INTERNATIONAL MARITIME RESCUE FEDERATION

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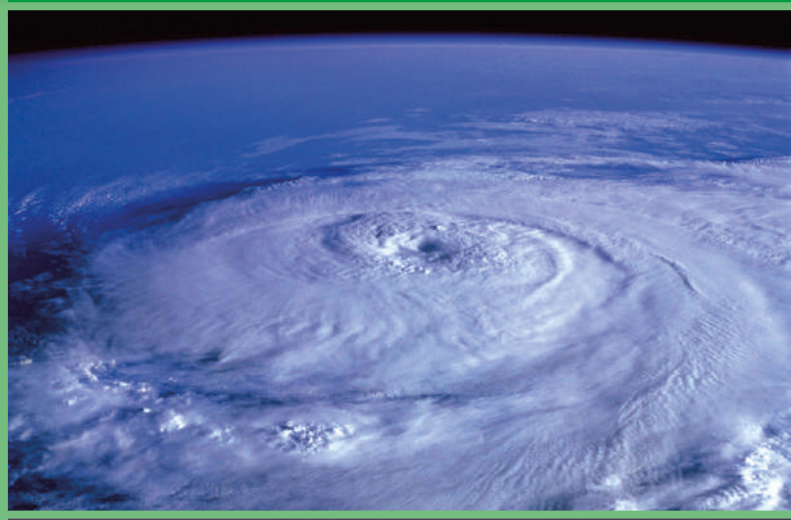
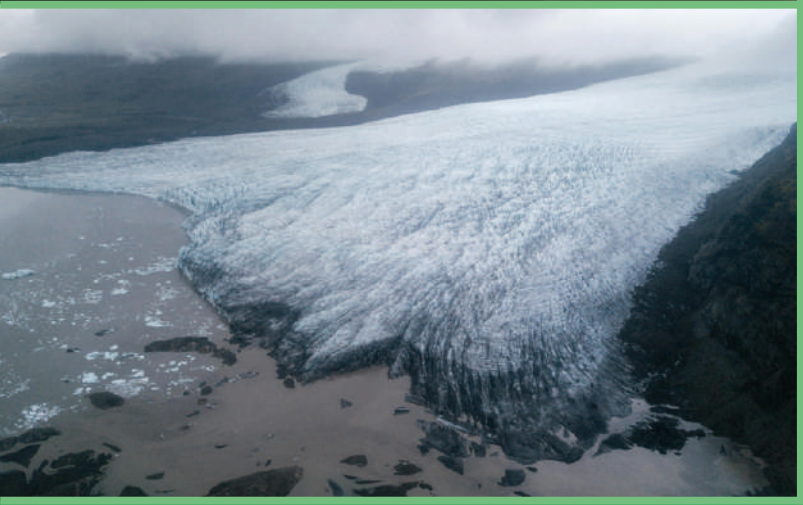
IMRF #FutureSAR





Phase 2:
Harnessing the Tides of Change

Final Report
December 2025


INTERNATIONAL
MARITIME RESCUE
FEDERATION

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Photo: SSRS

Introduction

Search and rescue (SAR) is built on simple promises: when someone calls for help, we go; when conditions worsen, we adapt. Climate change is testing both promises at once. It is changing the weather we face, the places we work, and the kinds of incidents we attend. It is also changing the pace. Seasons are longer, surges come more often, and crews have less time to recover between jobs.

IMRF #FutureSAR Phase 2 set out to meet this shift with practical steps that any organisation – large or small, paid or volunteer – can use today. We have focused on simple tools and shared language. The aim is not to predict every future, but to help crews keep launching as coastlines move, seas warm, and tasks multiply.

This report gathers what we learned and built together with IMRF members and partners around the world. This report follows from where the previous report – Tides of Change – stopped. In that report, we identified 85 different impacts that climate change may have on SAR services. In this report we provide a tool for SAR organisations to use to prepare for those impacts.

At the beginning of the report there are short case-based sections that show how climate impacts now appear on the water and at the shoreline: changes in rescue vessel propulsion and fuel; operational personnel mental health; flood rescue; Arctic and remote rescue; relocating or adjusting SAR stations; and SAR unit encounters with marine life.

A central outcome of Phase 2 is the Impact Response Card – a simple risk assessment and action planner that helps turn climate risk into action. It lets a station or organisation pick one hazard (flooding, heat, shoreline erosion, ice, stingers, and so on), score its likely impact on people, assets, facilities, operations or support, and then write down the next concrete action steps to be undertaken before, during and after an event.

To share what we know on preparations and adaptation, we built a climate response library in the IMRF website, where the filled in Impact Response Cards can be shared. The organisations can choose what information in the card is public or private, and can update their progress over time. It is a simple system by design. It lets a small volunteer unit on a river and a national service on an ocean speak in the same terms and learn from each other without heavy software or long guidance.

What follows is not a grand plan. It is a working set of stories and tools you can use this year. Start with one hazard and one station. Fill in one card. Share one action you completed. Add one small safeguard for your crew's health. Then repeat. As we keep doing that, across hundreds of stations and many countries, we will have done the most important thing: we will have kept our promises – to go when called and to adapt when conditions change.

Find the tools online at:
www.international-maritime-rescue.org/futuresar

Case #1: SAR Vessel Propulsion and Fuel

Climate change is changing where and how rescue crews work. Additionally, pressure towards net zero carbon emissions affects SAR organisations. This has pushed many organisations to look again at the engines that power their boats. Hybrid-electric designs are no longer just trials. They are entering service because they cut emissions, make less noise, and give crews strong, instant control around casualties. They also add a useful safety back-up if a main engine fails.

A good example comes from Canada. In 2023, the Canadian Coast Guard announced its first diesel-electric hybrid, built with a battery energy storage system so crews can work near ports and communities with less fuel use and less exhaust. The decision is framed as both an environmental step to fight climate change and a practical one for everyday operations.

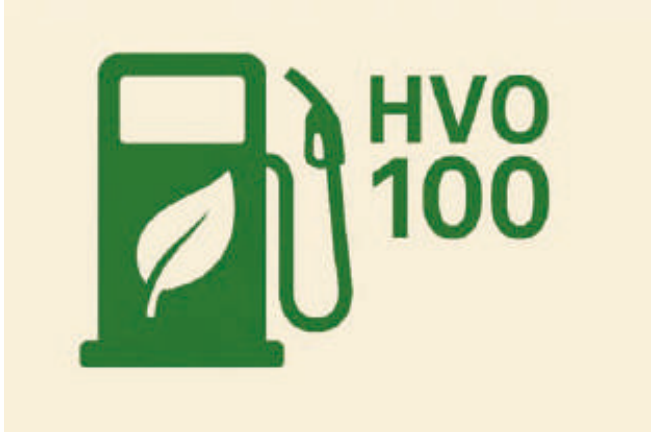
Similar ideas are appearing in rescue fleets across Europe. In Sweden, the Swedish Sea Rescue Society adopted in 2020 a parallel-hybrid set-up that pairs twin Scania diesels with an electric drive system. The vessel can operate with electricity for one and half hours with a speed of six knots. That may be useful in marinas, in sensitive waterways or during search operations.

Similarly, in Germany (2024), a new electric rescue boat delivered to City of Kiel Rescue Department uses both electric and diesel power and has been built for rescue, firefighting and disaster response in the Kiel canal and up to 10 nm off the coast. The vessel is able to operate using either the diesel engines, the electric engines (for 2 hours at 6 knots) or both.

Norway's Sea Rescue Society has taken the concept into true all-weather territory in 2024, ordering a hybrid boat aimed at around 30 knots, 600 nautical miles of range and about 30 tonnes of bollard pull – the first of its kind at that size for Norway, with delivery scheduled for 2026. That order is a clear sign that hybrid power is moving beyond harbours and into blue-water rescue.

The shift is not limited to small boats. China's Shenhai 01, built in 2020, is a large hybrid-electric rescue vessel that uses integrated power and energy management system to improve safety, efficiency and manoeuvring. It can operate for three hours through the electric engine. The ship shows the same ideas can scale up to bigger platforms that work offshore and in heavy weather.

In addition to hybrid propulsion, and some attempts at fully electrical SAR vessels (such as the electrically operated rescue runner), other innovations are taking place. The Dutch KNRM is cutting emissions by switching its lifeboats and vehicles to HVO (hydrotreated vegetable oil) fuel. HVO100 is a renewable diesel that can reduce CO_2 by roughly 90–95% compared with conventional marine diesel – and importantly newbuilds and many existing vessels can be migrated to the same fuel. KNRM's ESG plan is to drive down fleet emissions dramatically, showing how a rescue service can decarbonise without waiting for future hulls or engines.



These projects tell a simple story. SAR organisations are not passive players in the face of climate change. Hybrid and electric boats fit that world. They let crews work with less noise and exhaust, keep strong control in tight spaces, and hold a reserve of battery power if something goes wrong. The technology spans everything from fast-rescue boats to large all-weather craft. In the phase such innovations are not a "green extra", but equipment that makes rescues safer and more effective.

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Case #2: SAR Operational Personnel Welfare

Hotter summers, wet winters and longer seasons are changing who we rescue and how often. This shift lands directly on the people doing the work. Mountain rescue in Italy offers a useful case study. Warmer winters and more unstable conditions are changing when people head into the hills, what goes wrong, and how long teams stay out. Crews are adapting to these changes. The human lesson is the same at sea: the job is changing, so the support must change too.

In SAR, warmer conditions lengthen busy periods for floods, wildfires and heat-related call-outs, so recovery time between tough jobs shrinks. Scenes themselves are harder: heat, wildfire smoke, sewage-laden floodwater, and longer hours in heavy PPE increase dehydration, infection risk and strain injuries. There is also the moral load. Crews can spend days searching with uncertain outcomes, sometimes in full public view. Research on disaster responders shows that repeated exposure to difficult scenes is linked with real health effects – both physical (like fatigue and musculoskeletal pain) and psychological (including anxiety, low mood and post-traumatic stress). After major incidents these symptoms can persist, and if the tempo stays high, they build up over time.

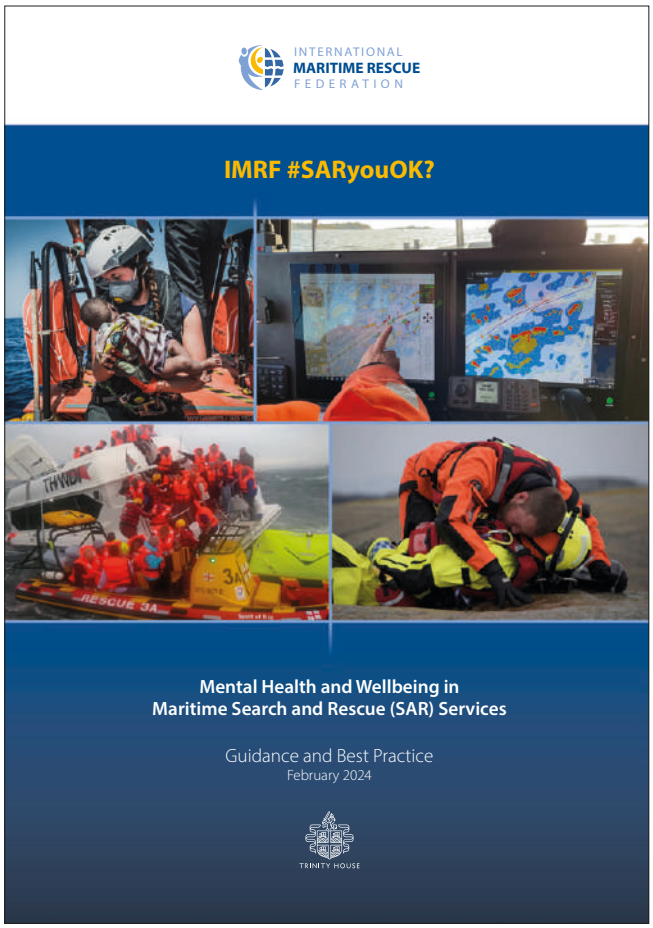
You can see this picture across different services. In the UK fire and rescue sector, a large survey of more than three thousand staff and volunteers found that disrupted sleep, occupational stress, burnout, anxiety and depression are impacting the service. Prevention and support are needed over an entire career, not just after a single incident. SAR guidance mirrors this.

The IMRF's #SARyouOK? campaign talks openly about the kind of distress crews carry home after long searches, mass-casualty scenes or recoveries, and why normalising help-seeking is part of being operationally ready.

What helps is not a single new piece of kit, but a way of working that treats wellbeing as part of the mission. Coast Guard authors have written about a "crisis of responsibility and force protection," arguing that tempo, duty and stigma can keep people from asking for help unless leaders make it clear – again and again – that using support is a sign of professionalism, not weakness. New Zealand's national approach turns that message into structure. NZSAR treats health, safety and wellbeing as a system-level responsibility, with clear guidance, training and oversight across the sector. That kind of governance becomes essential when climate change pushes demand up year after year.

Small design choices matter too. Set up shaded points and cooling plans during heat waves. Rotate the heaviest, hottest tasks. Brief families before the busy season so home life can adjust when call-outs surge. And measure what counts: track sleep debt, overtime, heat exposure and self-reported stress alongside other response metrics. These are simple habits, but together they change outcomes.

The thread through all these examples is clear. Climate change is turning surge into the new normal. If we do nothing, that means more exposure, less recovery, and growing risk of harm to the very people we rely on. But we are not starting from zero. We have evidence about what works, national frameworks that set the tone (NZSAR), sector campaigns that open the conversation (#SARyouOK?), and practical tools we can use this month. Investing in crew health is not separate from mission success – it is mission success when the season runs long.



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Case #3: SAR Operation Types

Floods are coming faster, lasting longer and hitting places that did not flood before. That changes the work of rescue teams. Instead of mostly coastal call-outs, crews must now prepare to spend more time in fast, dirty water that runs through streets, car parks and fields. The conditions may resemble those of a river, but they are often faster and more perilous. Power lines may still be live. Debris and oil move with the flow. Boats can flip if they are loaded badly or caught by wind and current. Teams have to add new tools – shallow-draft inflatables, measuring poles, or tools to break house windows – and special PPE, not to mention new skills or new ways of working, including airlifts and help from neighbouring regions and countries.

The risks are not theoretical. During the September 2025 monsoon in Pakistan, evacuation boats overturned on swollen rivers, first with nine deaths and then, a few days later, five more. Authorities pointed to strong currents and high winds. These tragedies show how quickly a rescue boat can become a casualty in flood water.

Services are adapting. In 2025, Suffolk Fire & Rescue Service in England acquired two Zodiac ERB 400 powered boats and inflatable rescue sleds. The unit is built for exactly what crews now face: fast water in built-up areas, mud and soft ground where wheels fail, and short, repeated shuttles to high ground. After deadly floods in Nova Scotia, Canada, in 2023, local leaders stressed how station rescue boats had saved lives and argued that more rural fire stations should be funded to carry similar craft. The message was simple: flood boats are not a luxury, they are now essential.

Big events often need outside help. In July 2025, a 45-person team from Protección Civil Nuevo León crossed from Mexico into Texas with boats, drones and search dogs to support river rescues alongside US agencies. It was a clear example of rapid mutual aid when local capacity was stretched. In Western Alaska this same autumn, coastal flooding and erosion cut off small communities reachable only by air or water. The response turned into one of the largest airlift operations in state history, a reminder that flood plans must include aviation bridges when roads are under water.

Alongside these case studies on new equipment and mutual assistance, the sector is sharing lessons in a more organised way. The FloodFighters@ Seawork 2025 seminar brought operators together to compare tactics, equipment and training for a warming world. Technical articles aimed at firefighters and water-rescue teams are pushing the same basics: keep rescuers out of the water when possible, manage boat loading and trim, choose routes that avoid hazards, and use decontamination after every deployment.

Main Stage - Virtual
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Flood rescue is no longer an occasional assist to the main maritime mission. In many places, it is a core task in a changing climate. The pattern keeps repeating: more water where people live, more debris and contamination in the flow, more wind-driven currents, and far more demand for the right boats, training and mutual-aid plans than many services expected. The good news is that practical answers already exist – and they are spreading through real-world examples. The challenge is to make these approaches standard before the next flood arrives.

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Case #4: SAR Operation Location

Climate change is shifting where people travel and work at sea. In the Arctic, sea ice is thinner and the open-water season is longer. Cruise ships and small expedition vessels are pushing further north and staying later into autumn. Cargo routes are also testing higher-latitude options. According to Arctic Council, the number of ships entering the Arctic grew by 25% between 2013-2019. The result is simple: more people and more ships are now far from roads, medevac runways and deepwater ports. When trouble starts, the nearest help can be many hours away if assets remain based in the south.

The difficulties are illustrated by the accidents of Clipper Adventurer in 2010 and Akademic Ioffe in 2018. In 2021 the Arctic Mass Rescue Operation exercised a cruise ship fire with 200 people at risk off Svalbard (Norway). The EPIRB distress signal was picked up and located in about two minutes through the Galileo satellite system, which shows that high-latitude alerting can be fast and reliable. But once the alarm went out, the old problem returned: very few rescue assets were close by. Good signals do not shorten long sea passages.

Industry forecasts suggest this pressure will grow. Global Maritime Trends 2050 report expects changing trade flows, new energy projects and different port patterns under several climate and technology scenarios. Some of those futures point to more ships in or near the Arctic, and to busy bottlenecks where only limited rescue cover exists today. Risk collects at these chokepoints and remote terminals long before full infrastructure catches up.

The technology to stretch our reach is improving. Uncrewed aircraft and surface vehicles can search wide areas, relay communications and scout ice and weather along routes before manned craft arrive. In a region with long distances and few harbours, those tools can buy time, guide helicopters and boats to the right patch of ocean and reduce exposure for crews.

Incidents are moving north and outward faster than bases and fuel depots are. International agreements and joint exercises already exist; what is needed now is to place real capability – people, aircraft, vessels, fuel and shelters – closer to where ships and tourists actually are. In practice that means a mix of permanent northern hubs, seasonal detachments that follow the traffic, and smart use of satellites and drones to close the remaining gaps.

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Case #5: Relocating SAR Stations

Rescue crews don't launch from thin air. They launch from slipways, beaches and small harbours. As sea level rises and storms hit harder, those places are taking more damage. Doors and roofs fail in big winds. Salt-water gets into electrics. Beach profiles change in a single night. The effect is simple: more downtime, more repairs, and more decisions about how to keep launching when the water is where it didn't used to be.

We can already see what this looks like. During Storm Eunice in February 2022, the lifeboat station at Sennen Cove, UK, lost sections of its roof cladding. The crew had to restrict service while repairs were organised and funds raised. It was a very public reminder that a station itself can become a casualty in extreme weather. Other building projects now prepare for the extreme winds and sea-level rise. On England's east coast, in Wells-next-the-Sea in Norfolk, the new RNLI boathouse has been built on an elevated area, taking rising water levels into account.

In Hawaii, the problem shows up in a different way. As the shoreline retreats, lifeguard towers have had to be moved more than once. Local agencies are shifting to patrols on all-terrain vehicles, and placing new facilities outside the zones most likely to be hit by future sea-level rise. The message is clear: fixed towers and low-lying stores are a risky bet on a moving beach.

Research backs up these stories with numbers. A study of western Mediterranean ports found that the most significant impact on the studied ports will be the reduction of operability of berthing structures due to insufficient freeboard as a result of sea-level rise. As the baseline water level climbs, the freeboard between decks and the water gets too small. Operations slow down or become unsafe even if offshore waves have not changed much. The result is lost operability unless decks are raised or floating solutions are used. The same logic applies to SAR bases: if the water is higher, the window to launch gets tighter.

Put together, these cases point to a practical path. Stations will need more robust roofs and walls and clear plans for temporary limits on service after big storms. Launching may rely more on floating pontoons or raised aprons in harbours, and on alternative launch points when beaches steepen or access is cut.

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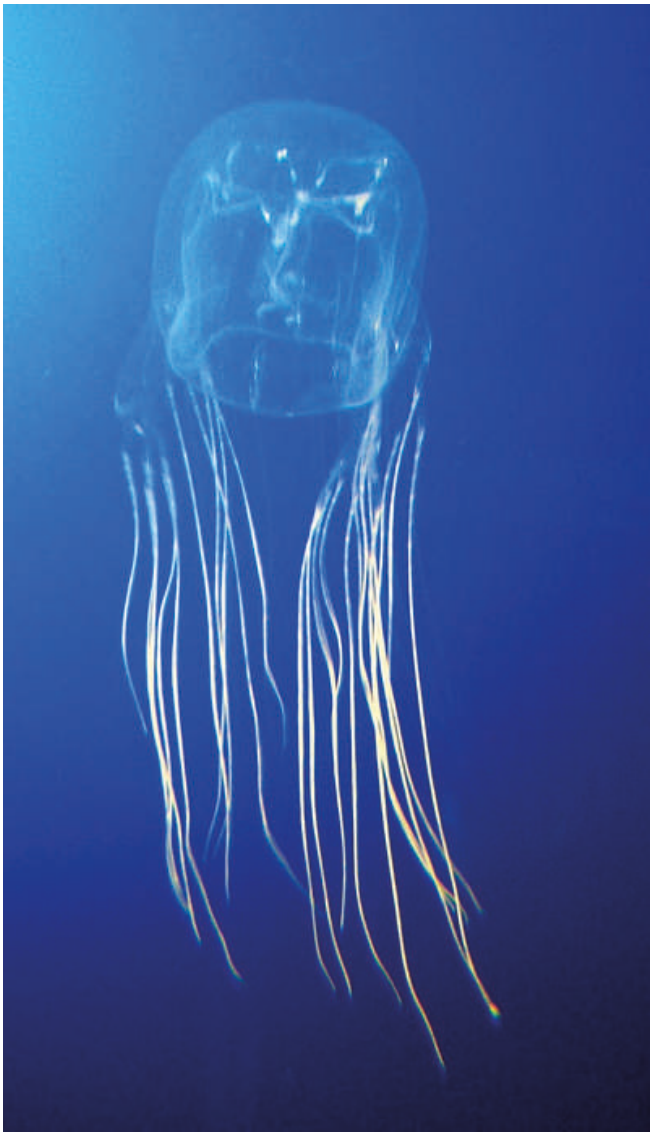
Case #6: SAR Units Facing New Marine Biota

Climate change is changing what lives in the seas and where those creatures appear. Warmer water, different salinity and shifting food chains are bringing new challenges to the rescue scene. Crews are finding for instance channels blocked by floating plants, beaches hit by sudden waves of jellyfish stings, and large marine mammals showing up where they were rare before. The stories below illustrate these impacts.

On Lake Victoria, bordering Uganda, Tanzania and Kenya, thick mats of water hyacinth can trap people as surely as a sandbar. Local reports describe men and small boats stuck for days, unable to push through. Standard rescue craft are struggling too: propellers clog, jet intakes overheat, and there is no room to manoeuvre. In some cases, locals cut paths by hand with machetes so a boat can reach the casualties. For responders, this means thinking differently about access – using shallow-draft, weed-tolerant boats, fitting guards on intakes and props, carrying cutting tools, or even flying drones to spot the few open leads.

On some coastlines, the hazard is not plants but stingers. In North Queensland, Australia, it is a regular part of life each summer that lifeguards drag the water for box jellyfish and Irukandji, set up swimming enclosures and wear full protective suits when they enter the sea. What is a routine for some areas, is a totally new experience for others. One hot weekend on Tybee Island in the south-eastern United States, lifeguards treated about 300 jellyfish stings. That kind of surge turns a quiet beach into a mass first-aid station and quickly drains supplies. Such surprises become more common with the changing climate.



In addition to wider ranges of dangerous jellies and lionfish, there have also been yellow-bellied sea snakes washing up in Southern California outside the usual El Niño pattern – one more sign that crews may face unfamiliar species as oceans warm. Species may not necessarily see an increase in abundance but will see their ranges shift as waters become too warm closer to the equator, pushing them northwards or southwards following their ideal temperature niches. For SAR teams, it is a matter of planning and preparation.

Large animals create planning issues even when they are not a direct threat. Right, humpback and fin whales have shifted their timing in key feeding areas. In the Gulf of Maine and Cape Cod Bay, peak use is now almost three weeks later than before, and right whales are staying longer. Mariners are being asked to change speed limits and fishing gear rules to match these new patterns. For SAR units, this means adjusting and adapting.

Sometimes the job is to help the animals themselves. When two dolphins stranded near Fraserburgh, UK, Fraserburgh RNLI crew worked with partners to refloat them. While saving animals may not be the primary task of SAR organisations, public pressure and changing cultural environment may drive organisations to fulfil such roles. Changing seas bring changing tasks.

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The Impact Response Card

The climate change Impact Response Card is a simple risk assessment tool for a changing climate. It is a tool that systematically evaluates climate readiness across multiple hazards and five key operational domains – People, Assets, Facilities, Operations, and Administration. It helps a SAR organisation take one hazard – say, more frequent storms, hotter summers, or coastal flooding – and turn lived experience into a short, shared assessment and action plan. The online form behind the card guides the assessor step by step, so the output is clear, comparable, and easy to brief to crews or station leaders.

By clearly identifying climate risks and the current adaptive capacities, the tool guides SAR organisations in prioritising critical adaptation actions. This approach supports proactive planning, informed decision-making, and enhanced operational resilience to climate hazards.

The principles behind the tool are:

- **Modularity**: Works for SAR organisations of different sizes and resources
- **Scalability**: Adaptable from local to national or regional contexts
- **Dynamic**: Reflects the evolving nature of climate risks
- **SAR-specific**: Built around real-world SAR operations and environments

We chose these principles to ensure the tool is practical, flexible, and directly applicable to the diverse operational contexts and evolving challenges faced by SAR organisations worldwide.

It starts with the basics: the assessor, the organisation name, geographical location, dates, the hazard being assessed, a short note explaining why this hazard was chosen now, and the timeframe for the assessment. These simple anchors matter when you come back later to compare seasons or repeat the assessment after an event. A copy of the response goes to the assessor's email, so records are easy to keep.

The heart of the card is a single table in the Risk and Adaptation Assessment section that looks at five domains of SAR work – people, assets, facilities, operations, and administration. For each domain, the assessor scores: how often the hazard is likely to hit; how severe the impact could be; today's adaptive capacity; and what further adaptation is needed. The scales are plain-language 1–5 bands (for example, probability runs from "Never" to "Very often," and severity from "Not severe" to "Extremely severe"), which keeps different teams scoring roughly in the same way. The result is a quick risk picture that management and crews can understand at a glance. There is also an open field where the scores can be explained briefly in order to provide some background information to the assessment.

From risk to response, next comes the Adaptation Planning - Action Tracker section, which asks the user to map what to do and when. For each action (for example, raising the door thresholds at a station, buying more advanced PPE), the tool records the domain, the timeframe (Pre-event, During, Post-event), who is responsible, resources needed, the priority (High, Medium, Low) and any notes. This turns the card into a live plan. It also keeps the card practical: not just red-amber-green, but who does what at each stage. The card allows planning multiple actions by clicking on the "Add New Action" button.

Finally, the Progress Tracking section lets the user return later and log what has been done. First, the action to which the progress refers to is recorded, followed by the status of the action (Not started, Ongoing, Completed, Not relevant), completion date, observed challenges, and any planned next steps.

There is also space for notes, links, and potential attachments. Before submitting, the user chooses how much of the content can be shared with the wider SAR community – just the hazard ID, the risk table as well, or the full action plan – while personal details will always stay private.

A short feedback box allows noting what worked and what didn't during the assessment, so the tool keeps improving with real-world use. A print option makes it easy to brief the team or tape the card to a noticeboard.

Once completed, each IRC feeds back into the dashboard, turning individual forms into a living adaptation library that is traceable, time-bound, and ready for monitoring.

How it fits #FutureSAR

For #FutureSAR, the Impact Response Card is the bridge between case studies and day-to-day practice. It lets a small station, a volunteer unit, or a national service all talk about climate impacts in the same, simple grammar – one hazard at a time, across the same five domains, using the same scales. That consistency helps in three ways:

- Faster learning: different stations can compare notes and spot patterns – even if their hazards are different – because the scoring and fields match.
- Smarter spending: action trackers and costs make gaps visible, which supports internal budgeting.
- Accountability over time: progress fields and dated cards show what changed between seasons, and which actions reduced risk.

Most of all, the card keeps the focus on the work: the people, boats, buildings, operations, and support systems that make rescues possible. It captures what hazards are doing to each of those, and it points to the next concrete step – so teams can keep launching, even as the shoreline, the weather, and the tasks keep changing.

You can find the Impact Response Card and the other tools at:

www.international-maritime-rescue.org/futuresar

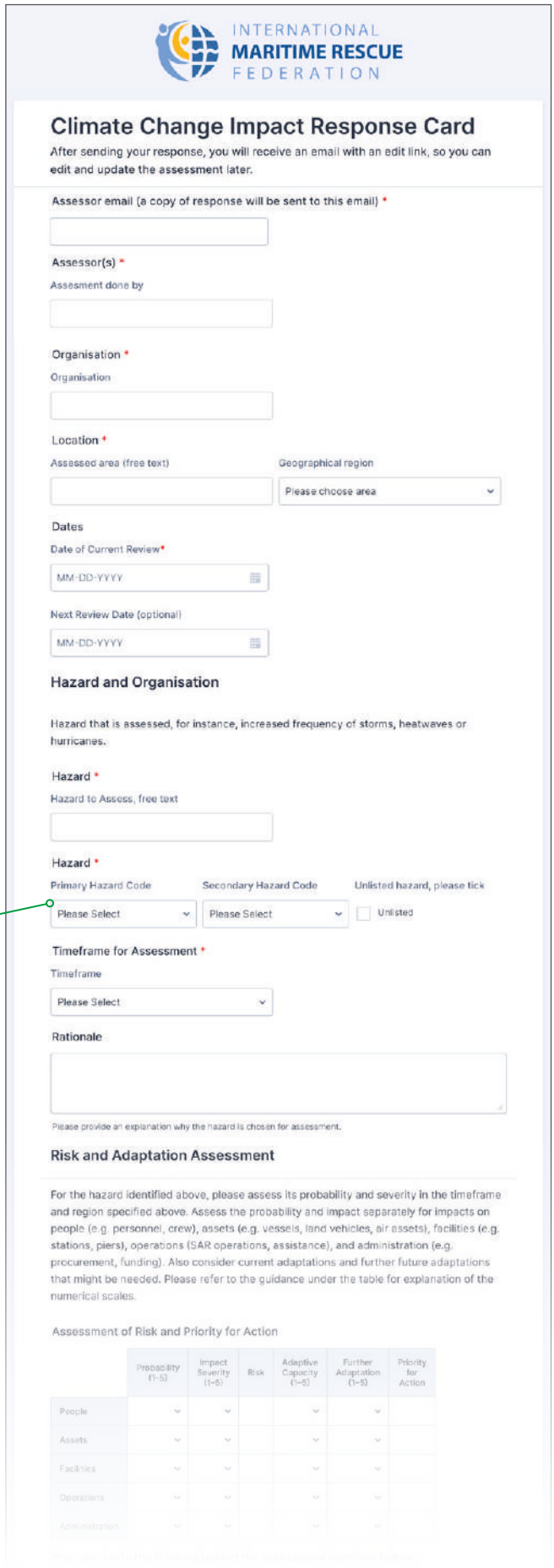
The Impact Response Card: User Guidance

This section provides short, practical guidance on using the Impact Response Cards.

Climate hazards

Please use the below hazard codes to classify the hazard you are assessing. Hazard codes serve as a classification aid in the IRC library to locate assessments of similar hazards.

	Hazard
HC1	Increased frequency of extreme weather events (e.g., storms, heatwaves, hurricanes, typhoons)
HC2	Increased wave heights and rougher seas
HC3	More frequent or prolonged flooding
HC4	Stronger or more unpredictable currents
HC5	Stronger and more unpredictable winds
HC6	Rising temperatures and more frequent heatwaves
HC7	Harsher cold spells and freezing conditions
HC8	Weaker and unpredictable ice conditions
HC9	More frequent wildfires, smoke, or sandstorms
HC10	Rising sea levels
HC11	Increased coastal erosion and sediment shifts
HC12	Decreased reliability of weather forecasts and increased unpredictability of weather conditions
HC13	Displacement or migration of people
HC14	New or increased presence of marine hazards (e.g., floating debris, algal blooms)
HC15	More frequent power and communication failures
HC16	Environmental stress (e.g., corrosion, heat stress, salinity)
HC17	Increased maintenance needs for SAR stations and vessels



Assessment Timeframe

Specify the exact temporal window for the assessment so that components in the risk assessment are interpreted consistently:

- 1-12 months (short term)
- 1-10 years (medium term)
- 10+ years (long term)

Choose the narrowest window that still captures the decision horizon; if a hazard requires multiple windows (e.g., acute heatwaves vs. chronic warming), create a distinct Impact Response Card for each. All probability and severity judgements must reference the stated window.

Assessment of Risk and Priority for Action

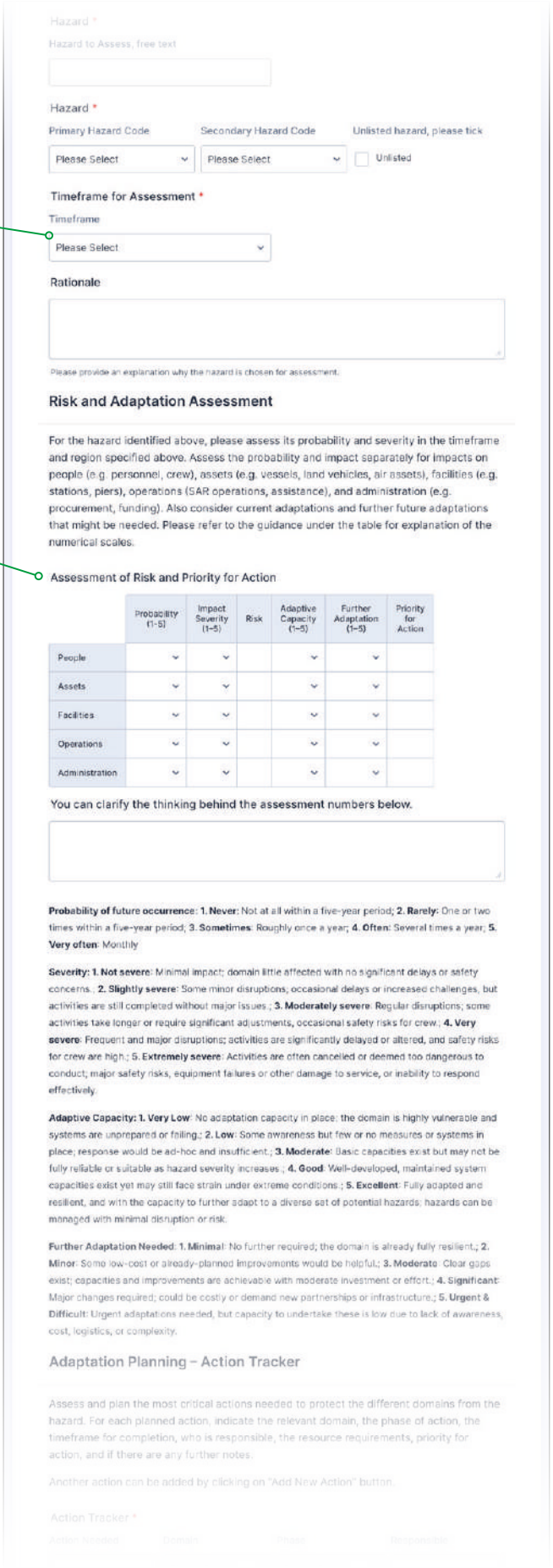
Operational Domains: The operational domains coincide with those in the Tides of Change report, with Vessels and equipment grouped under "Assets", SAR Stations included as Facilities, and SAR Units included in either operations or assets.

1. People (crew, volunteers, training, wellbeing)
2. Assets (vessels, vehicles, life-saving equipment)
3. Facilities (rescue stations, infrastructure)
4. Operations (procedures, planning, response)
5. Administration (partnerships, coordination)

Climate Risk Assessment

The assessment includes the following components.

1. Probability – How likely the hazard is going to affect the domain?
2. Impact Severity – How vulnerable is the domain to the hazard? How bad could it get if unaddressed?
3. Risk – What is the risk of the hazard to the domain? Product of probability and severity.
4. Current Adaptive Capacity – What ability does your SAR organisation have to adjust to potential climate change or respond to its consequences?
5. Further Adaptation Needed
6. Priority for Action



Hazard *

Hazard to Assess, free text

Hazard *

Primary Hazard Code | Secondary Hazard Code | Unlisted hazard, please tick

Please Select | Please Select | Unlisted

Timeframe for Assessment *

Timeframe

Please Select

Rationale

Please provide an explanation why the hazard is chosen for assessment.

Risk and Adaptation Assessment

For the hazard identified above, please assess its probability and severity in the timeframe and region specified above. Assess the probability and impact separately for impacts on people (e.g. personnel, crew), assets (e.g. vessels, land vehicles, air assets), facilities (e.g. stations, piers), operations (SAR operations, assistance), and administration (e.g. procurement, funding). Also consider current adaptations and further future adaptations that might be needed. Please refer to the guidance under the table for explanation of the numerical scales.

Assessment of Risk and Priority for Action

	Probability (1-5)	Impact Severity (1-5)	Risk	Adaptive Capacity (1-5)	Further Adaptation (1-5)	Priority for Action
People						
Assets						
Facilities						
Operations						
Administration						

You can clarify the thinking behind the assessment numbers below.

Probability of future occurrence: **1. Never**: Not at all within a five-year period; **2. Rarely**: One or two times within a five-year period; **3. Sometimes**: Roughly once a year; **4. Often**: Several times a year; **5. Very often**: Monthly

Severity: 1. Not severe: Minimal impact; domain little affected with no significant delays or safety concerns.; **2. Slightly severe**: Some minor disruptions; occasional delays or increased challenges, but activities are still completed without major issues.; **3. Moderately severe**: Regular disruptions; some activities take longer or require significant adjustments, occasional safety risks for crew.; **4. Very severe**: Frequent and major disruptions; activities are significantly delayed or altered, and safety risks for crew are high.; **5. Extremely severe**: Activities are often cancelled or deemed too dangerous to conduct; major safety risks, equipment failures or other damage to service, or inability to respond effectively.

Adaptive Capacity: 1. Very Low: No adaptation capacity in place; the domain is highly vulnerable and systems are unprepared or failing.; **2. Low**: Some awareness but few or no measures or systems in place; response would be ad-hoc and insufficient.; **3. Moderate**: Basic capacities exist but may not be fully reliable or suitable as hazard severity increases.; **4. Good**: Well-developed, maintained system capacities exist yet may still face strain under extreme conditions.; **5. Excellent**: Fully adapted and resilient, and with the capacity to further adapt to a diverse set of potential hazards; hazards can be managed with minimal disruption or risk.

Further Adaptation Needed: **1. Minimal**: No further required; the domain is already fully resilient.; **2. Minor**: Some low-cost or already-planned improvements would be helpful.; **3. Moderate**: Clear gaps exist; capacities and improvements are achievable with moderate investment or effort.; **4. Significant**: Major changes required; could be costly or demand new partnerships or infrastructure.; **5. Urgent & Difficult**: Urgent adaptations needed, but capacity to undertake these is low due to lack of awareness, cost, logistics, or complexity.

Adaptation Planning – Action Tracker

Assess and plan the most critical actions needed to protect the different domains from the hazard. For each planned action, indicate the relevant domain, the phase of action, the timeframe for completion, who is responsible, the resource requirements, priority for action, and if there are any further notes.

Another action can be added by clicking on "Add New Action" button.

Action Tracker *

Evaluate each domain under each component of climate risk assessment with the numeric scale 1 – 5. When completing the IRC survey, consider only negative impacts. While there may be positive impacts from particular climate hazards, these will need to be addressed during the planning and response phases, owing to the complexities involved in weighing their potential.

Probability

Probability of a hazard is defined as follows:

1. **Never:** Not at all within a five-year period.
2. **Rarely:** One or two times within a five-year period.
3. **Sometimes:** Roughly once a year.
4. **Often:** Several times a year.
5. **Very often:** Monthly.

Impact Severity

Impact severity is defined as follows:

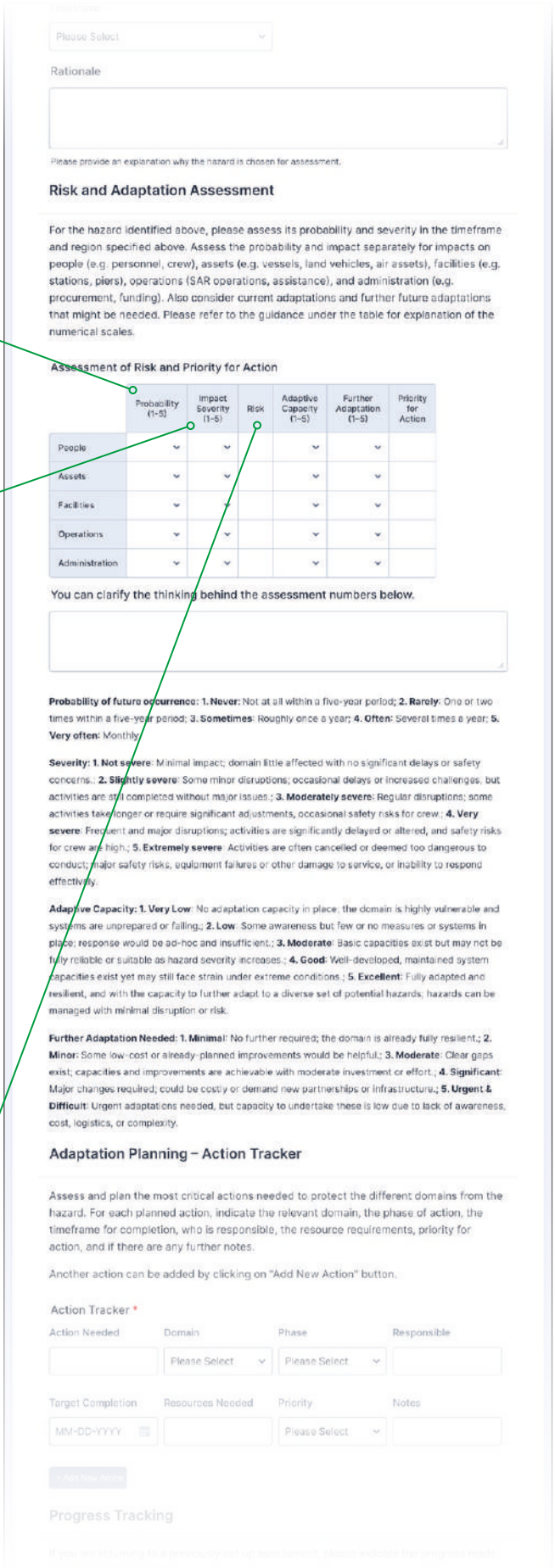
1. **Not severe**: Minimal impact; domain little affected with no significant delays or safety concerns.
2. **Slightly severe**: Some minor disruptions; occasional delays or increased challenges, but activities are still completed without major issues.
3. **Moderately severe**: Regular disruptions; some activities take longer or require significant adjustments, occasional safety risks for crew.
4. **Very severe**: Frequent and major disruptions; activities are significantly delayed or altered, and safety risks for crew are high.
5. **Extremely severe**: Activities are often cancelled or deemed too dangerous to conduct; major safety risks, equipment failures or other damage to service, or inability to respond effectively.

Risk

Risk: The calculation of risk is done automatically in the form as follows:

Risk = Probability x Impact Severity

This score is used to further support the IRC's auto-calculation of 'Priority for Action".


Please Select

Rationale

Please provide an explanation why the hazard is chosen for assessment.

Risk and Adaptation Assessment

For the hazard identified above, please assess its probability and severity in the timeframe and region specified above. Assess the probability and impact separately for impacts on people (e.g. personnel, crew), assets (e.g. vessels, land vehicles, air assets), facilities (e.g. stations, piers), operations (SAR operations, assistance), and administration (e.g. procurement, funding). Also consider current adaptations and further future adaptations that might be needed. Please refer to the guidance under the table for explanation of the numerical scales.

Assessment of Risk and Priority for Action

	Probability (1-5)	Impact Severity (1-5)	Risk	Adaptive Capacity (1-5)	Further Adaptation (1-5)	Priority for Action
People						
Assets						
Facilities						
Operations						
Administration						

You can clarify the thinking behind the assessment numbers below.

Probability of future occurrence: 1. Never: Not at all within a five-year period; **2. Rarely:** One or two times within a five-year period; **3. Sometimes:** Roughly once a year; **4. Often:** Several times a year; **5. Very often:** Monthly.

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Adaptive Capacity: 1. Very Low: No adaptation capacity in place; the domain is highly vulnerable and systems are unprepared or failing.; **2. Low:** Some awareness but few or no measures or systems in place; response would be ad-hoc and insufficient.; **3. Moderate:** Basic capacities exist but may not be fully reliable or suitable as hazard severity increases.; **4. Good:** Well-developed, maintained system capacities exist yet may still face strain under extreme conditions.; **5. Excellent:** Fully adapted and resilient, and with the capacity to further adapt to a diverse set of potential hazards; hazards can be managed with minimal disruption or risk.

Further Adaptation Needed: 1. Minimal: No further required; the domain is already fully resilient.; **2. Minor:** Some low-cost or already-planned improvements would be helpful.; **3. Moderate:** Clear gaps exist; capacities and improvements are achievable with moderate investment or effort.; **4. Significant:** Major changes required; could be costly or demand new partnerships or infrastructure.; **5. Urgent & Difficult:** Urgent adaptations needed, but capacity to undertake these is low due to lack of awareness, cost, logistics, or complexity.

Adaptation Planning – Action Tracker

Assess and plan the most critical actions needed to protect the different domains from the hazard. For each planned action, indicate the relevant domain, the phase of action, the timeframe for completion, who is responsible, the resource requirements, priority for action, and if there are any further notes.

Another action can be added by clicking on "Add New Action" button.

Action Tracker *

Action Needed	Domain	Phase	Responsible
	Please Select	Please Select	

Target Completion	Resources Needed	Priority	Notes
MM-DD-YYYY		Please Select	

Progress Tracking

Adaptive Capacity

Use the following scale from 1 to 5:

1. Very Low: No adaptation capacity in place; the domain is highly vulnerable and systems are unprepared or failing.
2. Low: Some awareness but few or no measures or systems in place; response would be ad-hoc and insufficient.
3. Moderate: Basic capacities exist but may not be fully reliable or suitable as hazard severity increases.
4. Good: Well-developed, maintained system capacities exist yet may still face strain under extreme conditions.
5. Excellent: Fully adapted and resilient, and with the capacity to further adapt to a diverse set of potential hazards; hazards can be managed with minimal disruption or risk.

Further Adaptation

What further adaptive capacities and adaptation measures are needed to safeguard the domain and how easy / practical / economic are they to undertake, using the following scales:

1. Minimal: No further required; the domain is already fully resilient.
2. Minor: Some low-cost or already-planned improvements would be helpful.
3. Moderate: Clear gaps exist; capacities and improvements are achievable with moderate investment or effort.
4. Significant: Major changes required; could be costly or demand new partnerships or infrastructure.
5. Urgent & Difficult: Urgent adaptations needed, but capacity to undertake these is low due to lack of awareness, cost, logistics, or complexity.

Priority for Action

Automatically calculated score based on combined risk and adaptations. It is calculated as follows:

Priority for Action = (Further adaptation needed/ Adaptive capacity) x Risk

Risk and Adaptation Assessment

For the hazard identified above, please assess its probability and severity in the timeframe and region specified above. Assess the probability and impact separately for impacts on people (e.g. personnel, crew), assets (e.g. vessels, land vehicles, air assets), facilities (e.g. stations, piers), operations (SAR operations, assistance), and administration (e.g. procurement, funding). Also consider current adaptations and further future adaptations that might be needed. Please refer to the guidance under the table for explanation of the numerical scales.

Assessment of Risk and Priority for Action

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Adaptation Planning – Action Tracker

Assess and plan the most critical actions needed to protect the different domains from the hazard. For each planned action, indicate the relevant domain, the phase of action, the timeframe for completion, who is responsible, the resource requirements, priority for action, and if there are any further notes.

Another action can be added by clicking on "Add New Action" button.

Action Tracker *

Action Needed	Domain	Phase	Responsible
	Please Select	Please Select	

Target Completion	Resources Needed	Priority	Notes
MM-DD-YYYY		Please Select	

+ Add New Action

Progress Tracking

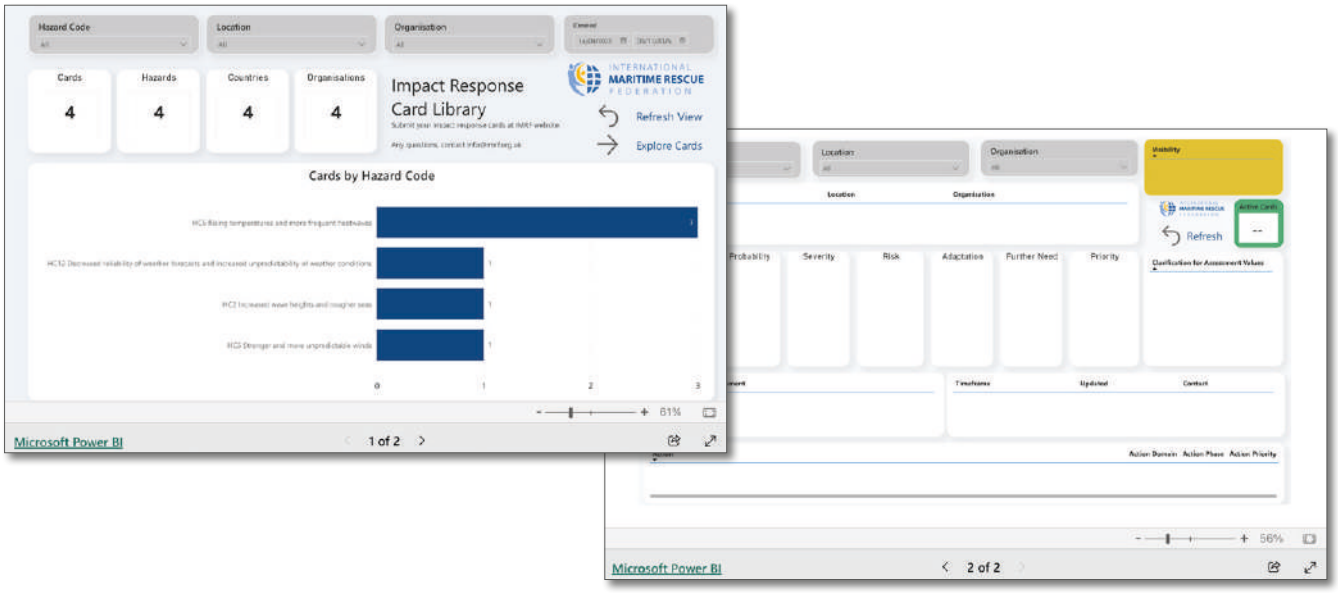
If you are returning to a previously set up assessment, please indicate the progress made in the actionable items.

Another progress item can be added by clicking "Add Another Progress Item" button.

Progress Tracking

Action	Status	Completion Date	Challenges
	Please Select	MM-DD-YYYY	

Next Steps



The Impact Response Card Library

When a team completes an Impact Response Card, it should not disappear into someone's inbox. The Library turns each card into a shared, living resource that other SAR organisations can learn from – while still giving the original author control over what is shown.

Here is the simple flow of what happens. A team fills in the online card. As soon as they press submit, the answers are saved to a secure online spreadsheet linked to the form. That sheet is IMRF's lightweight database. It stores the core fields from the card (hazard, geography, organisation, key actions, timelines) and, crucially, the visibility choice the author made on submission: private, partial, or full. The author also receives an automatic email containing the information they filled in as well as their unique edit link. If they later for instance upgrade a slipway, buy designated PPE, or complete a training action, they can open the same card and update progress without starting again.

At the IMRF website, the Library appears as an easy, read-only page that anyone in the IMRF network can browse. Behind the scenes it is a filtered view of the online spreadsheet; on the surface it feels like a simple catalogue. Members can search by hazard ("flooding", "extreme heat", "storm surge"), by geography, or by organisation name.

The visibility of the information to other members of the IMRF is handled as follows:

- Card marked "Low visibility": only the hazard, the location and the organisation undertaking the assessment are shown.
- Card marked "Partial visibility": the hazard, the location, the organisation and the risk assessment are shown.
- Card marked "Full visibility": the hazard, the location, the organisation, the risk assessment, and the planned actions are shown.

In all the cases any personal information on the person filling in the card, including their contact details, are not shown.

Editing stays with the people who wrote the card. Each record in the spreadsheet carries the author's edit link and timestamp, so the Library can display the most recent version. If an author misplaces their link, there is a simple request route in the library page. We resend the link to the email used on submission, and the team can update their actions and status.

This approach meets the core needs that came up in the project discussions: the form captures the data; authors keep control of what others see; the Library is searchable; submissions can be edited later; and everything sits inside the existing website without expensive new software. As usage grows, we can add a more polished front end – charts, maps, or dashboards – on top of the same data, but the essentials are already in place: a shared shelf of real-world climate adaptations that any SAR organisation can learn from, update, and build on.

Policy Recommendations

The increasing frequency and intensity of climate-related and extreme weather events that have become the "new normal" create a significant gap between the operational challenges faced by SAR teams and their capacity to respond effectively. SAR teams are the first responders for protecting global supply chains, water-based tourism and recreation, marine subsistence communities, scientific research, and other activities.

For SAR organisations, the current path creates a difficult cycle. Each severe weather event can damage vessels and exhaust resources, forcing a focus on short-term repairs that prevents crucial investment in future-proofing their operations. The goal must be to shift these vital frontline services from a reactive posture – responding to crises as they happen – to a proactive model of building long-term operational resilience.

To guide this resilience capacity building, the IMRF #FutureSAR "Tides of Change" report outlines 85 climate-driven impacts across all SAR operational categories and enumerates more than 300 resilience and adaptive actions. However, the breadth of climate impacts and array of resilience actions present an overwhelming and confusing planning task for many SAR organisations, especially those in under-resourced areas.

To build resilience capacities across operations, training and facilities, SAR organisations must be able to 1) Identify, prioritise and plan adaptation actions; 2) Access funding to implement adaptation actions.

IMRF current actions supporting SAR resilience

To help SAR organisations prioritise the myriad of resilience actions, IMRF partnered with Climate Adaptation Works under a grant from Lloyd's Register Foundation to create a first-of-its-kind system – Climate Impact Response Cards and the Impact Response Card Library – for SAR organisations to record and share the impact of climate-related events and extreme weather on their operations. The Impact Response Card system generates priority action areas linked to the #FutureSAR report operational categories and recommended resilience actions.

As more Impact Response Cards and recommendations are catalogued in the Impact Response Card Library over time, SAR organisations can access information about what adaptation actions others took and how they fared. This global information sharing can help organisations streamline resilience planning and be empowered to prepare for and mitigate climate impact risks to their operations and avoid interruption of SAR services. Organisations should weave this into their strategy and future resource plans, setting aside staff time to identify and plan the adaptations the organisation will need.

Recommendations

For the second part, access to funding for the implementation of actions, the following recommendations are made:

- Encourage financial streams for resilience actions and investments for SAR organisations so that the critical services they provide will keep pace with climate-accelerated demands on facilities, equipment, and personnel. Resilience finance remains stagnant, leaving underserved regions at heightened risk.
- Facilitate collaboration between insurers and reinsurers with the SAR community to create incentives for climate-resilient actions and procedures that align with current and future climate risks.
- Recommend funding for further research on the operational and human toll of climate impacts on SAR services, organisations, and the communities they serve.
- Amplify awareness of the severity of climate impacts on SAR services to the beneficiaries of these services in affected industries.
- Encourage beneficiary industries to support their region's SAR organisations.
- Support such efforts through national policies.

You can access the reports, the Impact Response Card and the Library at:

www.international-maritime-rescue.org/futuresar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https://www.international-maritime-rescue.org/contact-the-imrf

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