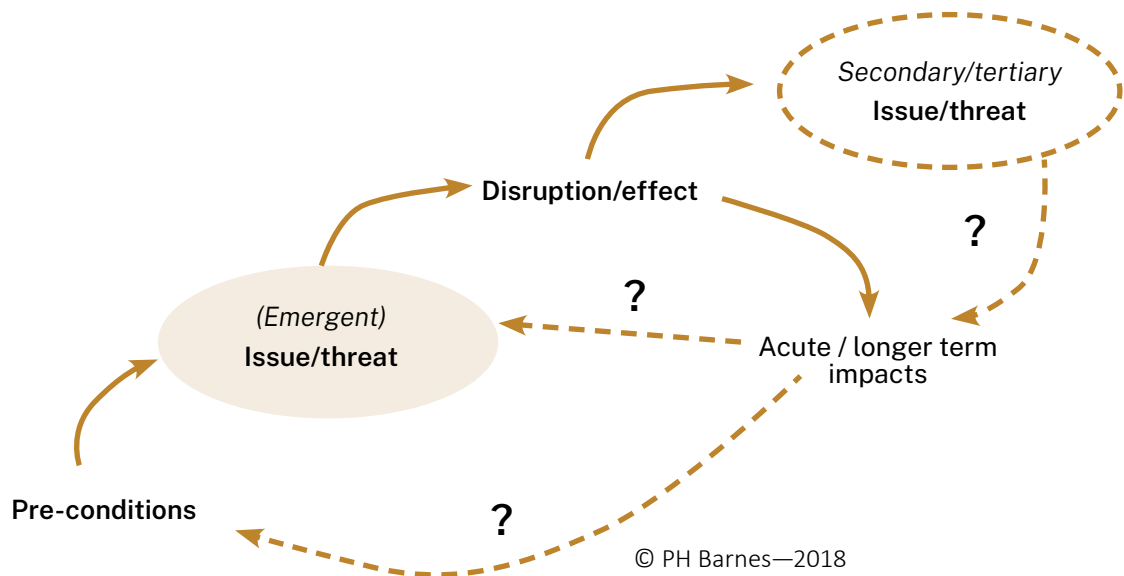
even though there is agreement that climate change will drive future displacement and patterns of movement.'²⁰ But, even if climate-change-related population displacements remain largely intra-state, they could have significant impacts on social and political stability for the states concerned.

For countries that rely on fishing for income and protein, a significant decline in fish resources could also contribute towards economic dislocation, declining living standards, violent extremism, political instability and potentially population displacement. An intensification of competition for fish resources could create security threats in a variety of ways, including through the operation of international fishing management regimes, national agencies, and non-state actors.²¹ Competition over marine resources will be likely to put states under greater pressure to assert claims over and to police their exclusive economic zones (EEZs) against other nations' fishers.

The National Security College, ANU, participated in a recent effort to assess the security consequences of environmental threats through a risk-based assessment of risks in the eastern Indian Ocean and the Southern Ocean.²² The conclusions of that assessment are set out in Annex 1. A team from the French Institut de Relations Internationales et Stratégiques undertook a similar assessment of environmental risks in the western Indian Ocean.²³

Importantly, environmental security threats cannot be properly understood in isolation from each other, or in isolation from 'conventional' security threats. Indeed, they can have a significant impact on broader strategic dynamics. Environmental disruptions cannot be assessed or addressed on a siloed basis. They frequently do not occur as isolated events, but in combination or as a cascading or compounding series of events. One disruption can contribute to or exacerbate the occurrence of another. One event might significantly reduce a community's resilience or its ability to respond to subsequent, unrelated, events. This potential for magnification or cascading influences can make it difficult to predict the consequences of what may individually appear to be moderate or manageable threats. This cascading influence effect is illustrated in Figure 1.

Figure 1: Cascading/compounding effects



Climate change, in particular, can lead to the cascading/compounding of natural hazards.²⁴ What may begin as what appears to be an isolated ‘natural’ hazard can also combine with other events to significantly magnify their individual impacts. Cascading hazards turn into cascading disasters when their effects increase in progression over time and generate unexpected secondary events. Those events can stem from overlaps of disasters and from failures of physical structures and the social functions that depend on them, including critical facilities. The inadequacy of mitigation strategies, such as evacuation procedures, land-use planning and emergency-management strategies, further exacerbates the situation. Cascading disasters tend to highlight the major gaps in addressing vulnerabilities in human societies.²⁵

The 2011 Great East Japan Earthquake illustrated the potential for concurrent or cascading impacts. The magnitude 9.1 earthquake caused immediate devastation in one relatively small part of Japan, resulting in around 100 deaths. However, the earthquake also generated a tsunami that devastated many coastal areas, killing around 18,000 people. Those events then caused the meltdown of the Fukushima nuclear facility north of Tokyo after the earthquake first shut down the electricity grid and the tsunami then disabled

back-up generators and pumps. The ensuing nuclear meltdown led to the long-term evacuation of some 200,000 people from the surrounding area—and a long-term move by Japan away from nuclear energy, which itself could have considerable further strategic implications. As was demonstrated in the case of Fukushima, a combination of events can overcome contingency plans that would have been effective for single events.

The impacts of environmental disruptions in the Indian Ocean can also be complicated by other factors. Threats and disruptions in the maritime domain also tend to be more international in nature than those that occur only on land. Many environmental threats occur outside of national jurisdictions. Even where maritime-related disruptions initially occur within national EEZs or national waters, they are likely to have interrelated impacts elsewhere. This means that maritime-related environmental disruptions will often require a regional response.

The interaction of environmental disruptions is further complicated by the strategic instability experienced within the region. The potential interaction of geo-environmental challenges and strategic and security threats is demonstrated by the following case studies.

Case study 1: Somali fish stocks and the strategic balance in the western Indian Ocean

The problem of Somali-based piracy over the past 20 years provides another example of the interrelationship between environmental, non-traditional and conventional security threats—in this case, triggered by the degradation of natural resources through overfishing.

One of the consequences of the collapse of the Somali state in the 1990s was the cessation of enforcement of national laws on land and at sea. That failure in governance led to the severe degradation of the once rich fishing grounds off the Somali coast through the failure to prevent overfishing by IUU fishers, many of them from outside the region. That had a major negative impact on the food and economic security of local fishing communities. Many Somali fishers in search of new forms of livelihood turned to piracy.²⁶

This had a significant and lasting impact on regional security. The threat of piracy to international trade in and around the Gulf of Aden prompted a large and sustained international military response, including the deployment of high-end naval vessels into the western Indian Ocean from many countries in and outside the region.

But, despite the significant reduction in Somali-based piracy over the past several years, many countries continue to maintain a regular naval presence in the western Indian Ocean. The presence of large numbers of extra-regional naval vessels, further militarising the northwest Indian Ocean, has had a long-term impact on the regional balance of power. The presence of a Chinese naval taskforce to combat piracy was used as justification for the establishment of naval support facilities by China in Djibouti, which has led to responses from other countries.

The Somali piracy threat also spurred the widespread use of military personnel and private security contractors aboard commercial vessels. That has had its own consequences for regional security, including the advent of private floating armouries in the central and northwest Indian Ocean. Countries such as the Maldives, for example, are concerned that the floating armouries in their waters could become a source of weapons for violent extremists.

It is possible that some of these consequences may have been different if the region had addressed Somali piracy in a different way. For example, if it had been addressed as primarily a law-enforcement issue rather than a military issue, then perhaps the strategic impact on the region might have been lessened. In any event, countries in the region now have to deal with what may now be more or less permanent consequences of the destruction of fish stocks in Somali waters.

Case study 2: The strategic impact of the 2004 Indian Ocean tsunami

The security consequences of natural disasters can also be highly unpredictable. The widely differing security impacts of the 2004 Indian Ocean tsunami in different countries provides an illustration of how unpredictable the potential strategic consequences of what might be categorised as ‘just’ a natural disaster can be.

The tsunami that occurred in December 2004 was a consequence of a major undersea earthquake off the coast of Sumatra, Indonesia. This generated waves up to 30 metres high, which led to the deaths of around 227,000 people in 14 countries. Major impacts were experienced in Indonesia, Sri Lanka, India, the Maldives and Thailand.

The disruption caused by the tsunami had a negative security impact in some countries. At that time in Sri Lanka, a tenuous truce existed between government and insurgent forces, led by the Liberation Tigers of Tamil Eelam (LTTE), in that country’s long-running civil conflict. However, following the tsunami, the LTTE used the opportunities presented by the chaos and inflow of economic aid to rearm and resume its insurgency. The flood of postwar tsunami aid money, and the LTTE’s control of portions of northern and eastern Sri Lanka, meant that the LTTE could dictate terms to aid agencies. Tens of millions of dollars of aid was diverted to acquire weapons to use against government forces.²⁷ The resumption of the civil conflict following the tsunami led to a further 30,000 deaths over the next three years and ultimately resulted in the defeat of the insurgency.

In the Maldives, the tsunami also caused major economic damage and considerable internal population displacement within the islands, but with quite different security consequences compared with Sri Lanka. Anecdotally, many analysts believe that the tsunami was an important factor in radicalising many local communities, with continuing implications for the region today. According to one report, the tsunami was, ‘a turning point in Maldivian religious beliefs, largely due to the fact that many of the clerics used it to convince people that it was God’s wrath wreaked upon them for not practicing the right Islam and straying from the path of Allah’.²⁸ In the aftermath, Pakistan-based jihadist groups such as Lashkar-e-Taiba (LeT) also exploited existing social fault lines through LeT’s charitable front organisation to establish a foothold, especially in the southern Maldives, in the guise of relief operations.²⁹ There has been a significant growth in violent extremism in the Maldives since around 2004, although the full long-term consequences of that are yet to be seen.

In Indonesia, the security and strategic consequences of the tsunami were quite different, and in many ways more unexpected. Indonesia, which experienced around 160,000 deaths, mostly in Aceh Province, was the hardest hit of any country. The devastation of Aceh Province, including the massive death toll, significantly weakened a long-running separatist insurgency. The Free Aceh Movement (Gerakan Aceh Merdeka) immediately declared a unilateral ceasefire, which was transformed into a permanent peace agreement with the Indonesian Government in 2005.³⁰ The tsunami also destroyed most of the boats used by local pirates (many of them associated with the insurgency), which is also believed to have been an important factor in the significant decline in piracy in the Malacca Strait.³¹

The 2004 tsunami also had an unexpected, long-term, impact on the strategic dynamics of the Indo-Pacific region. The US, Australian, Japanese and Indian navies were at the forefront in providing relief to countries in the eastern Indian Ocean, and their *ad hoc* cooperation as part of the ‘Tsunami Core Group’ later evolved into the Quadrilateral Security Dialogue.³² The ‘Quad’ has now become an important factor in the regional strategic balance.

China’s failure to play a significant role in international relief efforts in natural disasters such as the 2004 tsunami (and later Typhoon Haiyan in the Philippines in 2013) also led to a greater understanding in Beijing of humanitarian assistance and disaster relief operations as an important form of soft power. This has led the Chinese Navy to build a fleet of hospital ships to project soft power around the region. Beijing has also become much more aware of the soft-power benefits of responding to large-scale disasters, as was demonstrated by the rise of ‘Covid diplomacy’ in the wake of the COVID-19 pandemic.

The 2004 Indian Ocean tsunami also provides a good example of how external disaster-relief efforts can also have strategic implications, for good or bad. Outside efforts to provide assistance in natural disasters will not always be welcomed. Some countries may resist external efforts to provide aid, fearing the presence of foreign aid workers or military. This needs to be considered in developing regional responses to geo-environmental challenges.

The rise of Somali-based piracy following the destruction of Somali fish stocks and the disparate impacts of the 2004 tsunami provide good illustrations of how what might initially appear to be a single disruption to the natural environment could have significant, widespread, and often unexpected strategic consequences for the region.

The likely growth in the incidence and severity of environmental disruptions in the Indian Ocean in coming years has the potential to create severe geo-environmental challenges for the region. This will require a collective response—preferably one that is organised by the IOR itself.

1.3 Existing mechanisms for responding to environmental security challenges in the IOR

The great majority of countries in the IOR are committed to engaging and cooperating with relevant regional and international organisations and partners to improve environmental management. Regional leaders, at the national level and through regional agencies, have continued to promote sustainable development for the IOR through numerous initiatives that seek to secure the conservation and sustainable use of the environment, including the ocean environment.

However, many states in the IOR have limited capacity on their own to respond to national and regional environmental security challenges. There is a lack of regional standing arrangements among Indian Ocean states to address environmental security threats.

Indian Ocean countries are increasingly concerned about their capacity to improve environmental security coordination and strengthen environmental security information sharing, particularly about disaster risks and climate change.³³ Most support stronger measures to promote environmental security on a regional basis and wish to promote environmental security analysis and assessment. However, despite the significance of environmental security challenges in the IOR, and the importance that Indian Ocean states place on those threats, there are few regional mechanisms to help develop shared perspectives, coordinate responses or build capabilities.

Overall, the IOR suffers from deficits in regional governance. The region currently has relatively few mechanisms to promote cooperation, particularly in relation to environmental security. There is currently no forum within the region devoted to creating shared understandings among Indian Ocean states about environmental security threats.

The peak regional political organisation in the Indian Ocean—the Indian Ocean Rim Association (IORA)—is perceived by some to ‘punch below its weight’, although the recent establishment by IORA of working groups on maritime safety and security and disaster risk reduction could provide useful forums for some of these issues. While IORA has legitimacy as a regional political grouping and can act as a useful convening authority, its ‘member-driven’ organisational structure and lack of resources makes it difficult to achieve concrete outcomes through its own agencies.

Although IORA now has environmental security issues on its agenda, it has not made substantial progress in policy formulation or coordination on climate change and environmental security among its member states.

Two other Indian Ocean transregional groupings that are potentially relevant to environmental security issues are the Indian Ocean Tuna Commission (IOTC) and the Indian Ocean Naval Symposium (IONS). They are focused on specific issues (tuna fishing in the case of IOTC and navies in the case of IONS). While they can participate in elements of a regional response to environmental security threats, they are not suitable vehicles to be used as a regional mechanism to respond to a broad range of environmental security threats.

Other institutions and agencies that are potentially relevant to environmental security responses in the IOR are described in greater detail in Annex 2. They include UN agencies such as the UN Environment Programme. There are also sub-regional organisations such as the Association of Southeast Asian Nations (ASEAN), the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), the Asia-Pacific Economic Cooperation (APEC) forum and

the South Asia Co-operative Environment Program (SACEP). In addition, there are meetings of environment ministers of APEC and ASEAN member states, but there are no regular ministerial meetings of Indian Ocean states.

In summary, the paucity of effective transregional groupings means that regional initiatives to address environmental security challenges may need to be approached in innovative ways.

One useful grouping, although one that is largely geographically focused on the Pacific Ocean, is the Indo Pacific Environmental Security Partnership (IPESP). This is the US Indo-Pacific Command (INDOPACOM) program to explore solutions to environmental security issues throughout the Indo-Pacific region. The IPESP functions at an operational level and not the level of strategic policy. Its primary purpose is to increase regional militaries' understanding of these topics and their environmental stewardship obligations, and to coordinate efforts with civilian agencies and NGOs for whole-of-government and whole-of-society solutions.³⁴

The IPESP includes military and civilian representatives from numerous Indo-Pacific states and works to understand the geostrategic implications of threats to environmental security and develop adaptation and mitigation strategies to counter the effects of climate change.

The IPESP hosts the Indo Pacific Environmental Security Forum (previously called the Pacific Environmental Security Forum), which has met annually since 2011. Past forums have been hosted by Indonesia, Australia, the Maldives, Thailand, Fiji, the US and Mongolia. The 2022 forum was held in the Maldives and attracted participants from some 22 countries. The meetings have covered themes such as climate-change adaptation, biosecurity, energy security, water security, food security, noise abatement, installation management, environmental security dialogue, cultural heritage, historic preservation, disaster mitigation and air pollution.

The IPESP's activities with partner countries fall within eight key themes:

- oil-spill response training
- IUU fishing
- wildlife trafficking
- water security
- disaster mitigation
- engineering solutions to environmental issues
- coastal zone management
- waste management.

Its activities include tabletop exercises with civil and military stakeholders in partner countries and assistance in construction and surveys (supported by INDOPACOM). The only regular training activities are in oil-spill response, which is generally conducted in partner countries. The IPESP does not have a specific program relating to climate change.

The area of activities of the IPESF corresponds with the area of responsibility for INDOPACOM. For the IOR, this means that the IPESF engages only with countries in the eastern half of the Indian Ocean. Australia is an active participant through the Australian Defence Force. Sri Lanka and the Maldives are also active participants, while India and Bangladesh have also participated on occasion.

Although the experience of the IPESP may hold some useful lessons for a cooperative structure in the Indian Ocean, any such arrangement would need to reflect the particular characteristics of the IOR environment.



Flooded village in Manikganj District, Bangladesh,. 20 August 2017. Source: iStock

Section 2: Indian Ocean Dialogue on Environmental Security

This section examines options for Australia in promoting enhanced regional cooperation on environmental security, and includes a proposal for Australia to work towards the establishment of an Indian Ocean Dialogue on Environmental Security (IODES).

This would have several objectives:

- Promote Australia's regional influence and its image as a responsible regional actor that is willing to play a leading role in addressing climate change.

- Develop shared regional perspectives on environmental security risks and strategic policy responses.
- Create appropriate mechanisms for the coordination of responses to environmental security risks.

Proposals to achieve the second and third of those objectives are examined in greater detail below.

2.1 The case for IODES

In environmental security, it is important for all stakeholders to work together to share information and develop shared perspectives on threats. There is also a need for a mechanism to promote the development of strategic policy responses. As noted in Section 1, there are no other groupings or mechanisms for the development of shared perspectives on environmental security or the strategic coordination of responses to environmental security challenges in the IOR.

We propose that Australia work with like-minded partners in the Indian Ocean to establish an Indian Ocean Dialogue on Environmental Security. Its objectives would include:

- sponsoring regional declarations on climate change and other environmental threats
- creating information-sharing networks on environmental security threats
- improving understandings of shared threats and how to mitigate them
- building shared perspectives on priority threats
- facilitating the development of strategic policies
- building relationships among civil and military agencies with responsibilities or capabilities for dealing with environmental security threats
- acting as a regional voice in addressing environmental threats at the global level
- identifying and promoting capacity building and training among member states in mitigation and response
- acting as a sponsor of mechanisms to coordinate regional responses to specified incidents
- examining regional priorities and engagement with major stakeholders in the IOR on environmental security.

We propose that IODES be initially sponsored by Australia working together with key regional partners such as India, Indonesia,

Bangladesh and France, as well as selected small island states that are judged to have strong interests and track records for action in this area (such as Sri Lanka, the Maldives and Seychelles). Over time, by agreement of the founders, IODES could be incrementally expanded to include other regional partners.

IODES would begin as a regular (at least annual) meeting at senior officials level with the intention of developing it into a ministerial-level meeting. It would be led by relevant foreign affairs and environmental security agency officers working in conjunction with defence and national security authorities and maritime security agencies.

Just before the IODES officials meeting, there would be a Track 2 meeting of key stakeholders (academic, science, business and NGOs) from around the IOR and elsewhere. It would provide a platform for civil society stakeholders to provide input into the senior officials meeting.

This meeting might be known as the Perth Dialogue and be the premier policy summit to focus on environmental threats in the Indian Ocean. Perth is Australia's Indian Ocean gateway city. There is no multilateral forum in the IOR for public- and private-sector stakeholders and NGOs to come together to anticipate, prepare and respond to environmental security challenges. The Perth Dialogue would aim to fill that critical gap.

Key initial objectives of IODES could include:

- developing a regional consensus on priority environmental threats
- developing a road map for individual and collective responses by IOR states
- producing a declaration on regional responses to environmental security.

IODES could be positioned as a stand-alone regional initiative, although it may be preferable to establish it in loose association with an existing regional grouping such as IORA (although separately administered by sponsor states).

The costs of convening IODES would be relatively modest. It would not require a secretariat, at least in its initial stages. Costs would largely involve those associated with senior officials meetings, as well as costs associated with hosting the associated Track 2 dialogue.

Although IODES could be focused on threats specifically related to climate change, we recommend that it take a broader approach to environmental security threats. This reflects the relative importance to the region of threats to the environment or natural resources that arise from human activities (such as IUU fishing and shipping accidents), as well as the interconnectedness of those threats with climate change in many cases (for example, fish-stock sustainability).

2.2 Regional mechanisms to coordinate responses to environmental security threats

In addition to developing shared perspectives, there is also a need to establish regional mechanisms to coordinate responses to incidents or threats. IODES could provide a platform for Australia and its partners to work together to develop regional response and mitigation arrangements in relation to selected threats. This could include regional cooperation on adaptation (such as engineered infrastructure or early warning systems) or stand-alone mechanisms. Initial arrangements could focus on the following:

- humanitarian assistance and disaster relief (HADR) in response to cyclones and other severe weather events

- prevention and mitigation of oil spills and other shipping accidents.

Recent developments in the IOR have shown the lack of effective mechanisms to coordinate responses to specific threats. For example, several shipping accidents in 2020 and 2021 (see box on page 11) demonstrated that weak regional and international mechanisms prolonged the *in situ* oil spill management and control response, despite millions having been spent on capacity building. Regular natural disasters, many of them probably associated with climate change, also demonstrate the absence of regional response mechanisms.

Given the diverse nature of these threats and required responses, it may not be necessary to establish a single mechanism to coordinate regional responses to different types of threats, but it may be more efficient to create different mechanisms to respond to different types of threats. This is illustrated by potential mechanisms to provide HADR in response to natural disasters and potential contingency planning arrangements in relation to oil spills.

HADR in response to natural disasters

The IOR possesses the least well-developed coordination arrangements for disaster response in the world. At the same time, the region is one of the most vulnerable to threats from geophysical, meteorological, hydrological, climate, biological or man-made disasters.³⁵

While regional understandings and mechanisms exist, they do not form the basis of an effective regional HADR architecture.³⁶ IORA, the South Asian Association for Regional Cooperation, the Agreement on Rapid Response to Natural Disasters and IONS do provide mechanisms for high-level information exchange and standards setting, but those mechanisms do not equate to working arrangements to prepare for and respond to specific crises.³⁷ IORA, for example, has not progressed beyond seeking 'to ensure a holistic discourse on the human and environmental security of the region'. Its role is to promote partnerships between regional states and organisations, and it is developing guidelines for HADR, but it does not assist in coordinating disaster management at the operational level.³⁸

The FRANZ (France, Australia, New Zealand) arrangement in the Pacific may provide a model that could be drawn upon in developing arrangements for the IOR. FRANZ is a unique and diverse cooperative partnership that relies on information sharing, proximity and common interests to respond to both routine and unanticipated crises across a large area. FRANZ's success is founded on its delivery of practical coordination between the signatories and with regional states. Its 1992 joint statement agreed that:

it would be useful for officials to meet on a regular basis at a technical level, to review operational requirements and further strengthen bilateral cooperation in preparing for and responding to natural disasters in the South Pacific region in close consultation with the countries concerned.³⁹

Three decades of success in the FRANZ arrangement has demonstrated that these trilateral arrangements provide a sound basis for working with the island states of the Pacific. It is arguable that the evolution of an Indian Ocean regional community of interest provides a similar imperative for closer coordination of effort.

Regional coordination in oil-spill contingency planning

Another area where there is a high need for regional coordination is in oil-spill contingency planning. As discussed in Section 1 of this report, shipping accidents are a major threat to the natural environment of many Indian Ocean states. The grounding or sinking of a large vessel, particularly a large oil tanker, could cause immeasurable damage to the marine environment and the economies of many states. The number of tankers and other large vessels that cross the Indian Ocean make such accidents virtually inevitable, yet there is a paucity of regional mechanisms to respond to those events.

For many parts of the Indian Ocean, spill contingency planning systems for oil and other substances are relatively ineffective or effectively non-existent. Some governments and industries maintain oil-spill national risk management regulation and emergency response systems, including the Indian

Coast Guard,⁴⁰ Australia's National Offshore Petroleum Safety and Environmental Management Authority⁴¹ and Australian Marine Oil Spill Centre,⁴² the Seychelles Coast Guard,⁴³ and Cedre.⁴⁴ Australia, as a major offshore oil and gas producer, has particular experience and expertise in this area. In addition, previous international initiatives (such as the MASE project⁴⁵ and the Nairobi Convention⁴⁶), to the extent that they have included oil spills within their remits, have been *ad hoc* and generally ineffective.

There is potential for an Indian Ocean operational oil-spill forecast, warning and mitigation system to be established under the joint sponsorship of Australia, India and other partners.

If implemented, the system would:

- establish joint collaborative mechanisms among coastal states
- provide and inform on nation-specific emergency plan strategies, design and implementation

- service oil-spill planning forecast requirements for participating member states
- record operational information for management, health and safety, environmental, legal and technical requirements.

Such an arrangement would learn from the successful experience of the Joint Australian Tsunami Warning Centre and international cooperation under arrangements coordinated by the Indian Ocean Tsunami Warning and Mitigation System⁴⁷ by the UNESCO Intergovernmental Oceanographic Commission (UNESCO-IOC). This provides a credible analogy and basis for an operational oil-spill forecast, warning and mitigation system in the Indian Ocean.



India Gate covered in heavy smog, 21 November 2017. Source: Shutterstock

Section 3: Indian Ocean Centre for Environmental Security

This section sets out our proposal for the establishment of an Indian Ocean Centre for Environmental Security (IOCES, the mission of which will be to provide professional development and training to senior personnel from Indian Ocean states. It includes the following subsections:

3.1 The case for IOCES

3.2 The IOCES concept

3.3 Vision and strategic objectives

3.4 Institutional options and staffing

3.5 Funding and budget

3.6 Location

3.7 Risk management

3.8 Concluding thoughts and next steps.

3.1 The case for IOCES

The case for Australia sponsoring IOCES is essentially based on the following propositions:

- **Environmental security challenges of various kinds are at or near the top of the security agenda for most Indian Ocean states.**

Many Indian Ocean states place climate change and other types of environmental security threats at or near the top of their perceived priority threats. This means that security engagement by Australia with those countries needs to include partner states' priorities.

- **Environmental threats will have adverse impacts on economic development, social and political stability and other security threats.**

As discussed in Section 1 of this report, environmental threats could have multiple adverse impacts on Indian Ocean states and the region and directly and adversely affect Australia's security interests, including through adverse impacts on economic development and social and political stability and by exacerbating

other existing security threats. There is also potential for environmental events to trigger large-scale population displacements that will affect Australia.

- **There are currently no effective multinational training programs on environmental security in the region or institutions or organisations that are well placed to deliver such training.**

There is currently no institution or agency focused on providing professional education for civil or defence agencies of Indian Ocean states to enable them to respond more effectively to environmental security events and disasters. Nor does any existing institution or agency active in the IOR seem well suited to that task.

Annex 1 lists the institutions and organisations that might potentially deliver some elements of education or training on environmental security issues for Indian Ocean states. While a handful of them provide occasional *ad hoc* workshops on issues relating to environmental security, none of them appears to provide any sustained professional development or training on those issues.

While it may be possible to facilitate training through one or more of those institutions and organisations, it seems unlikely that such an approach would offer anywhere near the benefits of a dedicated centre such as IOCES that is focused exclusively on the provision of professional training and research on environmental security.

In regional consultations for this report, stakeholders also noted that responses to environmental threats were hampered by compartmentalised government structures at the national level (fisheries, environmental, disaster response and meteorological departments and so on). There has been limited success at the national or regional scale in promoting genuine multisectoral collaboration on environmental security. Regional agencies still largely reflect their thematic point of contact in member countries (agriculture, fisheries, national statistics etc.), and few Indian Ocean states have national agencies that address cross-sectoral environmental issues.

In addressing environmental security as a whole, the IOCES model offers a mechanism to promote cross-sectoral collaboration and professional development in environmental security that has so far been elusive. Of particular significance is the proposed interdisciplinary approach of IOCES, which would have the ability to bring together relevant experts in the environmental sciences, law, economics and security.

- **Australia would benefit from Indian Ocean states enhancing their capability and resilience in responding to these threats.**

IOCES professional development programs would involve engaging with environmental security partners from across the Indian Ocean to strengthen regional environmental security measures and advance environmental security partnerships. Through its programs, IOCES would be able to build response capacity and resilience.

Developing local capabilities would help reduce the adverse impacts of environmental events and disasters on the economic development and social and political stability of Indian Ocean states. It would also mitigate the potential effect of environmental events and disasters

in exacerbating other existing security threats (such as violent extremism, separatism and interstate disputes over access to resources). All of this could make a significant contribution to regional stability.

- **Australia would benefit from reducing need for future direct assistance in response to environmental events and disasters.**

As we have seen in the Pacific in recent years, Australia as a relatively wealthy neighbouring state is being increasingly called on to help respond to a series of environmental threats and disasters. Over the past few years alone, this has included responses by Australian civil and military agencies in Tonga (volcanic eruption, 2022), Fiji (Cyclone Yasa, 2021), Solomon Islands, Vanuatu, Fiji and Tonga (Cyclone Harold, 2020). This is in addition to major and growing expenditures on regional capacity building. At the 2019 Pacific Islands Forum, for example, Australia pledged to spend \$500 million over five years (2020–2025) to strengthen resilience to climate change and disasters in the Pacific.

While Australia's level of engagement in the IOR is relatively less than its engagement in the Pacific islands, the population numbers are far greater in the IOR, as are the likely future risks. As the wealthiest large economy in the region, Australia will be increasingly expected to make significant contributions towards responses to environmental threats and disasters in the IOR, particularly in the Bay of Bengal region, South Asia and the island states. We argue that relatively small expenditures on helping to improve capabilities and resilience in Indian Ocean states could represent a good investment by Australia.

- **IOCES would provide Australia with a major and sustained engagement opportunity with the IOR.**

Environmental security provides an unequalled platform for relationship building with Indian Ocean states. A focus on environmental security would help facilitate regional engagement by Australia without an overt focus on geopolitical issues.

In regional consultations, almost all stakeholders considered that the region would benefit from an environmental security facility that improves interdisciplinary professional development training in environmental security to meet national sustainable development and security challenges. Stakeholders stressed that Indian Ocean states must work together to solve common challenges related to such issues as pollution, biosecurity and water security. Through its professional development programs and research, IOCES would provide the means to involve environmental security partners

in strengthening regional environmental security measures.

From Australia's perspective, IOCES would be a vehicle for building long-term relationships and networks among institutions and key personnel. IOCES would promote the same kind of combined, joint, intragovernmental, interagency and multinational approach that defence force joint service colleges, or, say, the Jakarta Centre for Law Enforcement Cooperation (JCLEC) have done for many years. As Australia has previously done with the defence force colleges and JCLEC, there would be a particular focus on the creation and maintenance of alumni networks.

3.2 The IOCES concept

Key functions

The primary mission of IOCES would be to provide professional development and training for selected civil and military personnel in Indian Ocean states in relation to a range of environmental security threats. It would bring together experts in environmental sciences, law, economics and security from Australia and elsewhere in the region in a multidisciplinary environment involving sustained engagement with participants from the IOR.

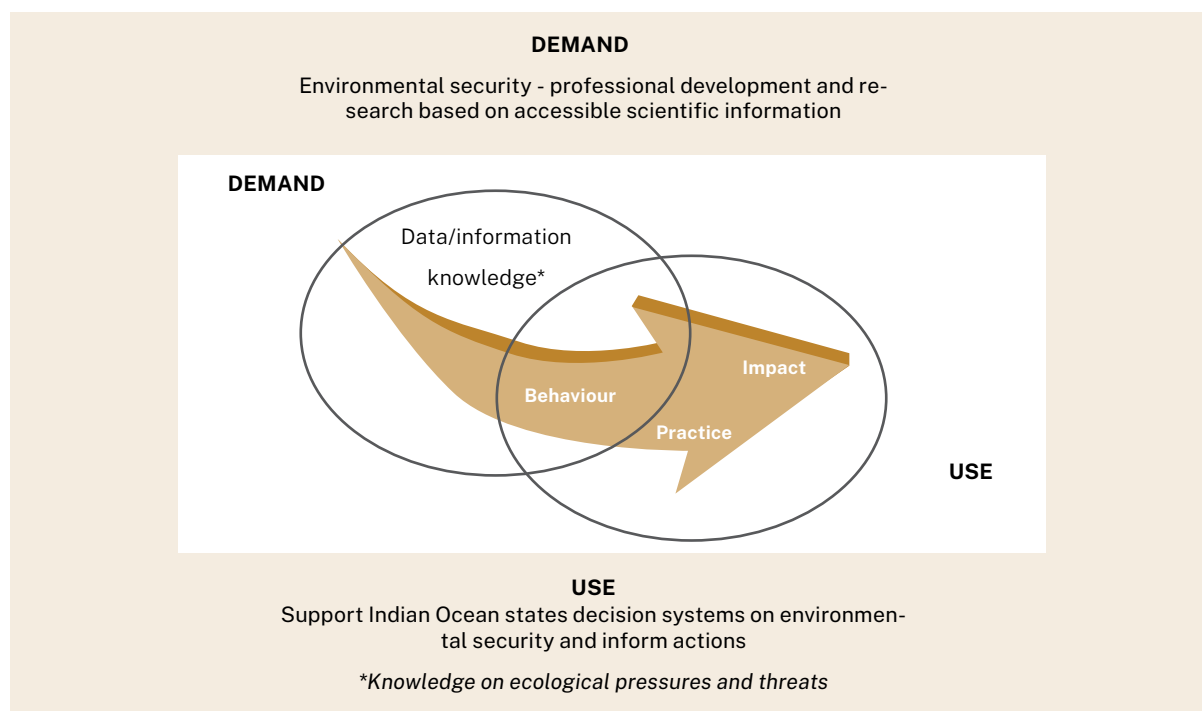
Other key functions of IOCES would include the following:

- IOCES would have a *research function to enable it to keep abreast of technical, legal and policy developments and how those might be employed by regional countries to assist them in providing environmental security at the national level (see details in Annex 4).*
- IOCES could undertake other *collaborative activities such as environmental security exercises or symposia with other environmental security stakeholders from the IOR.*
- IOCES would be a flagship for excellence and a dedicated regional environmental security *knowledge exchange hub* that facilitates the federation of regional scientific and technical expertise when it comes to environmental factors that affect security.

IOCES would *strengthen partnerships* with other organisations with complementary capacity, including with other Indian Ocean regional agencies and research institutions, higher education institutions that examine environment and security links and international organisations engaged in environmental issues. It would also explore innovative partnerships with civil society and the donor community.

In short, IOCES will focus on professional development, training and research in environmental security (Figure 2) so that Indian Ocean states are better equipped to mitigate and respond to ecological threats. As noted in Section 1 of this report, current levels of ecological degradation are likely to worsen, intensifying existing conflicts and becoming catalysts for new conflicts.

Figure 2: Transforming better environmental security outcomes in the Indian Ocean through IOCES training and research



IOCES work program

IOCES would deliver modularised training to middle and senior personnel in a suggested program of four weeks duration. Longer than that would be too time consuming and costly. An outline curriculum for such a course is in Annex 3.

IOCES would consult with regional organisations such as IORA on its work program. In tailoring courses on environmental security to the Indian Ocean context, it would remain alert to where the gaps are in existing training. IOCES would also seek to identify strategic interventions that would leverage the various strengths of existing regional institutions.

In addition to this core program, once established, IOCES might also offer courses and workshops that might be agency- or country-specific, or multiagency, multisector or multilateral.

IOCES could also potentially offer short master classes for alumni, young leaders and experienced practitioners. Its professional development activities should have a strong focus on equipping participants with pragmatic, real-life skills in environmental security through a range of methods, including cooperative exercises, simulations and scenario-based activities.

Where there is a need for an educational program to be accredited, the centre could seek a university partner. Western Australian universities may well be interested in being engaged with IOCES in this respect (see discussion in Section 3.6 on the centre's location).

A residential model for IOCES is preferred, as it provides for socialisation among participants of diverse backgrounds and builds relationships among them that might have long-term benefits. However, this model would not preclude a mixed mode of delivery—residential programs supplemented with online modules. This may be required if COVID-19 travel restrictions return.

An IOCES alumni association would also be valuable as participants move up to senior leadership roles in their organisations. Similar associations have been established by the Australian Defence Force and other regional defence forces and provide a valuable smart-power engagement tool that helps to maintain the people-to-people linkages so important to strong relationships.

IOCES would be apolitical with regard to regional environmental factors or future environmental disputes that may arise in the IOR (such as disputes over access to fish resources). It would reflect the position that environmental security is a common interest

of all Indian Ocean states and requires dialogue and cooperation regardless of any discord or disagreement.

There are a huge range of regional stakeholders and a vast array of complex interactions on environmental security in

the Indian Ocean. To ensure that IOCES is effectively advocating and delivering professional development and research services, it will need to engage with those stakeholders (Figure 3).

Figure 3: Environmental security activities carried out by IOCES

Professional development and training	Research	Outreach
<ul style="list-style-type: none"> Develop a reputation for innovation and effectiveness in the field of environmental security An integrated facility to improve the accessibility of environmental security knowledge Strategic-level environmental security training, covering both technical skills and broader thinking on environmental threats, especially cross-agency training Deliver training courses distinguished by their quality and use of leading policy practitioners Promote best practice for environmental security Create environmental security subject-matter networks across the Indian Ocean Facilitate contributions to environmental security training by other partners, such as India, the United States, France, Japan and the United Kingdom Provide confidence to governments in their approaches to environmental security challenges through, among other things, scenario-based exercises 	<ul style="list-style-type: none"> Strengthen integrated, interdisciplinary environmental security research Data collection and data management services for environmental security Scientific modelling approaches Ecological hotspot assessments Annual climate and security report Research on marine pollution, shipborne and land-based pollution Examination of oil-spill responses Studies on climate-change-related issues such as sea-level rise and its impact on reefs and coastal and regional fisheries IUU fishing assessments Conservation planning Best practice disaster response Aquaculture as an alternative food source and environmental capacity building Air quality Special vulnerabilities of small island states 	<ul style="list-style-type: none"> Work with existing structures and regional institutions such as the Indian Ocean Commission and IORA in areas relevant to environmental security Build long-term relationships with key partners and Indian Ocean agencies that deal with environmental security Operate in a way that builds lasting, trust-based relationships to ensure that Indian Ocean environment and security agencies see clear benefit in learning from and engaging with IOCES Be a conduit for sharing information Host Track 2 initiatives Collaborate with Indian Ocean environmental and security agencies to enhance capabilities to respond to environmental factors in security planning Host an alumni group to provide networked support for environmental professionals in the IOR

Issues covered by IOCES

During the preparation of this report, consultations were undertaken with a broad range of stakeholders from Indian Ocean states and regional bodies. A variety of threats arising from climate change were the primary concern for many of the representatives consulted, but there are also other types of environmental threats arising from human activities. This was reinforced in discussions with many representatives of regional organisations that are active on environmental issues. Support for mitigation and adaptation figured prominently in these discussions. Other priority areas include developing and resourcing national policy on environmental security and overall environmental capacity building.

The key environmental issues identified during consultations with regional stakeholders active in the environmental security sector were:

- marine pollution (plastics)
- shipborne and land-based pollution
- oil-spill response

- climate-change-related issues, such as sea-level rise and its impact on reefs and coastal and regional fisheries
- IUU fishing
- conservation planning
- disaster response
- aquaculture as an alternative food source and environmental capacity building
- air quality
- special vulnerabilities of small island states.

IOCES would need to continue to monitor the types and nature of environmental security threats to ensure that it will meet stakeholders' needs and priorities.

Consideration could also be given to extending the issues addressed by IOCES (through teaching and research) to include environmental security threats applicable to the Southern Ocean and Antarctica. Although notionally outside the IOR, those regions are physically contiguous, and their inclusion may be seen as valuable to a number of Indian Ocean states.

3.3 Vision and strategic objectives

Following consultation, we believe the following vision and four strategic objectives would meet the priorities of Indian Ocean states as the users of the institution.

Vision

To help Indian Ocean countries respond to sustainable-development and security challenges by providing world-class professional education and research services in environmental security.

Strategic objectives

Objective 1: IOCES will be the premier facility for professional development in environmental security in the IOR.

It will:

- play a unique role in enhancing regional cooperation on environmental security across the IOR

- develop a reputation for innovation and effectiveness in the field of environmental security
- add value to existing IOR environmental security services by providing an integrated facility to improve the accessibility of environmental security knowledge
- complement existing regional training programs by focusing on strategic-level environmental security training, covering both technical skills and broader thinking on environmental threats, especially cross-agency training when it comes to responding to environmental challenges
- collaborate with IOR environmental and security agencies to enhance capabilities to respond to environmental factors in security planning

- deliver training courses distinguished by their high quality and use of leading policy practitioners: course participants will have access to environmental security subject-matter experts and experienced practitioners from partner countries, and courses will focus on delivering practical environmental security management skills.

Objective 2: IOCES will be a centre of excellence respected for its expertise and deep understanding of the relationship between environmental challenges and national and regional security.

It will:

- leverage the best subject-matter experts
- strengthen integrated and interdisciplinary environmental security research
- promote best practice for environmental security
- be a conduit for sharing information
- create environmental security subject-matter networks across the IOR
- be professional in its approach, with strong management and strategic planning within the organisation and a well-informed communications strategy to ensure that its presence is consistent with its role as the Indian Ocean's leading professional development centre focused on environmental security
- build long-term relationships with key partners and IOR agencies that deal with environmental security
- facilitate contributions to environmental security training by other partners, such as the United States, France, Japan and the United Kingdom
- work with existing structures and regional institutions such as the Indian Ocean Commission and IORA in areas relevant to environmental security, perhaps hosting scenario-based environmental security exercises
- provide confidence to governments on their approach to environmental security challenges through, among other things, scenario-based exercises, a strong

focus on achieving practical results in its courses, and its commitment to ongoing mentoring

- operate in a way that builds lasting, trust-based relationships to ensure that IOR environmental and security agencies see clear benefit in learning from and engaging with IOCES and each other.

Objective 3: IOCES will bring greater coherence to environmental security training offerings in the IOR.

It will:

- carefully navigate and coordinate its efforts with national environmental and security agencies, donors and regional and international organisations
- strengthen information and knowledge assimilation and dissemination
- provide a sound foundation for catalysing interdisciplinary collaboration on environmental security across the IOR
- facilitate and strengthen partnerships with regional and international environmental security networks and institutions
- host an alumni group to provide networked support for environmental professionals in the IOR
- foster a sense of shared ownership.

Objective 4: IOCES will make a practical difference to environmental security.

It will:

- build capacity through professional development programs
- provide technical assistance to national partners on selected environmental security issues
- encourage adherence to key international rules and norms in environmental management
- create environmental security subject-matter networks across the IOR
- support the work of IORA, the Indian Ocean Commission and BIMSTEC.

Several strategies will need to underpin the establishment of IOCES and achieve the strategic objectives. Those strategies will cover:

- stakeholder engagement
- resourcing
- risk management

- alumni
- communications
- information and knowledge management
- capacity development.

3.4 Institutional options and staffing

It will be important that IOCES is established in a way that is effective and economical, minimises administrative burdens, is independent from political interference, and as much as possible also leverages existing regional arrangements. There are at least five main options for establishing and managing IOCES:

- **An independent organisation with its own advisory board**

An entirely stand-alone body has the potential to create a high-profile centre of excellence in the IOR. Even as an independent organisation, IOCES could be associated with a university that might provide accommodation for both the centre and residential studies and, in time, accredit courses.

- **A centre within a university, again with its own advisory board**

While this might appeal as a simpler way to stand the centre up (and it is likely to appeal to a university if there is funding attached), there are several potential downsides. There is a real risk that the centre could lose its identity or become subject to academic politics; that funds would be controlled by the university (with administration charges often in the order of 30%); and that university expectations of certification, scholarship and publications may limit the ability of the centre to offer appropriate professional development that meets the varied needs of IOR participants.

- **A unit under the administration of an existing regional body, such as IORA**

The envisioned IOCES education, research and outreach services might be delivered using current regional

bodies, possibly by creating a unit under IORA's administration. This would provide important benefits from factors such as IORA's legitimacy and networking and convening power. However, such a structure would require buy-in by all member states and potentially subject IOCES to the administrative burdens associated with multilateral groupings. Over time, IOCES may also be subsumed into the administering organisation's business, losing its identity and effectiveness.

- **A contracted private training company**

A commercial company, contracted to government, is not likely to offer the status or long-term vision that would make IOCES appealing to countries in the IOR, or to other sponsors.

- **An independent organisation that is associated with IORA and possibly an Australian university**

A further option that may provide the 'best of both worlds' would be to establish IOCES as an independently administered and funded organisation with its own advisory board that is nevertheless loosely associated with IORA. It would also be associated with a university to provide certain facilities and, potentially, course accreditation if that were required.

We judge that the last model would be the most optimal for IOCES. It would draw on elements of the experience of the IORA Blue Carbon Hub in leveraging IORA's legitimacy and networking and convening power, while also preserving the centre's flexibility, efficiency and administrative independence (see Annex 2). Like the Blue Carbon Hub, IOCES would also retain the ability when desired to work outside the IORA umbrella

(for example, on issues that might not strictly relate to the Indian Ocean). IORA chairs would not, for example, have leadership roles in IOCES.

A possible organisational structure for IOCES is set out in Annex 5, including the potential duties of key IOCES executives. It is not envisaged that IOCES will require a large team of dedicated staff: at maturity, it would be likely to have around a dozen full-time equivalent staff.

The skill sets and experience of IOCES staff should complement each other and include environmental management; professional training and course development (including resourcing, coordination and facilitation);

understanding of security risks and the impacts of environmental factors on national and regional security; information management; and professional networking. The professional skills and experience required for the director and deputy director positions would include working in a multinational environment.

An IOCES advisory board would provide high-level strategic oversight of IOCES, including consideration of annual work plans and IOCES priorities. It would identify strategic engagement opportunities for the centre. Members of the advisory board would be drawn from senior representatives from the IOR and highly regarded experts in the field.

3.5 Funding and budget

Australia should commit to core funding for IOCES for its first five years to support its establishment and operations and to demonstrate its leadership in this area. It is expected that IOCES will, as it becomes established, be successful in attracting external support, both in direct contributions to its budget and in kind.

There is potential for many IOCES course participants from relatively wealthier countries to be funded by their agencies. However, the notion of sponsorship will

be crucial to the success of the centre as a facilitator for integrating environmental security training across the IOR. Sponsors could assist in providing funding for participants from less developed countries and for course development. Sponsorships are likely to be from national governments, regional and international bodies or private foundations. JCLEC currently successfully operates on this model.

An indicative budget for a stand-alone IOCES is set out in Annex 7.

3.6 Location

Given Australia's regional reputation as a country with a strong environmental security record, there is a strong case for IOCES to be based in Perth, Western Australia.

Perth is the natural gateway for Australia's educational, business and scientific engagement with the IOR and for the pursuit of 'blue economy' opportunities. It is a natural point for engagement with Australia by Indian Ocean countries such as Indonesia, India and South Africa. Locating the centre in Perth would have significant symbolic value for IOCES stakeholders, sending a clear message that Australia faces environmental security

challenges similar to those faced by Indian Ocean partners.

Perth also affords IOCES participants the opportunity to engage with a variety of specialists from a diverse array of agencies concerned with environmental security. In the maritime environmental area, for example, Perth is already home to an impressive field of agencies and programs in marine science, including CSIRO, the Integrated Marine Observing System, the Australian Institute of Marine Science, the Indian Ocean Marine Research Centre, the IORA Blue Carbon Hub, and related state and national institutional

programs. Perth has until recently hosted the only UNESCO-IOC regional office in the Southern Hemisphere, and that office's legacy of networks and connections in the IOR and beyond would benefit IOCES (see Annex A2.4). Also, several Western Australian universities are engaged in environmental policy research and training (see Annex A2.3).

Together, these institutions and programs provide a major opportunity for Perth to emerge as a world-class hub on matters relating to environmental management and its links to national and regional security. IOCES will be able to leverage existing entities in

international marine and climate science that operate out of the west coast of Australia to promote relationships that can strategically and practically lead to blue economy and related regional security benefits.

On a practical level, Perth offers direct air access to many regional participants. There is suitable city office space in Perth that could be fitted out with a lecture room and syndicate rooms, and student accommodation in Perth should not be a problem. Ideally, students would be accommodated proximate to each other, preferably with common eating facilities, to encourage socialising.

3.7 Risk management

While IOCES is a low-risk investment, the risks identified in the SWOT analysis in Annex 6 would need to be addressed.

We identify three potential risks associated with the establishment of IOCES. The key risk to the success of the centre would be if Indian Ocean states do not perceive that it has status or relevance and so it has a low success in attracting participants or funding partners.

A further risk is that of competition should one of the institutions listed in Annex 2, or a new institution, decide to offer a program that fills the gaps that IOCES is designed to fill. We assess that the risk of the development of a competing institution that provides a comprehensive program of professional development and training on environmental security in the IOR is relatively low. Nevertheless, any risks can be minimised by close consultation between IOCES and other regional bodies. It is expected that, as awareness of IOCES services increases, that risk will be reduced. And, if IOCES adheres to its objectives of adding value, avoiding replication and facilitating partnerships, the risk should be minimised.

Another possible risk is that IOCES may be perceived within the region as an Australian enterprise designed to serve Australian interests. This risk can be minimised if IOCES course offerings are seen as relevant, if countries sponsor participants or contribute to the centre in other ways, and if the *modus operandi* of IOCES is framed to ensure regular, meaningful and inclusive communication across the IOR constituency that the centre is meant to serve. Perhaps a 'reference group' type role for selective operatives of the IOCES regional constituency in the centre's governance framework could be considered in order to facilitate engagement and underpin the solidification of regional support for IOCES. This could be used to facilitate collegiality in how the centre progresses, sets its courses up, selects its topics and helps in planning international gatherings. An engagement and communications strategy would need to assess all potential external stakeholder relations with IOCES.

3.8 Concluding thoughts and next steps on IOCES

IOCES would help partner nations to develop environmental security leaders in the region. It would foster multinational interagency environmental security partnerships that can facilitate regional responses to challenges in the environmental field that affect national and regional security.

Through multinational courses and alumni engagement, IOCES would foster relationships and networks. Through its expertise, it would develop tremendous ‘convening authority’ and so be able to gather national leaders to address important topics in an atmosphere that fosters openness and debate. Through commissioning applied research, the centre would provide valuable information to regional environmental and security authorities.

In sum, IOCES would operate innovative programs in the area of environmental security to build partner capacity, promote

professionalism in agencies concerned with such matters and strengthen regional cooperation to better meet environmental security challenges.

In terms of next steps, this proposal, if supported by Department of Foreign Affairs and Trade, might be considered by Australia and India at an India–Australia 2+2 ministerial dialogue. Key IOR states such as France and extra-regional partners such as the United States and Japan could consider support for IOCES. However, careful consideration would need to be given to any partner assistance in IOCES to avoid it being perceived as a ‘geopolitical’ initiative. In any event, an IOCES initiative should closely involve key Indian Ocean states with a strong interest in environmental security issues, such as Bangladesh, Sri Lanka, the Maldives, Mauritius and Seychelles.

Annexes

Annex 1: Risk assessment matrix for the eastern Indian Ocean

Issue/disruption	A Negligible (no disruptive effects; 'business as usual')	B Minor (regional tensions increase temporarily; situation is manageable within existing processes)	C Significant (conflict is temporary and generally constrained by existing arrangements)	D Major (significant disruption; limited to some areas)	E Catastrophic (significant widespread disruptions)
1 Rare (most unlikely but might occur in exceptional circumstances)					
2 Unlikely (unlikely to occur without significant change in current circumstances)		<ul style="list-style-type: none"> Impact of seabed mining 			<ul style="list-style-type: none"> Interdiction of maritime trade by state actors
3 Possible (can occur in most circumstances in the foreseeable future)			<ul style="list-style-type: none"> Terrorist attacks on shipping, maritime infrastructure or the marine environment Disruption of / illicit access to undersea cables 		
4 Likely (will occur in current circumstances)			<ul style="list-style-type: none"> Shipping accidents Marine pollution Piracy Significant declines in marine-based tourism Human trafficking / unregulated population movements 		
5 Almost certain (already occurs regularly)				<ul style="list-style-type: none"> Declining marine living resources Growing competition for fish resources 	

Source: A Bergin, D Brewster, F Gemenne, P Barnes, *Environmental security in the eastern Indian Ocean, Antarctica and the Southern Ocean: a risk mapping approach*, National Security College, ANU, May 2019

Annex 2: International, regional and selected national institutions involved in Indian Ocean environmental security

This annex describes some international, regional and national institutions operating in the IOR that are involved in:

- the coordination of regional or international responses to environmental security events
- or
- the provision of professional development or training in environmental security.

A2.1. International multilateral agencies and groupings

United Nations Environment Programme

The UN Environment Programme (UNEP) is the leading global environmental authority that sets the global environmental agenda, promotes the coherent implementation of the environmental dimension of sustainable development within the UN system and serves as an authoritative advocate for the global environment.

Headquartered in Nairobi, Kenya, the UNEP works through its divisions as well as regional, liaison and out-posted offices and a network of collaborating centres of excellence. The UNEP Asia and the Pacific Office is in Bangkok, Thailand.

The UNEP has 193 member states and representatives from civil society, businesses and other stakeholders to address environmental challenges through the UN

Environment Assembly, which is the world's highest level decision-making body on the environment.

The UNEP's mission is to provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations.

The UNEP depends on voluntary contributions for 95% of its income. It has run training courses that have involved some Indian Ocean states in areas such as environmental law, environmental assessment, sea-level rise and waste management. It has also published reports on various Indian Ocean issues related to maritime disasters, corals, mangroves and marine plastics. In September 2021, the UNEP concluded an agreement with India to establish an office in that country.

Interpol

Interpol has run courses in the IOR on strengthening border controls and preventing and combating various forms of environmental crime, such as fisheries crime, forestry crime, pollution crime and wildlife crime. Frontline police officers in a

number of Indian Ocean states have been trained in the use of Interpol's databases and forensic and border-management tools, as well as maritime crime scene investigation, criminal intelligence analysis and investigative interviewing techniques.

United Nations Office on Drugs and Crime

The UN Office on Drugs and Crime (UNODC) runs the Global Maritime Crime Programme (GMCP). Under the GMCP, the Indian Ocean Forum on Maritime Crime conducts capacity building through training sessions on visit, board, search and seizure, maritime domain awareness and criminal investigation skills. Based in Bangkok, the GMCP Pacific Ocean Team assists states in Southeast Asia and the IOR to build their capability to tackle environmental crimes. It has, for example,

established a series of maritime law-enforcement dialogues for Southeast Asia, which serve as a platform for cooperation between Indonesia, Malaysia, the Philippines, Thailand and Vietnam.

The UNODC also runs the Global Program for Combating Wildlife and Forest Crime. It has worked with some Indian Ocean states on tackling corruption as it relates to wildlife crime; illegal logging and trade in timber; dumping and illegal waste trafficking; and illegal mining and fishing.

A2.2. Regional agencies and groupings

Indian Ocean Rim Association

IORA is the only ministerial-level forum concerned with the Indian Ocean. It has six focus areas, at least three of which are relevant to environmental security: maritime safety and security; fisheries management; and disaster risk management.

IORA conducts limited and *ad hoc* capacity-building activities for its member states, although its resources are very limited. In September 2021, for example, IORA provided a training program on decision-making in disaster risk management.

Organisations formally within the IORA umbrella, but under the separate administration or sponsorship of member states, include the Fisheries Support Unit in Oman and the IORA Blue Carbon Hub in Perth.

IORA Blue Carbon Hub

The IORA Blue Carbon Hub was formally announced in September 2019. It is co-located with CSIRO and is funded by the Australian Government. The hub aims to build knowledge and capacity in protecting and restoring blue-carbon ecosystems throughout the Indian Ocean. The hub aims to complement efforts in IORA and by others that seek to establish sustainable blue economies by:

- providing a knowledge hub to provide advice and capacity-building expertise to IORA member states
- engaging in and facilitating research that seeks to improve knowledge and provide an evidence base for the development of robust policy and finance mechanisms

- helping to conserve and restore blue-carbon ecosystems
- establishing best practice and disseminating information about best practice
- developing partnerships with organisations that can assist with the implementation of activities that meet these objectives.

The Blue Carbon Hub undertakes various training and capacity-building activities for IORA member states. It also offers short-term fellowships to selected academics working in the blue-carbon field.

Indian Ocean Naval Symposium

IONS was established in 2008 as a network for navies and coastguards of Indian Ocean littoral states. It now has 24 members. It provides a forum for networking and dialogue among the region's navies. It has three working groups that promote dialogue on HADR, maritime security and information sharing and interoperability. It provides occasional workshops for member navies.

Indo Pacific Environmental Security Partnership

The Indo Pacific Environmental Security Partnership (IPESP) is hosted by INDOPACOM, which is based in Hawaii. Environmental security issues are a core focus of the organisation. Through the IPESP, INDOPACOM has sought to increase understanding of environmental stewardship obligations among militaries in the region and develop into a multilateral civil-military organisation focused on mitigating environmental security threats.

The partnership includes military and civilian representatives from numerous Indo-Pacific states and works to understand the geostrategic implications of threats to environmental security and develop adaptation and mitigation strategies to counter the effects of climate change. Representatives have shared lessons learned and best practices, participated in exercises and conducted site visits to environmental security projects.

The IPESP has recently been transformed from an event-centric initiative to a non-binding multilateral 'partnership', which is intended to be a sustainable structure for cooperative environmental security. The partnership will seek to regularise more frequent engagement among environmental security practitioners.

The IPESP hosts the Indo Pacific Environmental Security Forum (previously called the Pacific Environmental Security Forum), which has met annually since 2011. Past forums have been hosted by Indonesia, Australia, the Maldives, Thailand, Fiji, the US and Mongolia. The 2022 forum was held in the Maldives and attracted participants from some 22 countries. The meetings have covered themes such as climate-change adaptation, biosecurity, energy security, water security, food security, noise abatement, installation management, environmental security dialogue, cultural heritage, historic preservation, disaster mitigation and air pollution.

The IPESP has four working groups:

- *Networking*: to keep civil and military partners connected and share best practices and lessons learned
- *Education*: to identify learning opportunities for partners, including technical expert exchanges, workshops etc.
- *Policy*: to support partners in developing relevant policies and procedures and to develop standardised terminology
- *Mitigation*: to identify and prioritise action-oriented environmental security projects.

The IPESP's activities with partner countries fall within eight key themes:

- oil-spill response training
- IUU fishing
- wildlife trafficking
- water security
- disaster mitigation
- engineering solutions to environmental issues
- coastal zone management
- waste management.

These activities include tabletop exercises with civil and military stakeholders in partner countries and assistance in construction and surveys (supported by INDOPACOM). The IPESP does not have a specific program relating to climate change.

Its only regular training activities are in oil-spill response, and are generally conducted in partner countries.

Australia is an active participant through the Australian Defence Force. Sri Lanka and the Maldives are also active participants, while India and Bangladesh have participated on occasion.

The area of activities of the IPESF corresponds with the area of responsibility for INDOPACOM. For the IOR, this means that that IPESF engages only with countries in the eastern half of the Indian Ocean.

Association of Southeast Asian Nations

The main objectives of ASEAN are to accelerate economic growth, social progress and cultural development in the region and to promote regional peace and stability. The ASEAN Community has three pillars: the ASEAN Political-Security Community, the ASEAN Economic Community and the ASEAN Socio-Cultural Community. Member states are Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam.

The entire length of Southeast Asia's western and southern coastline faces the Indian Ocean: Myanmar, Thailand, Malaysia, Singapore and Indonesia are IOR littoral states. They are gradually stepping up their

involvement in regional arrangements in the Indian Ocean, although ASEAN has not made the IOR a significant policy agenda item.

The ASEAN Ministerial Meeting on Environment and the ASEAN Senior Officials on Environment implement regional programs to promote environmental protection. ASEAN makes efforts in environmental protection through policy dialogue, research and capacity building. It is addressing land management and ensuring food security in the context of climate change through the ASEAN Climate Leadership Program, which supports ASEAN's strategic plan on the environment (2016–2025).

ASEAN Regional Forum

Established in 1994, the ASEAN Regional Forum (ARF) is an important platform for security dialogue in the Indo-Pacific. It provides a setting in which members can discuss current security issues and develop cooperative measures to enhance peace and security in the region. The ARF is characterised by consensus-based decision-making.

It comprises 27 members: the 10 ASEAN member states (Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand and Vietnam), the 10 ASEAN dialogue partners (Australia, Canada, China, the European Union, India, Japan, New Zealand, the Republic of Korea, Russia and the United States), Bangladesh, the Democratic People's Republic of Korea, Mongolia, Pakistan, Sri Lanka and Timor-Leste, and one ASEAN observer (Papua New Guinea).

Australia co-chaired, with China and Thailand, the ARF Workshop on Regional Climate Change and Coastal Disaster Mitigation on 1–2 November 2018 in Tianjin, China.

The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation

BIMSTEC is a regional organisation comprising seven member states lying in the littoral and adjacent areas of the Bay of Bengal: Bangladesh, Bhutan, India, Nepal, Sri Lanka, Myanmar and Thailand. It has identified 14 priority sectors, among which are energy, fisheries, agriculture, public health, environmental and disaster management and climate change. One of BIMSTEC's purposes

is to provide assistance to its members in the form of training and research facilities in the educational, professional and technical spheres.

BIMSTEC includes the Centre on Weather and Climate, which is co-located in India's National Centre for Medium Range Weather Forecasting in Noida, Uttar Pradesh. One aim of the centre is to promote scientific capacity building in weather and climate research. However, the centre does not appear to undertake training activities.

Indian Ocean Commission

The EU-sponsored Indian Ocean Commission (IOC) brings together the states of the western Indian Ocean (Mauritius, Seychelles, Madagascar and Comoros) plus French Reunion. It promotes cooperation in numerous fields, among which are economic development, waste management, port security and safety at sea, agriculture, fishing, conservation of resources and ecosystems, the blue economy and disaster resilience.

The IOC has been effective in recent years in developing a voice for relatively small and weak island states. With the assistance of France and funding from the EU, it has facilitated maritime security capacity building among its members.

The IOC has undertaken some training courses in areas such as disaster law, climate resilience, climate-sensitive diseases and the blue economy.

South Asian Association for Regional Cooperation

The South Asian Association for Regional Cooperation (SAARC) *promotes economic and regional integration. Its members are* Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan and Sri Lanka.

SAARC operates a disaster management centre, which provides technical support, capacity building and training services and facilitates Information and expertise sharing. The SAARC Consortium on Open and Distance Learning is a regional cooperation agency set up under the auspices of SAARC with the objective of promoting cooperation and collaboration among institutions imparting knowledge through open and distance learning within member states.

South Asia Co-operative Environment Programme

The South Asia Co-operative Environment Programme (SACEP) is an intergovernmental organisation established in 1982 to promote and support the protection, management and enhancement of the environment in the region. SACEP member countries are Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan and Sri Lanka.

SACEP has implemented a number of projects and programs in the areas of environmental education, environmental legislation, biodiversity, air pollution, and the protection and management of the coastal environment. SACEP is also the secretariat for the South Asian Seas Programme. SACEP runs a regional project on plastic-free rivers and seas designed to catalyse actions that reduce the flow of plastic pollution into South Asian seas. It runs training exercises, workshops, seminars, conferences and meetings on various environmental and sustainable development issues.

Southern African Development Community

The vision of the Southern African Development Community (SADC) is to promote peace and prosperity in the South African region. Members are Angola, Botswana, Malawi, Mozambique, Swaziland, Tanzania, Zambia, Zimbabwe, Namibia, South Africa, Mauritius, the Democratic Republic of the Congo and Seychelles. SADC's three main environmental policy goals are to improve the health, environment and livelihoods of **the people of southern Africa, preserve the natural heritage, biodiversity and life supporting ecosystems in southern Africa, and support regional economic development.** Climate change represents a significant threat to the SADC region. The SADC Climate Services Centre provides training in climate prediction for personnel in national meteorological services.

Gulf Cooperation Council

The activities of the Gulf Cooperation Council (GCC) include work on environmental cooperation in the Gulf region, climate change and disaster response. The states of the GCC are vulnerable to climate change and, as environmental changes intensify, will

be acutely affected. The GCC states have signed or accepted more than 33 regional and international agreements and conventions in the field of the environment and the protection of wildlife and natural resources. GCC states have formed a working team for each agreement to follow up relevant developments with a view to maintaining the interests of the GCC states at both the regional and international levels. GCC members are the United Arab Emirates, Saudi Arabia, Qatar, Oman and Bahrain.

African Union

The objective of the African Union (AU) is to accelerate the integration of the African continent to enable it to play its rightful role in the global economy while addressing social, economic and political problems. There are 55 member states. The AU has a program for advancing Africa's climate-change agenda, including by enhancing the capacities of member states and producing near-real-time environmental, natural resources and climate information for policy- and decision-making and development planning by improving Africa's exploitation of Earth observation technologies through the implementation of the Monitoring for Environment and Security in Africa program.

The AU facilitates the formulation and implementation of its Integrated African Strategy on Meteorology (Weather and Climate Services) to enhance weather and climate service delivery for sustainable development. It coordinates the implementation of the Africa Regional Strategy on Disaster Risk Reduction. The AU holds stakeholder workshops on matters related to the environment and security.

The Global Monitoring for Environment and Security and Africa is one of the AU's flagship programs funded by the European Commission and focusing on environmental sustainability in Africa. The AU has held workshops on climate change and security.

East African Community

The East African Community (EAC) is a regional intergovernmental organisation of six states: Burundi, Kenya, Rwanda, South Sudan, Tanzania and Uganda. Its headquarters are in Arusha, Tanzania.

The EAC promotes cooperation among the partner states in managing and sustaining the ecosystems and natural resources of the community. It supports work in climate-change adaptation and mitigation, biodiversity conservation, disaster risk reduction and management, and pollution control and waste management.

In December 2021, officials from the EAC secretariat and six member states affirmed new strategies involving cross-border cooperation on 'natural capital' landscapes.⁴⁸ The EAC secretariat has conducted numerous regional workshops on environmental challenges, particularly those that are transboundary in nature. For the past decade, it has been facilitating national climate-change roundtables in partner states.

Shanghai Cooperation Organisation

The Shanghai Cooperation Organisation (SCO) is focused on security and development, but environmental protection is noted in the SCO Charter. By virtue of the membership of Russia, China and India, it is an important IOR forum. Energy cooperation is a primary goal of the organisation. Full members are India, Pakistan, Kazakhstan, China, Kyrgyzstan, Russia, Tajikistan and Uzbekistan. Sri Lanka is a dialogue partner, and Iran is an observer.

The SCO has an environmental information-sharing platform for policy dialogue; exchanges of environmental technologies and industrial cooperation; scientific research and capacity building in environmental protection; and education for SCO members, observers and partners. In April 2021, it convened an experts' seminar on biodiversity conservation and ecological restoration.

A2.3. Selected national agencies and institutions

Jakarta Centre for Law Enforcement Cooperation

JCLEC is an Indonesian-registered not-for-profit foundation supported by the Indonesian Police, the Australian Federal Police (AFP) and several other agencies. It generates revenue through services rendered to sponsor agencies and through donations.

JCLEC was established by the Indonesian and Australian governments in 2004 as a training resource for the Southeast Asia region in the fight against transnational crime and terrorism. Australia initially committed \$36.8 million over five years to support the establishment and operations of JCLEC and continues to provide funding and personnel to support ongoing operations. Other donors have included the UK Foreign, Commonwealth and Development Office, Immigration New Zealand, the New Zealand Police, the governments of Canada, Denmark, the Netherlands and the United States and the UN Office on Drugs and Crime.

Oversight is provided through a three-tiered governance structure comprising the board of patrons, the board of management and the board of supervisors. The current executive directors are Brigadier General Aby Nursetyanto (Indonesian National Police Executive Director) and Commander Greg Davis (AFP Executive Director Programs.)

There are normally two AFP members at JCLEC.

JCLEC, as its name implies, is a centre for law-enforcement cooperation, which includes training, events management support, dialogue and workshop facilitation. It provides a platform for regional cooperation through stakeholder coordination meetings.

Typically, international law-enforcement agencies approach JCLEC to seek its services and resources such as technology, infrastructure, event managers and translators to deliver activities chosen by the sponsor. This support also extends to engaging Indonesian agencies and making introductions where that may be necessary.

JCLEC does not host any curriculum relating to environmental crimes such as IUU fishing or illegal logging, mining and wildlife smuggling, but there has been some engagement in recent times seeking the support of JCLEC to facilitate dialogue with stakeholders on environmental crimes, such as illegal dumping of waste.

Ministry of Environment, Forest and Climate Change, India

The Ministry of Environment, Forest and Climate Change plans, promotes, coordinates and oversees the implementation of India's

environmental and forestry policies and programs. The ministry also serves as the nodal agency in the country for the UNEP, SACEP and the International Centre for Integrated Mountain Development and for the follow-up of the UN Conference on Environment and Development. The ministry is also entrusted with issues relating to multilateral bodies such as the Commission on Sustainable Development and regional bodies such as SAARC on matters pertaining to the environment.

Centre for Environment, Climate Change and Sustainable Development, India

The Centre for Environment, Climate Change and Sustainable Development is located within the Impact and Policy Research Institute in New Delhi. It undertakes multidisciplinary research on the environment for sustainable development. Its aim is to improve knowledge and capacity on climate change and environmental issues, renewable energy, soil, agriculture, food and water security, biodiversity and international environmental institutions and agreements.

Centre for Environment and Development, India

The Centre for Environment and Development, Ashoka Trust for Research in Ecology and the Environment, Bengaluru, India, addresses critical issues at the interface of the environment and development, particularly issues related to forests, water and sanitation, and climate change.

The centre seeks to generate policy insights into various uses of water in domestic, agricultural and industrial applications, the underlying causes of inequity in access to water, sanitation, unsustainable extraction of groundwater, water pollution and the vulnerability of water resources. It carries out capacity building to help identify social, technological and governance solutions to India's water and sanitation problems.

NITI Aayog, India

The NITI Aayog (the National Institution for Transforming India) serves as the top public-policy think tank of the Indian Government and the nodal agency tasked with catalysing economic development and fostering cooperative federalism through the involvement of the state governments

of India in the economic policymaking process. It provides advice and encourages partnerships between key stakeholders and like-minded national and international think tanks, as well as educational and policy research institutions. Its Environment and Forests Division provides relevant strategic and technical advice on key elements of policymaking and disseminates best practices to protect India's environmental resources. The holistic development of islands has been accorded high priority by the Indian Government, and NITI Aayog has been mandated to steer that process.

Indian marine agencies

Ocean science institutes in India can play useful roles in delivering training programs that deal with marine environmental issues. They include institutes such as the Indian National Centre for Ocean Information Services, the National Institute of Ocean Technology, the National Institute of Oceanography and the National Centre for Sustainable Coastal Management.

Australian agencies

Australia has provided some training on marine environmental security issues in the Indian Ocean. In South Asia, for example, the Australian Department of Home Affairs has supported the operational capabilities of the Sri Lanka Navy and Coast Guard to combat illegal maritime activity in the region. This has included the provision of technical training, as well as the gifting of and ongoing technical support for maritime assets. The Australian Border Force has in the recent past undertaken joint exercises with an Indian Coast Guard vessel off Darwin and is looking for more opportunities with India and Bangladesh.

In the western Indian Ocean, Home Affairs conducts a range of capacity-building activities focused on enhancing the capacity of coastal states to detect and interdict threats within their borders and territorial waters. The most recent engagement was the Indian Ocean Small Craft Intelligence and Targeting Course delivered by Home Affairs in Mauritius during March 2019. Participants included 18 officers from relevant maritime agencies from eight countries across East and Southern Africa.

The Australian Maritime Safety Authority receives some support from the International Maritime Organization for technical support programs and to deliver training on the Indian Ocean Memorandum of Understanding on Port State Control. It runs an annual two-week maritime professional development program for Indo-Pacific countries in Canberra that has around 15 participants.

The Australian Fisheries Management Authority (AFMA) has worked on capacity building with partner agencies in Southeast Asia and has provided training as part of the Regional Plan of Action to Promote Responsible Fishing Practices including Combating Illegal, Unreported and Unregulated Fishing to identify priority areas for surveillance and response. There is an Indonesia–Australia fisheries surveillance forum. AFMA has contributed to training at JCLEC on monitoring, control and surveillance issues and also port state control for Southeast Asian states.

The AFP has run a number of training programs in the IOR on the operational aspects of responding to transnational crime, including environmental crime. The AFP provides significant funding and training for JCLEC.

The Australian Civil-Military Centre was established to provide training principally to Australian military and civil agencies in HADR and other operations. It operates under the Department of Defence, although many of its staff are secondees from other agencies, such as the Department of Foreign Affairs and Trade, the AFP and Emergency Management Australia, and NGOs.

Universities in Western Australia

The University of Western Australia (UWA) has several institutes that are relevant to environmental security in the Indian Ocean. UWA's Centre for Environmental Economics and Policy addresses multifaceted environmental problems through research and training. The UWA Oceans Institute brings the strength of UWA researchers into a multidisciplinary organisation dealing with oceanography, ecology, engineering, resource management, social sciences and governance. The Minderoo–UWA Deep-Sea Research Centre has recently been established to

explore the submerged earth fractures of the eastern Indian Ocean.

The UWA Indian Ocean Marine Research Centre brings together the Australian Institute of Marine Science, CSIRO, the Western Australian Department of Fisheries and UWA's Oceans Institute. The centre has more than 300 marine scientists in disciplines including biodiversity, climate change and conservation.

Murdoch University hosts the Harry Butler Institute, which researches and teaches on environmental sustainability. Edith Cowan University hosts the Centre for Sustainable Energy and Resources, which works on decarbonising the energy supply chain. Curtin University hosts the Sustainability Policy Institute.

Asia–Pacific Center for Security Studies

The Asia–Pacific Center for Security Studies (APCSS) operates under INDOPACOM and is based in Honolulu. It undertakes residential programs on security issues and hosts Track 2 activities. APCSS supports INDOPACOM by developing and sustaining relationships among security practitioners through executive education, leadership development and organisational capacity building. The centre defines its mission as 'building capacities and communities of interest by educating, connecting, and empowering security practitioners to advance Asia–Pacific security'.

Its vision for implementing that goal includes serving as a venue of choice for professional military education; facilitating security assessments and approaches; building capacity for individual leaders and organisations; analysing security information; enabling strategic understanding of complex challenges; and developing security-related communities of interest and expertise in the Asia–Pacific region.

Some APCSS course offerings and workshops consider components of environmental security, such as climate change and transnational environmental crime. For example, the APCSS has hosted a workshop on environmental issues for Pacific island countries.

A2.4. UNESCO Intergovernmental Oceanographic Commission (UNESCO-IOC) and related alliances

UNESCO Category 2 institutes and centres

Category 2 institutes and centres under the auspices of UNESCO are a global network of institutions of excellence in UNESCO's domains of competence. Given their expertise, the institutes and centres contribute to the implementation of UNESCO's strategic priorities, programs and global development agendas through international and regional cooperation, research, knowledge production, policy advice and capacity development.

Although independent of UNESCO, Category 2 institutes and centres are privileged partners of the organisation with access to UNESCO's logo and international and intergovernmental bodies and networks and may leverage UNESCO's international reach and convening powers.

They provide nationally hosted facilities for training and capacity building for regional constituents in areas that relate to UNESCO-IOC's mission. We note that many of these areas align with those proposed for IOCES.

UNESCO-IOC presides over two Category 2 centres, both of which encompass Indian Ocean constituencies: one based in India and one based in Iran. Through the recent UNESCO-IOC Perth Programme Office's tenure, strong relationships were built with both of those Category 2 centres, the former head of the office, Dr Nick D'Adamo, having been formally engaged at formative strategic and ongoing operational levels for both. Dr D'Adamo retains connections with both centres that would be relevant to IOCES.

The Category 2 centres could provide logistical and thematic support for specific course interests through the development of collaborations with IOCES.

International Training Centre on Operational Oceanography, India

The International Training Centre on Operational Oceanography is hosted by the Indian Centre for Ocean Information Services, which is part of the Indian Ministry of Earth Sciences. The mission of the centre is to assist the countries on the Indian Ocean rim,

African countries bordering the Indian and Atlantic oceans and small island countries in the development and optimisation of oceanographic scientific bases and related technology and information systems and to create a vast pool of trained ocean scientists to cater to the growing demand for operational oceanography services. The centre contributes to defining regional and global problems and priorities, the solution of which requires regional and international cooperation, and assists in the identification of training, education and mutual assistance needs.

Regional Research Centre on Oceanography for West Asia, Iran

The Regional Research Centre on Oceanography for West Asia is established under the auspices of UNESCO in the Iranian National Institute for Oceanography and Atmospheric Science. The centre creates the basis for scientific understanding of the processes going on in the marine and coastal environment of the geographical area covering the Persian Gulf, Gulf of Oman and Caspian Sea, with relevance to the Arabian Sea of the northwest IOR. It assists UNESCO-IOC member states of the region in achieving sustainable development and facilitating regional partnership and cooperation. The centre develops regional marine and coastal management policy by identifying and meeting national and regional priorities through sharing knowledge and experience and by operating education and training programs and raising public awareness concerning the need for sustainable management of sea and coastal areas.

There also a number of regional training centres aligned with UNESCO-IOC throughout the IOR that could potentially play a similar role to the two Category 2 centres (see above) for IOCES. The same applies in respect to regional training centres under the auspices of the World Meteorological Organization.

Global Ocean Observing System and related networks of alliances and programs

The Global Ocean Observing System (GOOS) was created in 1991 and is now led by the

UNESCO-IOC, with co-sponsorship by the World Meteorological Organization, the UNEP and the International Science Council.

GOOS leads and supports a community of international, regional and national ocean-observing programs, governments, UN agencies, research organisations and individual scientists in support of ocean observing, which is fundamental to achieving the goals of the UN Decade of Ocean Science for Sustainable Development 2021–30. GOOS involves the development of the observing tools and technology, information systems, scientific analysis and forecasts that enable the global community to leverage the value of its investment.

An integrated matrix of alliances strongly related to GOOS and that address many disciplines and matters complementary to environmental security as a subject has been established under the auspices or with the support of the former UNESCO-IOC Perth Programme Office. They remain active, as does a network of collegial and programmatic links among stakeholders within and beyond the IOR.

IOCES would be able to develop its own collegial linkages with this network of alliances, thereby drawing on members in those alliances from the bottom up (communities/users), through practitioners (scientists/managers) to decision-makers (advisers, institutions, government entities). The network's linkages already include IORA, the UNESCO-IOC Category 2 centres, the UN Decade of Ocean Science for Sustainable Development 2021–30 and many of the other entities listed in Annex 2.

The Indian Ocean Global Ocean Observing System (IOGOOS) is one of 13 'regional alliances' supporting GOOS globally. IOGOOS was established in 2002 and until last year was supported by both the former UNESCO-IOC Perth Programme Office and the Indian Ministry of Earth Sciences through its Hyderabad-based Indian National Centre for Ocean Information Services, which continues as the IOGOOS secretariat. IOGOOS has nearly 30 members from a range of institutions in 15 countries, covering a wide cross-section of ocean and related climate and environmental disciplines. IOGOOS has been instrumental in the creation (and ongoing support) of a number of related international alliances with strategic and operational missions in support of ocean observation and related research and services for the Indian Ocean.

The essential value to IOCES of all of the above IOR alliances is as a font of relevant material that could support course curricula, options for in-field excursions to support curricula and the building of relationships of a wide and varied related operating constituency in ocean and climate sciences, both strategic and applied. The legacy of the former UNESCO-IOC Perth office in this context is that there are many enduring collegial relationships built over the past two decades between the former Perth-based office head (Dr Nick D'Adamo), staff and colleagues and the international community represented in the network of alliances.

Annex 3: IOCES — indicative curriculum: mainstream course

All weeks would include syndicate problems and desktop exercises.

Week 1: Course introduction

The structure and requirements of the course will be explained, along with a general overview of key features of the Indian Ocean environment, including contemporary threats to that environment. Each course participant will be asked to provide a short presentation describing their own country's national arrangements for responding to a range of environmental security challenges.

- Course introduction
- Indian Ocean environmental geography
- The concept of environmental security,

including how environmental factors can be sources of instability

- Combating environmental crime in the IOR (separate lectures on wildlife crime; illegal logging and trade in timber; dumping and illegal waste trafficking; and illegal mining and IUU fishing)
- Current regional organisations and cooperative arrangements for environmental security, highlighting gaps in arrangements
- National presentations.

Week 2: Climate change and environmental security

Week 2 will cover aspects of climate change that are relevant to environmental security. It will provide a description of the scientific basis of climate change and its main drivers and analyse the potential impacts of climate change for national security along a range of political, economic, social and ecological lines. It will examine what is needed to mitigate climate change, especially energy systems.

It will compare national security strategies, and policy options that have been adopted in the IOR in relation to climate change and environmental security. It will then identify and discuss relevant international instruments that provide the international framework for environmental security.

- The scientific basis of climate change and its main drivers
- Potential impacts of climate change for national and regional security in the IOR
- The transformation in energy systems and other measures that will be required to mitigate climate change
- Case studies on IOR national security strategies and environmental policy options in relation to climate change and environmental security
- Case studies of conflict over natural resources in the Indian Ocean, exploring environmental impacts

- The protection the land environment under relevant international instruments
- The management of sea resources under relevant international instruments
- Regional conventions and arrangements relevant to environmental security
- Impacts of sea-level rise
- Environmental governance and climate change
- Renewable energy projects in the Indian Ocean
- Settling environmental disputes caused by climate change.

Week 3: Selected issues in environmental security

Week 3 will focus more specifically on key regional issues in IOR environmental security. It will address the specific enforcement and regulatory powers of Indian Ocean states to respond to a range of environmental risks. It will also address technical issues in environmental security. The class will conduct an environmental threat identification and ranking exercise.

- Environmental movements in the IOR
- Water security
- Biosecurity threats and management
- Disaster risk reduction
- Urban environmental security
- Marine protected areas
- Food security
- Waste management
- Environmental security assessment
- Environmental conflict management
- Environmental governance
- Agriculture, natural resources and sustainable development
- Forestry
- Coastal management.

Week 4: Policy and administrative issues

Week 4 will address a range of issues associated with the development of policy and administrative arrangements for environmental security at both the national and the regional levels. Best practice and lessons learned in the management of environmental security at those levels will be discussed, and there will be a major focus on the promotion of cooperation at both levels. There will be an environmental disaster contingency tabletop exercise.

- Environmental security as an issue of public policy for Indian Ocean states
- Capacity building for environmental security—developing best practice
- New and emerging technologies for environmental security (such as uncrewed systems)
- National and regional coordination of environmental security
- Crisis management and response (using oil spills in the region as a case study)
- HADR in the region
- The role of intelligence agencies in environmental security, especially information sharing and decision support
- Maritime domain awareness and protecting the marine environment
- The role and regulation of private companies in environmental management
- The role of armed forces and the environment
- The role of multilateral approaches in mitigating environmental security threats
- Course review.

Annex 4: IOCES — indicative research agenda

Given the environmental security challenges that the Indian Ocean is facing, IOCES will have a research *function*.

IOCES research will help environmental security authorities do their jobs as effectively as possible by delivering high-quality analysis and insights. In particular, IOCES research might focus on identifying technologies and capabilities for responding to environmental security challenges. Research might be contracted out to academia, think tanks and private companies. IOCES will identify operational gaps where technology might enhance Indian Ocean states' capabilities to

respond to environmental threats.

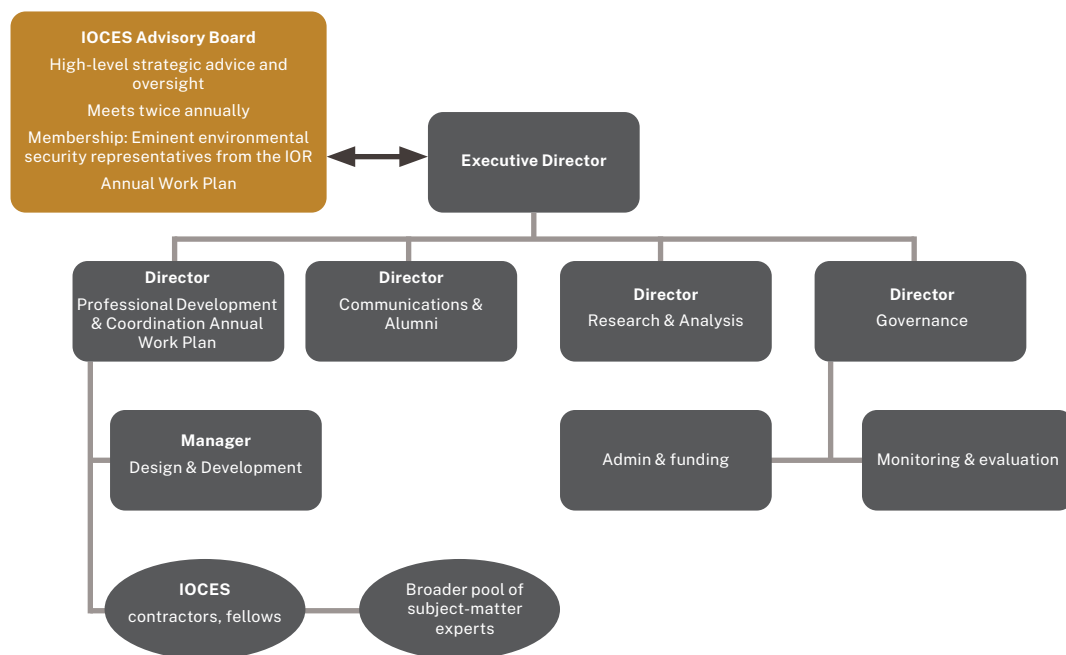
IOCES could examine national and legal barriers *that nations face in responding to environmental threats as well as information barriers that prevent greater regional cooperation on environmental factors that may affect security*. IOCES might, for example, conduct a comprehensive IOR climate risk assessment that incorporates security impacts.

Key research themes should be principally member driven and funded.

Annex 5: Possible IOCES organisational structure and illustrative duty statements for key staff

IOCES would be a small, nimble organisation focused on delivering outcomes. At maturity it would have around a dozen staff (Figure 4)

Figure 4: IOCES organisational structure



Illustrative duty statements

Executive Director

- Provide leadership and strategic direction to develop, design and manage IOCES with partners that reach an Australian and Indian Ocean audience.
- Oversee the day-to-day activities of the centre.
- Provide oversight and direction to the governance and reporting function.
- Engage with Australian and other Indian Ocean regional agencies to ensure the coordination and deconfliction of training.
- Be responsible for the development (in collaboration with the team and stakeholders) of all high-level IOCES program deliverables.
- Oversee the creation of links with environmental and security agencies in the IOR and specific training providers in areas where they are able to support the effective implementation of IOCES work plans.
- Oversee the development and maintenance of an effective alumni program for the centre.
- Lead a strong strategic communications function for IOCES.
- Be responsible for developing and implementing a strategic plan for IOCES.
- Evaluate the effectiveness of IOCES structure and programs to ensure success.
- Represent the centre to the broader Indian Ocean environmental security community and stakeholders.
- Foster innovation in all aspects of IOCES activities.
- In collaboration with relevant IOCES staff, coordinate the compilation of a baseline of environmental security training capabilities and capacity in consultation with Indian Ocean countries.
- In cooperation with Indian Ocean countries and relevant IOCES staff, coordinate a comprehensive needs analysis for professional development in environmental security for the IOR.
- Work with the Director, Communication and Alumni to seek, build and develop ongoing relationships and partnerships with environmental security leaders and senior environmental security stakeholders.
- Guided by the IOCES Advisory Board, develop a range of activities and work plans that lead to capacity development and learning activities for Indian ocean countries in the environmental security sector. The activities will be tailored (based on the needs analysis) and relevant to individual country issues and shared Indian Ocean environmental security issues.
- Coordinate the delivery of the centre's program of training and learning events.
- Create links with learning institutions, government agencies and specific training and learning providers in niche environmental security areas that are able to support the effective implementation of the centre's work plans.
- Contribute to an effective alumni program that allows for ongoing engagement with former course participants with the centre to discuss and resolve regional environmental security issues.
- Contribute to the development and maintenance of a strong strategic communications function for the centre.

Director, Professional Development and Coordination

- Establish innovative ways to develop and deliver professional development to the IOR on matters relating to environmental security.

- Represent the centre to the broader Indian Ocean community.

Director, Communications and Alumni

- In collaboration with the Executive Director and senior IOCES staff, lead an effective alumni program that allows for the ongoing engagement and interconnectedness of environmental security professionals engaging with the centre.
- Develop a comprehensive communications strategy for the centre to engage key stakeholders, supported by an effective website and social media presence.
- Seek, build and develop ongoing relationships and partnerships with environmental security leaders and senior stakeholders.
- Work with the Director, Professional Development to create links with learning institutions, government agencies and specific training and learning providers in niche environmental security areas that are able to support the effective implementation of the centre's work plans.

Director, Research and Analysis

- In collaboration with the Executive Director and senior IOCES staff, set the strategic research direction and oversee the activities of the research program, including by identifying suitable external contributors to the program.

- Manage the research program budget, financial delegations and staffing.
- Identify potential sources of revenue for the research program and support fundraising activities.
- Represent IOCES in public discussions of environmental security issues.
- Assist in the planning and conduct of seminars and other events.
- Report on outcomes and activities as required to the Executive Director.

Director, Governance

- Be responsible for IOCES human resources management, including recruitment; performance management; employee relations; compliance; learning and development; work health and safety; grievance handling; and the writing and implementation of human resources processes, policies and procedures.
- Be responsible for ongoing IOCES operations and procedures in finance, administration, external relations, events and IT.
- Provide support to the Executive Director.

Annex 6: SWOT analysis on IOCES

Strengths	Weaknesses
<ul style="list-style-type: none"> • Strong support for the IOCES concept • Likely to develop strong ties with the donor community and with influential elements of the environmental security community—including institutions and organisations within the region • Generally strong support for a Perth base • Appropriate timing • Potential very high for the delivery of professional training and capacity building • Confidence that Indian Ocean states would be reasonably represented on the IOCES Advisory Board 	<ul style="list-style-type: none"> • Not clear about resources and who would provide core funding • High degree of competition for limited funding • Not clear what gaps IOCES is trying to address that cannot be addressed through increased attention by other bodies • Unclear where the demand is • Concept is accepted, but no detail about how it will be governed or its activities • Unsure what attention/resources would be deployed to raise the profile of IOCES • Unclear how IOCES will be agile and responsive to emerging issues
Opportunities	Threats
<ul style="list-style-type: none"> • Numerous national, regional and international activities and events offer significant opportunity for IOCES awareness raising and engagement • Offers integration potential for professional development in environmental security not currently being achieved • Would profile the Indian Ocean as a centre of excellence in environmental security affairs and strengthen engagement in global ocean environmental initiatives, such as those dealing with marine debris • Serve as an important regional vehicle for raising political awareness of environmental factors in security • Build existing strategic partnerships among donors and researchers and expand networks in environmental security in the IOR • Offers consolidation of information on environmental security dispersed across organisations • Elevates environmental security nationally and regionally • Attracts new funding and resources as an appealing new initiative that is conveniently timed to coincide with global initiatives to promote environmental management • Attracts new partner agencies and donors • Serves as a major partner and facilitator in environmental security capacity building • Contributes to long-term alumni who will eventually become influential in environmental security affairs • Assists in identifying current gaps in environmental security and contributes to future project planning • Reduces duplication of initiatives in environmental security training 	<ul style="list-style-type: none"> • Lack of financial support • Changing priorities of donors • Disruption of existing programs on the environment provided by national and regional bodies • Viewed as an Australian, not an IOR, body • Quality of professional development training not assured • Indian Ocean states' support not forthcoming • Establishment of IOCES might cause established partnerships of regional bodies to deteriorate, leading to some trying to discredit the initiative • Other national and regional bodies do not engage because of implications for their own 'branding' • IOCES does not meet the needs of Indian Ocean states

Based on authors' stakeholder engagement

Annex 7: Indicative establishment and running costs for a stand-alone IOCES

Note: The option of expanding the remit of an existing body, such as the IPESF, or putting IOCES under the auspices of IORA, would place less demand on core budget requirements than would be associated with the establishment of IOCES as a stand-alone organisation.

Assumptions

- 4 core courses per year, each of 30 students
- 10 students in each course will be sponsored (paying own airfares; cost recovery of accommodation and tuition fees)
- Approximately 75% of lectures and syndicate problems will be delivered by external lecturers

Staff

Positions	Annual salary (\$A)
Executive Director	250,000
Executive assistant	100,000
4 x deputy directors @\$150,000 each	600,000
IT Officer	120,000
Office Manager	130,000
2 x administrative assistants @ \$90,000 each	180,000
2 x research assistant @ \$90,000 each	180,000
Total	1,270,000

Office space

Position	Office space (m ²)	Requirements (m ²)
Executive Director	20	20
Executive Assistant	12	12
Deputy directors	15 x 4	60
IT Officer	15	15
Research assistant x 2	12	24
General office	50	50
Seminar rooms x 3	50	150
Main lecture theatre	300	300
Store rooms etc.	100	100
Total		731

- Assume requirement is 800 m².
- Perth rental of \$450/m²/year.⁴⁹
- Therefore annual rental = \$480,000/year.

Timeline

- Day 1
 - Appoint Director and executive assistant
 - Appoint Project Manager and assistant
- Day 1 + 6 months
 - Appoint remaining staff
 - Start fit-out
- Day 1 + 12 months
 - Start first course

Start-up costs

Item	Cost (\$A)
Salaries	800,000
Temporary office rental	100,000
Vehicles x 2	100,000
Fit-out	250,000
Furnishings	100,000
IT equipment	100,000
Rental	180,000
Recruitment	50,000
Travel — mainly overseas for Director to promote the centre and attract students from target countries	100,000
Contingency	100,000
Total	1,880,000

Running costs per year

Item	Cost (\$A)
Salaries	1,270,000
Office rental	360,000
Staff travel	50,000
Student accommodation, meals, per diems (4 courses x 30 students x \$300 per day)	1,080,000
Airfares – non-sponsored students (4 courses x 20 students x \$2,000)	160,000
Local transport – centre vehicles, bus hire etc	100,000
Insurance	100,000
Lecturer costs (3 sessions/day x 20 x \$1,000/session; accommodation and meals; airfares)	280,000
Contingency	100,000
Total	3,500,000

Income (from sponsored students)

Item	Income (\$A)
Tuition fees (10 x 4 x \$10,000)	400,000
Accommodation etc. (cost recovery): 4 x 10 x 30 x \$300	360,000
Total	760,000

Approximate annual costs

Running costs (\$3,500,000) less income (\$760,000) = \$2,740,000

Acronyms and abbreviations

AFMA	Australian Fisheries Management Authority
AFP	Australian Federal Police
ANU	Australian National University
APEC	Asia-Pacific Economic Cooperation
ARF	ASEAN Regional Forum
ASEAN	Association of Southeast Asian Nations
AU	African Union
BIMSTEC	Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation
CSIRO	Commonwealth Scientific and Industrial Research Organisation
EAC	East African Community
EEZ	exclusive economic zone
EU	European Union
FRANZ	France, Australia, New Zealand
GCC	Gulf Cooperation Council
GMCP	Global Maritime Crime Programme
GOOS	Global Ocean Observing System
INDOPACOM	US Indo-Pacific Command
IOC	Indian Ocean Commission
IOCES	Indian Ocean Centre for Environmental Security
IODES	Indian Ocean Dialogue on Environmental Security
IOGOOS	Indian Ocean Global Ocean Observing System
IONS	Indian Ocean Naval Symposium
IOR	Indian Ocean region
IORA	Indian Ocean Rim Association
IOTC	Indian Ocean Tuna Commission
IPESP	Indo Pacific Environmental Security Partnership
IUU	illegal, unreported and unregulated
JCLEC	Jakarta Centre for Law Enforcement Cooperation
LeT	Lashkar-e-Taiba
LTTE	Liberation Tigers of Tamil Eelam
NGO	non-government organisation
NITI Aayog	National Institution for Transforming India
SAARC	South Asian Association for Regional Cooperation
SACEP	South Asia Co-operative Environment Program
SADC	Southern African Development Community
SCO	Shanghai Cooperation Organisation
UN	United Nations
UNESCO-IOC	UNESCO Intergovernmental Oceanographic Commission
UNODC	UN Office on Drugs and Crime
US	United States
UWA	University of Western Australia

Endnotes

1. For the purposes of this report, 'Indian Ocean states' means the littoral states of the Indian Ocean, including associated waters of the Bay of Bengal, Arabian Sea, Persian Gulf and Red Sea. The great majority of those states are members of the Indian Ocean Rim Association (IORA), which is the leading political grouping of the IOR.
2. Office of the Director of National Intelligence, *Annual threat assessment of the US national intelligence community*, US Government, February 2022, 21.
3. Australia is a lead partner on the maritime ecology pillar of the Australia–India Indo-Pacific Oceans Initiative Partnership, which helps to shape maritime cooperation in the Indo-Pacific.
4. Robert Glasser, *Preparing for the Era of Disasters*, Australian Strategic Policy Institute (ASPI), Canberra, March 2019.
5. Intergovernmental Panel on Climate Change (IPCC), *Managing the risks of extreme events and disasters to advance climate change adaptation*, 2012, Chapter 9.
6. 'Severe cyclonic storms intensity in northern Indian Ocean increasing', *Mint*, 29 July 2021.
7. US Agency for International Development (USAID), 'Climate change risk profile: Madagascar', fact sheet, US Government, 2016.
8. Rebecca Hersher, 'Mozambique is racing to adapt to climate change. The weather is winning', *National Public Radio*, 27 December 2019.
9. Food and Agriculture Organization of the United Nations, *State of world fisheries and aquaculture*, 2014.
10. David J Agnew, John Pearce, Ganapathiraju Pramod, Tom Peatman, Reg Watson, John R Beddington, Tony J Pitcher, 'Estimating the worldwide extent of illegal fishing', *PLoS ONE*, 2009, 4(2).
11. Shiraz Habbib, 'Indian Ocean second-most polluted in the world', *Northglen News*, 2 June 2016.
12. BD Hardesty, TJ Lawson, T van der Velde, M Lansdell, 'Estimating quantities and sources of marine debris at a continental scale', *Frontiers in Ecology & Evolution*, vol. 15, 2016; JR Jambeck, R Geyer, C Wilcox, TR Siegler, M Perryman, A Andrady, R Narayan, KL Law, 'Plastic waste inputs from land into the ocean', *Science*, 13 February 2015, 3.
13. US Energy Information Administration, 2020.
14. C Bueger, T Edmunds, *Mauritius oil spill reveals weakness of maritime security architecture in the Western Indian Ocean*, ORF: Observer Research Foundation, 3 September 2020.
15. D Brewster, 'Tackling environmental security threats in the Indian Ocean', *The Interpreter*, Lowy Foundation, Sydney, 14 September 2020.
16. Malaka Rodrigo, 'Oil tanker fire in Sri Lanka's rich waters highlights need for preparedness', *Mongabay*, 1 October 2020.
17. Malaka Rodrigo, 'Oil tanker fire in Sri Lanka's rich waters underscores need for preparedness', *Eco-Business*, 2 October 2020.
18. Joseph Hincks, 'A rusting oil tanker off the coast of Yemen is an environmental catastrophe waiting to happen. Can anyone prevent it?', *Time*, 14 May 2021.
19. IPCC, *AR5 Climate change 2014: impacts, adaptation, and vulnerability*, Chapter 12, 'Human security'.
20. UNISDR, *Global assessment report on disaster risk reduction 2015*, p.107.
21. D Rumley, 'A policy framework for fisheries conflicts in the Indian Ocean', in D Rumley, S Chaturvedi, V Sakhuja (eds), *Fisheries exploitation in the Indian Ocean: threats and opportunities*, Institute of Southeast Asian Studies, 2009.

22. A Bergin, D Brewster, F Gemenne, P Barnes, *Environmental security in the eastern Indian Ocean, Antarctica and the Southern Ocean: a risk mapping approach*, National Security College, ANU, May 2019.
23. F Gemenne, S Kabbej, R Monange, J Tasse, *Climate security in the western Indian Ocean*, IRIS: Institute de Relations Internationales et Stratégique, France, September 2020.
24. Glasser, *Preparing for the Era of Disasters*.
25. Adapted from Shlomo Mizrahi, 'Cascading disasters, information cascades and continuous time models of domino effects', *International Journal of Disaster Risk Reduction*, vol. 49, October 2020. See Economic and Social Commission for Asia and the Pacific, *Resilience in a riskier world: managing systemic risks from biological and other natural hazards: Asia-Pacific disaster report 2021*.
26. Peter Kerins, *Somali perspectives on piracy and illegal fishing*, Oceans Beyond Piracy, no date; M Sow, *Piracy and illegal fishing in Somalia*, Brookings Institution, 12 April 2017.
27. CB Hull, B Tarrant, 'Tale of war and peace in the 2004 tsunami', *Reuters*, 18 December 2009.
28. Maldivian Democracy Network, *Preliminary assessment of radicalisation in the Maldives*, 2016.
29. N Manoharan, 'Divergent Maldives: too close for comfort', *Deccan Herald*, 4 September 2018.
30. Edward Aspinall, *Islam and nation: separatist rebellion in Aceh, Indonesia*, National University of Singapore Press, Singapore, 2009.
31. J Burton, 'Piracy in Aceh waters ceases after tsunami', *Financial Times*, 6 January 2005.
32. T Madan, 'The rise, fall, and rebirth of the "Quad"', *War on the Rocks*, 16 November 2017.
33. See, for example, the media release of the 21st IORA Council of Ministers Meeting, 17 November 2021, which adopted a memorandum of understanding between the Coalition for Disaster Resilient Infrastructure and IORA for promoting the resilience of new and the existing infrastructures to reduce and eliminate climate and disaster risks within the IOR.
34. Pacific Environmental Security Forum.
35. 'Disaster risk management', IORA.
36. L Luke, *FRANZ disaster relief co-ordination a model for the Indian Ocean region*, Future Directions International, 30 October 2013.
37. Anura Shrestha, *Regional cooperation on disaster risk reduction*, South Asia Watch on Trade, Economics and Environment, no date.
38. 'Disaster risk management', IORA.
39. Joint Statement of France, Australia and New Zealand, December 1992.
40. Indian Coast Guard, *Oil Spill Disaster Contingency Plan (NOS-DCP)*, Indian Government.
41. National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA).
42. Australian Marine Oil Spill Centre (AMOSOC).
43. Seychelles Coast Guard (SCG).
44. Cedre.
45. Mars Analogues for Space Exploration (MASE).
46. Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region (Nairobi Convention), 21 June 1985.
47. Indian Ocean Tsunami Warning and Mitigation System.
48. 'EAC partner states join forces against eco-threats to the region's estimated US\$11 billion annual natural capital', news release, East African Community, 17 December 2021.
49. See, for example, REIWA.com.



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