

ROYAL AUSTRALIAN NAVY

# SEA POWER

## SOUNDINGS



Issue 28, 2021

## **The Impacts of Climate Change on maritime Boundaries in the Western Pacific**

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### Executive Summary

Under the United Nations Convention on the Law of the Sea (UNCLOS), states have special rights within the 200 nautical miles of water surrounding them.<sup>1</sup> This is known as their Exclusive Economic Zone (EEZ).<sup>2</sup> However, low-tide lines and other coastal features that form the baselines of EEZs are susceptible to inundation and damage from climate change, potentially leading to contractions in maritime territory.<sup>3</sup> Furthermore, the capacity of a landmass to generate an EEZ at all is debatably dependent on its inhabitability, an issue also complicated by climate change.<sup>4</sup>

Drawing on modelling that predicts a 0.4–0.8 metre sea level rise by 2100, this paper discusses the crucial legal issues that arise when antiquated international law is applied to the contemporary problem of climate change.

Two case studies will be considered: Kiribati and the Marshall Islands. In each case, I examine the environmental impacts of climate change (notably the salination of groundwater and the acidification of the ocean), the most at-risk basepoints and the legal issues that arise from these challenges.

This paper does not purport to know all the answers to the issues raised by climate change, only to ask the right questions. These are new and evolving problems which are only just beginning to be explored. However, I do hope to offer some preliminary insights into how Australia, specifically the Royal Australian Navy (RAN), can approach the problems at hand.

I argue that Australia should support a practice of freezing maritime baselines and boundaries to provide clarity in the face of climate change. To support this approach, I recommend that the RAN assist in the mapping of unfinished boundaries and baselines in the region. The inclusion of multi-beam sonar on the new Pacific Support Vessel and the commissioning of a replacement vessel for at least one of the Leeuwin-class survey vessels currently in operation is recommended to facilitate this project.



### Introduction

In 1982, the United Nations Convention on the Law of the Sea (UNCLOS) was adopted.<sup>5</sup> It was designed as the legal authority on the oceans and seas, an all-encompassing guide to the maritime domain.<sup>6</sup> In many respects, it has fulfilled this role. However, it did not anticipate climate change. Under UNCLOS, the legal status of maritime zones is dependent on the existence of certain geophysical formations, many of which are threatened by climate change.

This report will analyse the friction between international maritime law and climate change in the Western Pacific and assess how the Royal Australian Navy (RAN) can help Pacific Island countries navigate the challenges that emerge. I will argue that Australia, through the RAN, should support a model of permanently fixing maritime zones to create regional stability amid the ambiguity generated by climate change.

In Part 1 of this paper, I will introduce the problem, illustrating how climate change clashes with contemporary maritime law. In Part 2, I will consider the legal implications of this problem for the Western Pacific. Part 3 will focus on the two states in the region likely to be the most heavily impacted: the Republic of the Marshall Islands (henceforth the Marshall Islands) and the Republic of Kiribati (Kiribati). Finally, in Part 4 I will consider how Australia, and the RAN specifically, can support Islanders.

This analysis will focus on the period from 2020 to 2100. This period was chosen because, as with any predictions, climate modelling becomes less reliable the further it extends into the future. A 2100 outlook facilitates long-term planning without significantly compromising on the reliability of data.

Geographically, my project is limited to a study of the Western Pacific for four reasons.<sup>7</sup> Firstly, the region's proximity renders it relevant to Australia's national interests. As identified in the *2017 Foreign Policy White Paper* and *2016 Defence White Paper*, a prosperous, secure and stable near region is a key focus of Australia's international engagement.<sup>8</sup> Secondly, the Western Pacific is one of the most vulnerable areas in the world to climate change, predominantly due to the low elevation of island states and the above average levels of sea-level rise (SLR) (see Part One).<sup>14</sup> Thirdly, the size of the maritime territory at stake is substantial.



95 per cent of Pacific Islander territory is maritime.<sup>15</sup> This means that changes in maritime boundaries have the potential to substantially impact the territorial claims of island states. Fourthly, the Western Pacific is rich in maritime resources.<sup>16</sup> It follows that boundary adjustment could have a significant impact on the resource endowment of states. This is particularly significant given the dependence of Pacific Islanders on maritime resources (see Box 1).<sup>17</sup> In sum, the Western Pacific is of interest because its stability is in Australia's interests and the stakes are high.

### Box 1: Resources in the Pacific

Pacific Islanders rely on fish to support their largely subsistence lifestyles.<sup>9</sup> Fish are also commercially valuable as a major regional export.<sup>10</sup> Tuna fishing is particularly lucrative, accounting for approximately \$5.6 billion per year for the Pacific Island region.<sup>11</sup> Tourism, a sector that is highly reliant on marine biodiversity and maritime activities, accounts for 7.2 per cent of regional GDP.<sup>12</sup> The Pacific is also richly endowed with minerals, although there are no reliable estimates of their value.<sup>13</sup>

In these ways, maritime resources are crucial to both the food security and economic viability of Pacific Island countries.



### 1. The Problem: Climate Change vs. International Law

According to UNCLOS, states have special control over the 200 nautical miles (nm) of water around them, their Exclusive Economic Zone (EEZ).<sup>18</sup> This includes sovereign rights to the natural resources in these waters.<sup>19</sup> In most cases, the EEZ baseline is an island's coastal low-tide line.<sup>20</sup> For a more in-depth explanation of EEZ baselines, see Appendix B.

As sea levels rise, the coast which forms the EEZ baselines is, for many island states in the Western Pacific, gradually submerging.<sup>21</sup> Debatably, under contemporary international law, this contraction in baselines results in a proportional contraction in the EEZ outer boundary; in this sense, baselines are considered, 'ambulatory'.<sup>22</sup>

There is precedence. The United States successfully argued for a substantial reduction in Mexico's EEZ after an island in the Gulf of Mexico, which formed part of Mexico's EEZ baseline, could no longer be located.<sup>23</sup> Climate change is also affecting the inhabitability of landmasses which, as will be shown, raises its own legal complications,

Sea levels worldwide have risen by an average of 3.2mm each year between 1993 and 2010.<sup>24</sup> This change is not geographically uniform; the Western Pacific has seen increases of three to four times the global mean between 1993 and 2009 (up to 12mm/year).<sup>25</sup>

The above average SLR experienced in the Western Pacific is partially attributable to the El Niño – Southern Oscillation (ENSO), a natural climatic cycle, which sees the Western Pacific periodically experience higher than average rainfall.<sup>26</sup> However, there are other factors at play as well. Ice sheet melt and deglaciation disproportionately impact the Western Pacific.<sup>27</sup> This has not been a significant influence to date; between 1993 and 2003, ice sheet mass loss was only responsible for about 15 per cent of SLR.<sup>28</sup> Thermal expansion (~50 per cent) and glacier melting (~30 per cent) were the most significant influences.<sup>29</sup> However, since 2003, ice sheet melt has been accelerating, as both an aggregate and relative contribution to SLR.<sup>30</sup> This water, combined with that from deglaciation, is expected to pool around the regions furthest from the glacial and ice melt.<sup>31</sup>

Modelling the effect of climate change through to 2100 is difficult because of the multiplicity of variables involved. Some of the most reliable estimates are those published by the United Nations Intergovernmental Panel on Climate Change (IPCC).<sup>32</sup> The IPCC presents a variety of scenarios depending on the policy responses adopted by governments.<sup>33</sup> These scenarios are known as the Representative Concentration



Pathways (RCPs).<sup>34</sup> There are four RCPs: RCP 2.6, RCP 4.5, RCP 6.0 and RCP 8.5.<sup>35</sup> RCP 2.6 is the most progressive, featuring strict environmental policies.<sup>36</sup> RCP 4.5 and 6.0 are intermediate scenarios while RCP 8.5 represents a high emissions situation.<sup>37</sup> A business-as-usual approach is expected to produce a result somewhere between RCP 6.0 and RCP 8.5.<sup>38</sup>

RCP 2.6 predicts a SLR of between 0.4 and 0.5 metres for the Western Pacific (see Figure 1). RCP 8.5 predicts a rise of between 0.7 and 0.8 metres.<sup>39</sup> This is based on a comparison of the mean sea level between 1986 and 2005 and the expected mean between 2081 and 2100.<sup>40</sup> This paper will draw on the range provided by these estimates, assuming a SLR of between 0.4 and 0.8 metres by 2100.

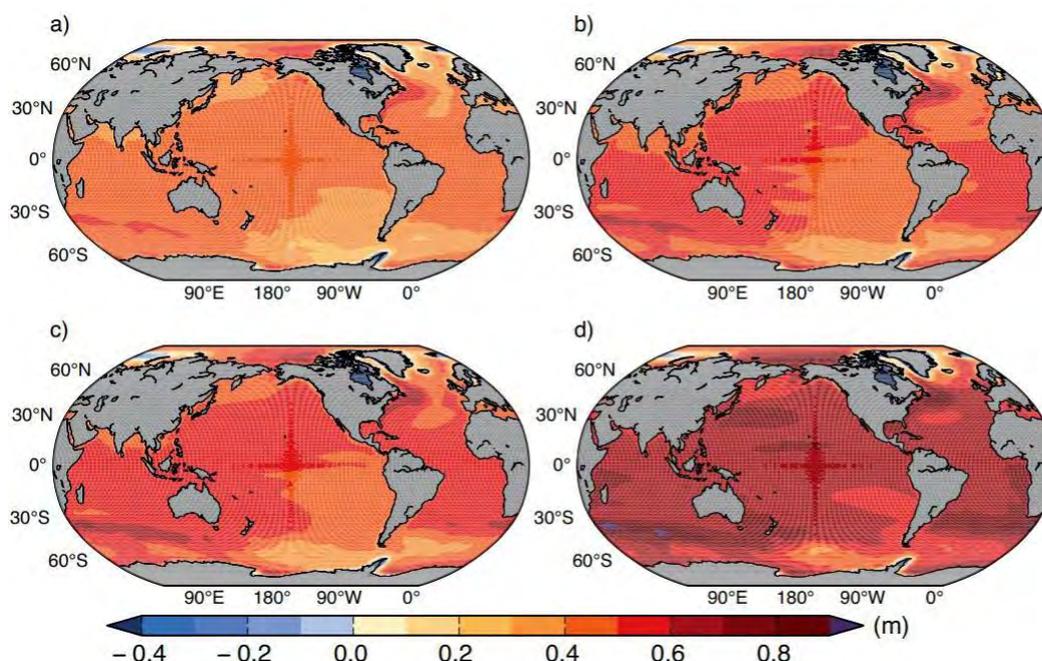


Figure 1: Predicted SLR under RCP 2.6 (a), RCP 4.5 (b), RCP 6.0 (c) and RCP 8.5 (d)

Source: Church et al., 'Sea Level Change', p. 1195.

It should be noted that IPCC estimates, in general, are quite conservative.<sup>41</sup> Its predictions for 2100 are lower than that of a majority of other climate authorities.<sup>42</sup> Its 2100 forecasts do not account for the melting of major ice sheets in Antarctica and Greenland because of the high degree of uncertainty over the rate of melting.<sup>43</sup> Even so, given that the most low-lying states in the Western Pacific have a mean elevation of 2–3 metres, it is unlikely that any will completely submerge by 2100.<sup>44</sup>



An important distinction must be made here between states and individual islands as many states in the Western Pacific are comprised of multiple individual islands. The maximum elevation of a state is the highest point across all these islands; many of the individual islands are much lower. There is already precedence of individual islands submerging, but the inundation of entire states is not expected by 2100.<sup>45</sup> However, it is quite possible that some states will become uninhabitable.<sup>46</sup> There are several possible channels through which this can happen. The main mechanisms are shown in Table 1.

**Table 1: Channels through which climate change affects island inhabitability<sup>1</sup>**

**Decreases in available land** *Submersion of land due to SLR.* This is particularly concerning given the shallow gradient of many coastlines in the Western Pacific and the concentration of populations in coastal areas.

*Coastal erosion due to the death of coral reefs.* Warmer waters and ocean acidification caused by higher levels of carbon dioxide in the water kill off the coral reefs which protect the coast from waves.

It should be noted that erosion is counterbalanced by accretion, the process by which washed up coral gradually builds up islands. While, in the past, accretion has predominated erosion, this is changing, most likely due to higher sea levels. Most studies predict that erosion will be the dominant force in the future.

*Coastal erosion due to the death of mangroves.* Mangroves also protect the coast from erosion. However, they are threatened by inundation and salination from SLR.

**Salination of ground water**

The livelihoods of many Pacific Islanders depend on groundwater. The intrusion of saltwater into the water table is a serious concern.

**Natural disasters**

The severity of the damage of natural disasters to low-lying states combined with the limited capacity of governments to fund repairs means that small islands evacuated due to natural disasters are often never inhabited again. Climate change is predicted to increase the frequency of natural disasters in the Western Pacific.



It follows that even a small rise in sea levels could render islands uninhabitable.<sup>47</sup> Also, since many EEZ baseline features are insubstantial landmasses just above sea level, they are likely to be some of the earliest victims.<sup>48</sup> This raises several interesting legal issues.

## 2. The Law

There are three central questions that arise as a result of climate change as it pertains to maritime boundaries. They are:

- Can a state continue to exist without territory?
- Are uninhabitable landmasses entitled to an EEZ?
- Should boundaries, once set, be fixed regardless of changes in the baselines from which they were measured?

Let us consider each in turn.

### Conditions for the Continued Existence of the State

The conditions under which a country maintains its statehood are of central concern because only states are entitled to an EEZ.<sup>49</sup>

According to the Montevideo Convention, there are four conditions for statehood: a population, a landmass, a government and international recognition.<sup>50</sup> However, it is unclear whether these conditions are necessary solely for the establishment or also the maintenance of a state.<sup>51</sup> A strict reading of the Convention suggests the latter.<sup>52</sup> Precedence indicates otherwise. The Papal See was recognised as a state between 1870 and 1929 despite losing its territory to Italy in 1870.<sup>53</sup> It regained territory in 1929 when it was granted Vatican City.<sup>54</sup> The Order of St John was deterritorialised when Napoleon invaded Malta in 1798 but continued to enjoy international recognition from many states.<sup>55</sup>

There have already been moves by the Tuvaluan Government to adopt a similar deterritorialised model, wherein the state would continue to exist even after its territory becomes uninhabitable.<sup>56</sup> In 2001 and, reportedly, 2008, Tuvalu approached Australia and, in the former instance, New Zealand, looking to negotiate a deal that would see Australia or New Zealand take in the Tuvaluan population while allowing Tuvalu to remain a sovereign state.<sup>57</sup> In 2008, Tuvaluan Government spokesperson, Kilifi O'Brien stated that, 'we would be looking at taking one sovereign country to another – we would



want to keep our economic exclusion zone, our United Nations seat and so on. We would want to keep our identity as Tuvalu, in another location'.<sup>58</sup> This demonstrates Tuvalu's support for a deterritorialised model of statehood. However, finding a host state willing to support this model has proved difficult.<sup>59</sup>

For its part, Kiribati did successfully purchase 24 km<sup>2</sup> of land from Fiji in 2014 for the purpose of relocation.<sup>60</sup> However, Kiribati does not have a sovereign claim to this territory, meaning that migration of the Kiribati people would still be at the discretion of the Fijian Government.<sup>61</sup>

If Pacific Island states are forced to abandon the deterritorialised model and move to another country where their population and government are absorbed by that of the host state (as opposed to continuing to operate as their own entities), then the consensus is that statehood would be forfeited.<sup>62</sup> Under UNCLOS, a dissolved state has no EEZ.<sup>63</sup>

This is one of the issues for states in the Western Pacific that could arise as a result of climate change.

### Entitlements of Uninhabited Landmasses

Another related issue concerns the entitlements of individual islands (not whole states) that become uninhabitable. Article 121 (3) states that, 'rocks which cannot sustain human habitation or economic life of their own shall have no exclusive economic zone'.<sup>64</sup> The South China Sea Arbitration found this is to mean that if an island is uninhabitable, it is a rock and is therefore not entitled to an EEZ (see Box 2).<sup>65</sup>

#### Box 2: South China Sea Arbitration

The *South China Sea Arbitration* was a series of arbitral proceedings between the Republic of the Philippines and the People's Republic of China (China). It considered, among other issues, whether certain landmasses in the South China Sea generated maritime claims. In considering these issue and related concerns, the Arbitration clarified several ambiguities in international law that can be applied to a study of the Western Pacific.

However, the South China Sea Arbitration also noted that, when determining whether a landmass is uninhabitable, it is the *natural* form of the landmass that counts.<sup>66</sup> In the context of rising sea levels, this could be understood to mean the form of the landmass prior to anthropogenic climate change.<sup>67</sup> The Arbitration also noted that, while an absence of past habitation does not necessarily mean a landmass is uninhabitable, evidence of previous habitation 'may be relevant for establishing a feature's capacity'.<sup>68</sup>



These findings could be used to make a case for maintaining the EEZ claims of landmasses rendered uninhabitable by climate change.<sup>69</sup> However, this conclusion is far from unanimous among scholars, practitioners and island states themselves.<sup>70</sup>

### Fixing Maritime Boundaries

The final concern relates to the practice of ‘freezing’ maritime baselines and/or boundaries. Under this approach, states would register the coordinates of their EEZ baselines and EEZ outer boundaries with the United Nations.<sup>71</sup> Subsequent contractions in the baseline (due to the uninhabitability, submersion or erosion of basepoints) would be ignored.<sup>72</sup>

This approach was endorsed in the 2014 Palau Declaration where leaders of the 45th Pacific Islands Forum, called for, among other initiatives, ‘strengthened regional efforts to fix baselines and maritime boundaries to ensure that the impact of climate change and SLR does not result in reduced jurisdiction’.<sup>73</sup> The Declaration was endorsed by Australia, the Federated States of Micronesia, the Republic of Kiribati, the Republic of Nauru, Niue, Palau, Papua New Guinea, the Marshall Islands, Samoa, Solomon Islands, Tonga, Tuvalu, New Zealand, the Republic of Vanuatu, and the Cook Islands, demonstrating a widespread regional commitment to freezing EEZ baselines and boundaries.<sup>74</sup>

The general sentiment of the Palau Declaration was welcomed by the United Nations Secretary-General at the time, Ban Ki-moon, although he did not comment on the specific practice of fixing baselines and boundaries.<sup>75</sup>

The Marshall Islands, Kiribati, Tuvalu, Palau, the Cook Islands, Fiji and Nauru have already acted upon the Declaration, unilaterally confirming their EEZ baselines and/or outer boundaries through domestic legislation.<sup>76</sup> There does not seem to have been any objections to this practice from other states so far.<sup>77</sup>

However, it is unclear whether this approach is legal under UNCLOS.<sup>78</sup> The only section concerned with the freezing of EEZ boundaries or baselines is Article 7 (2), which states that where, ‘because of the presence of a delta and other natural conditions the coastline is highly unstable, the appropriate points may be selected along the furthest seaward extent of the low-water line and, notwithstanding subsequent regression of the low-water line, the straight baselines shall remain effective until changed by the coastal State in accordance with this Convention’.<sup>79</sup>

At first glance, this suggests that baselines made unstable by climate change should be frozen. However, a closer study raises four questions.



Firstly, the immediately preceding clause is concerned with indented coastlines leading some scholars to argue that Article 7 (2) is subordinate to the previous paragraph.<sup>80</sup> That is, it should only apply to indented coastlines.<sup>81</sup> Secondly, *and* is debatably used in the cumulative sense suggesting that both a delta and other natural conditions are necessary.<sup>82</sup> Thirdly, it is questionable whether anthropogenic climate change counts as a natural condition. Fourthly, even if we grant that it does count, it is argued that the last phrase of the article, which discusses the changing of baselines, implies that states will eventually have to amend their baselines.<sup>83</sup> As a result of these ambiguities, the legal literature is divided on where UNCLOS stands on climatechange-affected EEZ baselines.<sup>84</sup>

There is potential for regional powers to capitalise on this ambiguity by trying to discredit the claims of Western Pacific states to gain access to the resource-rich waters which are currently the sovereign territory of Pacific Islanders.<sup>85</sup> As we will see, the RAN, and Australia more broadly, have a role to play in supporting a fixed baselines and boundaries approach, in line with Australia's endorsement of the Palau Declaration.

### 3. Case Studies

The complexity of the issues raised by climate change is best captured through a study of the Marshall Islands and Kiribati. These states were chosen because they have a lot to lose and a relatively high chance of losing it (see Box 3).

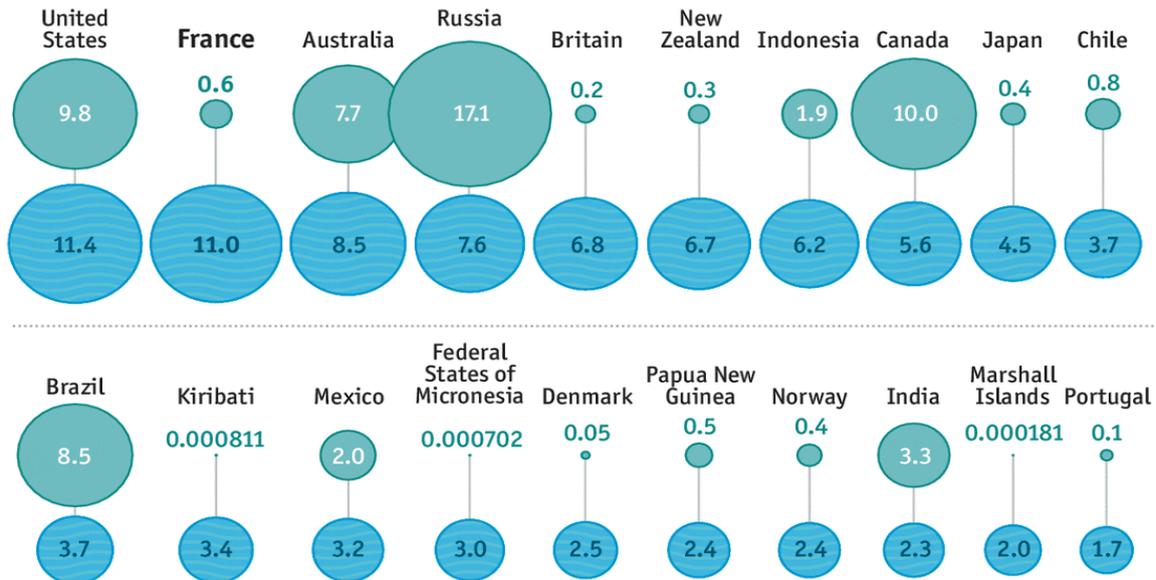
#### **Box 3: Why Kiribati and the Marshall Islands?**

Kiribati and the Marshall Islands are high-risk states for three reasons. Firstly, as very low-lying atolls they are some of the most susceptible states to SLR.<sup>86</sup> Secondly, they have very large EEZs (see Figure 2).<sup>87</sup> When calculated as a percentage of landmass, they have the first and third largest EEZs in the world.<sup>88</sup> Thirdly, the maritime territory of the Marshall Islands and Kiribati are particularly rich in natural resources as both states have prioritised the conservation of marine life.<sup>89</sup>



Countries with the largest Exclusive Economic Zones (EEZ), 2015

● EEZ, km<sup>2</sup> m ● Land area, km<sup>2</sup> m



Sources: Holman Fenwick Willan; United Nations

Figure 2: The World's Biggest EEZs

Source: 'Drops in the Ocean: France's Marine Territories', *The Economist*, 2016, <https://www.economist.com/graphic-detail/2016/01/13/drops-in-the-ocean-frances-marine-territories>.

### The Marshall Islands

The Marshall Islands is comprised of a series of thin, low-lying coral atolls with a mean elevation of approximately two metres.<sup>90</sup> In a 2009 submission to the United Nations, the Marshall Islands stated that half a metre SLR, or less, could threaten the inhabitability of the state.<sup>91</sup> This is well within even the conservative scenarios of the IPCC.<sup>92</sup>

The most significant threat to the inhabitability of the Marshall Islands is food and water security.<sup>93</sup> The salination of water supplies is the primary concern.<sup>94</sup> The atolls of the Marshall Islands are highly permeable owing to their coral foundation.<sup>95</sup> This means that the freshwater table, which sits just above the saltwater table, can easily be polluted by rising sealevels, to the detriment of crops and groundwater supplies (see Figure 3).<sup>96</sup>

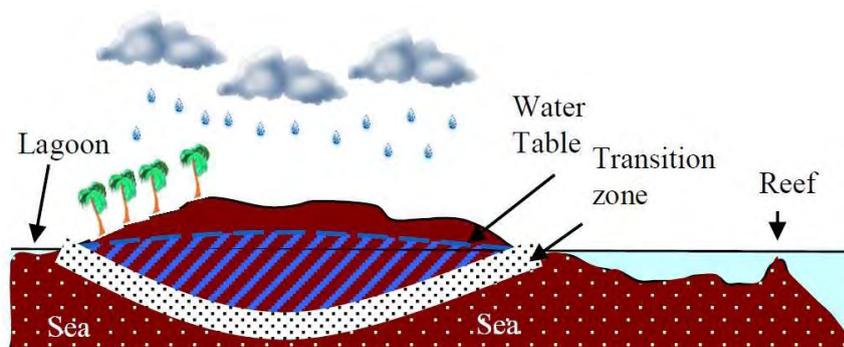


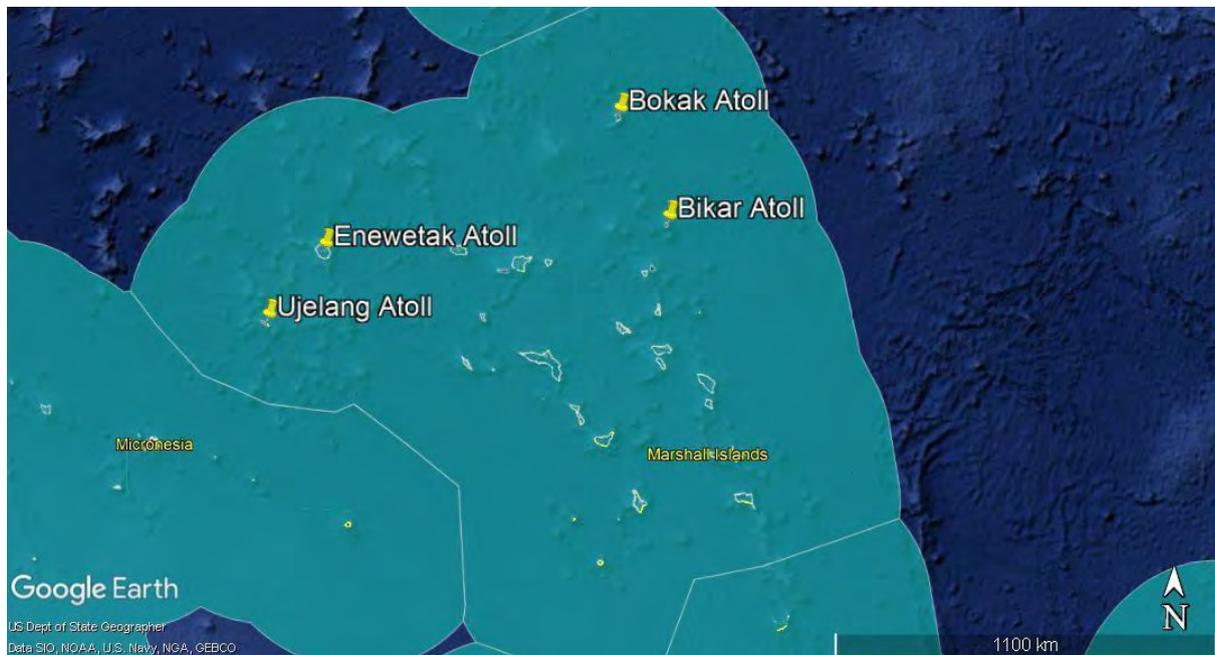
Figure 3: Cross-Section of a Typical Coral Atoll

Source: Yamamoto and Esteban, 'Vanishing Island States and Sovereignty', p. 5.

### ***Legal Implications for the Marshall Islands***

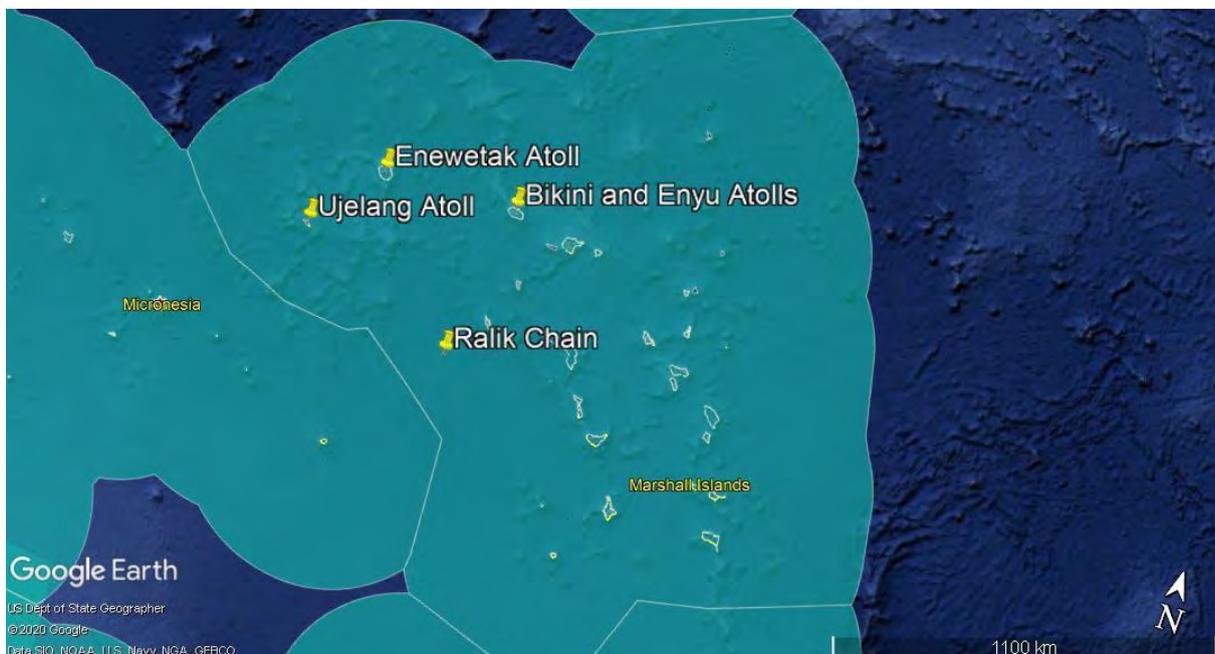
The EEZ basepoints that would trigger the most substantial loss in maritime territory if they became uninhabitable and were found to have no EEZ claim are the Ujelang, Enewetak, Bokak and Bikar atolls (shown in Figure 5).<sup>97</sup> It is hard to calculate exactly how much maritime territory would be lost in this eventuality because if the outermost atolls became uninhabitable then it is likely that the second most outer atolls would be in a similar position. If, for demonstration's sake, we assume a situation in which only the Ujelang and Enewetak atolls become uninhabitable, then the Bikini and Enyu atolls (approximately 215nm east of Enewetak) and the Ralik Chain (approximately 320nm south-east of Ujelang) would become the replacement basepoints (see Figure 6), signifying a major contraction in maritime territory.<sup>98</sup>

This is particularly alarming given that the Marshall Islands' EEZ is currently the world's largest shark sanctuary.<sup>99</sup> If these waters were found to fall outside of the Marshall Islands' EEZ, they would no longer be protected.



*Figure 5: At-risk Basepoints in the Marshall Islands EEZ.*

Source: *Google Earth Pro* (version 7.3.3.7786 (64-bit)). Windows. Google, 2020.



*Figure 6: Fallback Basepoints*

Source: *Google Earth Pro* (version 7.3.3.7786 (64-bit)). Windows. Google, 2020.



The potential for maritime territory loss was noted in a 1992 report by the South Pacific Regional Environment Program which stated that, ‘the partial loss of land in the [Marshall Islands] may lead to loss of base points for EEZ boundaries which could considerably reduce Marshall Islands territory with its important pelagic and sea bottom resources’.<sup>100</sup> Similarly, a 2009 submission to the UN Framework Convention on Climate Change expressed concern about the ability of the Marshall Islands to maintain its statehood (and therefore EEZ claims) in light of climate change.<sup>101</sup> These reports demonstrate long-running concerns for the Marshall Islands’ statehood, EEZ claims and resources.

A fixed baselines/boundaries approach would resolve this issue as the inhabitability of the basepoints in the future would be irrelevant. The only concern would be the inhabitability of the basepoints at the time that baselines were fixed.

### **Kiribati**

Kiribati is also predominantly comprised of low-lying coral atolls.<sup>102</sup> The state has a mean elevation of 1.98m.<sup>103</sup> However, some islands are substantially below this level.<sup>104</sup> Predictions from the World Bank estimate that up to 54 per cent of the Kiribati settlement of Bikenibeu will be inundated by 2050, although it should be noted that the level of certainty attributed to this result was low.<sup>105</sup>

Of primary concern is the loss of fresh groundwater as it is the sole source of drinkable water for most Islanders and crucial to the survival of vegetation.<sup>106</sup> As with the Marshall Islands, rising sea levels threaten to intrude upon the freshwater table.<sup>107</sup> Kiribati’s water scarcity is also a product of low levels of rainfall and increased evaporation due to high temperatures.<sup>108</sup>

Ocean acidification is a further issue. Increased carbon dioxide in the water harms coral reefs, catalysing coastal erosion.<sup>109</sup> The toxins produced by acidification also kill marine life.<sup>110</sup> The lagoon of the Phoenix Islands, one of three island chains that form Kiribati, has lost almost all of its coral.<sup>111</sup> The flow-on effects for fisheries are substantial; it is expected that Kiribati will experience a 70 per cent reduction in its maximum catch potential by 2050 under RCP 8.5.<sup>112</sup> This is based on a comparison of the maximum potential catch average between 1991 and 2010 and the expected average between 2041 and 2060.<sup>113</sup> Since Islanders rely on fish to survive, the acidification of the ocean impacts the inhabitability of the land.<sup>114</sup>

### ***Legal Implications for the Marshall Islands***



As with the Marshall Islands, the legal fallout from landmasses rendered uninhabitable is a serious concern. Kiribati has an EEZ of 1.8 million square nautical miles.<sup>115</sup> If Kiribati's islands become uninhabitable, a situation considered possible by mid-century, then its claim to this territory is unclear.<sup>116</sup>

In addition to inhabitation concerns, climate change also threatens the archipelagic status of Kiribati's Gilbert Island chain.<sup>117</sup> Under UNCLOS, when an archipelago has a land-to-water ratio of between 1:1 and 9:1 (and satisfies a few other dimensional requirements), it can claim archipelagic status.<sup>118</sup> This entitles it to draw archipelagic baselines (see Appendix B), effectively extending its EEZ.<sup>119</sup>

The eligibility of Kiribati's Gilbert Island chain under this criterion is questionable, with early estimates suggesting that the area of water is far greater than permitted.<sup>120</sup> Nonetheless, Kiribati eventually succeeded in acquiring archipelagic status, registering a land-to-water ratio of 8.9:1.<sup>121</sup> It follows that any inundated territory would threaten Kiribati's archipelagic status.<sup>122</sup> If the Gilbert Island chain lost its archipelagic status, the EEZ baseline would contract to the individual islands of the archipelago rather than the straight baselines drawn around the archipelago, leading to a loss of maritime territory.<sup>123</sup> Again, freezing baselines and/or boundaries would resolve this issue.

#### 4. Australia's Role

At present, the scales hang in the balance. On one side there is an argument for fixing maritime boundaries to avoid the complications that arise from shrinking islands and uninhabited landmasses. This is the developing customary law among states in the Western Pacific.<sup>124</sup> On the other side are proponents of ambulatory baselines who interpret UNCLOS to mean that maritime claims contract as sea levels rise.<sup>125</sup> Australia has an important role to play here in tipping the scales in favour of the Pacific Islanders' approach.

#### Why Should Australia Support Fixed Maritime Boundaries?

Australia committed to the practice of fixing maritime baselines and boundaries when it endorsed the Palau Declaration.<sup>126</sup> It is in Australia's interests to continue to endorse this practice because the ambiguities that arise if boundaries are not clarified have the potential to destabilise the region.<sup>127</sup> Resource-scarce states may be tempted to take advantage of ambiguities in maritime boundaries to extract resources from areas that were previously definitive Islander territory.<sup>128</sup> With specific reference to the Pacific,



Caron notes that, ‘uncertainty regarding ownership of a valuable resource is fertile ground for conflict’.<sup>129</sup>

Note that instability is only one possibility; resource-scarce states may find it less complicated to simply purchase fishing licences from Pacific Island states as is currently common practice.<sup>130</sup> However, the potential for tension stemming from ambiguity exists and it is possible that Australia can hedge against by supporting fixed maritime boundaries. Both the *2016 Defence White Paper* and *2017 Foreign Policy White Paper* specifically note that a secure, near region is a key Australian interest.<sup>131</sup>

### What Can the Navy Do?

The main capacity in which the RAN can assist Islanders is through its hydrographic capabilities.

As of July 2020, there were 18 EEZ boundaries yet to be declared in the Pacific region, almost all of which fell within the Western Pacific as it is defined in this paper (FAO 71).<sup>132</sup> If Pacific Islanders are going to present a case to the international community that boundaries should be fixed, then a preliminary step is determining where these boundaries are.<sup>133</sup>

However, mapping is costly and difficult for Pacific Island countries.<sup>134</sup> Excellent work has and continues to be done by the Pacific Maritime Boundaries Project, an initiative between the Pacific Community, the Pacific Islanders Forum Fisheries Agency, the Department of Foreign Affairs and Trade (Australia), the Attorney General’s Department (Australia) and the European Union, assisting Pacific Islanders in establishing their maritime claims.<sup>135</sup>

However, there is still more to be done, particularly with respect to continental shelves.<sup>136</sup> Continental shelves are the seabed and subsoil that, usually, extend along the length of the EEZ.<sup>137</sup> In some cases, however, a state may be eligible to claim an extended continental shelf of up to 350nm.<sup>138</sup> Several Pacific Island countries seem to be eligible for this extension.<sup>139</sup> To claim an extended continental shelf, states must submit detailed geological and geomorphological data to the UN Commission on the Limits of the Continental Shelf (UNCLCS).<sup>140</sup>

It should be noted that the fallout from ambiguous continental shelf boundaries in the context of climate change is not as severe as for EEZs. This is because, according to Article 76 (9), once registered with the UN, the outer boundaries of a continental shelf are permanently fixed.<sup>141</sup> However, since many countries have not submitted a claim to the UN, their continental shelves are still subject to changes in ambulatory baselines.<sup>142</sup>



It is therefore important to map and register these maritime zones before substantial baseline contractions occur.

There is scope for the RAN to assist in the mapping required for the extended continental shelf submissions and the delineation of the remaining EEZs. However, the RAN is currently transitioning towards contracting out its hydrographic operations.<sup>143</sup> It is understood that its current hydrographic capabilities, two Leeuwin-class and four Paluma-class vessels, are being replaced by 12 Arafura-class Offshore Patrol Vessels (OPV). This is concerning for the RAN's hydrographic capabilities for two reasons. Firstly, the OPVs do not have the same specialist hydrographic capabilities as current platforms, particularly the Leeuwin class.<sup>144</sup> Secondly, this move signals a reduction in aggregate platforms since the 12 OPVs will also be replacing 13 Armidale-class and 2 Cape-class Patrol Vessels, potentially stretching resources.<sup>145</sup>

Given the importance of the hydrographic work yet to be done in the Pacific, this consolidation and outsourcing seems ill-advised. It is recommended that some hydrographic capability be retained by equipping the newly announced Pacific Support Vessel with multibeam sonar, a surveying tool used to map the seafloor (see Box 4).<sup>146</sup> It is understood that filing continental shelf submissions to the quality that the UN is now requiring will be very difficult without deep-ocean multibeam sonar capabilities. These are not resources that Pacific Island countries have.

Secondly, the RAN should consider investing in another platform like the Leeuwin-class when the two current vessels are decommissioned. The specialist capabilities afforded by the sophisticated hydrographic technology aboard the Leeuwin-class would be a valuable asset in settling boundary ambiguities in the Pacific.<sup>147</sup> The Leeuwin-class can also support aircraft, which is particularly significant given the important role that aerial photography plays in mapping.<sup>148</sup>



### Box 4: Multibeam Sonar

The multibeam sonar is understood to be crucial in boundary and baseline delineation and continental shelf mapping. It employs multiple beams to map the seabed, providing detailed data on a range of metrics from water depth to seafloor hardness.<sup>149</sup> The new Pacific Support Vessel is believed to be in the consultation phase of development; the inclusion of multibeam sonar should be strongly considered as part of this process.

The detailed mapping provided by the sonar would have additional benefits beyond the stability created by clear baselines and boundaries. At present, large vessels cannot traverse some parts of the Western Pacific because the charts are insufficiently detailed.<sup>150</sup> This is economically damaging for Pacific Island countries because cruise ships often will not enter these waters.<sup>151</sup> There is also potential for vague, inaccurate or non-existent charts to impede humanitarian and disaster relief efforts in the region.

### Conclusion

Climate change has created a new set of problems for states in the Western Pacific that UNCLOS did not anticipate. This report firstly examined the IPCC's climate predictions, noting that while whole states are unlikely to be completely inundated by climate change this century, uninhabitability is an imminent concern that presents its own set of unique legal challenges. I first considered the legal ramifications of a whole state becoming uninhabitable, finding that there is precedent for a deterritorialised state.

Secondly, I asked whether individual landmasses (not an entire state) rendered uninhabitable by climate change could still generate a maritime claim. The South China Arbitration states that it is the natural form of the island that matters, suggesting that the condition of the island prior to anthropogenic climate change should be the focus.<sup>152</sup> However, there is no consensus on this interpretation. Thirdly, I considered whether baselines and boundaries should be fixed or ambulatory. There is growing support among Pacific Islanders for a fixed boundaries model.<sup>153</sup> If current boundaries could be frozen, then the future uninhabitability of basepoints would no longer be a concern with respect to states' EEZ claims.

Case studies of the Marshall Islands and Kiribati illustrated the complexity of the challenges created by climate change. In both cases, the uninhabitability of islands is threatened by decreasing food and water security stemming from the salination of groundwater and ocean acidification. The archipelagic status of Kiribati's Gilbert Island chain is also threatened by the inundation of even minor amounts of land. Unless



baselines are frozen, this could lead to significant contractions in maritime territory.

Australia committed to the fixed baselines model when it endorsed the Palau Declaration.<sup>154</sup> The RAN can assist in the uptake of this model through the deployment of hydrographic vessels to map incomplete claims in the Western Pacific. Including multibeam sonar on the new Pacific Support Vessel and commissioning a platform of similar capability to the Leeuwin-class vessels is recommended to assist with this work. Through this approach, Australia can help states in the Western Pacific navigate the legal ambiguities created by climate change, to the benefit of regional stability.



### Appendix A: Defining the Western Pacific

The map below (Figure A1) shows the Western Pacific as it is defined by the Food and Agriculture Organization of the United Nations.<sup>155</sup> This is the definition used in this paper.

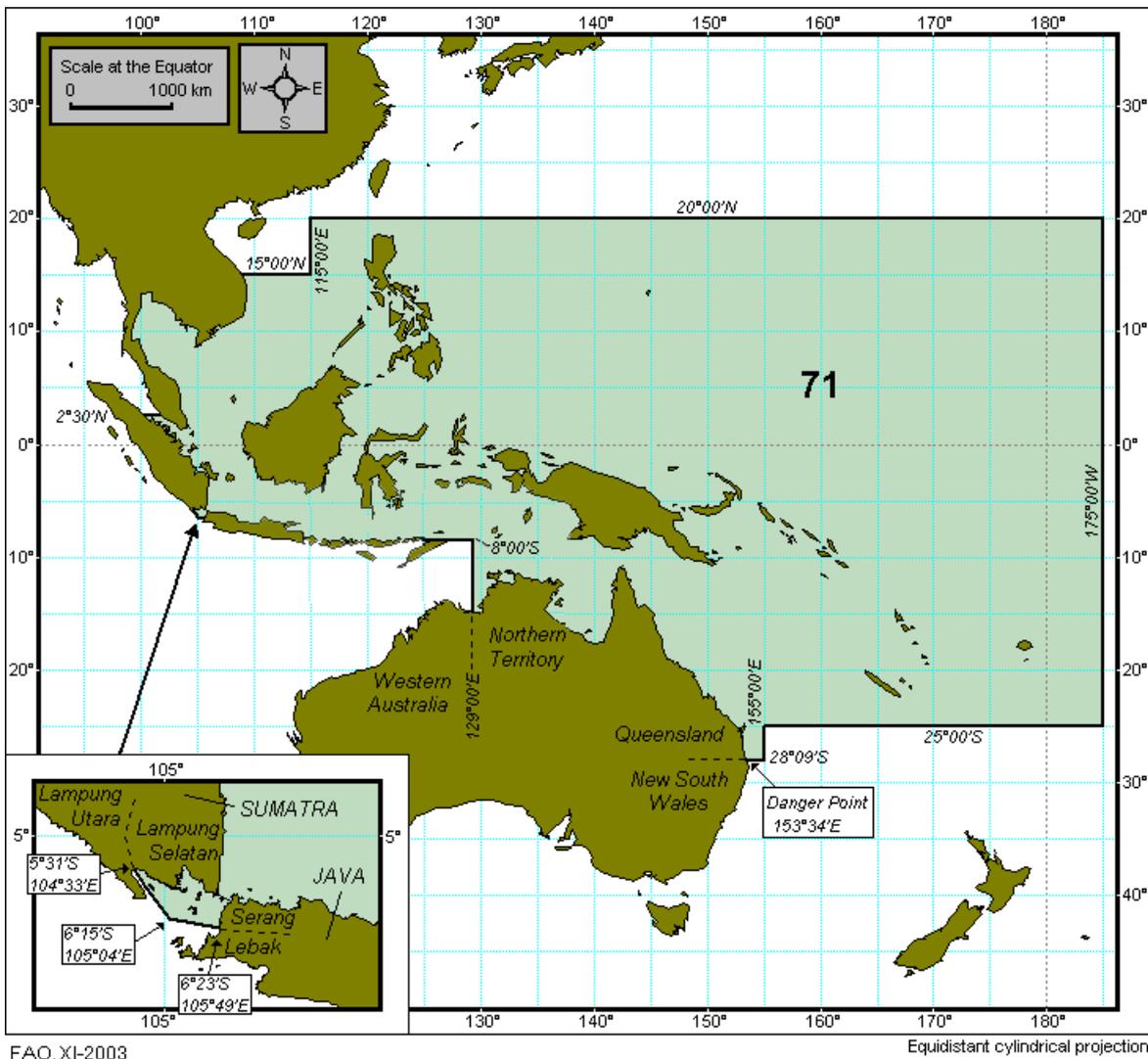


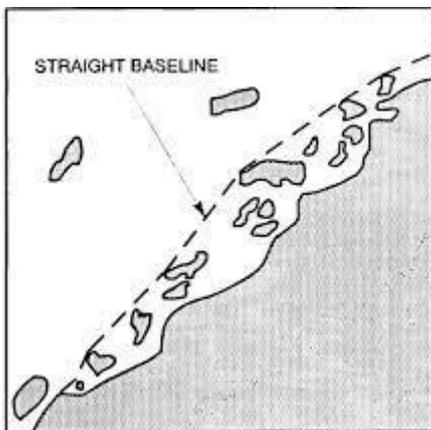
Figure A1: FAO Area 71, Western Central Pacific

Source: 'FAO Major Fishing Areas: Pacific, Western Central', Food and Agriculture Organization of the United Nations, 2020.

## Appendix B: Types of Baselines

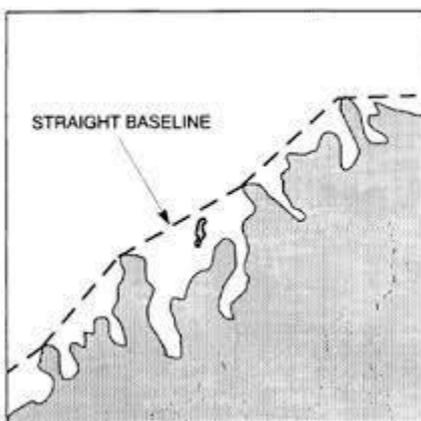
In the case of normal baselines, an EEZ is measured from the low-water line along the coast.<sup>156</sup> There are a few scenarios where a different approach is used. These include:

- 1) Where there is a fringing reef, the low-water line of the fringing reef is used instead.<sup>157</sup>
- 2) Where there are islands just off the coast of the landmass, then straight baselines are drawn around the islands (Figure B1).<sup>158</sup>



*Figure B1: Fringing Islands*

Source: Roach, J. Ashley, 'Baselines under the Law of the Sea: Benefits and Challenges', (Presentation, National University of Singapore, 2016), p. 5, <https://cil.nus.edu.sg/wp-content/uploads/2017/11/Session-3-Baselines-Islands-Rocks-and-Low-Tide-Elevations-Roach-2017.pdf>.



- 3) Where the land is deeply indented, straight baselines may also be used (Figure B).<sup>159</sup>

*Figure B2: Deeply Indented Coast*

Source: Roach, 'Baselines under the Law of the Sea: Benefits and Challenges', p. 5.



- 4) Archipelagic states (states comprised of several islands that meet specific size and land-to-water ratio requirements) are allowed *archipelagic baselines*, which are formed by drawing straight lines around the outer islands of the archipelago.<sup>160</sup>



Figure B3: Archipelagic Baselines

Source: Roach, 'Baselines under the Law of the Sea: Benefits and Challenges', p. 12.

In instances where states are less than 400nm apart (and hence cannot each claim a 200nm EEZ), a median line is drawn unless an alternative agreement is reached between the states or historical use indicates a different division would be more appropriate.<sup>161</sup>



## End notes

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