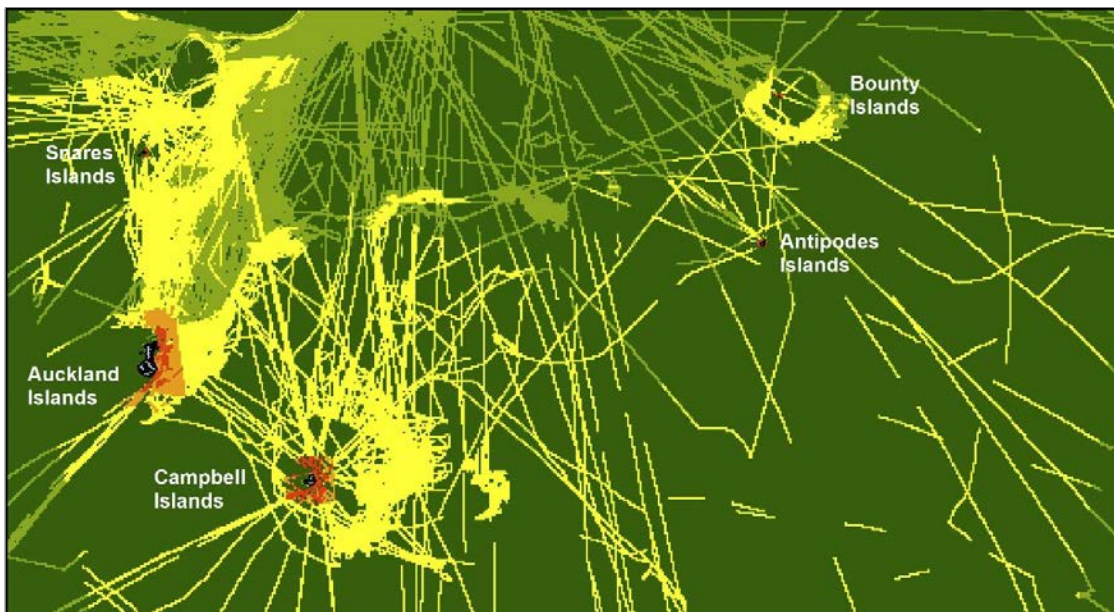




LAND INFORMATION NEW ZEALAND

SUB-ANTARCTIC ISLANDS HYDROGRAPHIC RISK ASSESSMENT – ANNEXES



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LAND INFORMATION NEW ZEALAND

SUB-ANTARCTIC ISLANDS HYDROGRAPHIC RISK ASSESSMENT – ANNEX REPORT

Prepared for: Land Information New Zealand

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Annex A RISK CRITERIA MATRIX

Risk Criteria Matrix - Sub-Antarctic Islands and Antarctica		0	1	2	3	4	5	Rating	Category Weighting	Model Weighting	Overall Weighting	
		CONTINUOUS SCALES										
Traffic	Potential Loss of Life		Insignificant	Low	Moderate	High	Catastrophic		42%		25%	
	Potential Oil Outflow		Insignificant	Low	Moderate	High	Catastrophic		38%			
	Economic		Insignificant	Low	Moderate	High	Catastrophic		15%			
	Salvage		Insignificant	Low	Moderate	High	Catastrophic		5%			
		LIKELIHOOD SCALES										
Causation Criteria	Charting	Chart Quality		A	B	C	D	U	3		25.00%	25%
		Survey Age		<5 years	5-10 years	10-20 years	20-30 years	>30 years	1	50.0%	8.33%	
		Chart Adequacy		Excellent	Good	Moderate	Poor	Unacceptable	2		16.67%	
	Route Characteristics	Navigational Complexity		Open Sea >10nm	Offshore Navigation (5-10nm)	Coastal Navigation (1-5nm)	Port Approaches	Constrained Navigation (<1nm)	3	20.0%	10.00%	
		Great Circle Route	>100nm	50-100nm	25-50nm	10-25nm	0-10nm	Offshore Route	1		3.33%	
		Depth of Water 15m Contour	>10nm	5-10nm	2.5-5nm	1.5-2.5nm	1-1.5nm	Within 1nm	2		6.67%	
	MetOcean	Prevailing Wave/Wind		Sheltered at Most Times	Mainly Sheltered	Moderate Exposure	Mainly Exposed	Exposed on Most Days	3	10.0%	10.00%	
	Navigational Hazards	Known Sea Mounts	>10nm	5-10nm	2.5-5nm	1.5-2.5nm	1-1.5nm	Within 1nm	1		2.86%	
		Calving Ice - After release	None	Insignificant	Minor	Moderate	Major	Significant	2	20.0%	5.71%	
		Isolated Dangers - Rocks/Wrecks/etc.	>2.5nm	2.5-2nm	1.5-2	1-1.5nm	500m-1nm	<500m	2		5.71%	
		Charted Tidal Hazards	>2.5nm	2.5-2nm	1.5-2	1-1.5nm	500m-1nm	<500m	2		5.71%	
			CONSEQUENCE SCALES									
Environmentally Sensitive Criteria (Pollution Impact Only)												
Consequence Criteria	9/10 ESV	Antipodean Albatross	>20nm	Within 20nm	Within 5nm	Within 2nm of Habitat	Habitat for Single Species	Habitat for Multiple Species		25%	25%	50%
		Campbell Island Snipe										
	NZ Sealion											
	Salvin's Mollymawk											
	7/8 ESV	Yellow-eyed Penguin	>20nm	Within 20nm	Within 5nm	Within 2nm of Habitat	Habitat for Single Species	Habitat for Multiple Species		20%	20%	
	5/6 ESV	Auckland Island Dotterel										
		Auckland Island Shag										
		Auckland Island Teal										
		Campbell Albatross										
Campbell Island Teal												
Erect-crested Penguin		>20nm	Within 20nm	Within 5nm	Within 2nm of Habitat	Habitat for Single Species	Habitat for Multiple Species		15%	15%		
Gibson's Albatross												
Northern Giant Petrel												
3/4 ESV	Rockhopper Penguin											
	Southern Elephant Seal											
	Antipodes Island Snipe											
	Auckland Island Rail											
	Auckland Island Snipe											
	Bounty Island Shag											
	Campbell Island Shag											
	Grey Petrel (Burrowing Petrel)											
	Light Mantled Sooty Albatross											
	Snare's Crested Penguin	>20nm	Within 20nm	Within 5nm	Within 2nm of Habitat	Habitat for Single Species	Habitat for Multiple Species		10.0%	10.0%		
1/2 ESV	Snare's Island Snipe											
	Sooty Shearwater											
	Southern Royal Albatross											
	White-capped Mollymawk											
Habitats	Antarctic Prion	>20nm	Within 20nm	Within 5nm	Within 2nm of Habitat	Habitat for Single Species	Habitat for Multiple Species		5%	5%		
	Buller's Mollymawk											
Environmental Protection	Fulmar Prion											
	Southern Right Whale											
	Proximity to Large Reef (High quality / or Isolated shoreline)	>20nm	10-20nm	5-10nm	2.5-5nm	1-2.5nm	Within 1nm	2	5%	5.00%		
Economically Sensitive Areas (Economic Impact Only)	World Heritage Site	>20nm	10-20nm	5-10nm	2.5-5nm	1-2.5nm	Within 1nm	3		8.57%		
	Vessel Access Restrictions	>12nm	12nm	6nm	1000m	600m	300m	1	20%	2.86%		
	Proximity to Marine Protected Area	>20nm	10-20nm	5-10nm	2.5-5nm	1-2.5nm	Within 1nm	3		8.57%		
Economical	Fishing Grounds	>20nm	10-20nm	5-10nm	2.5-5nm	1-2.5nm	Within 1nm	2		50.00%		
	Tourist Sites	>20nm	10-20nm	5-10nm	2.5-5nm	1-2.5nm	Within 1nm	2		50.00%		

Annex B CONSULTATION RECORDS

Date	Organisations Present	Location	Attendees
09-02-18	DOC Marico	Marico Office, Wellington	<ul style="list-style-type: none"> DOC Representative - Ecologist with specialisation in Antarctica/Subantarctic Islands Marico Ecologists x2

Results/Updates/Actions to be taken
<ul style="list-style-type: none"> Vetting of the Ecological Risk Criteria/Species Composition Suggestions on criteria and species of interest were made by DOC reps. Changes to Risk Criteria following more research by Marico were made

Table 1: Stakeholder Attendees and Results for 09-02-18

Date	Organisations Present	Location	Attendees
23-04-18	DOC LINZ Marico	DOC Office, Invercargill	<ul style="list-style-type: none"> DOC Representative for Subantarctic Management Marico Consultant Marico Director LINZ Hydrographer

Results/Updates/Actions to be taken
<ul style="list-style-type: none"> Information on tourist management for all sites was given Cruise ship trends and future booking information was obtained Vessel Access Permitting systems information was obtained

Table 2: Stakeholder Attendees and Results for 23-04-18

Date	Organisations Present	Location	Attendees
10-05-18	LINZ Marico Cruise NZ	Cruise NZ Office, Auckland	<ul style="list-style-type: none"> • Marico Consultant • Marico Director • LINZ Hydrographer • Cruise NZ Representative x2

Results/Updates/Actions to be taken
<ul style="list-style-type: none"> • Information on Cruise Industry Trends obtained • Nautical and Navigational Information obtained

Table 3: Stakeholder Attendees and Results for 10-05-18

Date	Organisations Present	Location	Attendees
23-08-18	Marico NZ Cruise Industry Representative	Marico Office, Wellington (Phone Interview)	<ul style="list-style-type: none"> • Marico Consultant • NZ Cruise Industry Representative

Results/Updates/Actions to be taken
<ul style="list-style-type: none"> • Verification of current interest of Cruise Industry in visiting uncharted areas in Subantarctic Islands • Information on Size/Capacity of upcoming Cruise Vessels was obtained

Table 4: Stakeholder Attendees and Results for 23-08-18

Annex C RISK CRITERIA - INPUT LAYERS

1 TRAFFIC

1.1 POTENTIAL LOSS OF LIFE

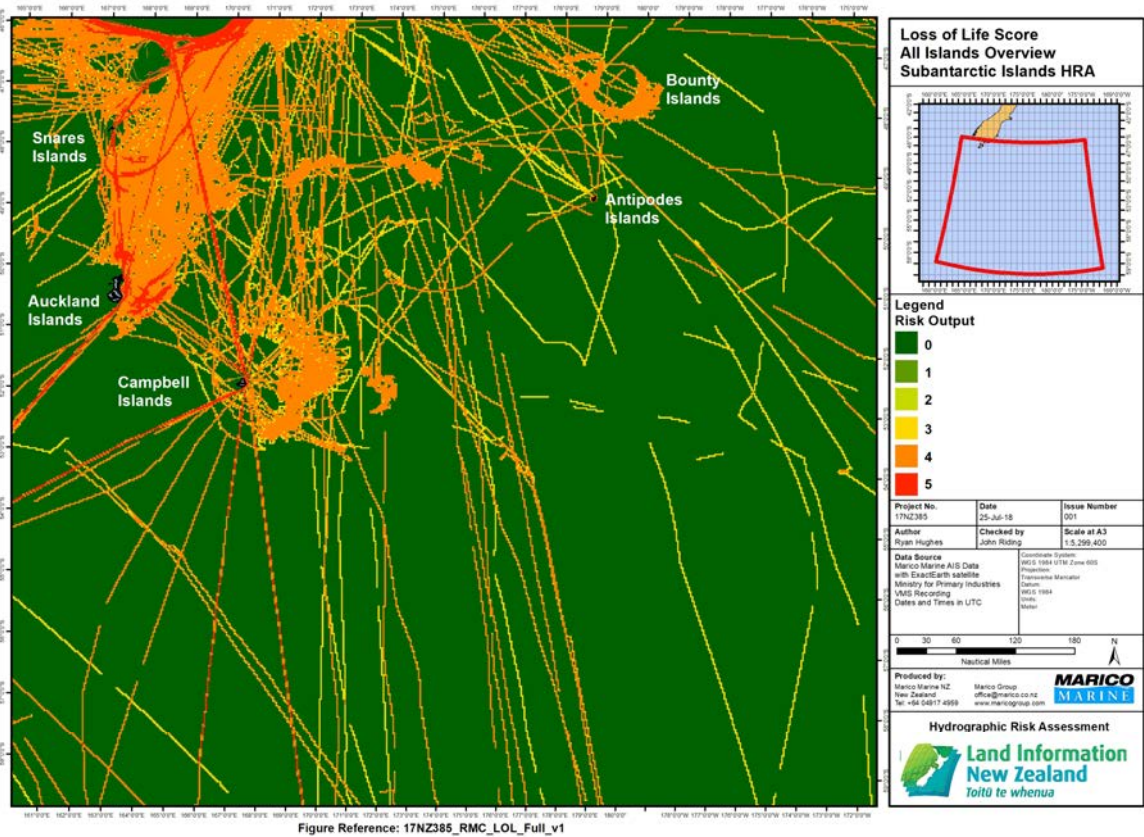


Figure 1, Potential Loss of Life Risk Output, All Islands Overview

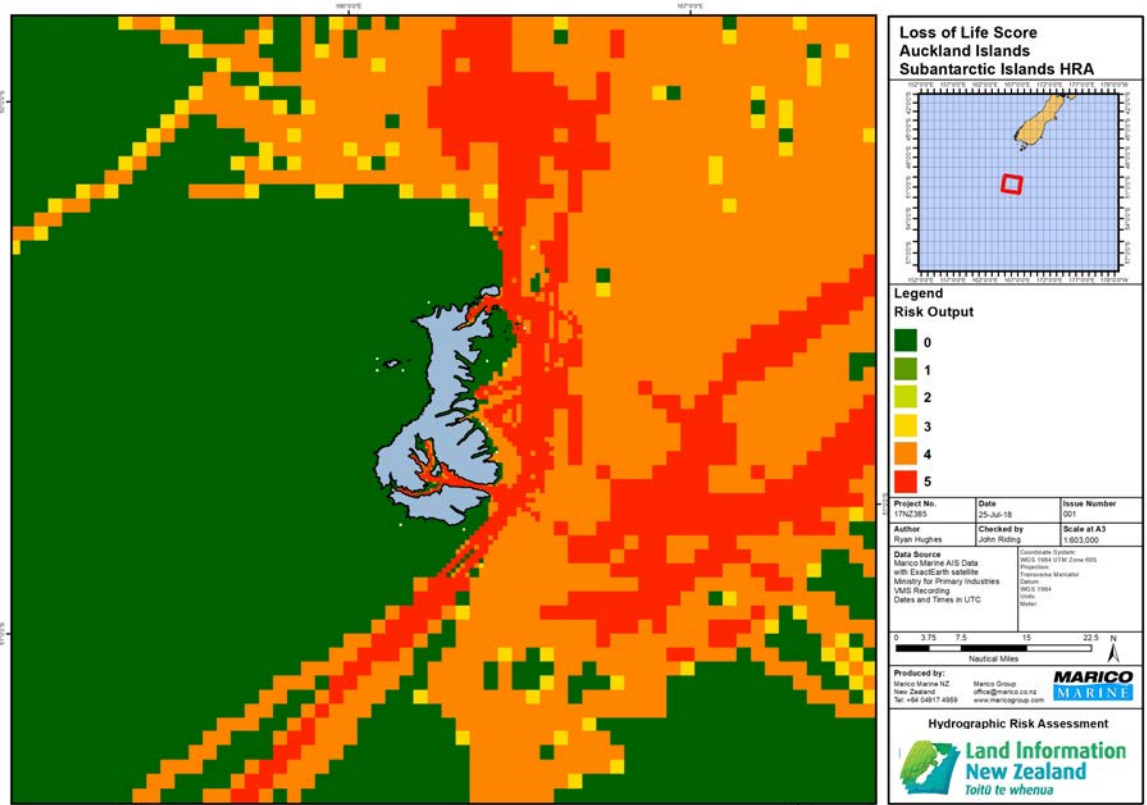


Figure Reference: 17NZ385_RMC_LOL_Auckland_v1

Figure 2, Potential Loss of Life Risk Output, Auckland Islands

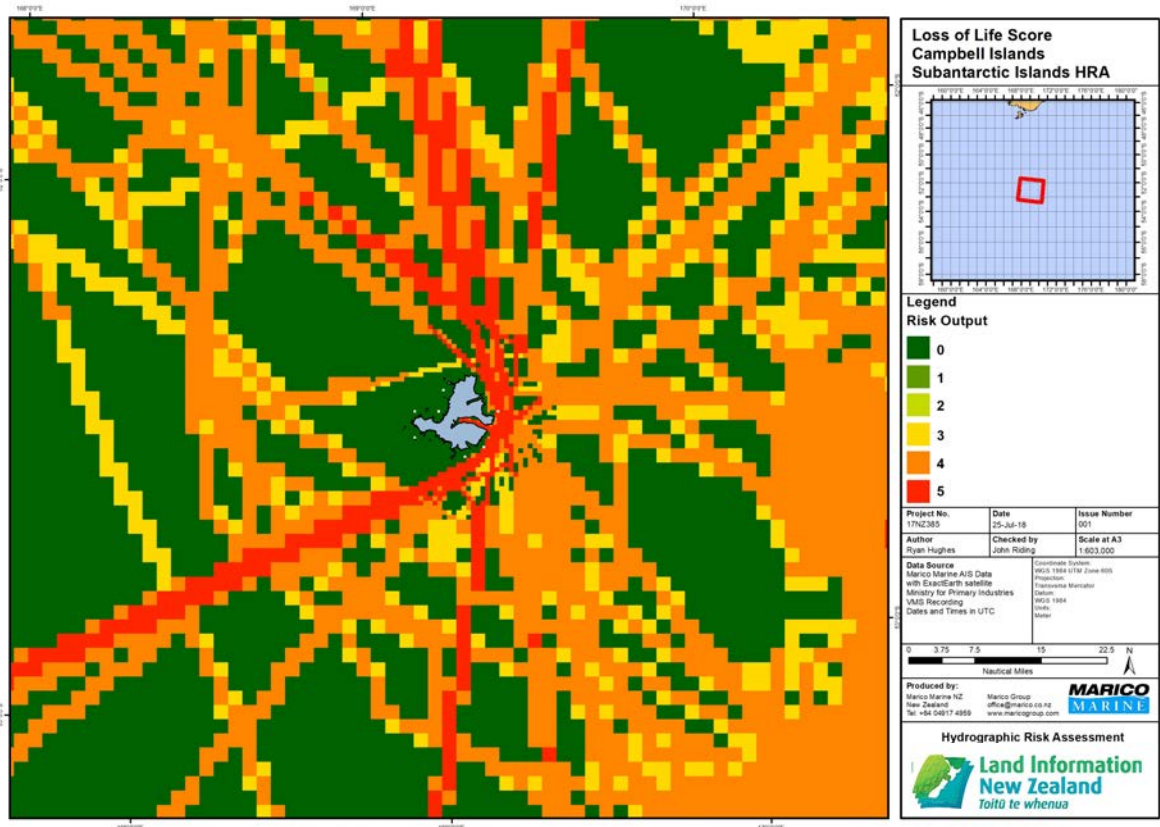


Figure Reference: 17NZ385_RMC_LOL_Campbell_v1

Figure 3, Potential Loss of Life Risk Output, Campbell Islands

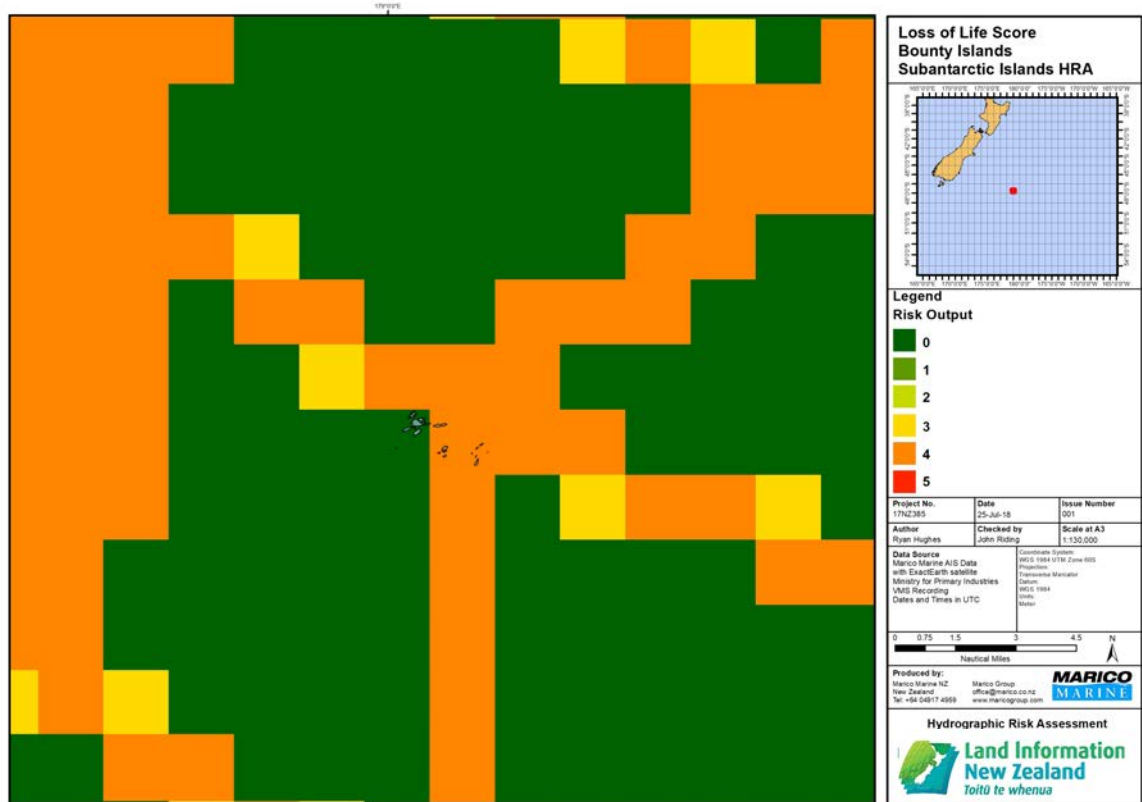


Figure Reference: 17NZ385_RMC_LOL_Bounty_Zoom_v1

Figure 4, Potential Loss of Life Risk Output, Bounty Islands

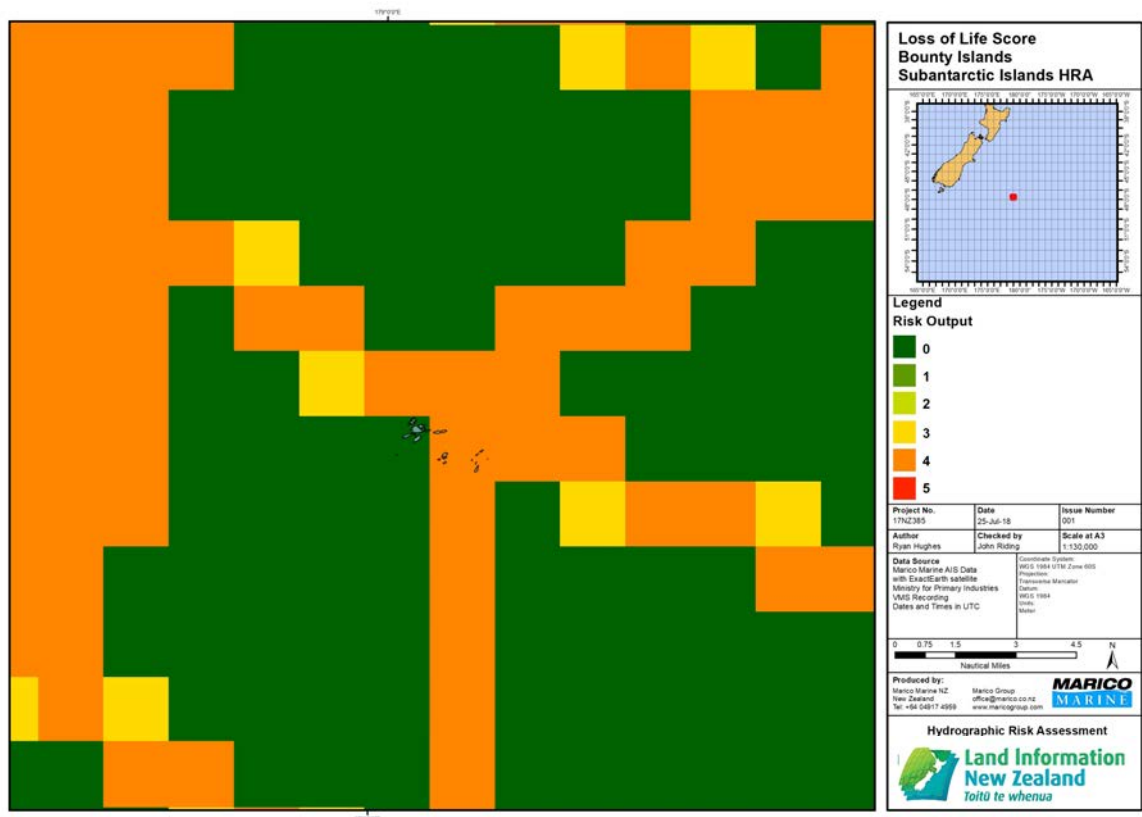


Figure Reference: 17NZ385_RMC_LOL_Bounty_Zoom_v1

Figure 5, Potential Loss of Life Risk Output, Bounty Islands Zoom

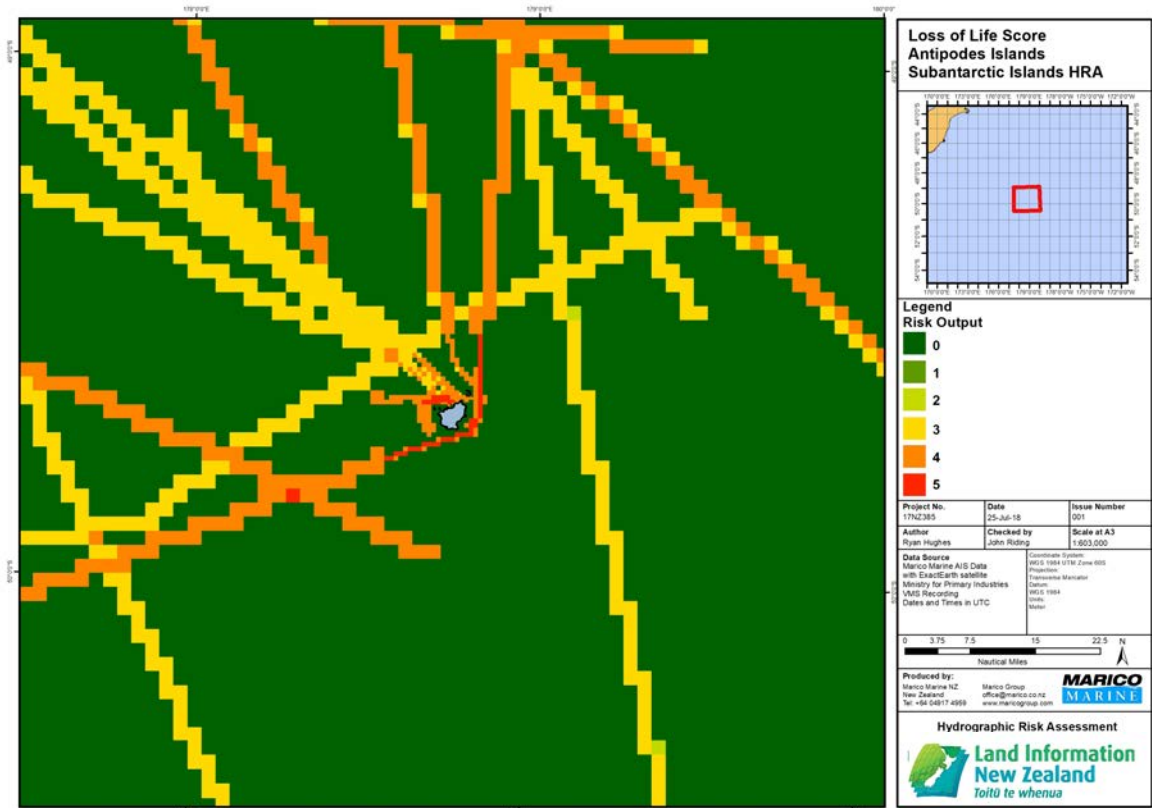


Figure Reference: 17NZ385_RMC_LOL_Antipodes_v1

Figure 6, Potential Loss of Life Risk Output, Antipodes Islands

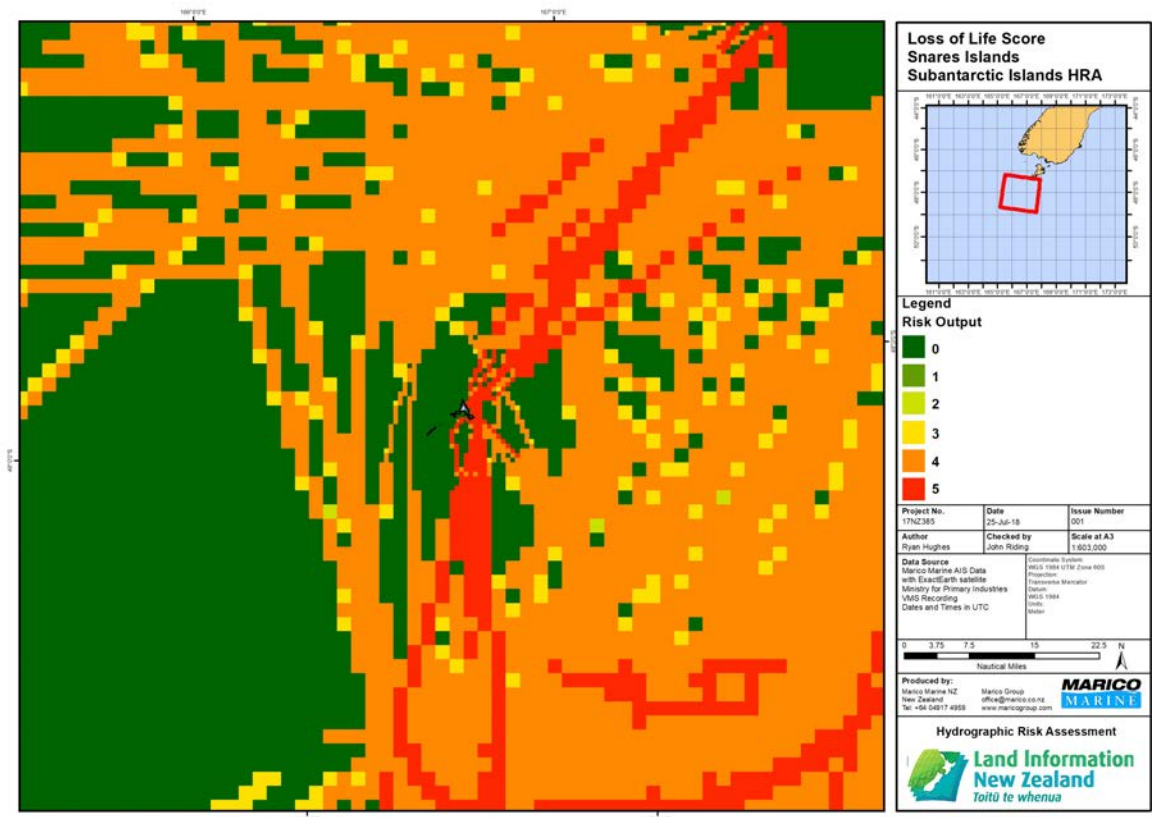


Figure Reference: 17NZ385_RMC_LOL_Snares_v1

Figure 7, Potential Loss of Life Risk Output, Snares Islands

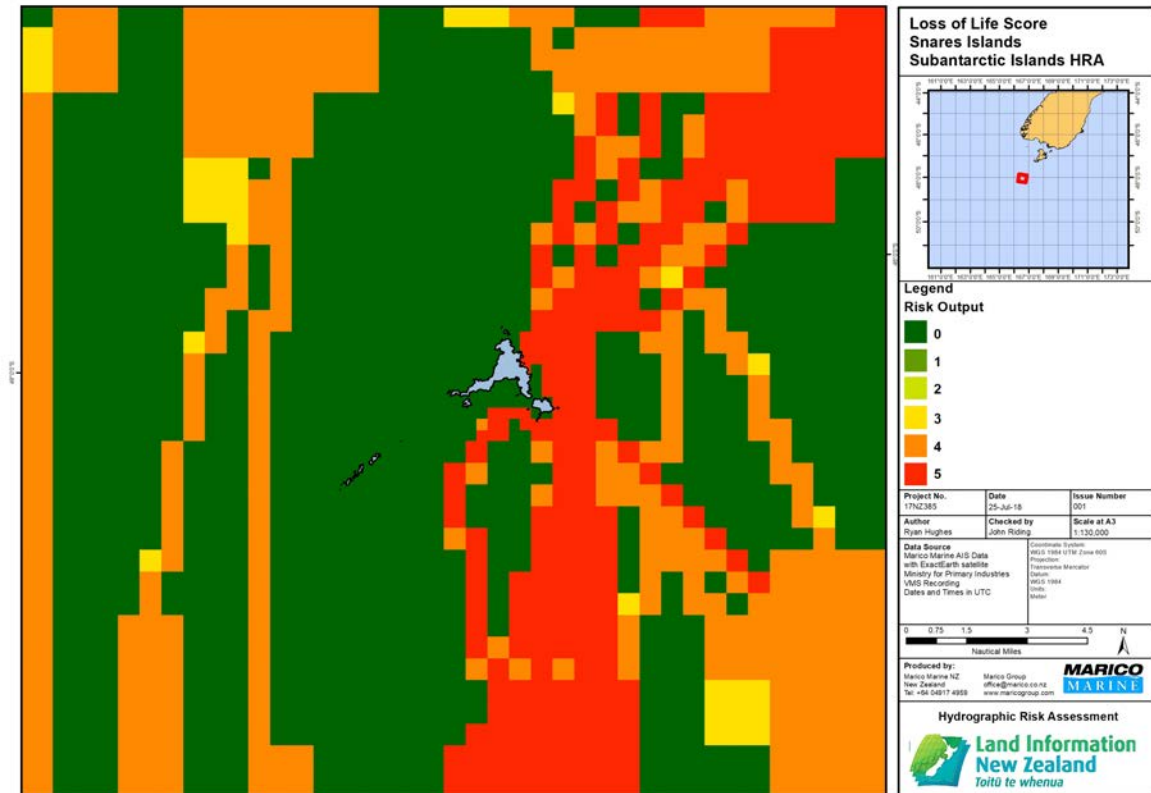


Figure Reference: 17NZ385_RMC_LOL_Snares_Zoom_v1

Figure 8, Potential Loss of Life Risk Output, Snares Islands Zoom

1.2 POTENTIAL OIL OUTFLOW (POLLUTION)

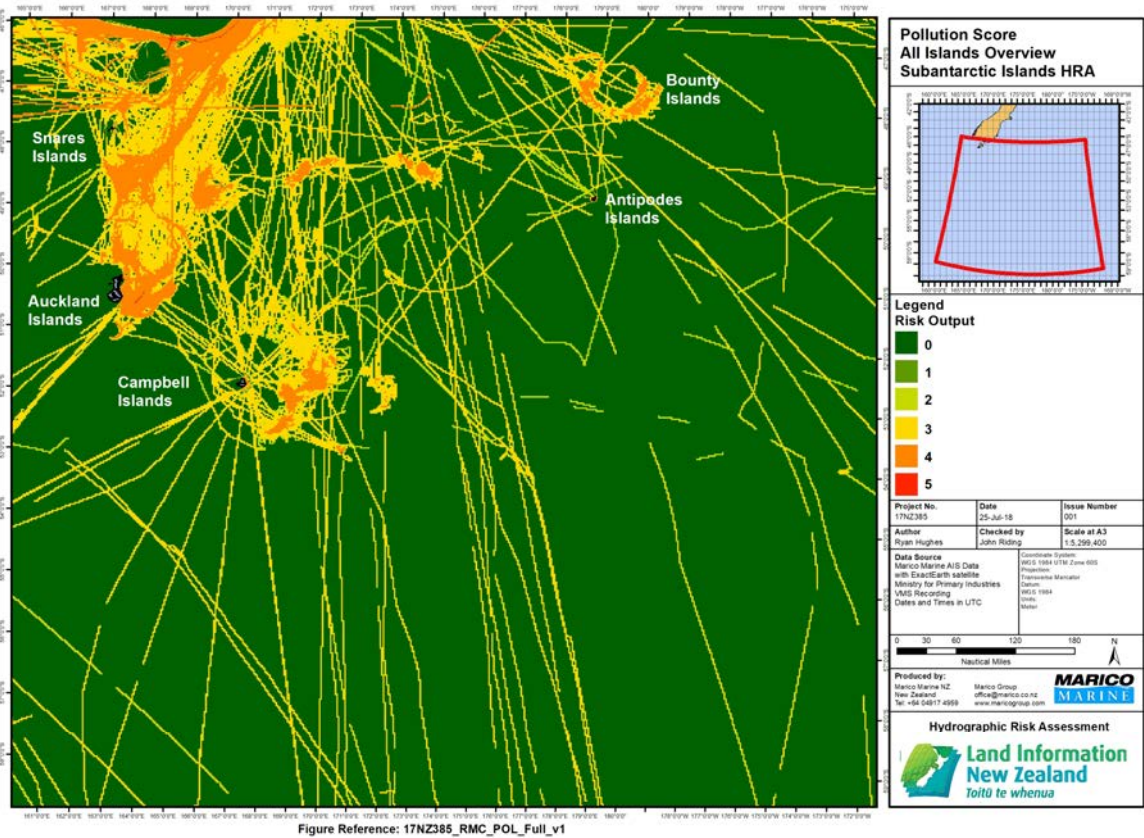


Figure 9, Potential Oil Outflow Risk Output, All Islands Overview

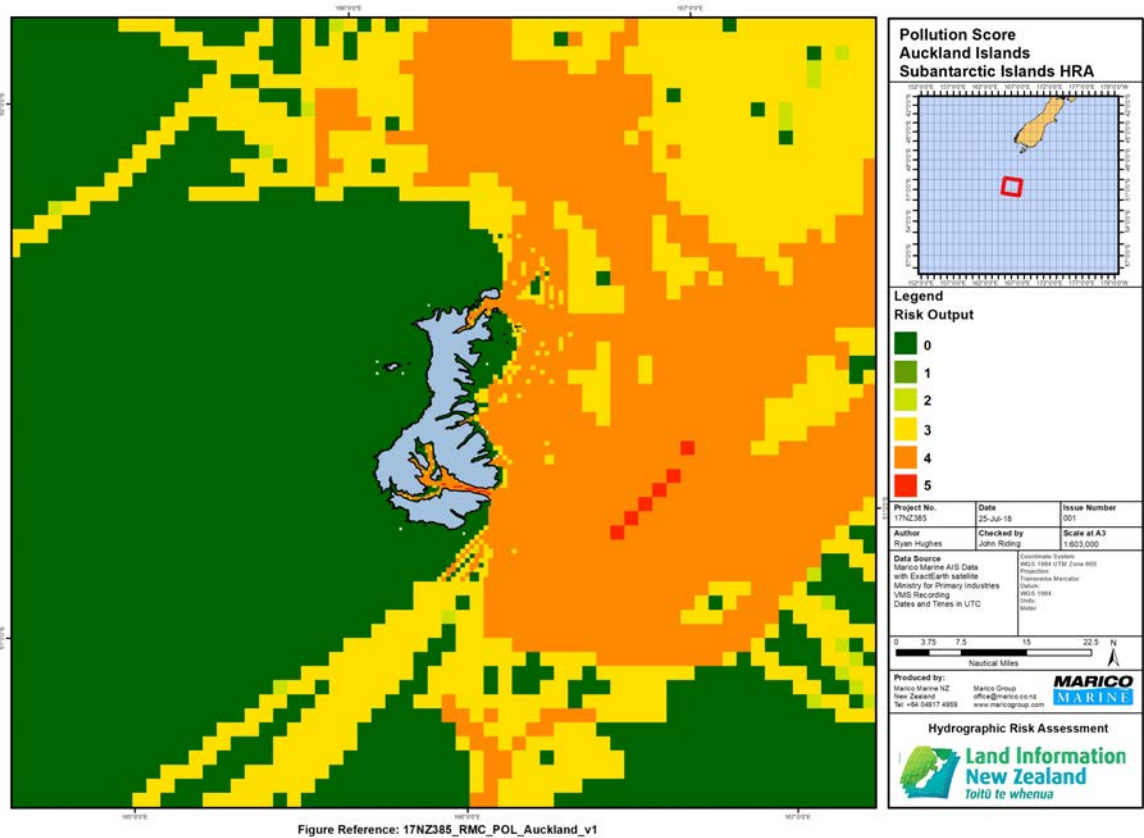


Figure 10, Potential Oil Outflow Risk Output, Auckland Islands

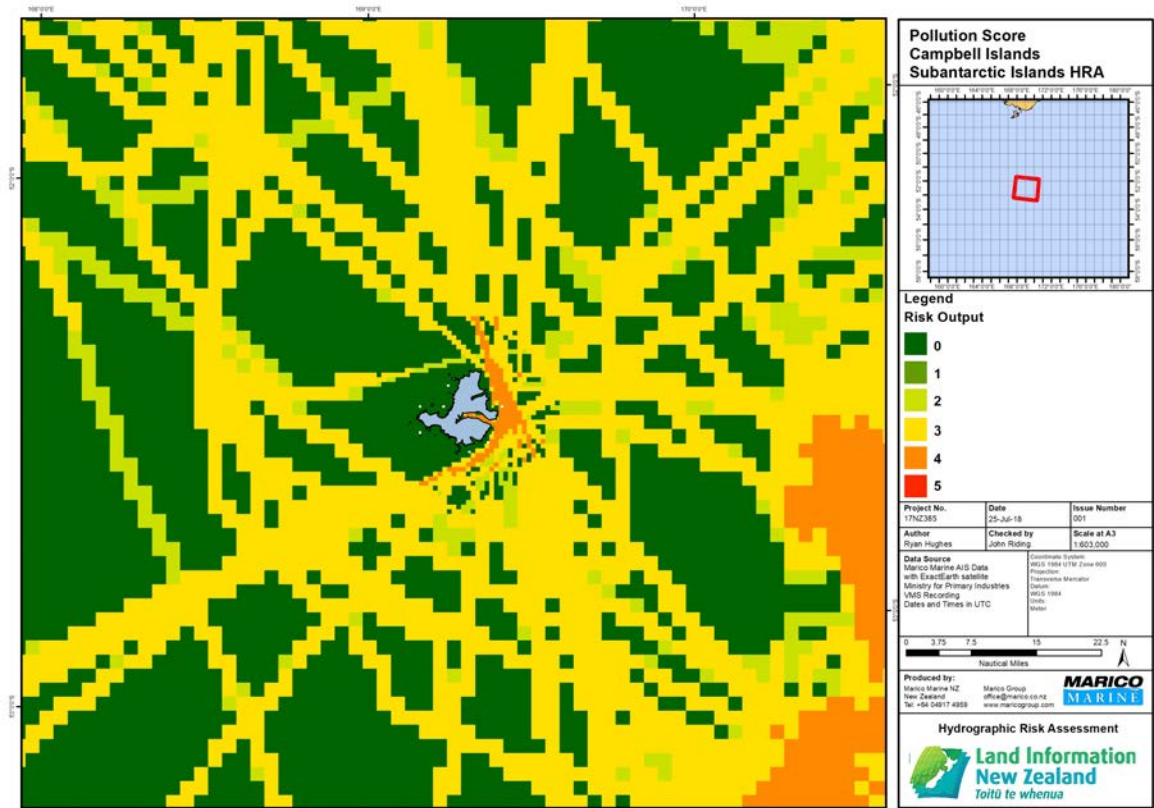


Figure Reference: 17NZ385_RMC_POL_Campbell_v1

Figure 11, Potential Oil Outflow Risk Output, Campbell Islands

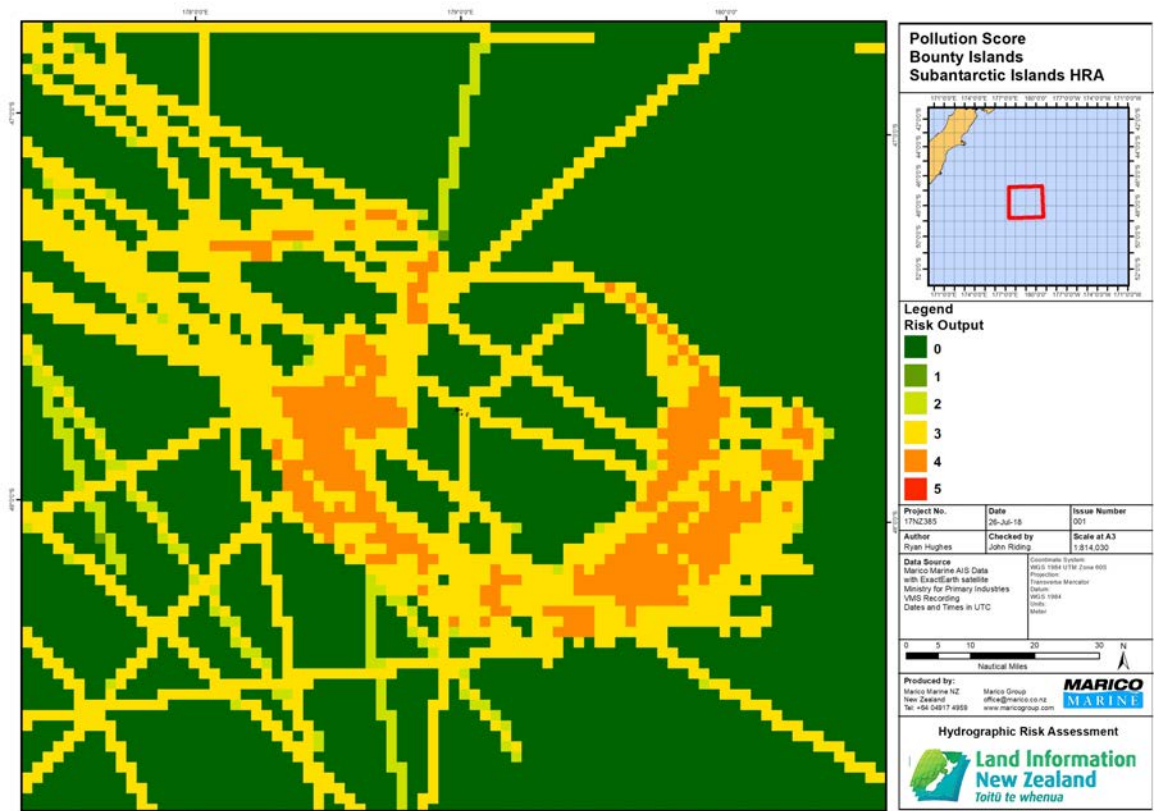


Figure Reference: 17NZ385_RMC_POL_Bounty_v1

Figure 12, Potential Oil Outflow Risk Output, Bounty Islands

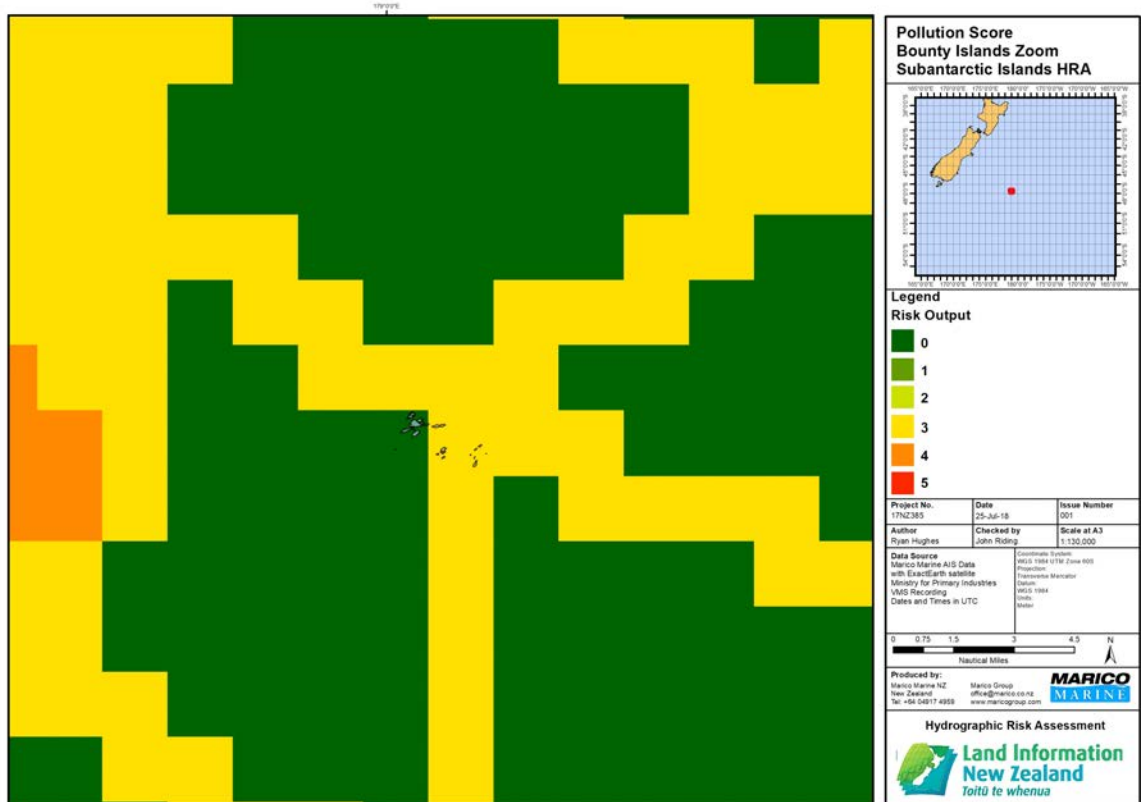


Figure Reference: 17NZ385_RMC_POL_Bounty_Zoom_v1

Figure 13, Potential Oil Outflow Risk Output, Bounty Islands Zoom

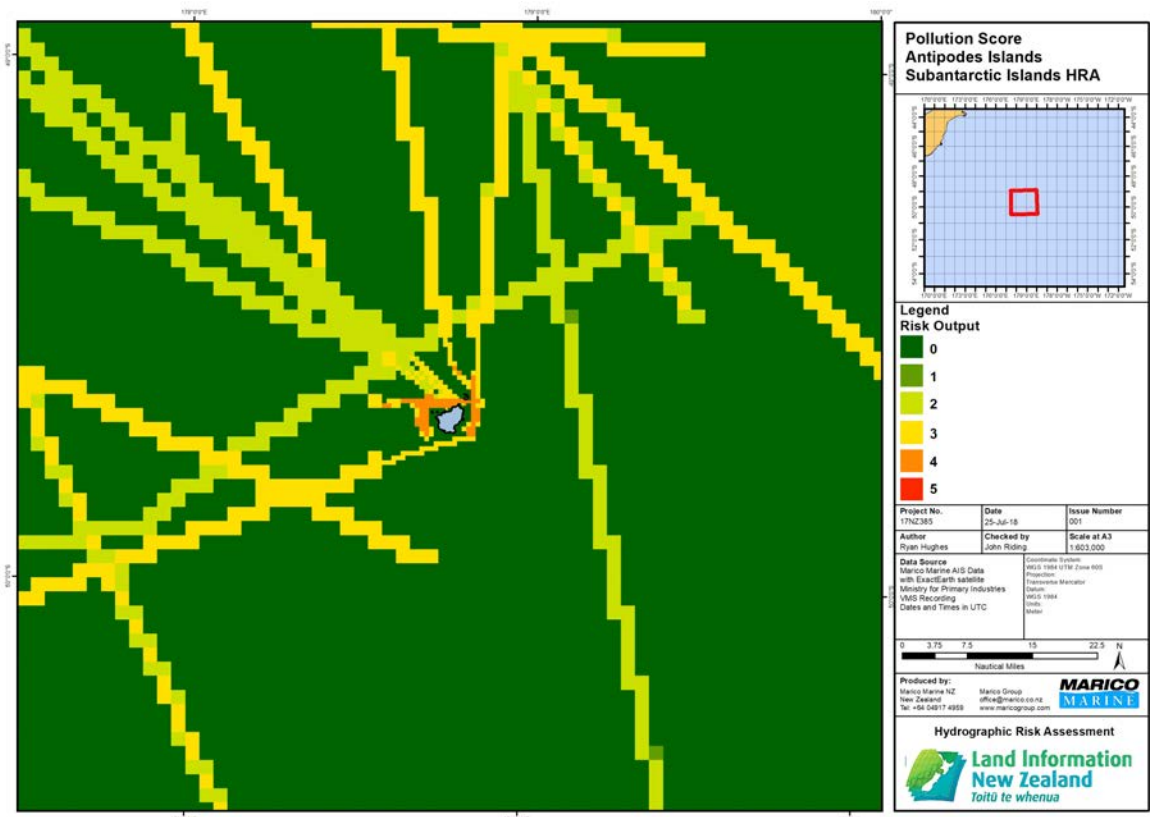


Figure Reference: 17NZ385_RMC_POL_Antipodes_v1

Figure 14, Potential Oil Outflow Risk Output, Antipodes Islands

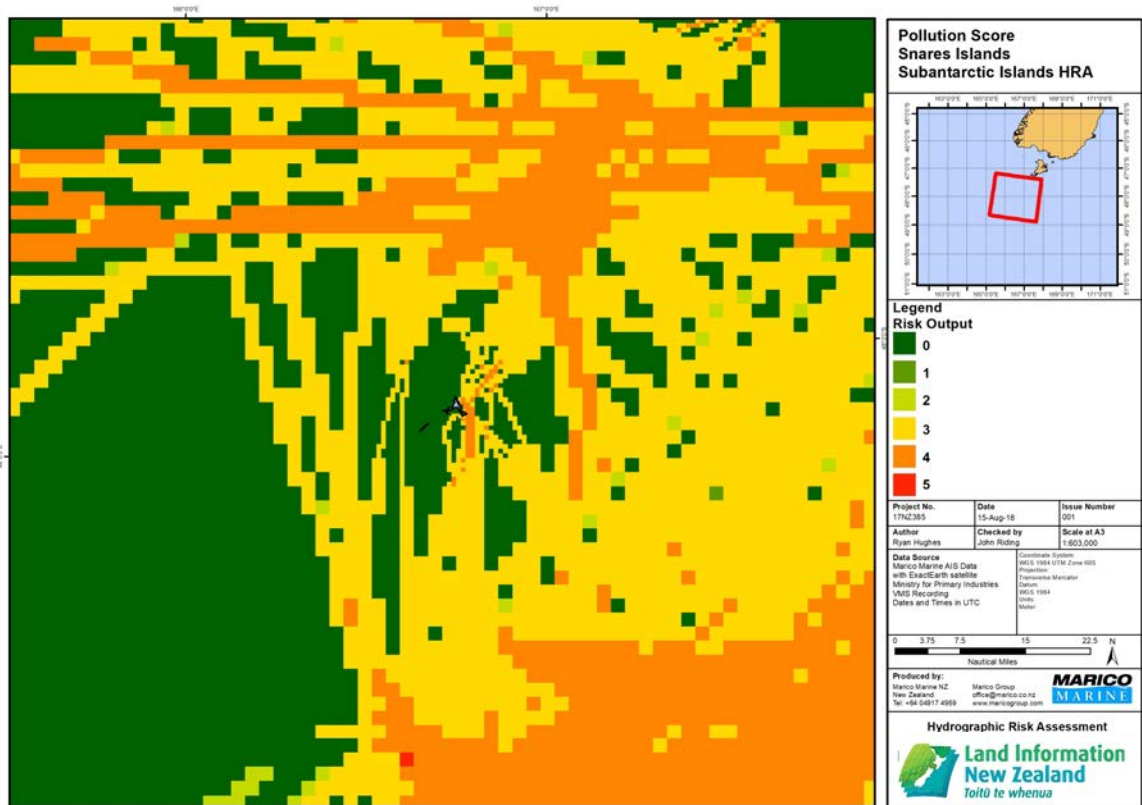


Figure Reference: 17NZ385_RMC_POL_Snares_v1

Figure 15, Potential Oil Outflow Risk Output, Snares Islands

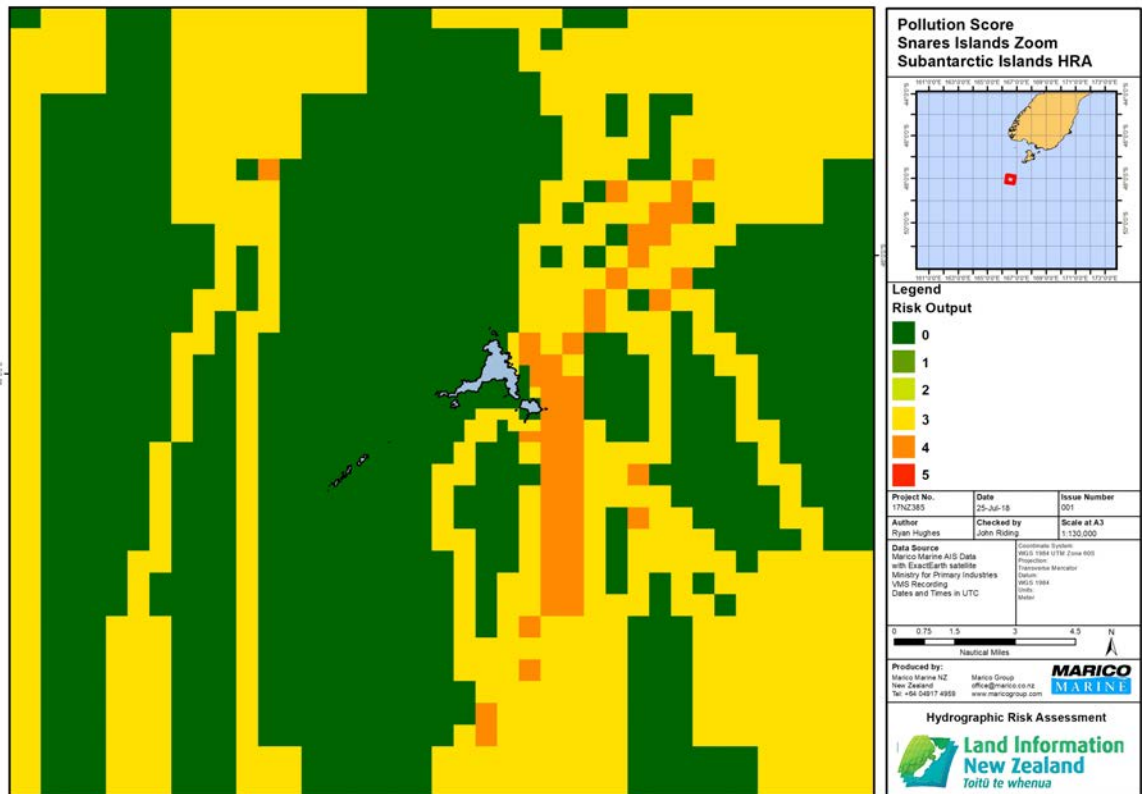


Figure Reference: 17NZ385_RMC_POL_Snares_Zoom_v1

Figure 16, Potential Oil Outflow Risk Output, Snares Islands Zoom

1.3 ECONOMIC (STAKEHOLDERS)

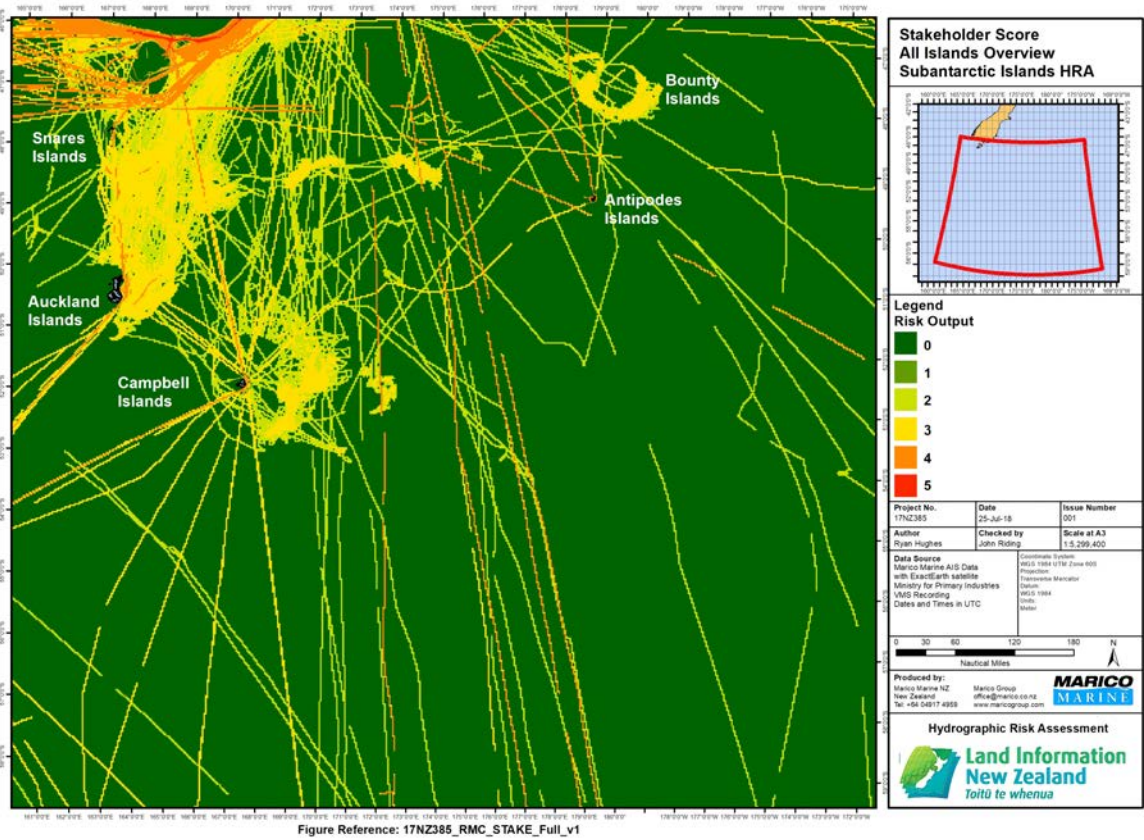


Figure 17, Economic Risk Output, All Islands Overview

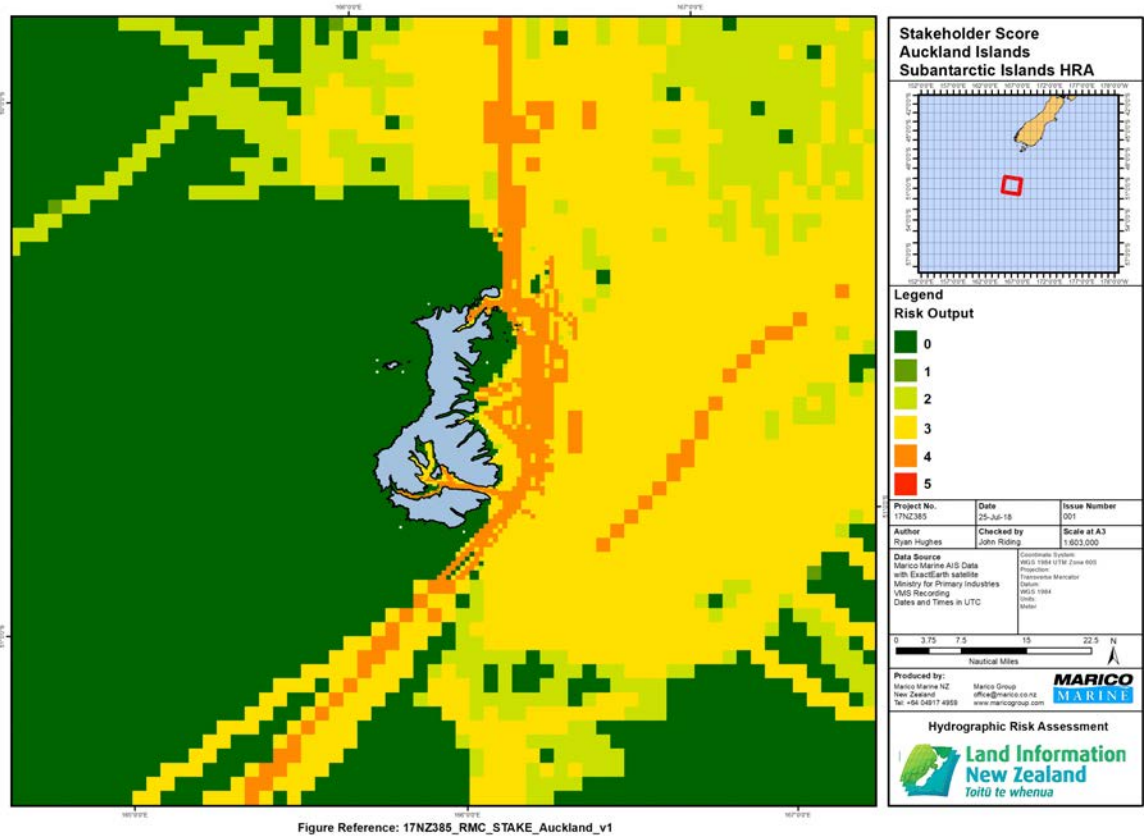


Figure 18, Economic Risk Output, Auckland Islands

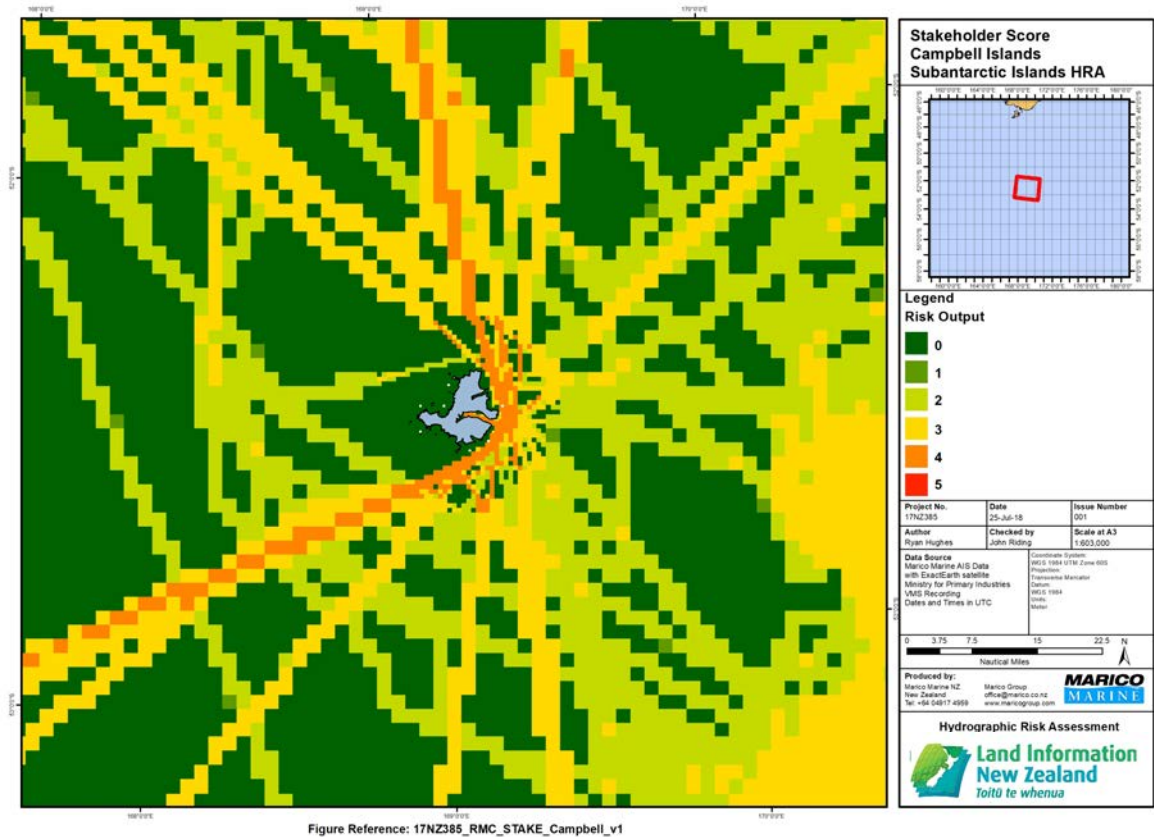


Figure 19, Economic Risk Output, Campbell Islands

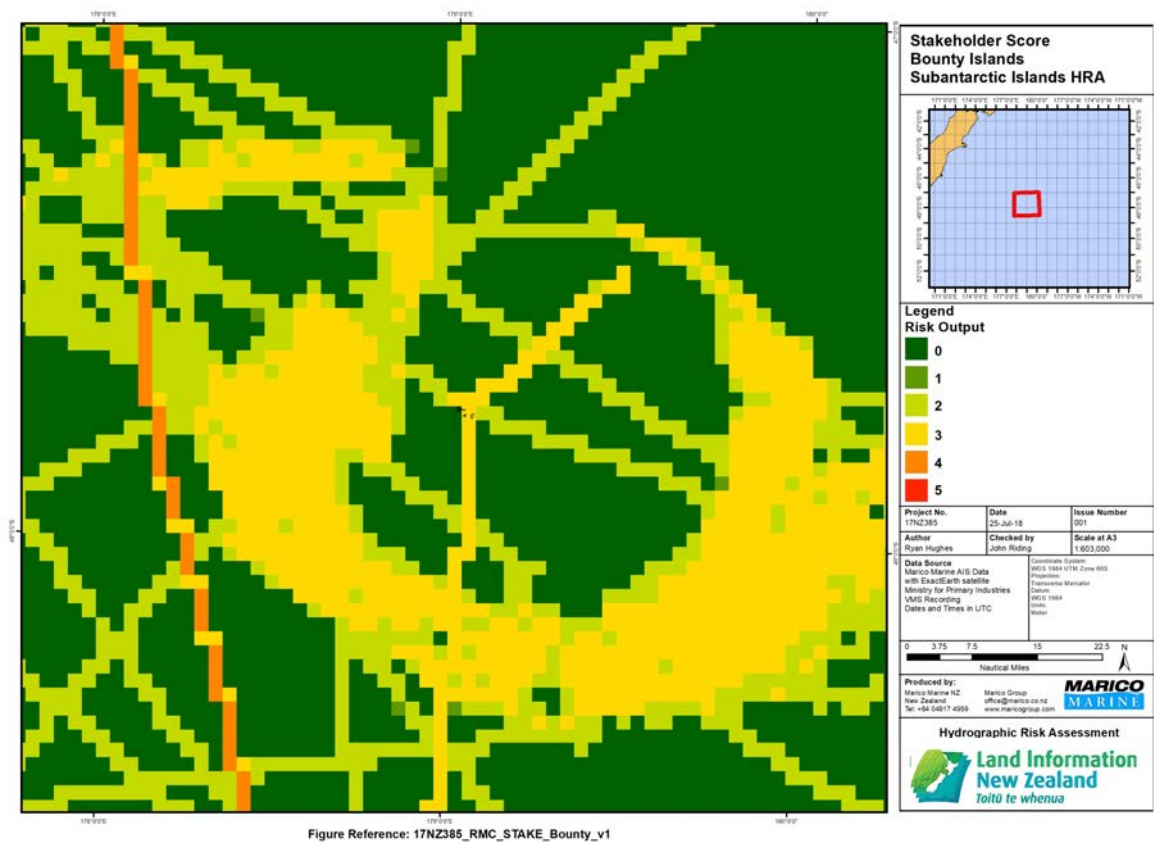


Figure 20, Economic Risk Output, Bounty Islands

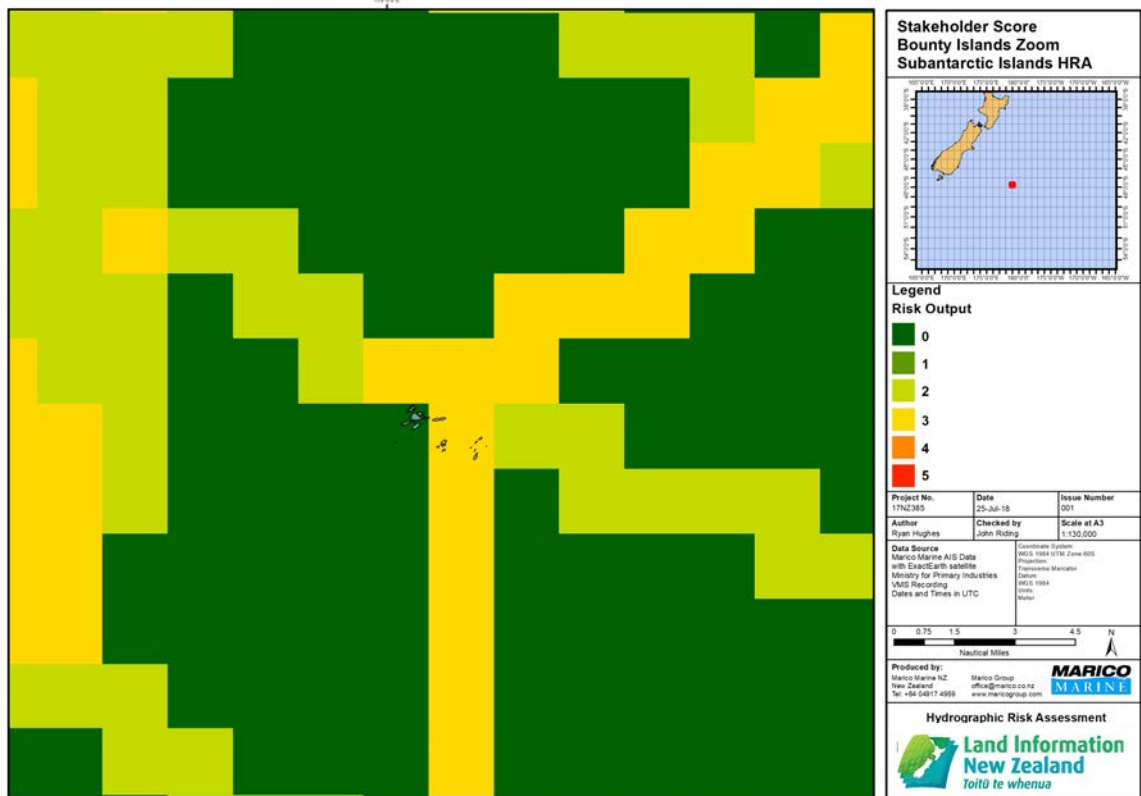


Figure Reference: 17NZ385_RMC_STAKE_Bounty_Zoom_v1

Figure 21, Economic Risk Output, Bounty Islands Zoom

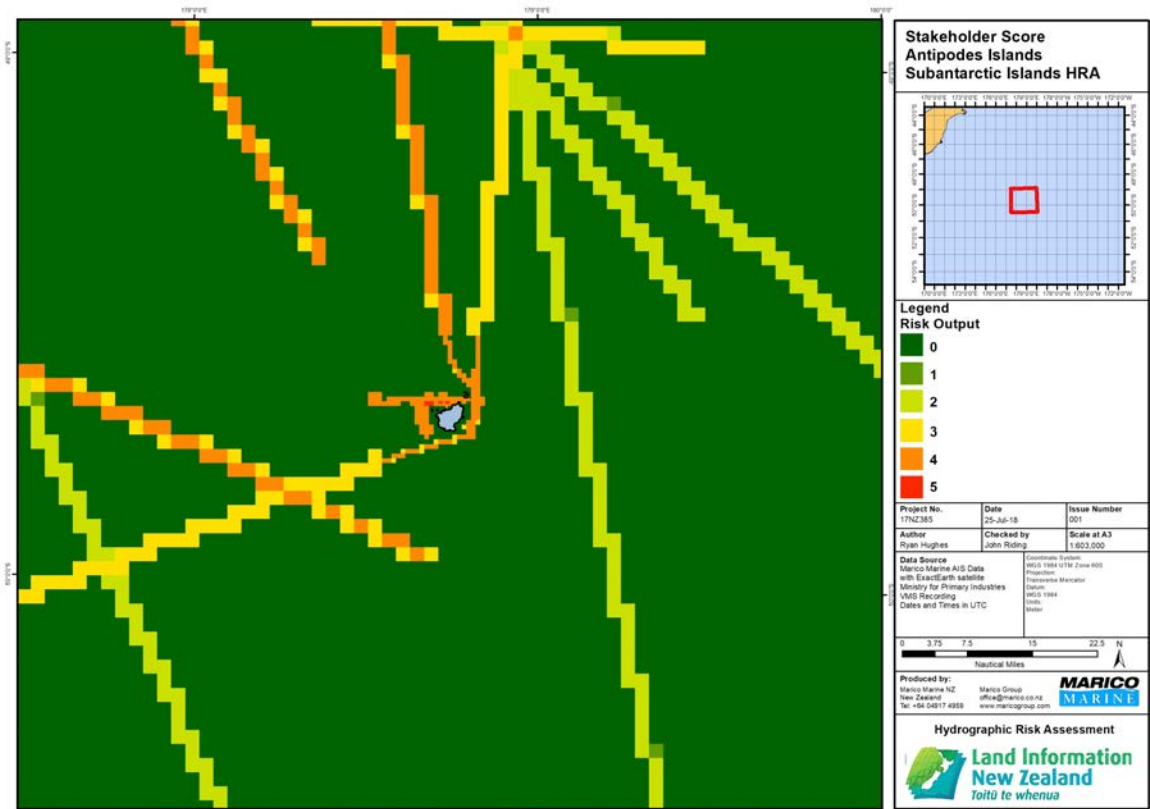


Figure Reference: 17NZ385_RMC_Stake_Antipodes_v1

Figure 22, Economic Risk Output, Antipodes Islands

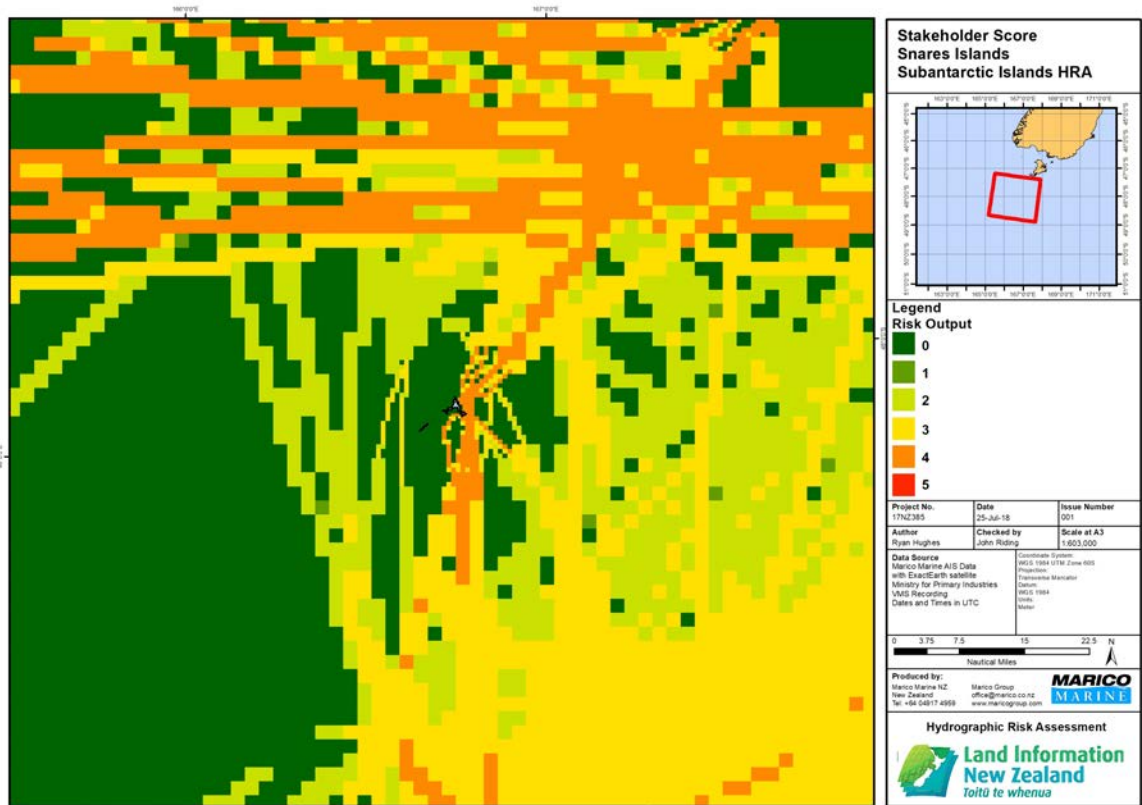


Figure Reference: 17NZ385_RMC_STAKE_Snares_v1

Figure 23, Economic Risk Output, Snares Islands

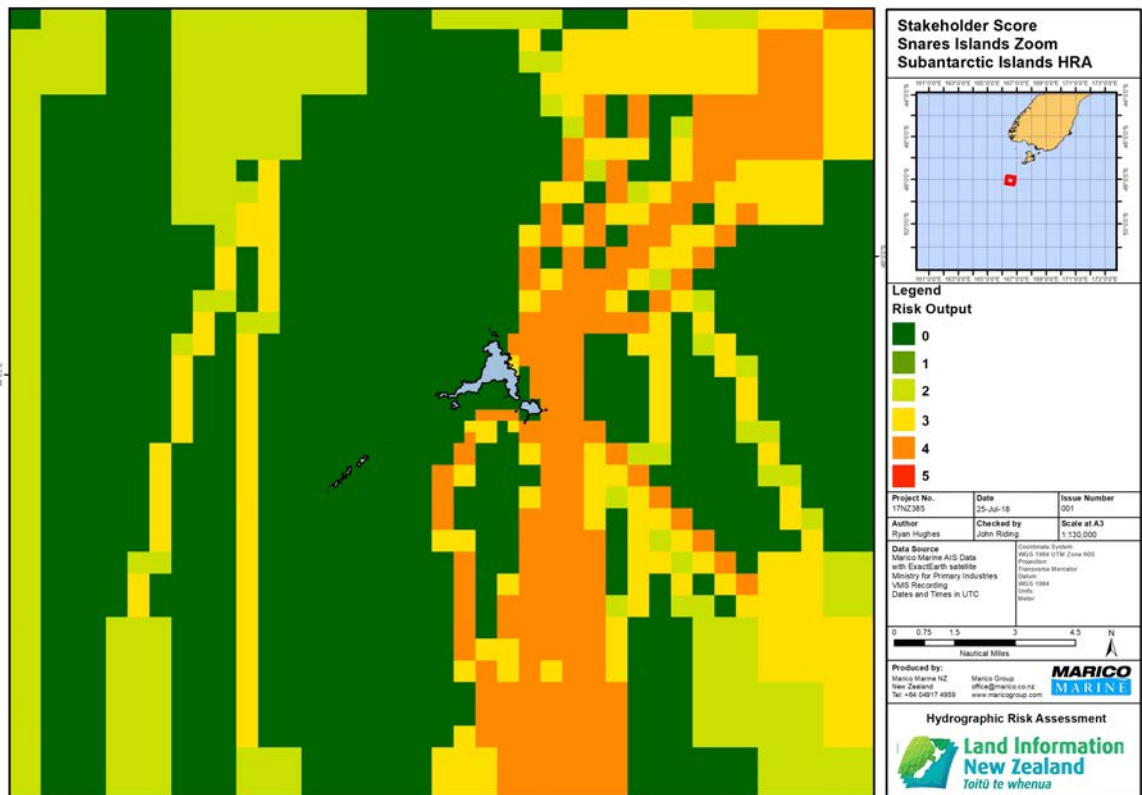


Figure Reference: 17NZ385_RMC_STAKE_Snares_Zoom_v1

Figure 24, Economic Risk Output, Snares Islands Zoom

1.4 SALVAGE

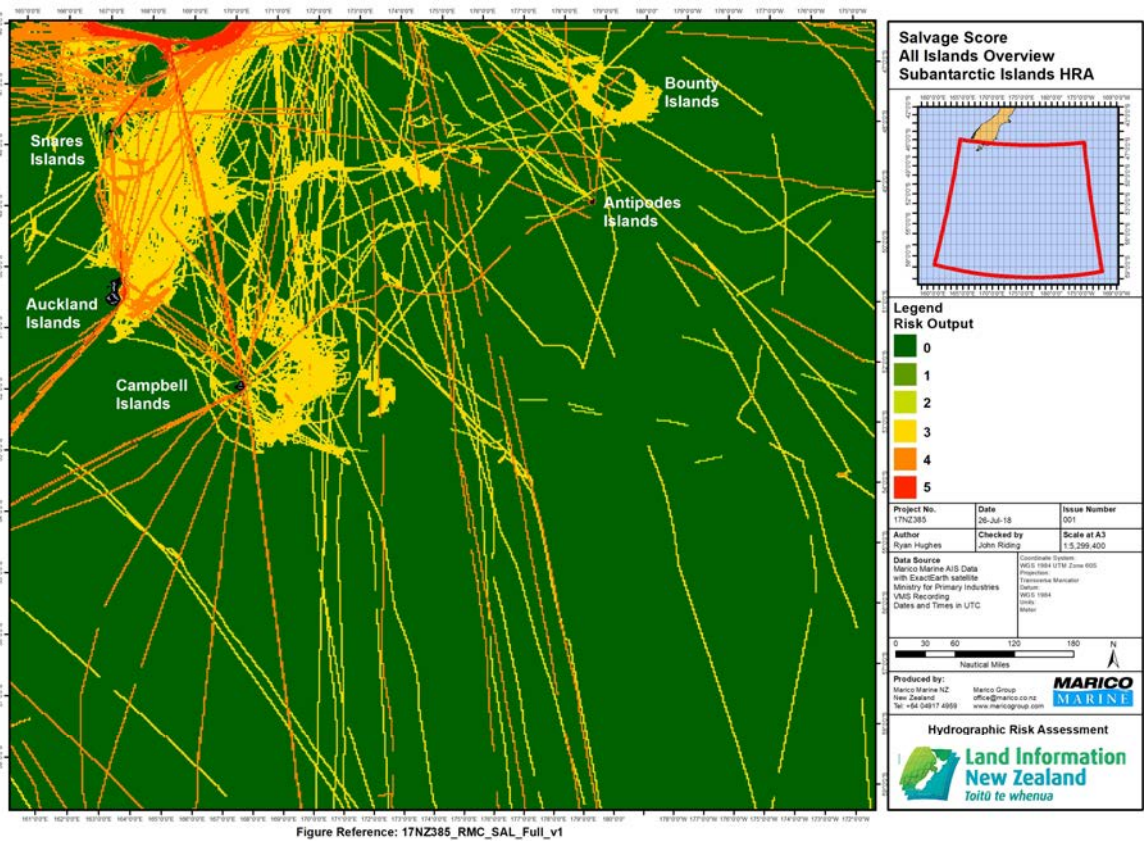


Figure 25, Salvage Risk Output, All Islands Overview

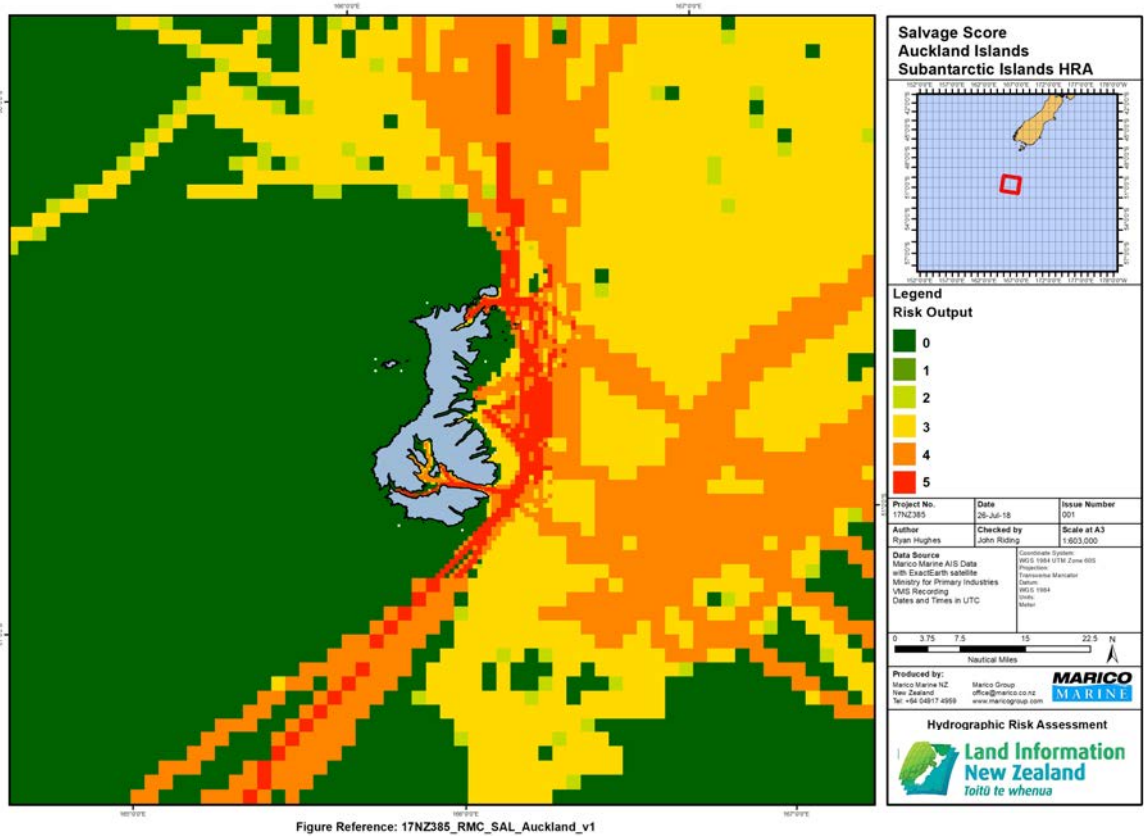


Figure 26, Salvage Risk Output, Auckland Islands

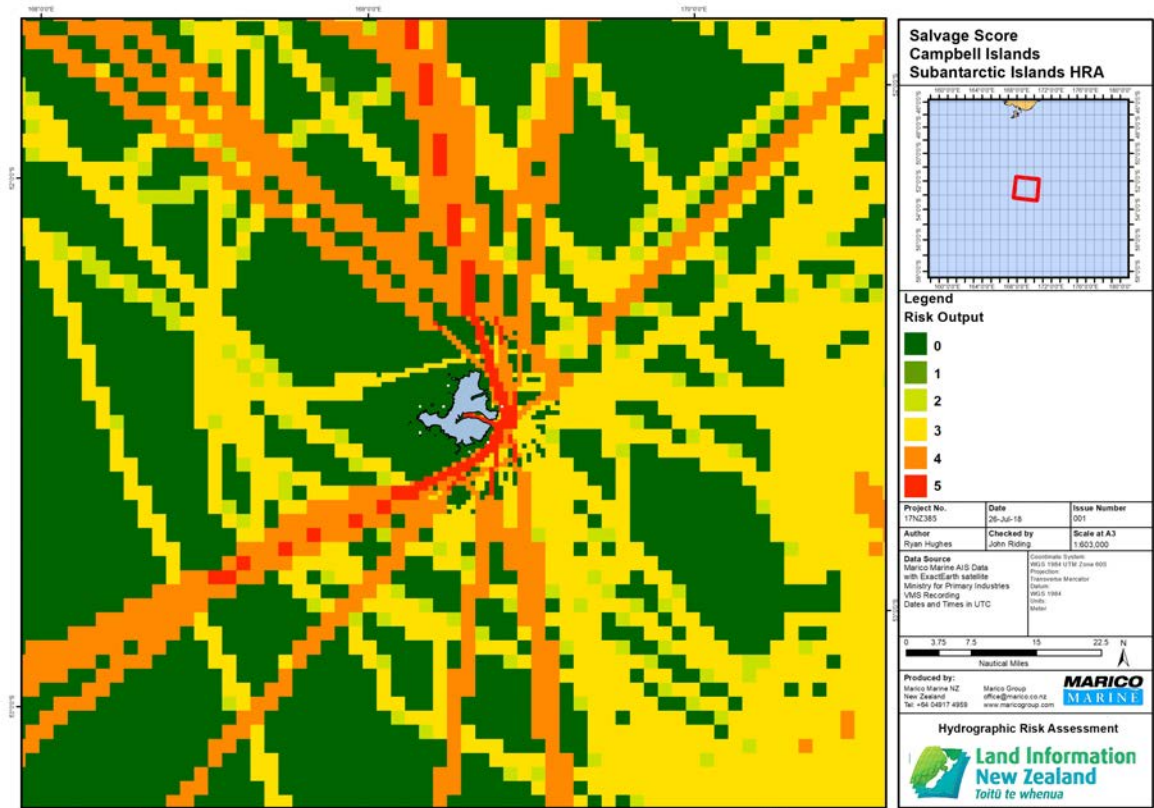


Figure Reference: 17NZ385_RMC_SAL_Campbell_v1

Figure 27, Salvage Risk Output, Campbell Islands

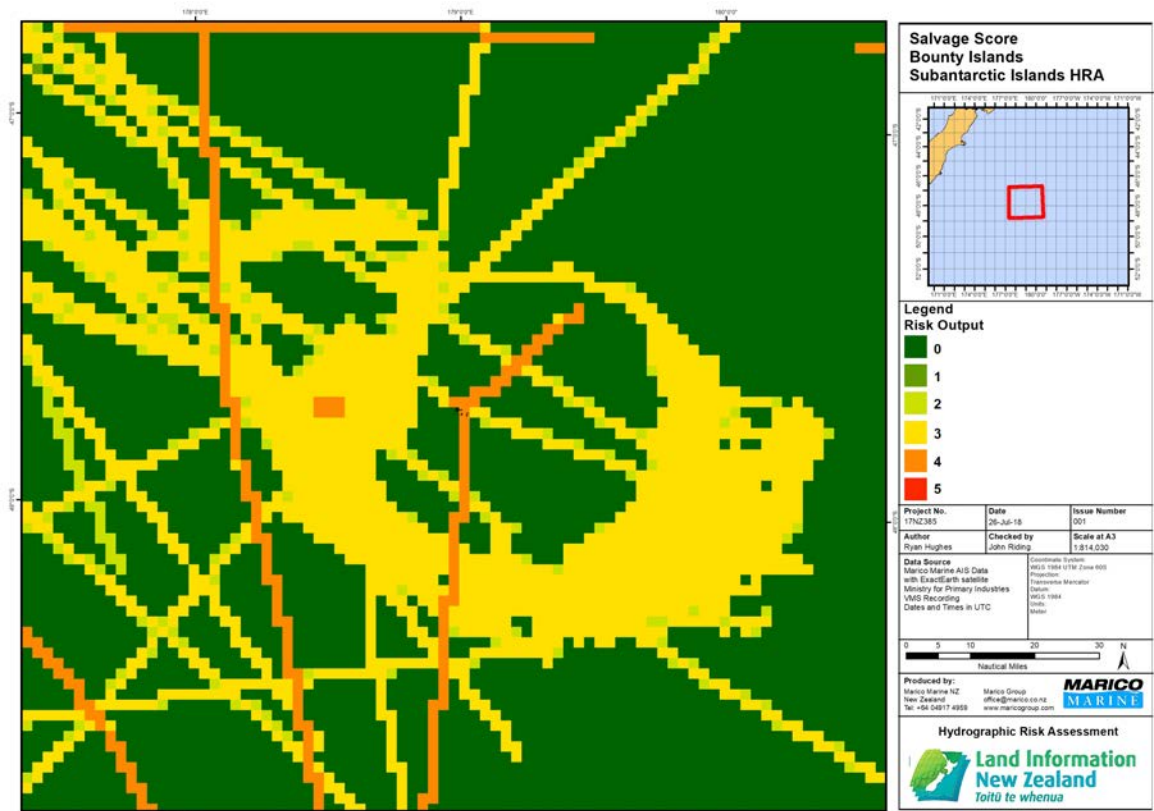


Figure Reference: 17NZ385_RMC_SAL_Bounty_v1

Figure 28, Salvage Risk Output, Bounty Islands

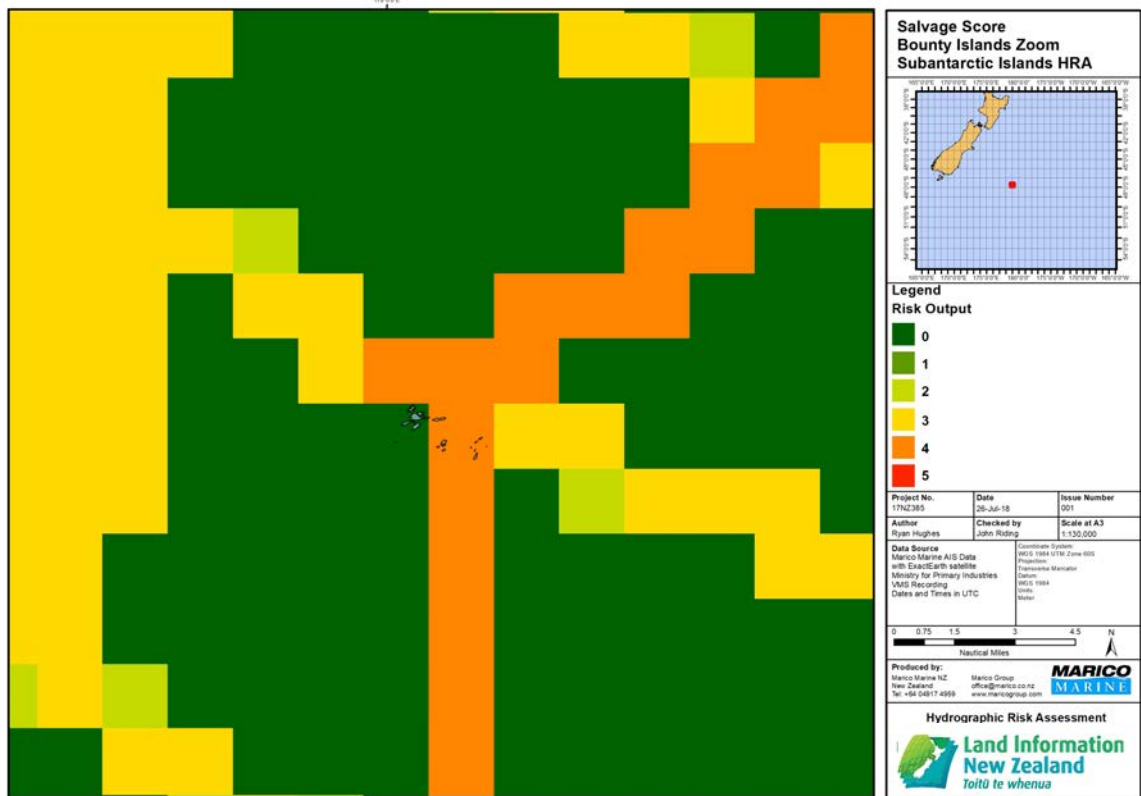


Figure Reference: 17NZ385_RMC_SAL_Bounty_Zoom_v1

Figure 29, Salvage Risk Output, Bounty Islands Zoom

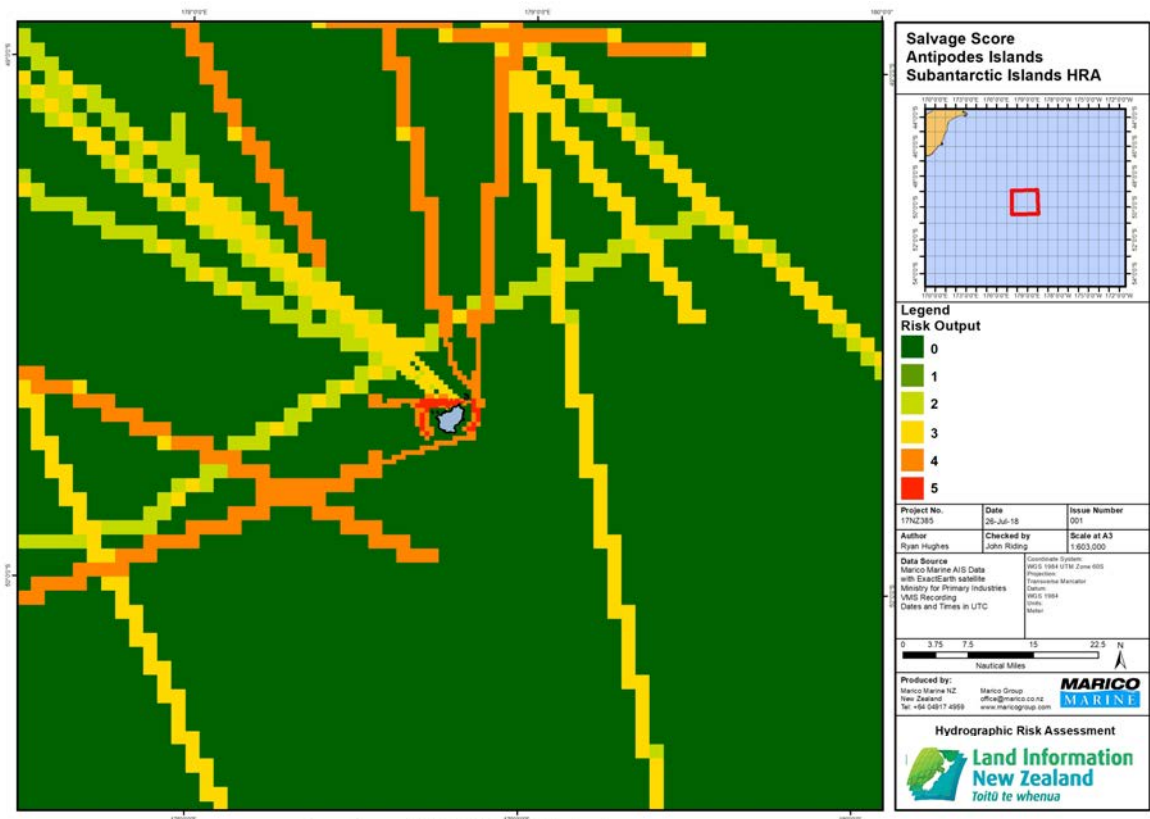


Figure Reference: 17NZ385_RMC_SAL_Antipodes_v1

Figure 30, Salvage Risk Output, Antipodes Islands

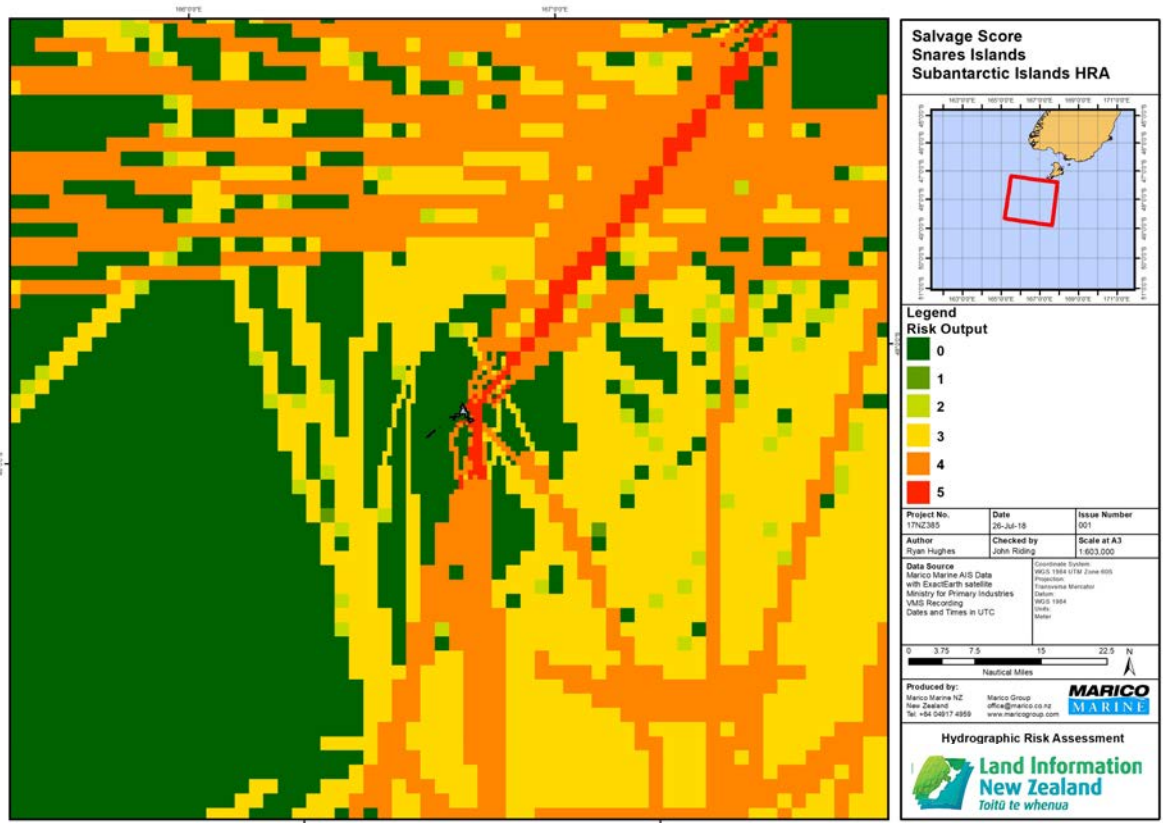


Figure Reference: 17NZ385_RMC_SAL_Snares_v1

Figure 31, Salvage Risk Output, Snares Islands

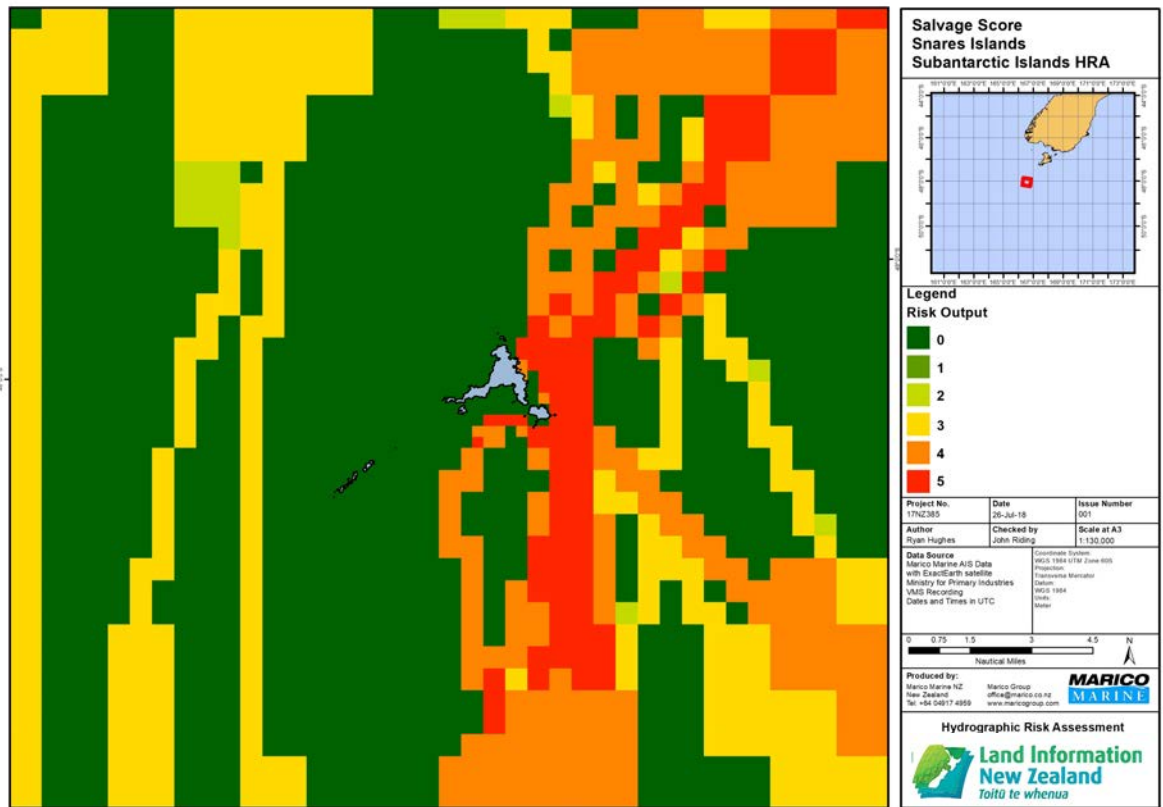


Figure Reference: 17NZ385_RMC_SAL_Snares_Zoom_v1

Figure 32, Salvage Risk Output, Snares Islands Zoom

2 CAUSATION CRITERIA

2.1 CHARTING

2.1.1 CHART QUALITY

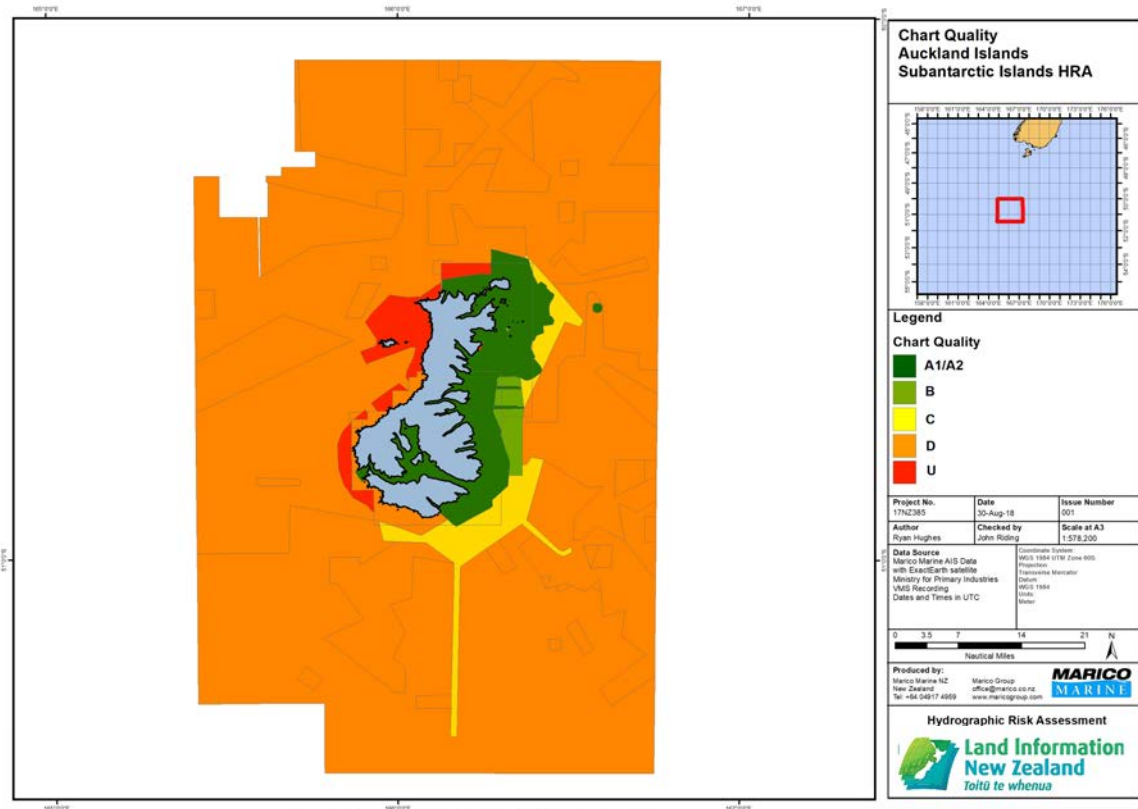


Figure Reference: 17NZ385_RMC_Chart_Quality_Auckland_v2

Figure 33, Chart Quality (CATZOC Rating), Auckland Islands

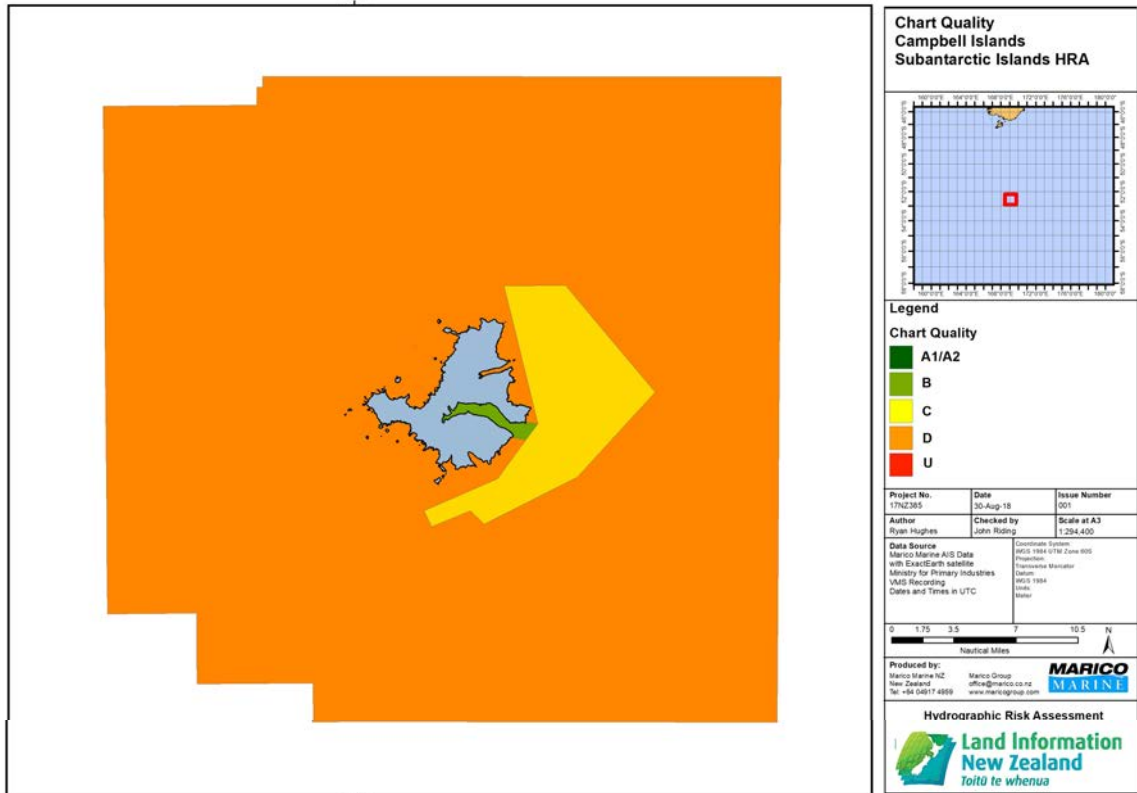


Figure Reference: 17NZ385_RMC_Chart_Quality_Campbell_v2

Figure 34, Chart Quality (CATZOC Rating), Campbell Islands

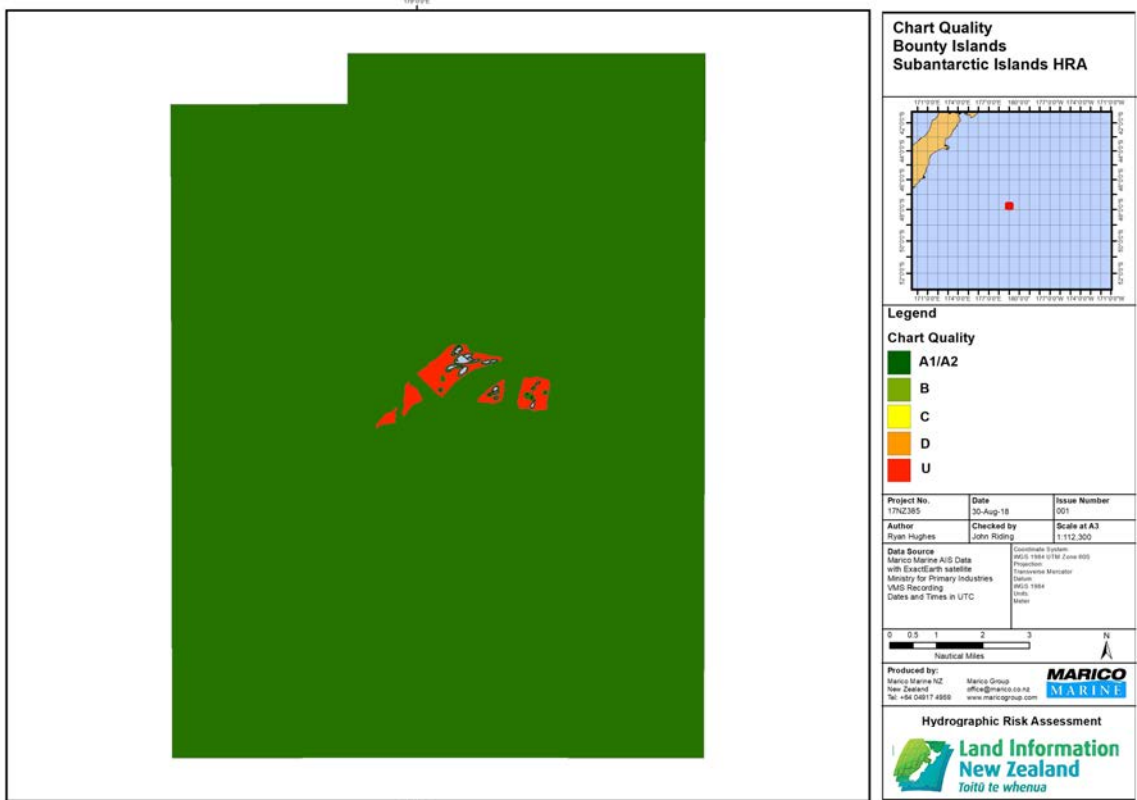


Figure Reference: 17NZ385_RMC_Chart_Quality_Bounty_v2

Figure 35, Chart Quality (CATZOC Rating), Bounty Islands

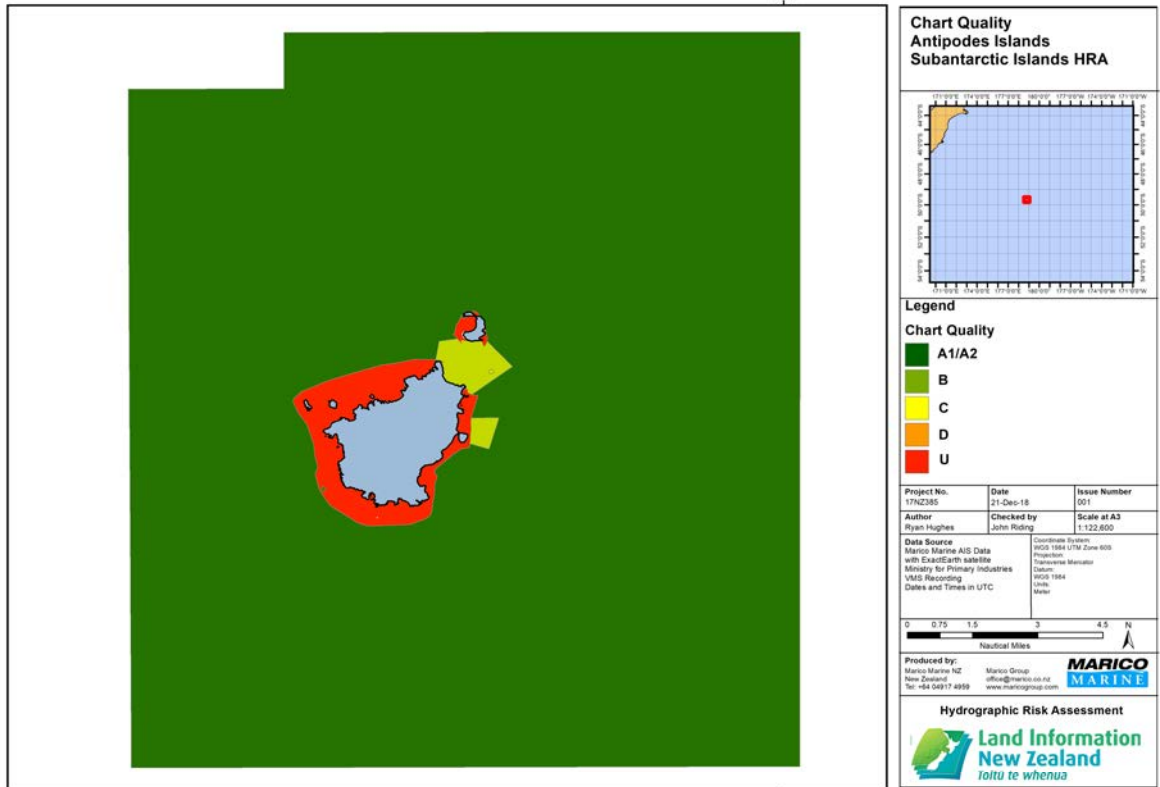


Figure Reference: 17NZ385_RMC_Chart_Quality_Antipodes_v2

Figure 36, Chart Quality (CATZOC Rating), Antipodes Islands

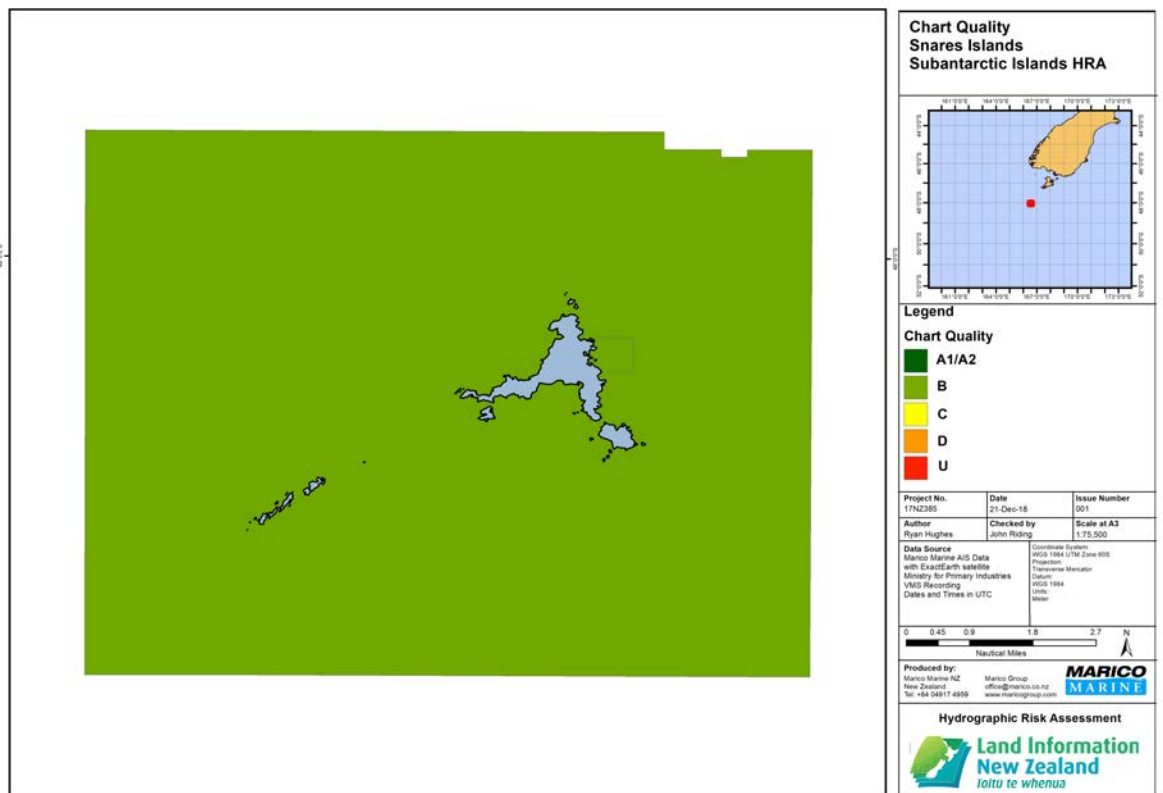


Figure Reference: 17NZ385_RMC_Chart_Quality_Snares_v2

Figure 37, Chart Quality (CATZOC Rating), Snares Islands

2.1.2 Survey Age

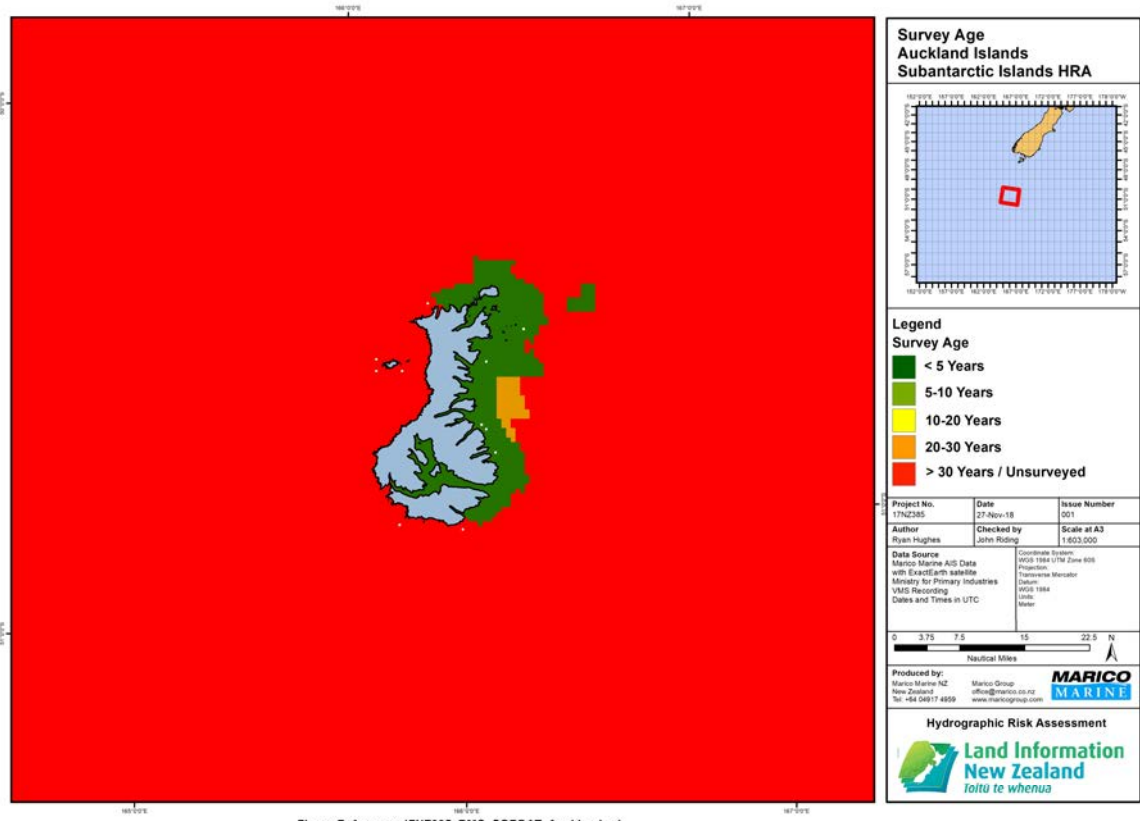


Figure Reference: 17NZ385_RMC_SORDAT_Auckland_v1

Figure 38, Survey Age, Auckland Islands

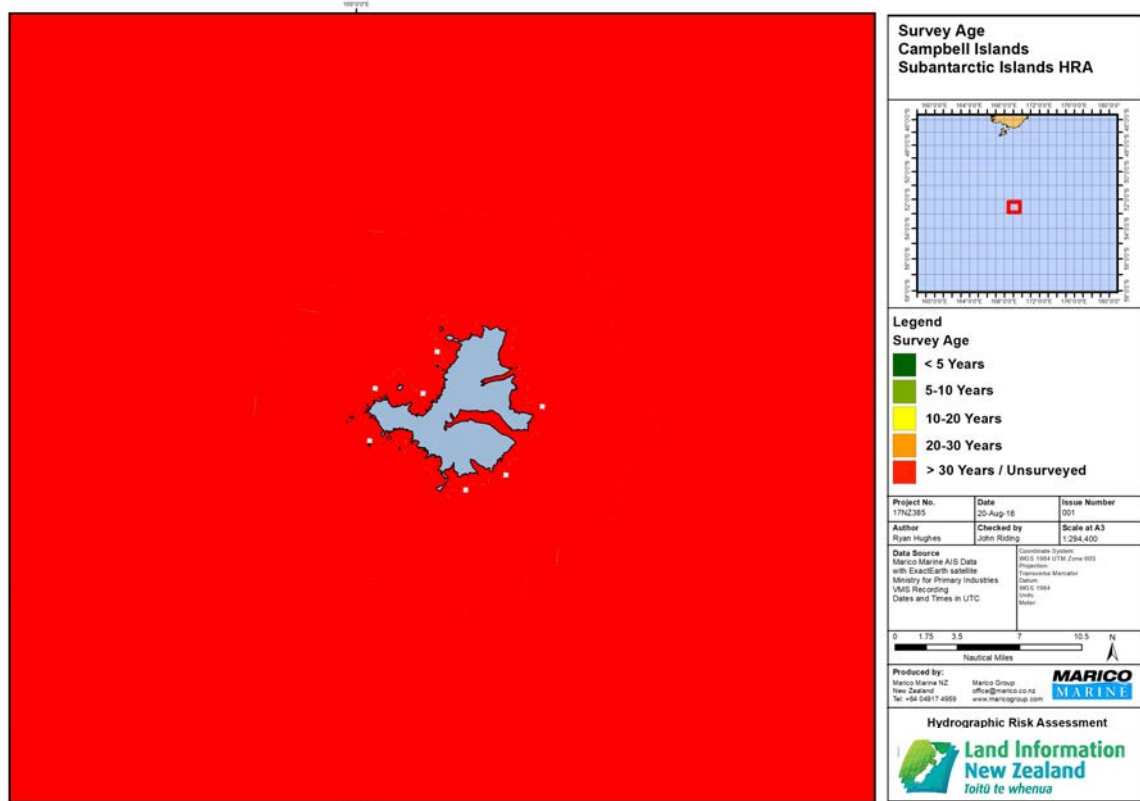


Figure Reference: 17NZ385_RMC_Chart_Quality_Campbell_v2

Figure 39, Survey Age, Campbell Islands

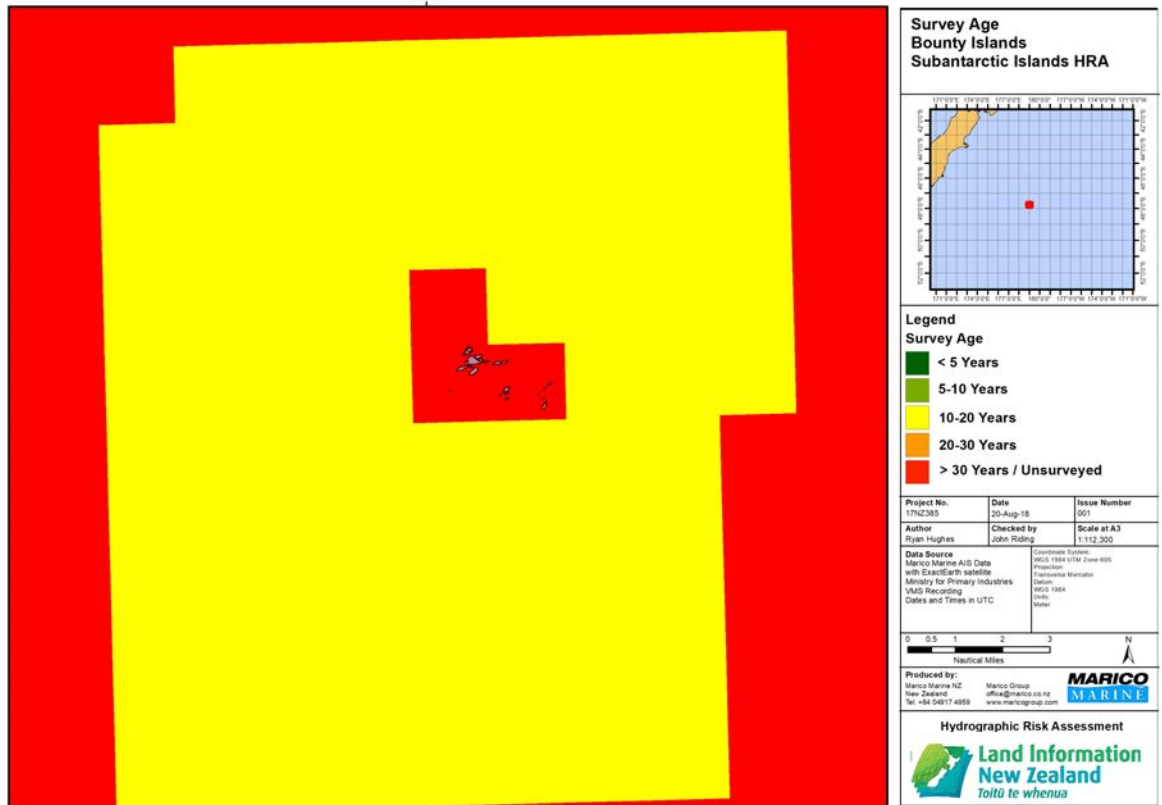


Figure Reference: 17NZ385_RMC_Chart_Quality_Bounty_v2

Figure 40, Survey Age, Bounty Islands

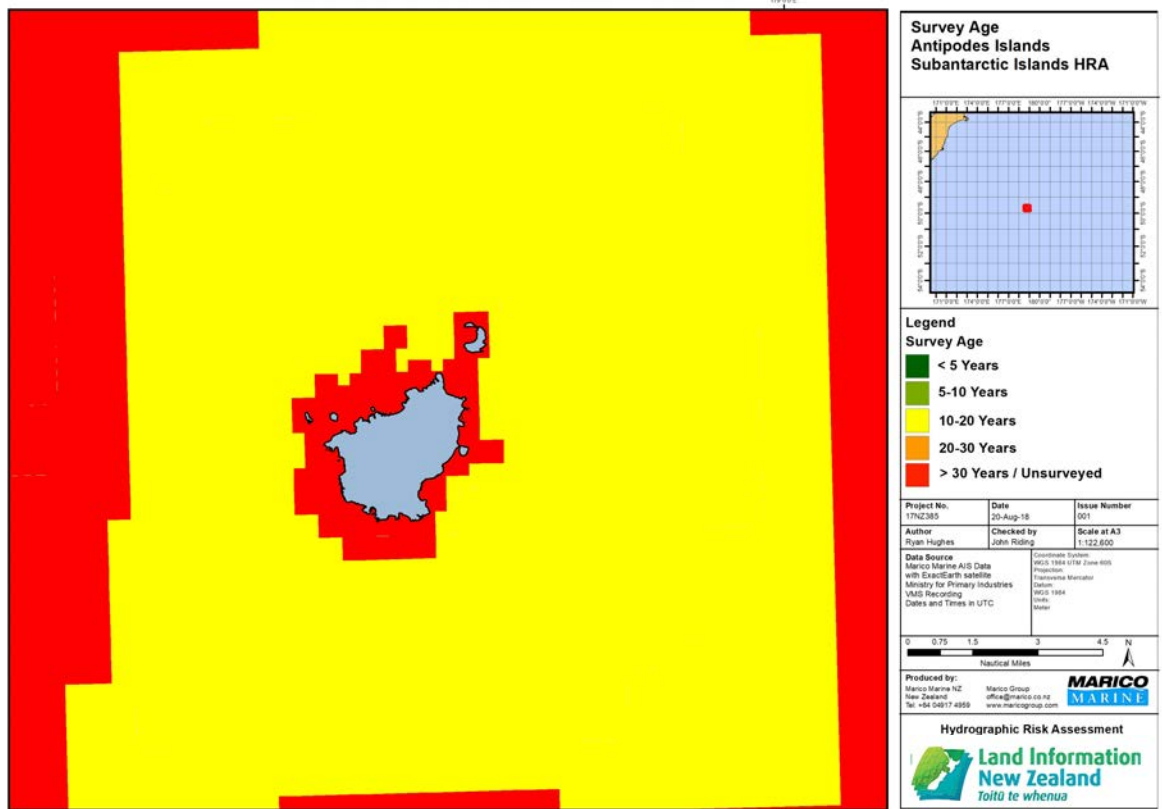


Figure Reference: 17NZ385_RMC_SORDAT_Antipodes_v1

Figure 41, Survey Age, Antipodes Islands

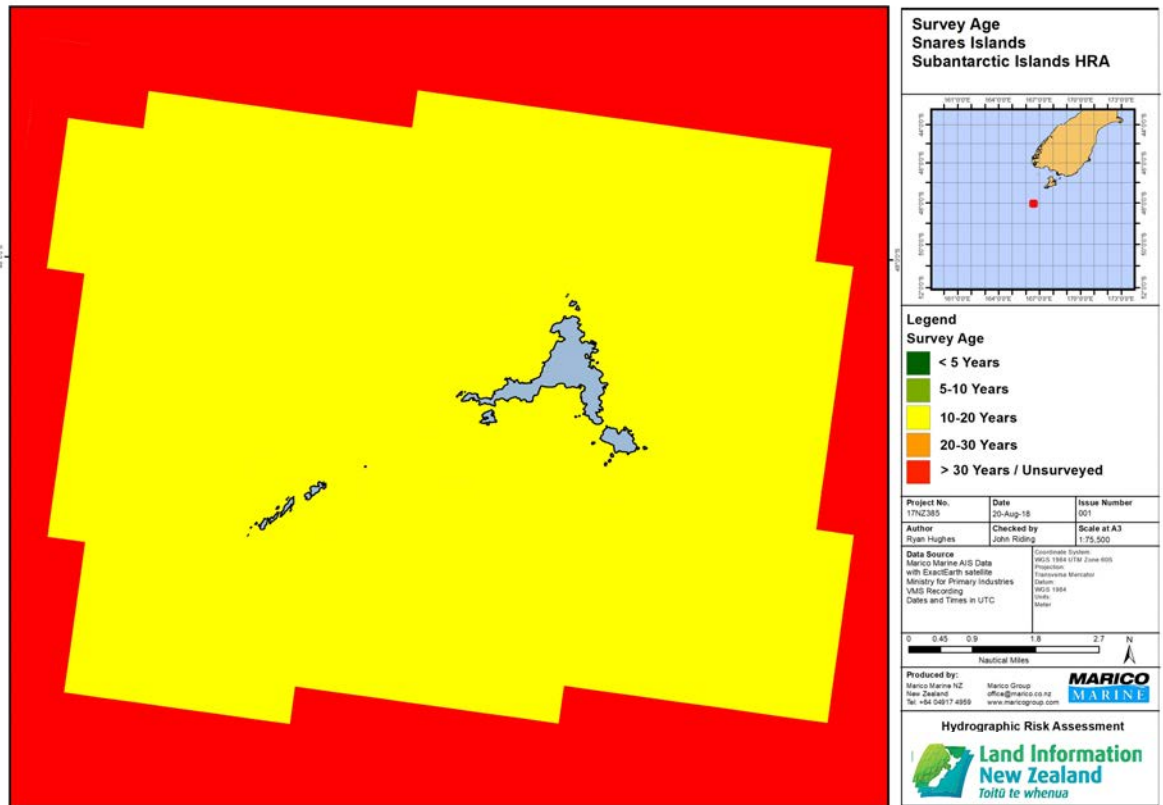
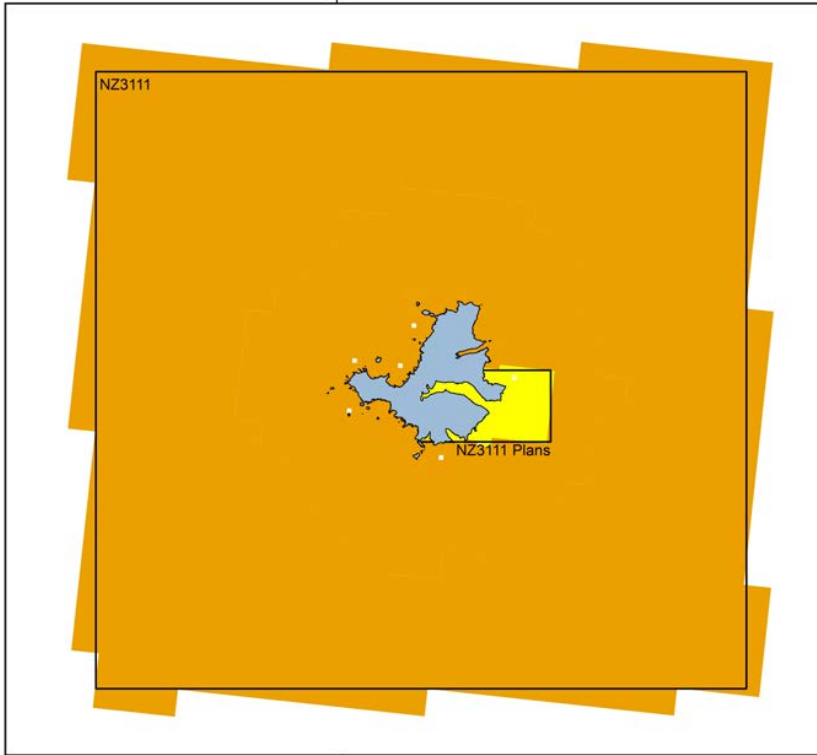


Figure Reference: 17NZ385_RMC_Chart_Quality_Snares_v2

Figure 42, Survey Age, Snares Islands



Charting Adequacy Campbell Islands Subantarctic Islands HRA

Legend
Chart Adequacy

- Excellent
- Good
- Moderate
- Poor
- Unacceptable

Project No. 17NZ385	Date 20-Dec-18	Issue Number 001
Author Ryan Hughes	Checked by John Riding	Scale at A3 1:284,000
Data Source Marico Marine AIS Data with ExactEarth satellite Ministry for Primary Industries VMS Recording Dates and Times in UTC		Coordinate System: WGS 1984 UTM Zone 60S Projection: Transverse Mercator Datum: WGS 1984 Units: Meter

0 1.75 3.5 7 10.5 N
Nautical Miles

Produced by:
 Marico Marine NZ
 New Zealand
 Tel: +64 0917 4939

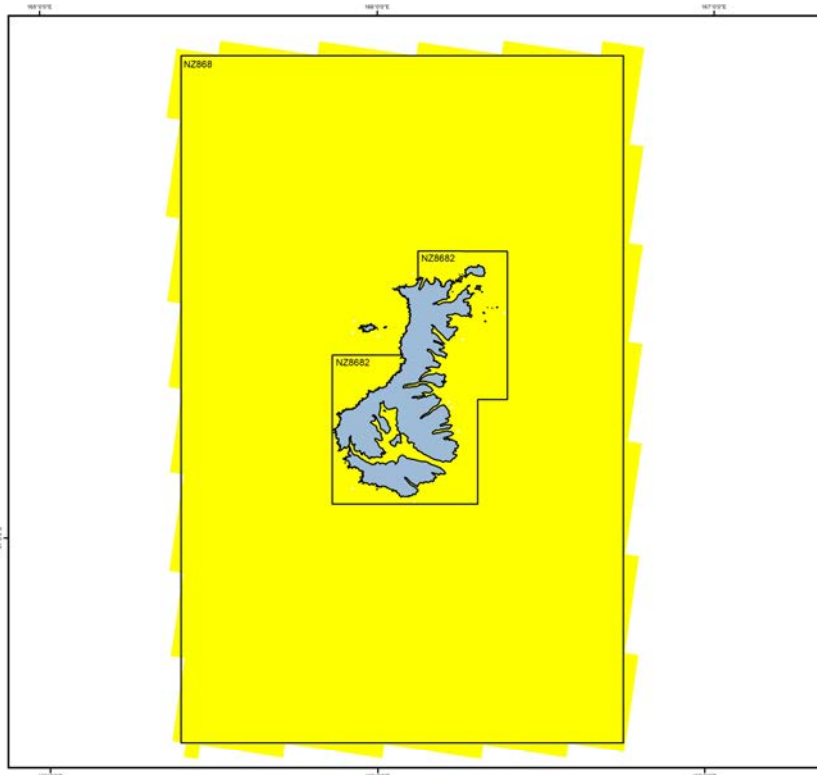
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Hydrographic Risk Assessment

Land Information New Zealand
toitu te whenua

Figure Reference: 17NZ385_RMC_CA_Campbell_v3



Charting Adequacy Auckland Islands Subantarctic Islands HRA

Legend
Chart Adequacy

- Excellent
- Good
- Moderate
- Poor
- Unacceptable

Project No. 17NZ385	Date 19-Dec-18	Issue Number 001
Author Ryan Hughes	Checked by John Riding	Scale at A3 1:578,200
Data Source Marico Marine AIS Data with ExactEarth satellite Ministry for Primary Industries VMS Recording Dates and Times in UTC		Coordinate System: WGS 1984 UTM Zone 60S Projection: Transverse Mercator Datum: WGS 1984 Units: Meter

0 3.5 7 14 21 N
Nautical Miles

Produced by:
 Marico Marine NZ
 New Zealand
 Tel: +64 0917 4939

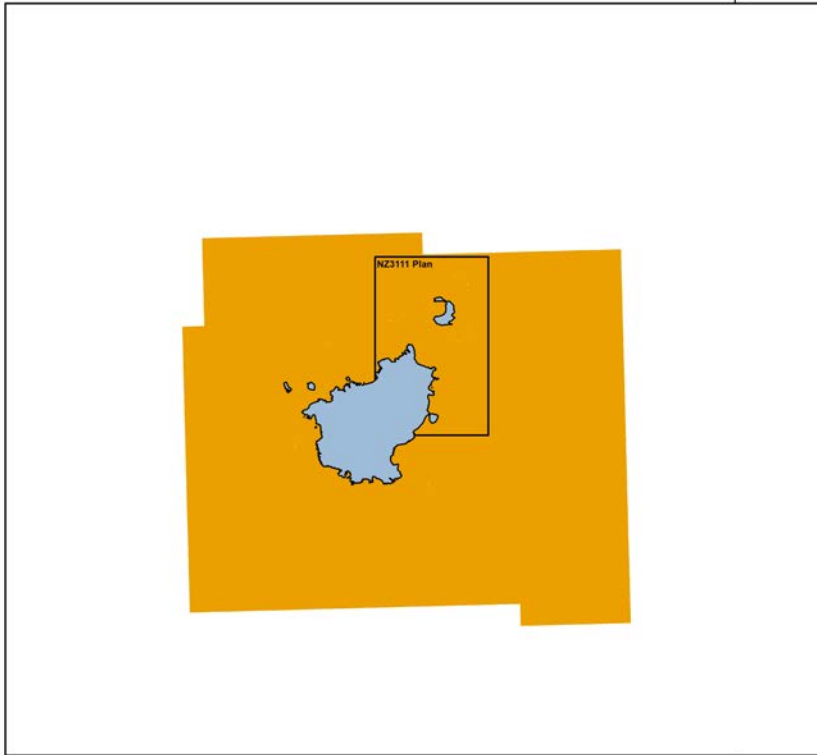
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Hydrographic Risk Assessment

Land Information New Zealand
toitu te whenua

Figure Reference: 17NZ385_RMC_CA_Auckland_v2



Charting Adequacy Antipodes Islands Subantarctic Islands HRA

Legend
Chart Adequacy

- Excellent
- Good
- Moderate
- Poor
- Unacceptable

Project No. 17NZ385	Date 19-Dec-18	Issue Number 001
Author Ryan Hughes	Checked by John Riding	Scale at A3 1:122,600
Data Source Marico Marine AIS Data with ExactEarth satellite Ministry for Primary Industries VMS Recording Dates and Times in UTC		Coordinate System WGS 1984 UTM Zone 60S Projection: Transverse Mercator Datum: WGS 1984 Units: Meter

0 0.75 1.5 3 4.5 N
Nautical Miles

Produced by:
Marico Marine NZ
New Zealand
Tel: +64 04917 4939

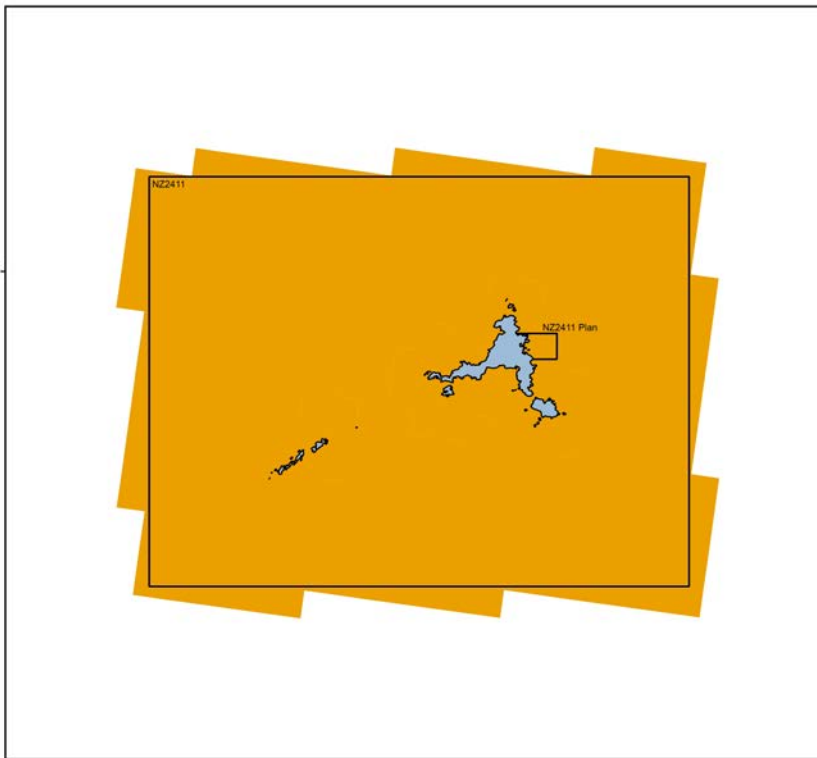
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Land Information New Zealand
Iotiu te whenua

Figure Reference: 17NZ385_RMC_CA_Antipodes_v2



Charting Adequacy Snares Islands Subantarctic Islands HRA

Legend
Chart Adequacy

- Excellent
- Good
- Moderate
- Poor
- Unacceptable

Project No. 17NZ385	Date 27-Nov-18	Issue Number 001
Author Ryan Hughes	Checked by John Riding	Scale at A3 1:95,720
Data Source Marico Marine AIS Data with ExactEarth satellite Ministry for Primary Industries VMS Recording Dates and Times in UTC		Coordinate System WGS 1984 UTM Zone 60S Projection: Transverse Mercator Datum: WGS 1984 Units: Meter

0 0.5 1 2 3 N
Nautical Miles

Produced by:
Marico Marine NZ
New Zealand
Tel: +64 04917 4939

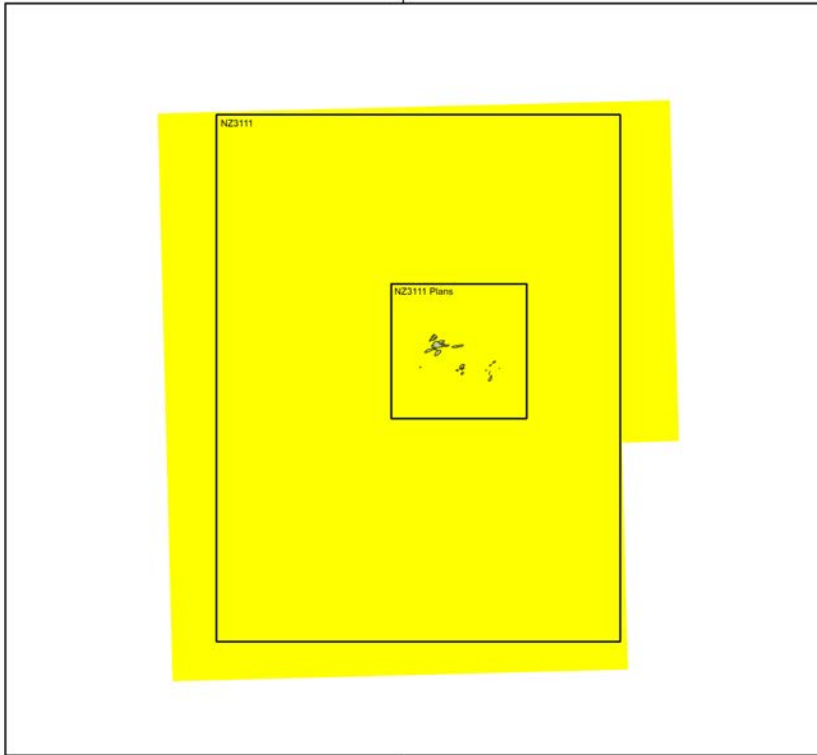
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Hydrographic Risk Assessment

Land Information New Zealand
Iotiu te whenua

Figure Reference: 17NZ385_RMC_CA_Snares_v2



Charting Adequacy Bounty Islands Subantarctic Islands HRA

Legend
Chart Adequacy
 Excellent
 Good
 Moderate
 Poor
 Unacceptable

Project No. 17NZ385	Date 20-Dec-19	Issue Number 001
Author Ryan Hughes	Checked by John Riding	Scale at A3 1:142,375
Data Source Marico Marine AIS Data with ExactEarth Satellite Ministry for Primary Industries VMS Recording Dates and Times in UTC		Coordinate System WGS 1984 UTM Zone 60S Projection Transverse Mercator Datum WGS 1984 Units Meter

0 0.75 1.5 3 4.5 N
Nautical Miles

Produced by:
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 New Zealand
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Hydrographic Risk Assessment

Figure Reference: 17NZ385_RMC_CA_Bounty_v2

2.1.3 CHART ADEQUACY

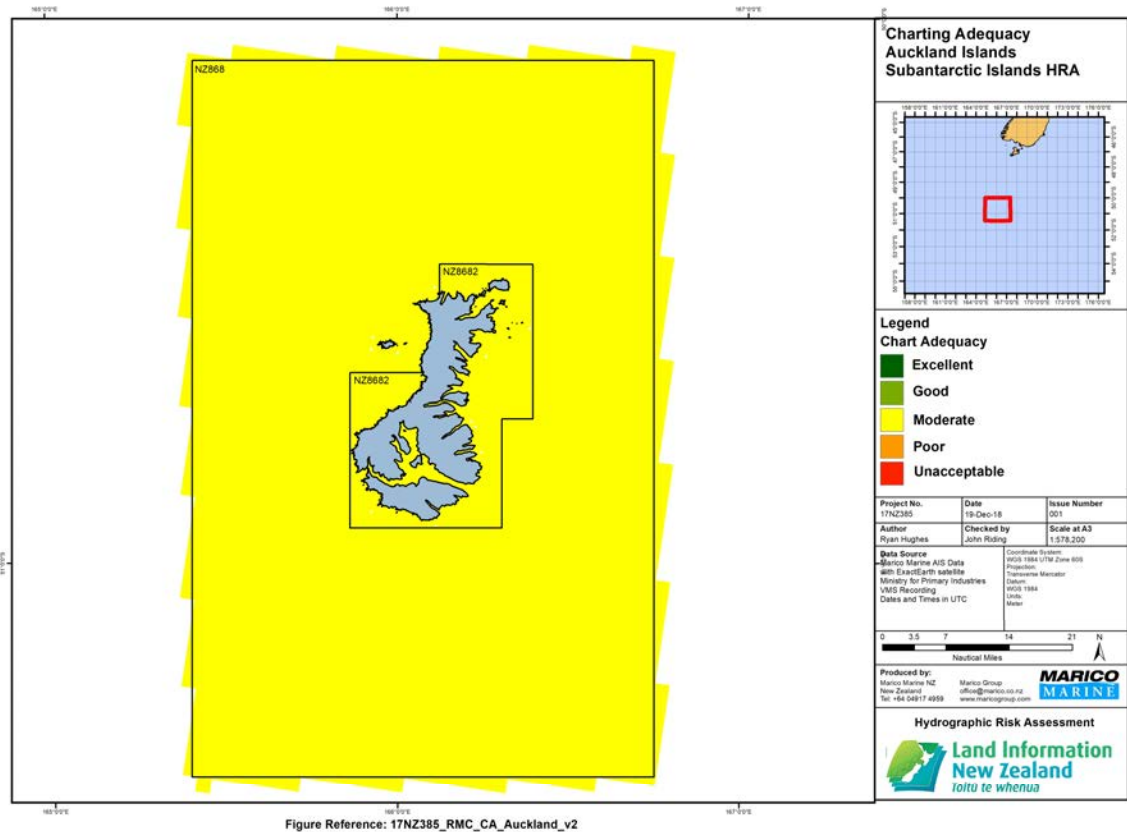


Figure 43, Chart Adequacy, Auckland Islands

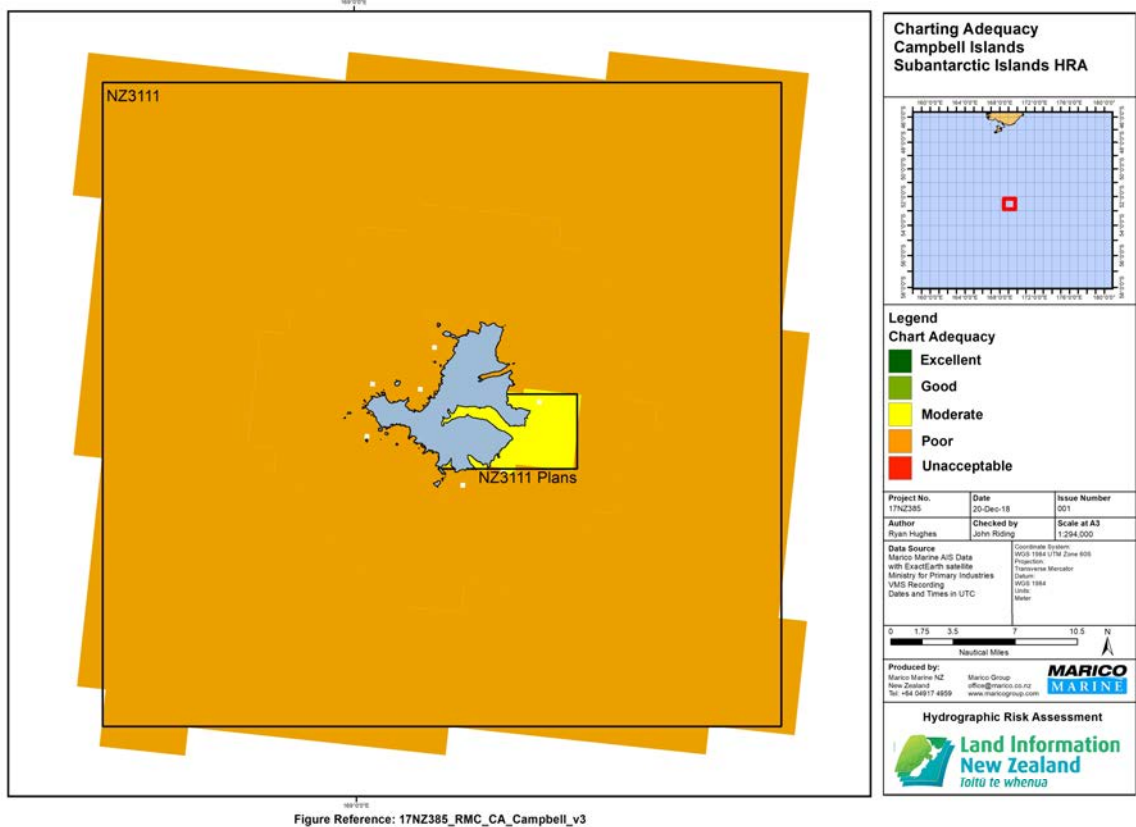


Figure 44, Chart Adequacy, Campbell Islands

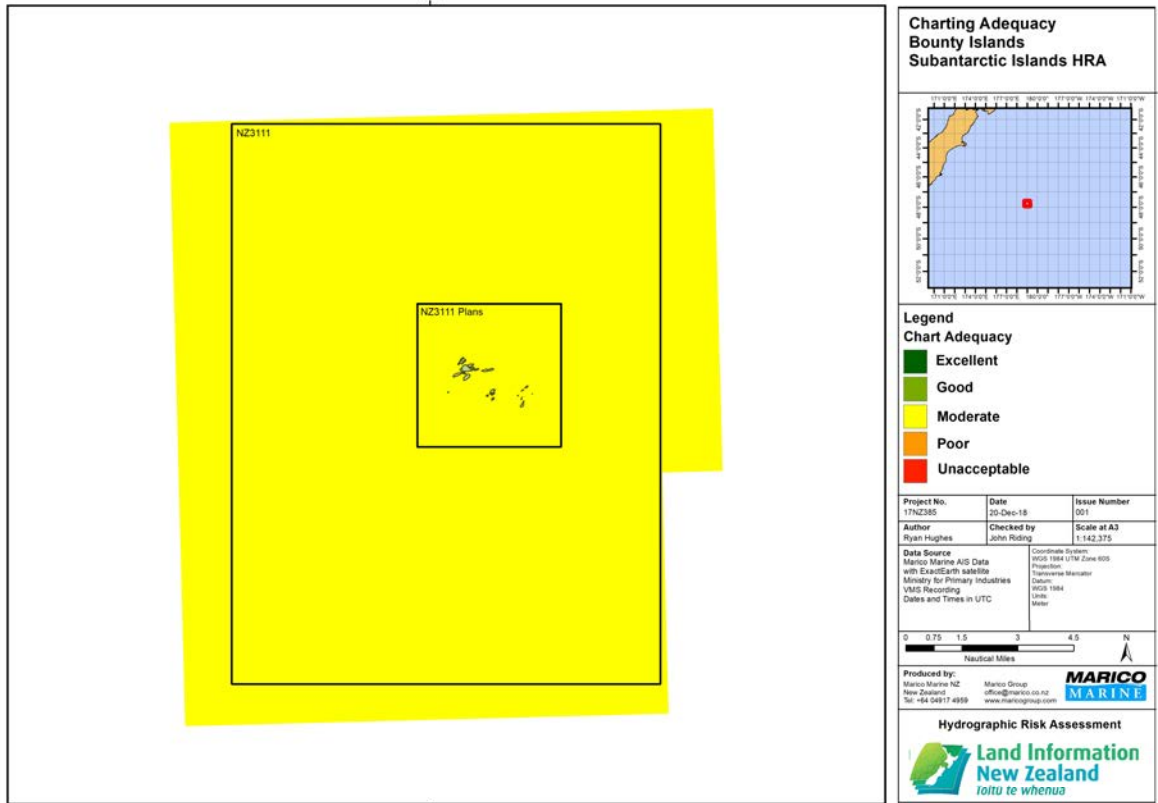


Figure Reference: 17NZ385_RMC_CA_Bounty_v2

Figure 45, Chart Adequacy, Bounty Islands

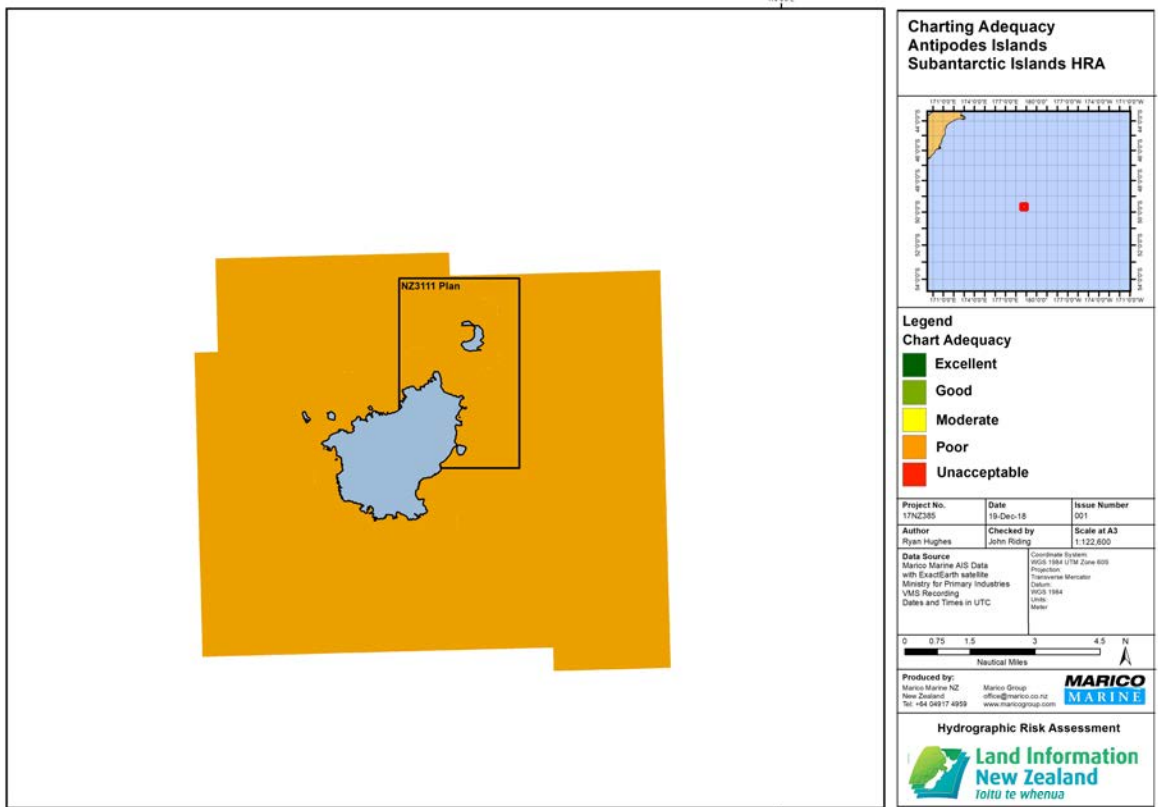


Figure Reference: 17NZ385_RMC_CA_Antipodes_v2

Figure 46, Chart Adequacy, Antipodes Islands

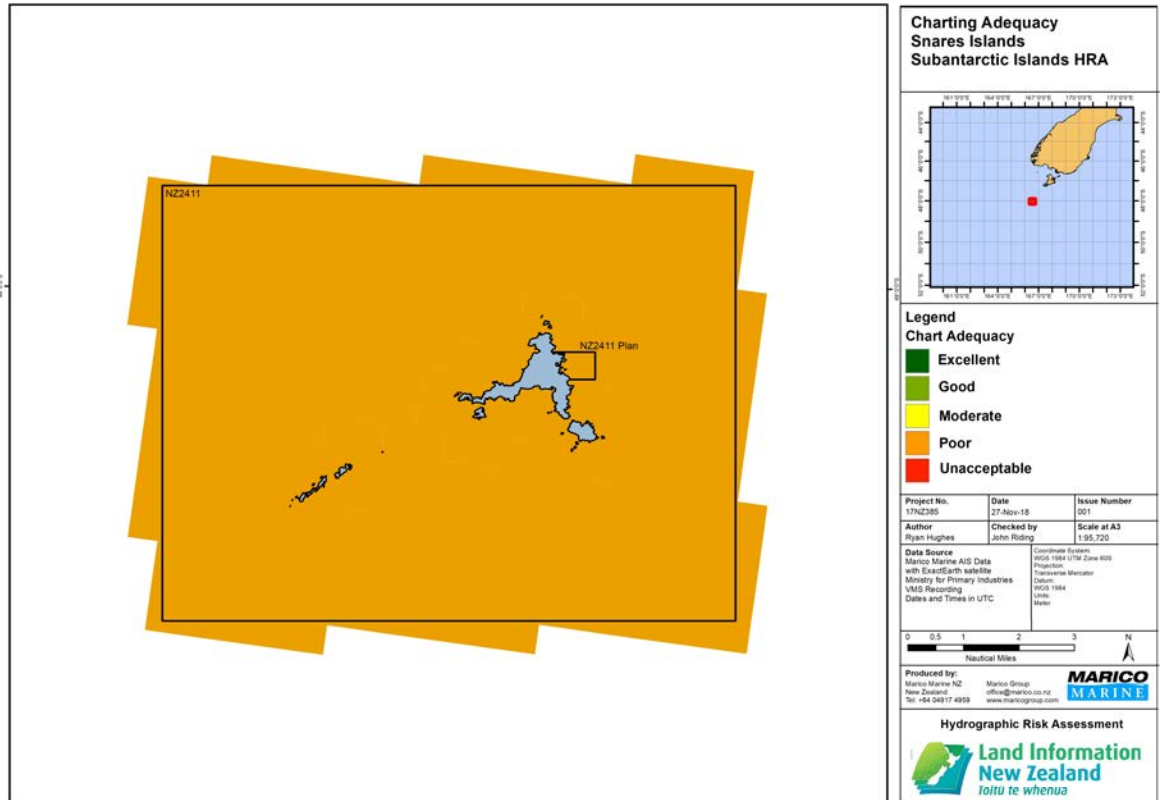


Figure Reference: 17NZ385_RMC_CA_Snares_v2

Figure 47, Chart Adequacy, Snares Islands

2.2 ROUTE CHARACTERISTICS

2.2.1 NAVIGATIONAL COMPLEXITY

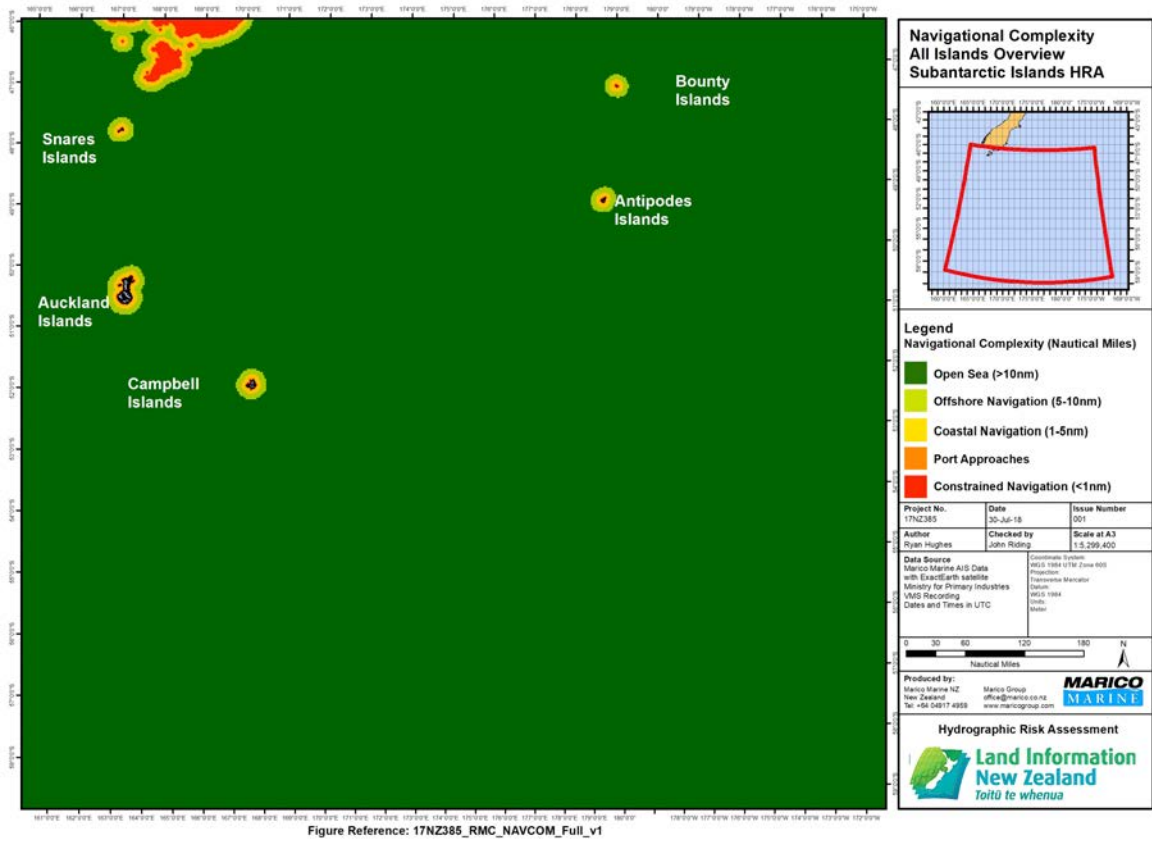


Figure 48, Navigational Complexity, All Islands Overview

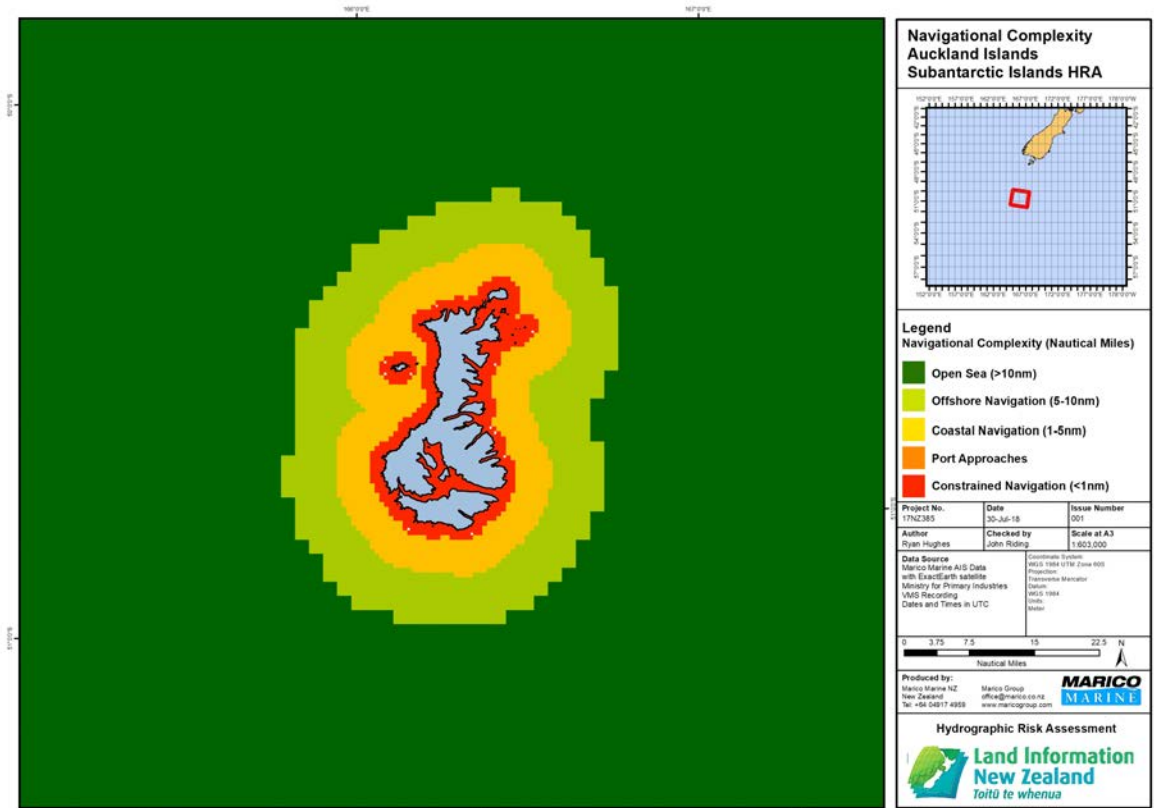


Figure Reference: 17NZ385_RMC_NAVCOM_Auckland_v1

Figure 49, Navigational Complexity, Auckland Islands

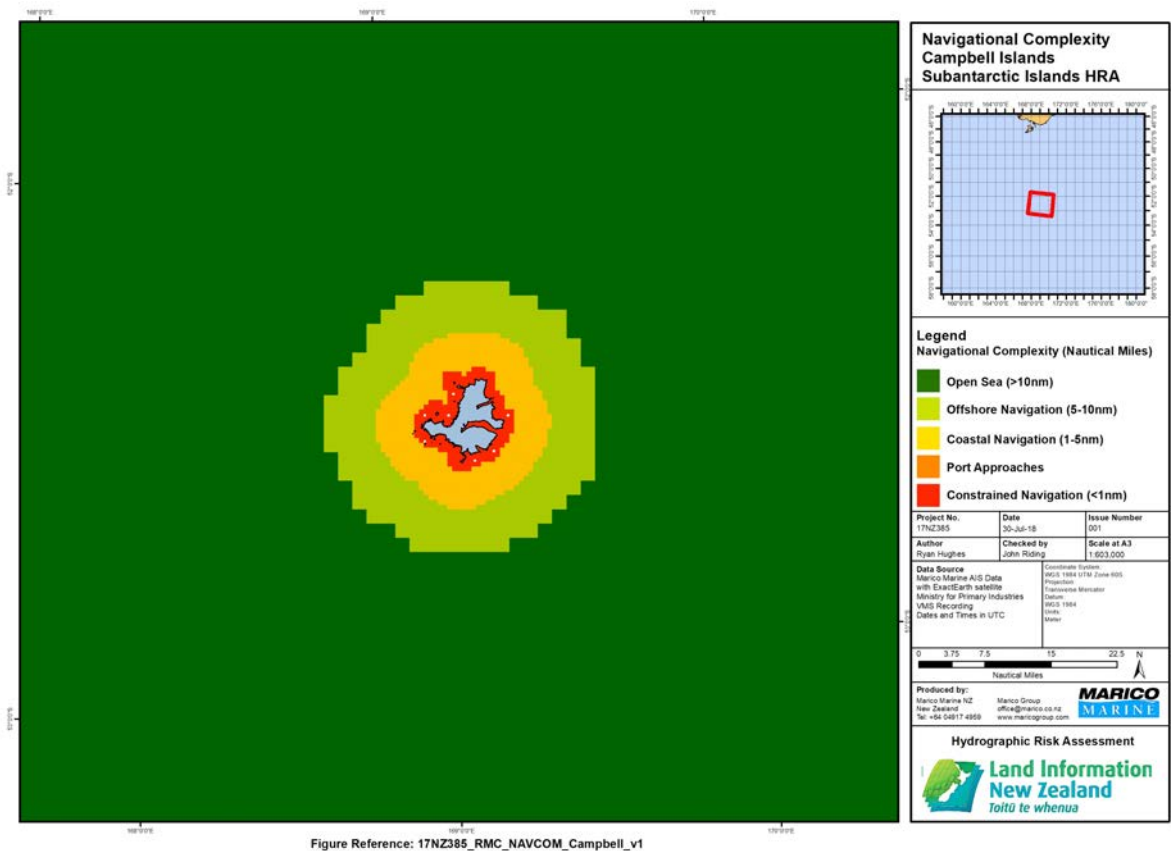


Figure Reference: 17NZ385_RMC_NAVCOM_Campbell_v1

Figure 50, Navigational Complexity, Campbell Islands

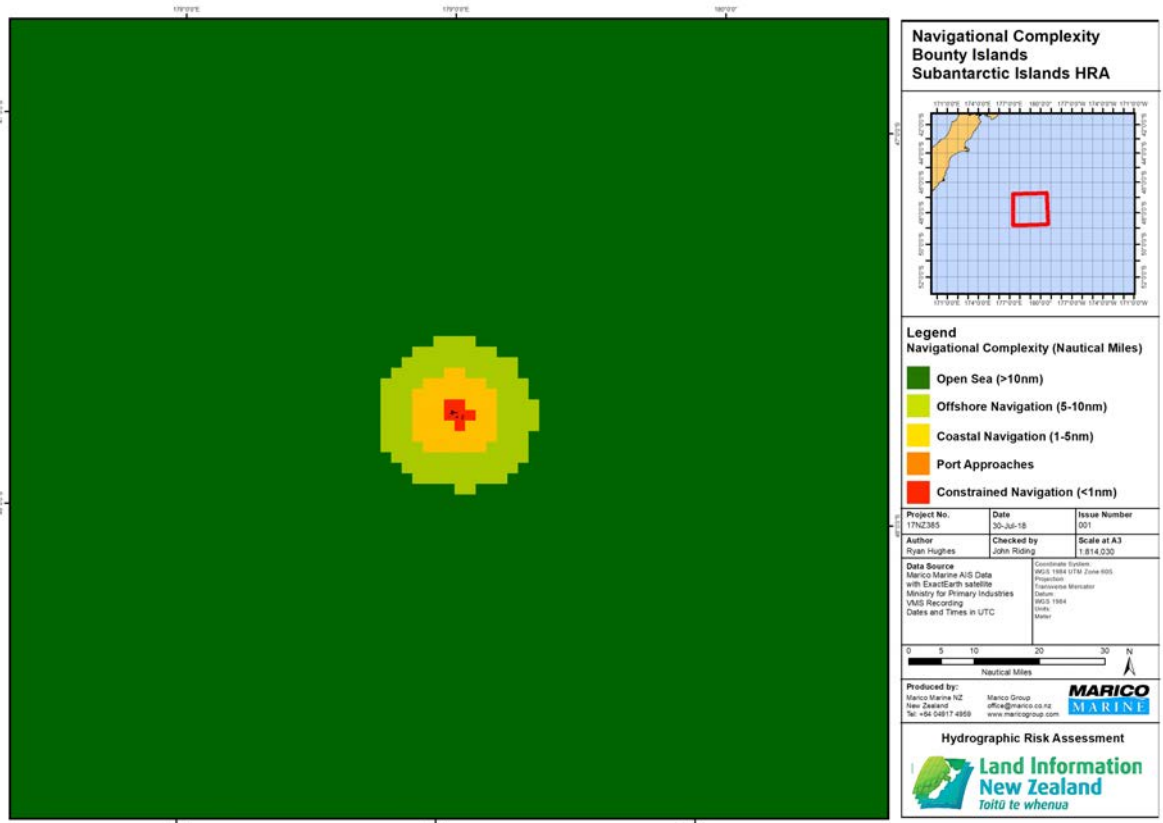


Figure Reference: 17NZ385_RMC_NAVCOM_Bounty_v1

Figure 51, Navigational Complexity, Bounty Islands

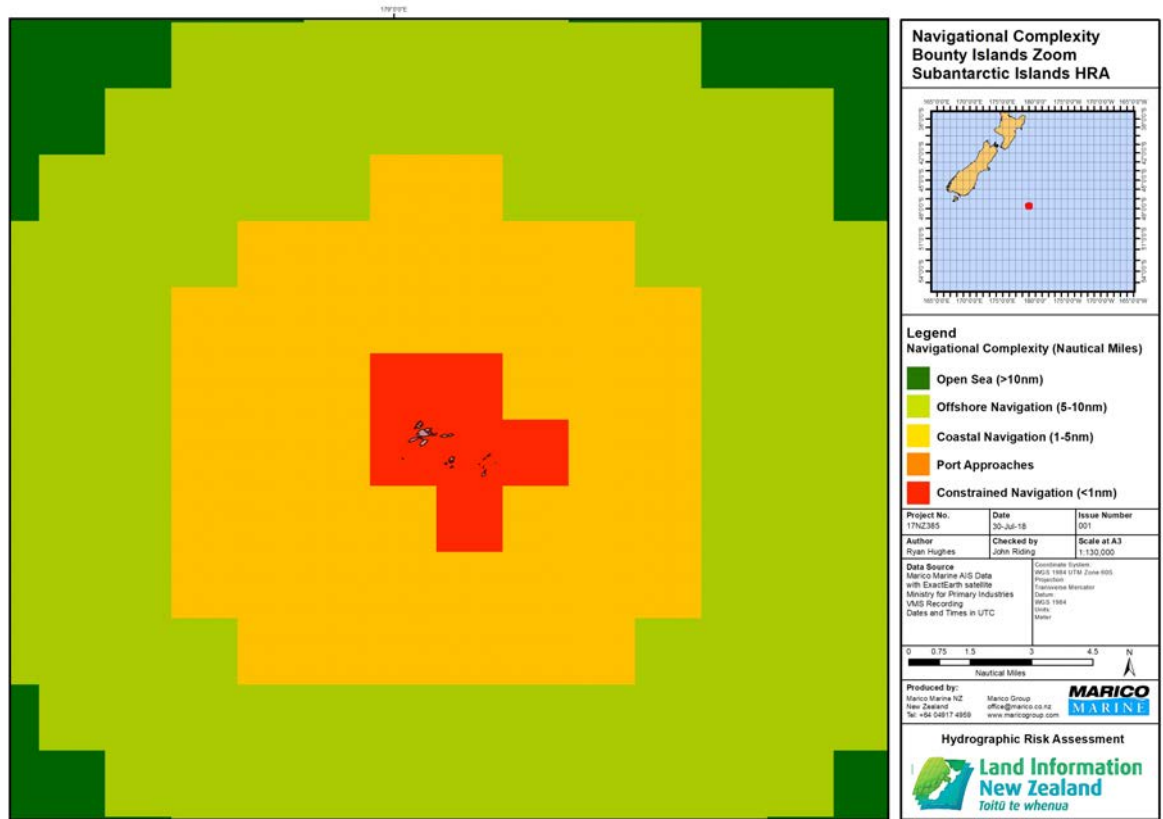


Figure Reference: 17NZ385_RMC_NAVCOM_Bounty_Zoom_v1

Figure 52, Navigational Complexity, Bounty Islands Zoom

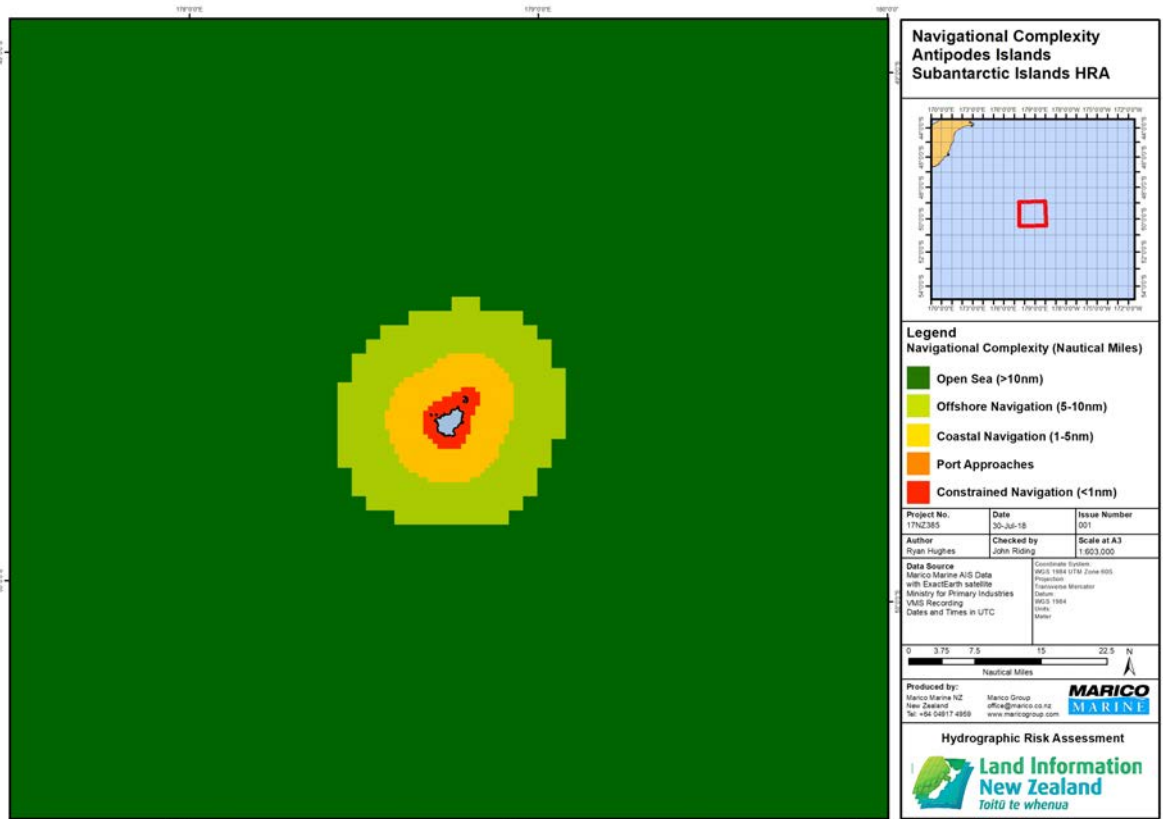


Figure Reference: 17NZ385_RMC_NAVCOM_Antipodes_v1

Figure 53, Navigational Complexity, Antipodes Islands

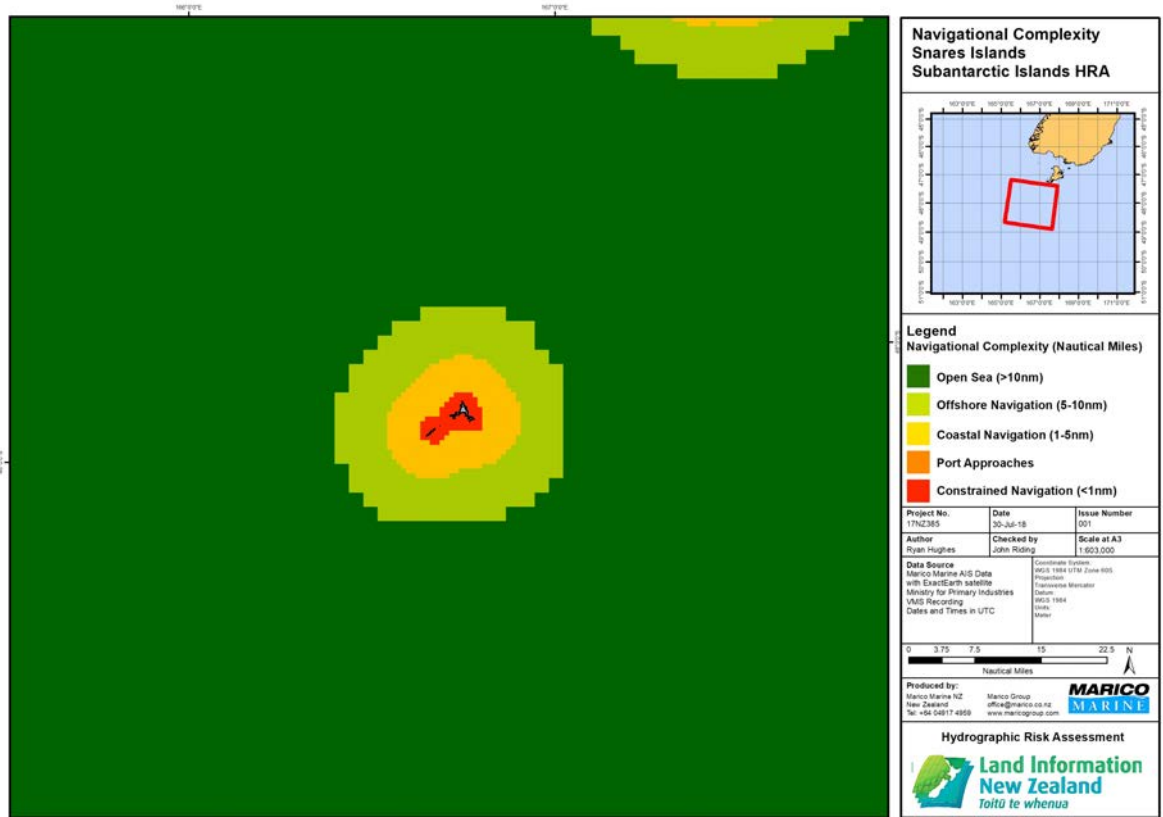


Figure Reference: 17NZ385_RMC_NAVCOM_Snares_v1

Figure 54, Navigational Complexity, Snares Islands

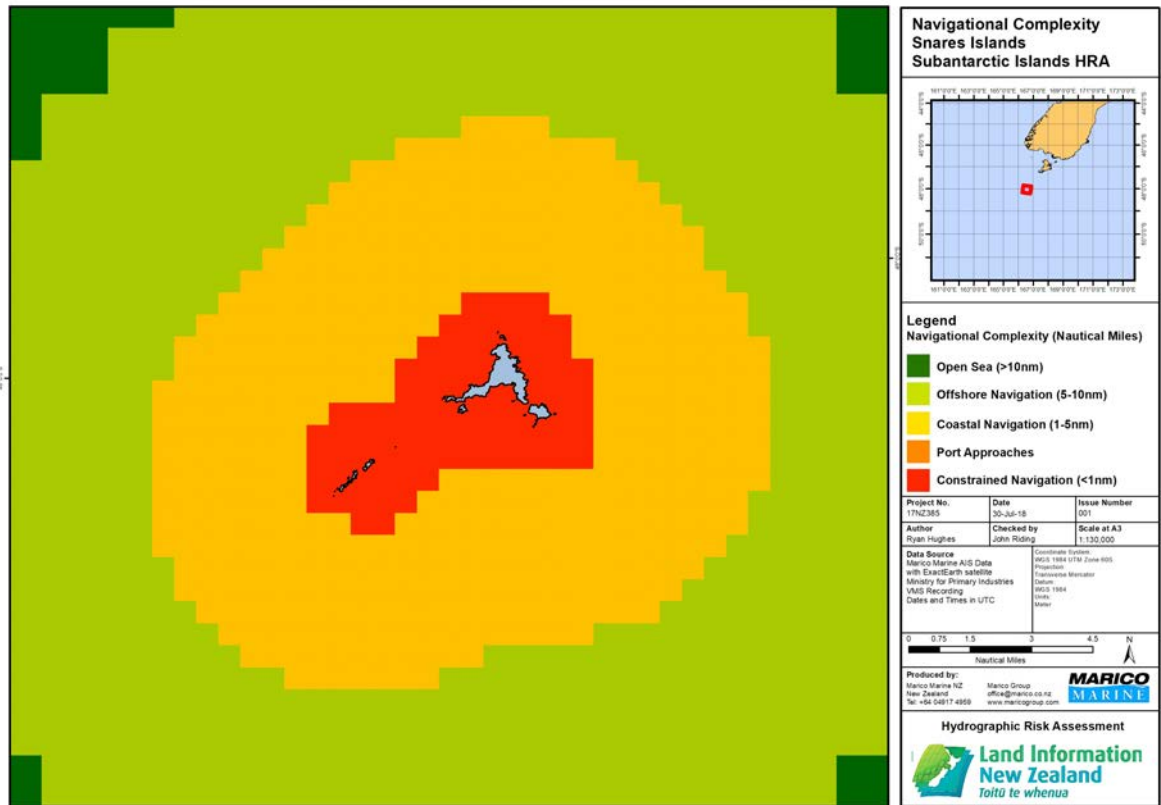


Figure Reference: 17NZ385_RMC_NAVCOM_Snares_Zoom_v1

Figure 55. Navigational Complexity, Snares Islands Zoom

2.2.2 GREAT CIRCLE ROUTE

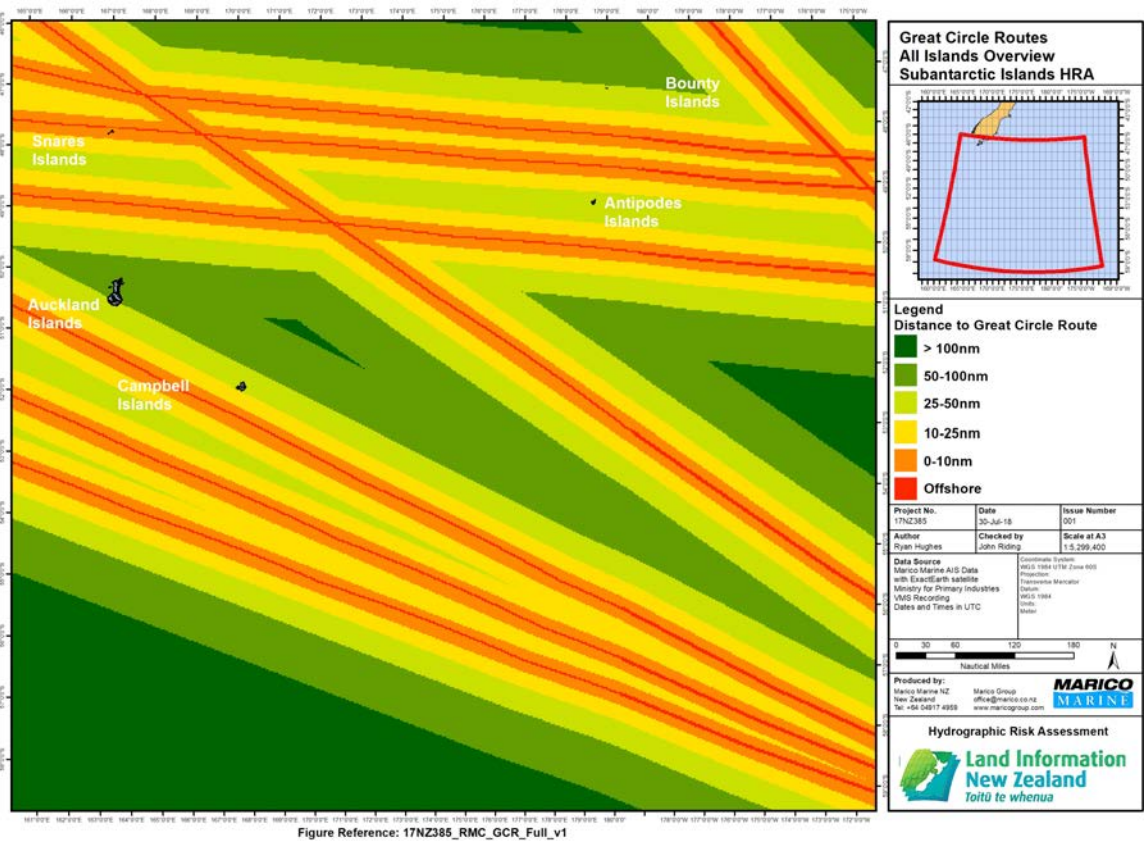


Figure 56, Great Circle Route, All Islands Overview

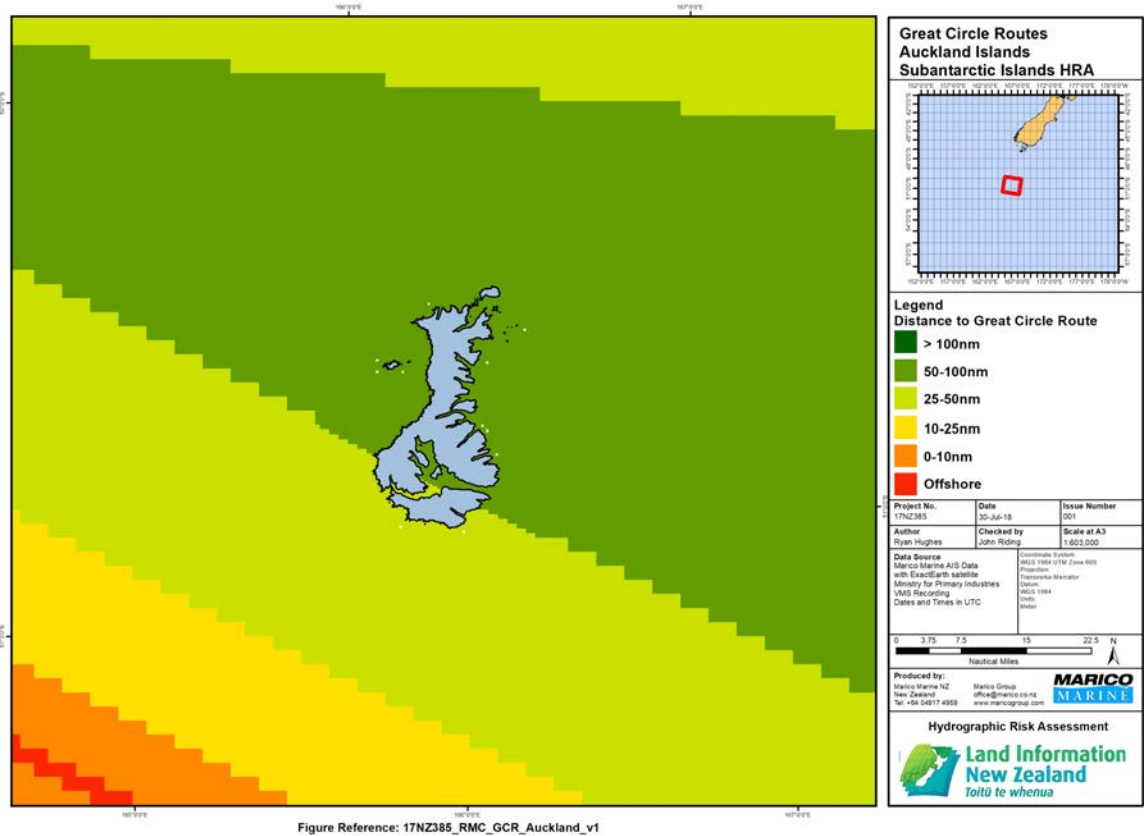


Figure 57, Great Circle Route, Auckland Islands

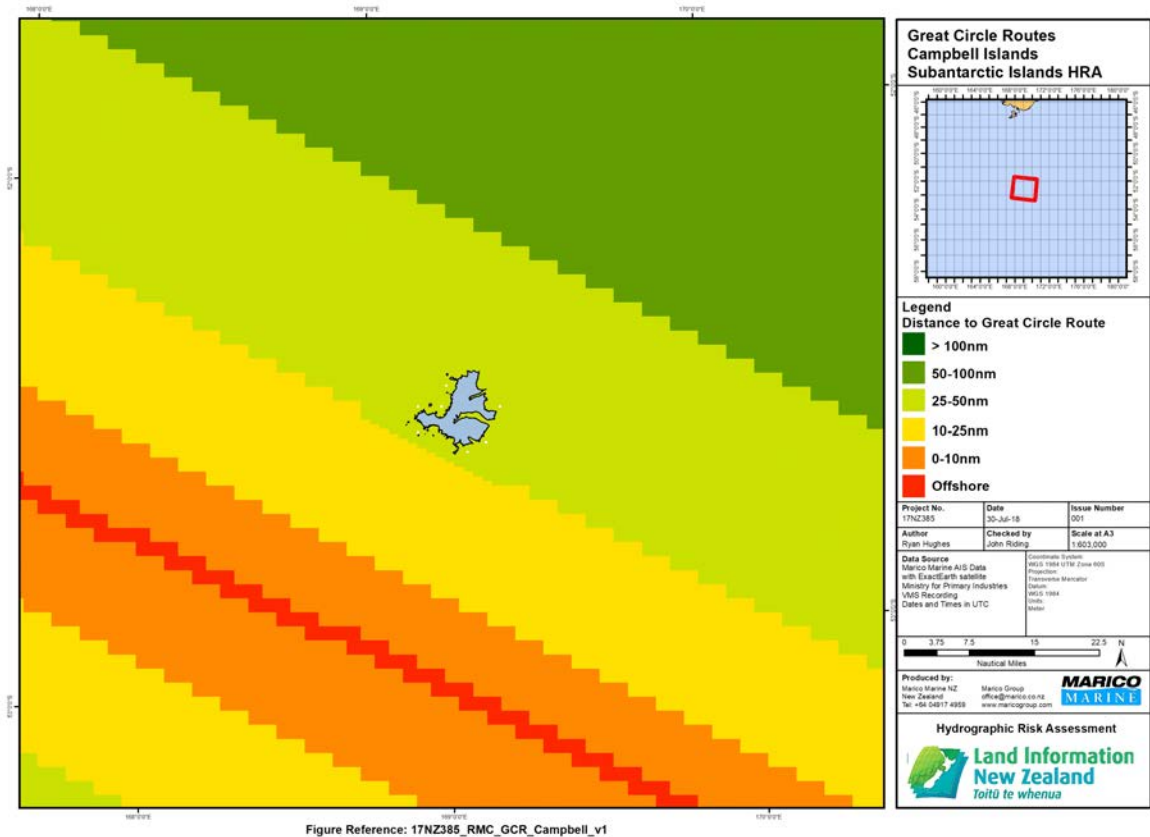


Figure 58, Great Circle Route, Campbell Islands

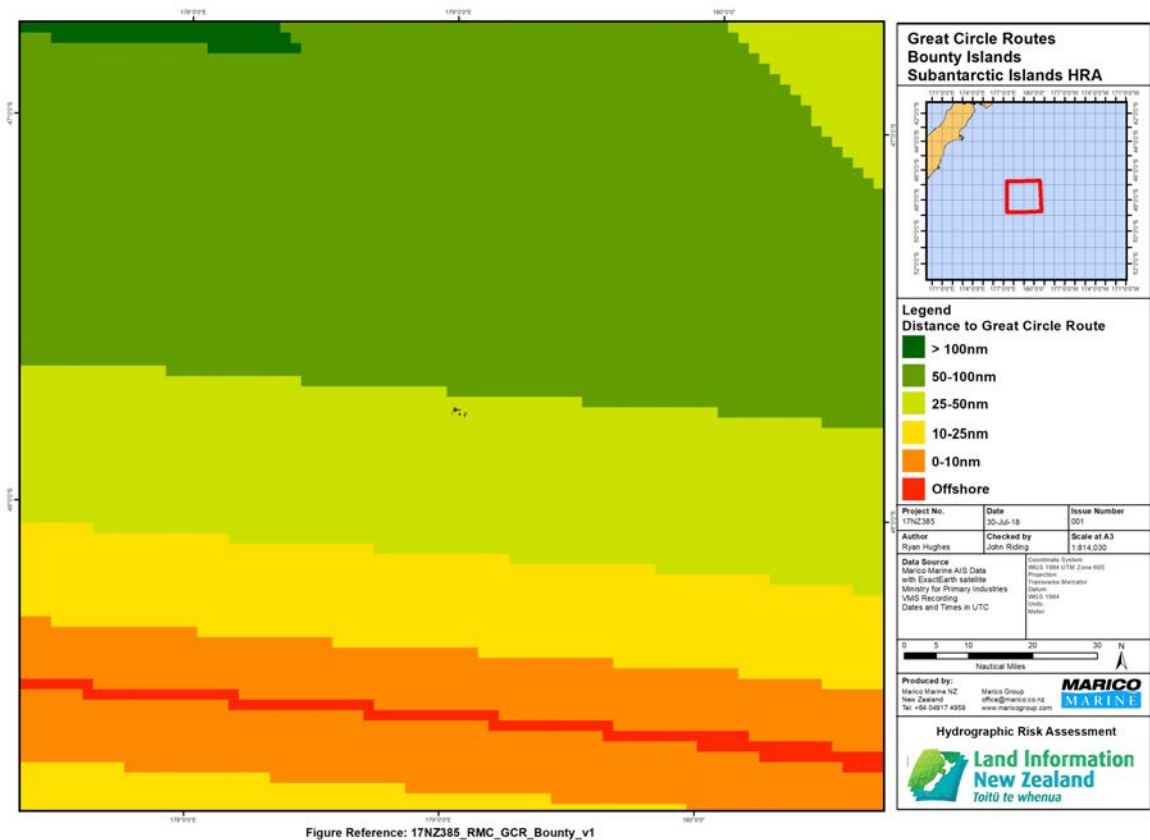


Figure 59, Great Circle Route, Bounty Islands

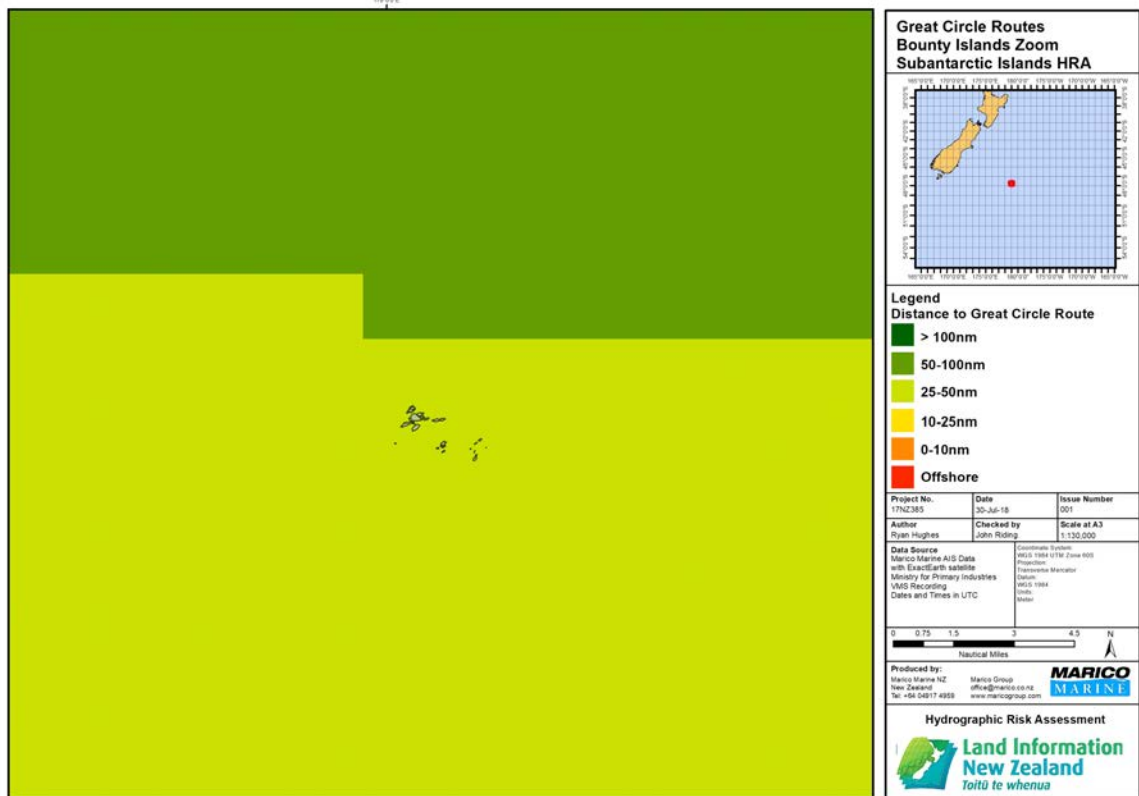


Figure Reference: 17NZ385_RMC_GCR_Bounty_Zoom_v1

Figure 60, Great Circle Route, Bounty Islands Zoom

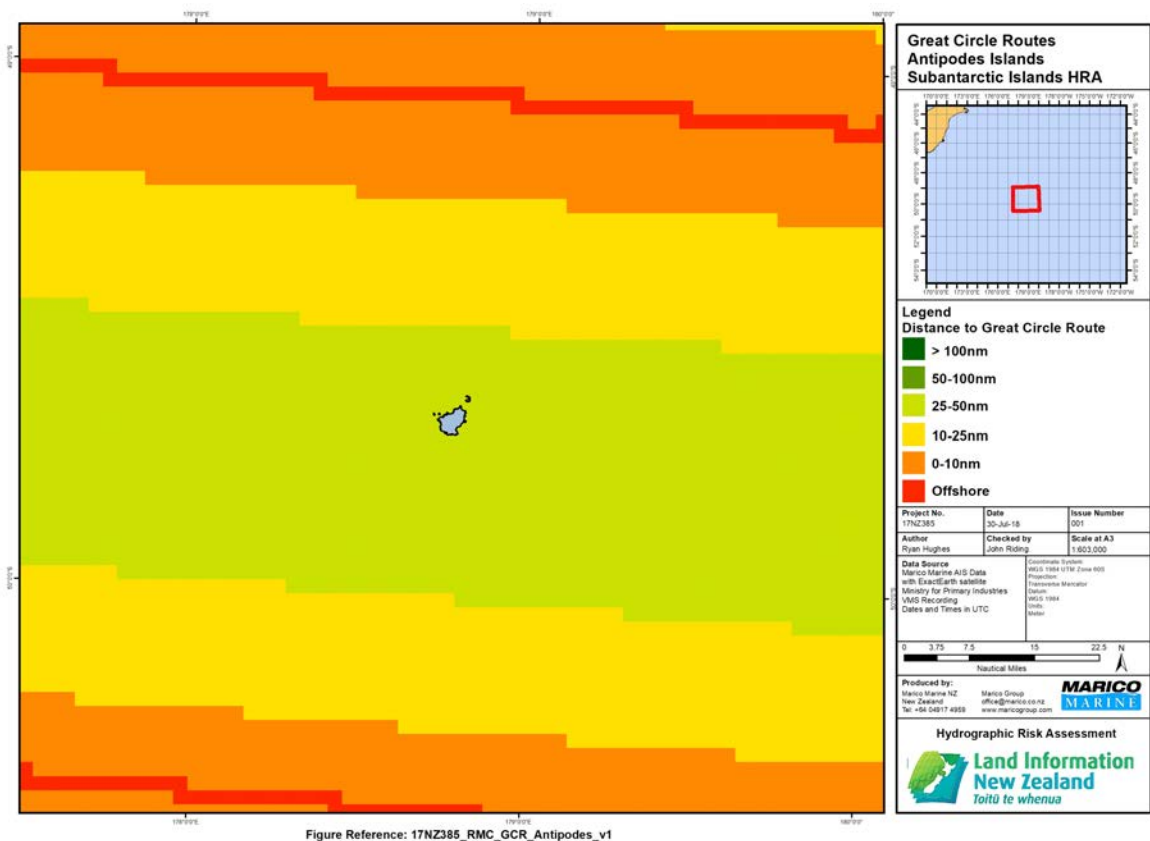


Figure Reference: 17NZ385_RMC_GCR_Antipodes_v1

Figure 61, Great Circle Route, Antipodes Islands

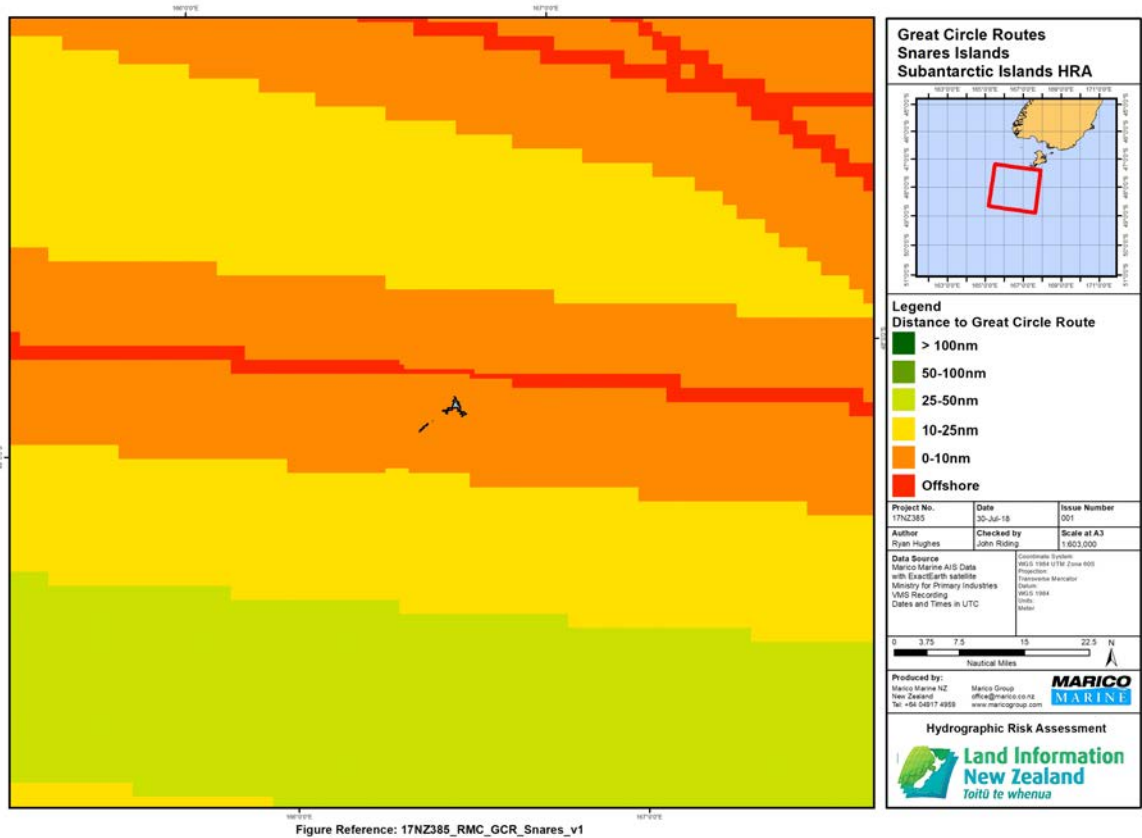


Figure 62, Great Circle Route, Snares Islands

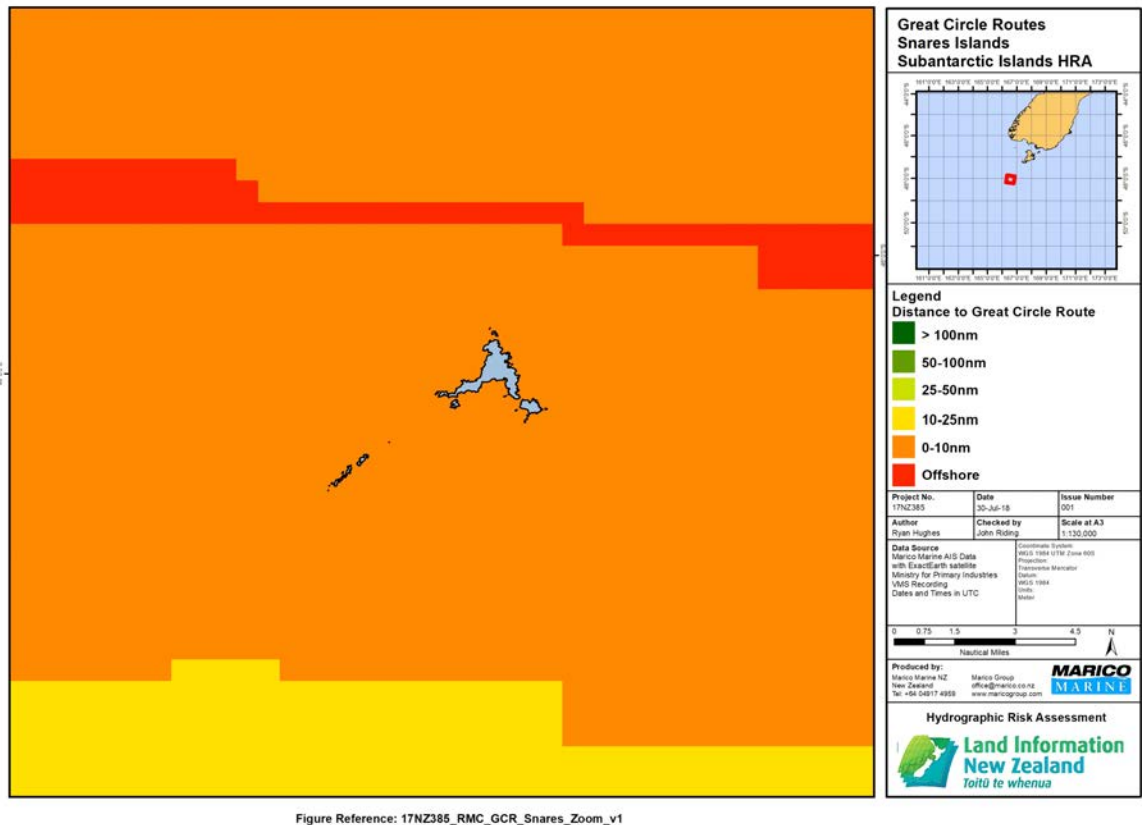


Figure 63, Great Circle Route, Snares Islands Zoom

2.2.3 DEPTH OF WATER 15M CONTOUR

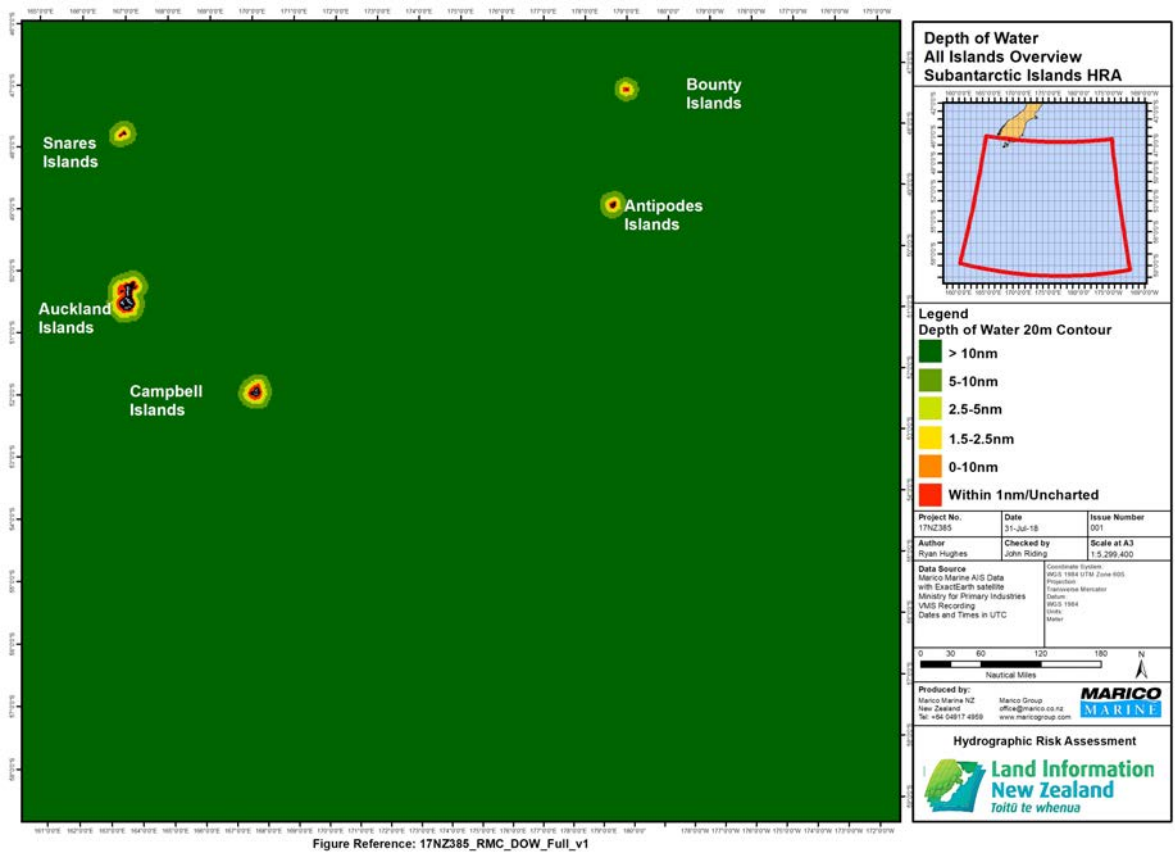


Figure Reference: 17NZ385_RMC_DOW_Full_v1

Figure 64, Depth of Water, All Islands Overview

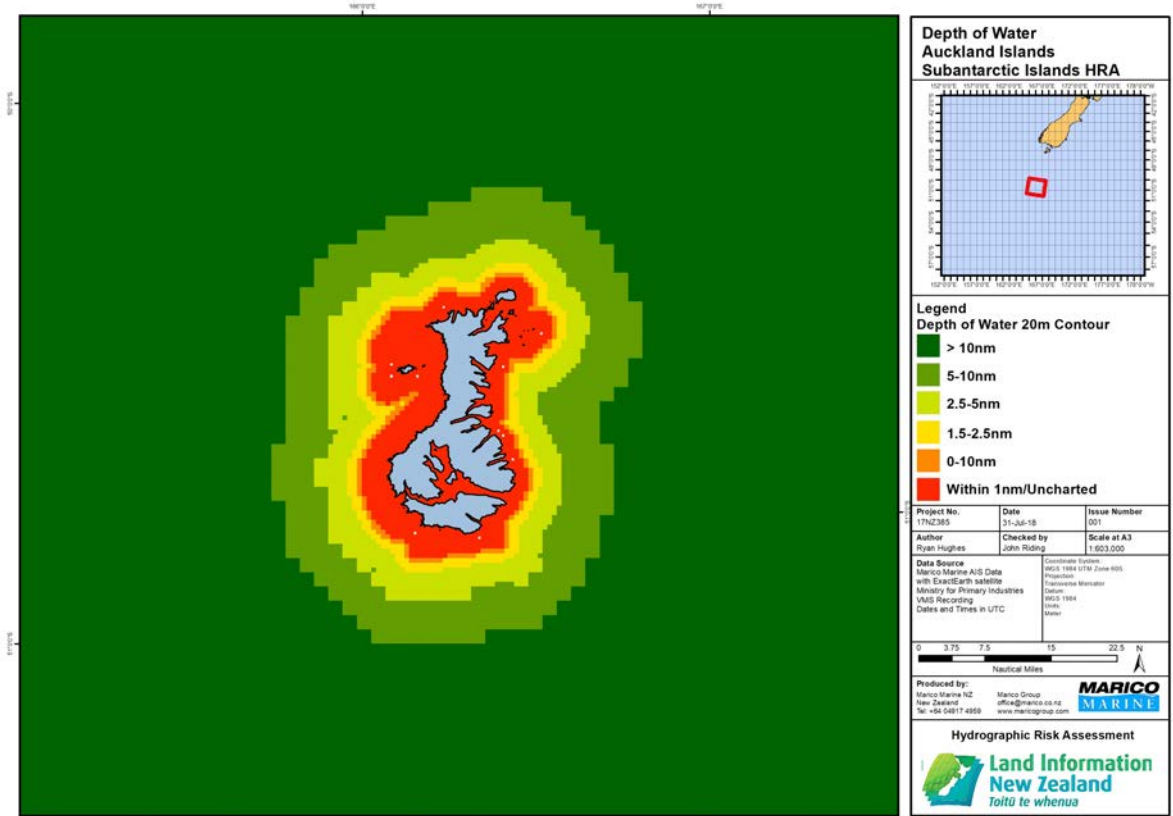


Figure Reference: 17NZ385_RMC_DOW_Auckland_v1

Figure 65, Depth of Water, Auckland Islands

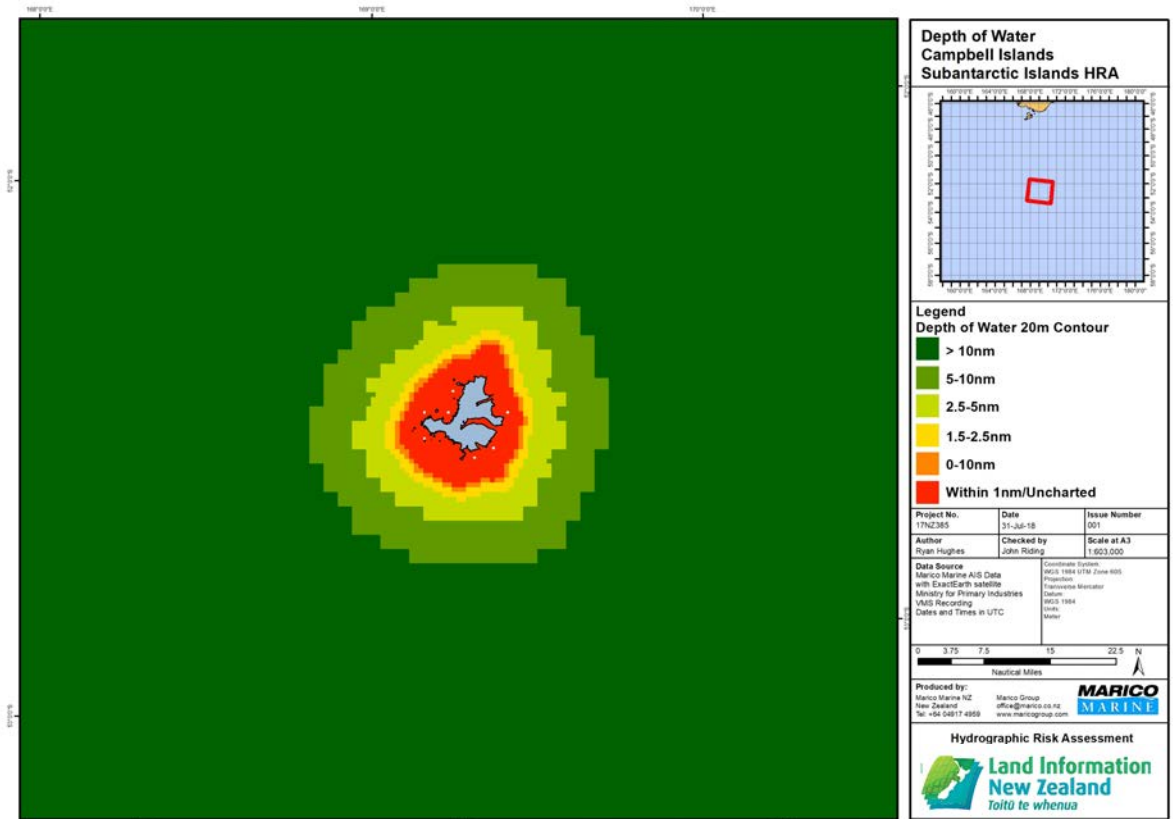


Figure Reference: 17NZ385_RMC_DOW_Campbell_v1

Figure 66, Depth of Water, Campbell Islands

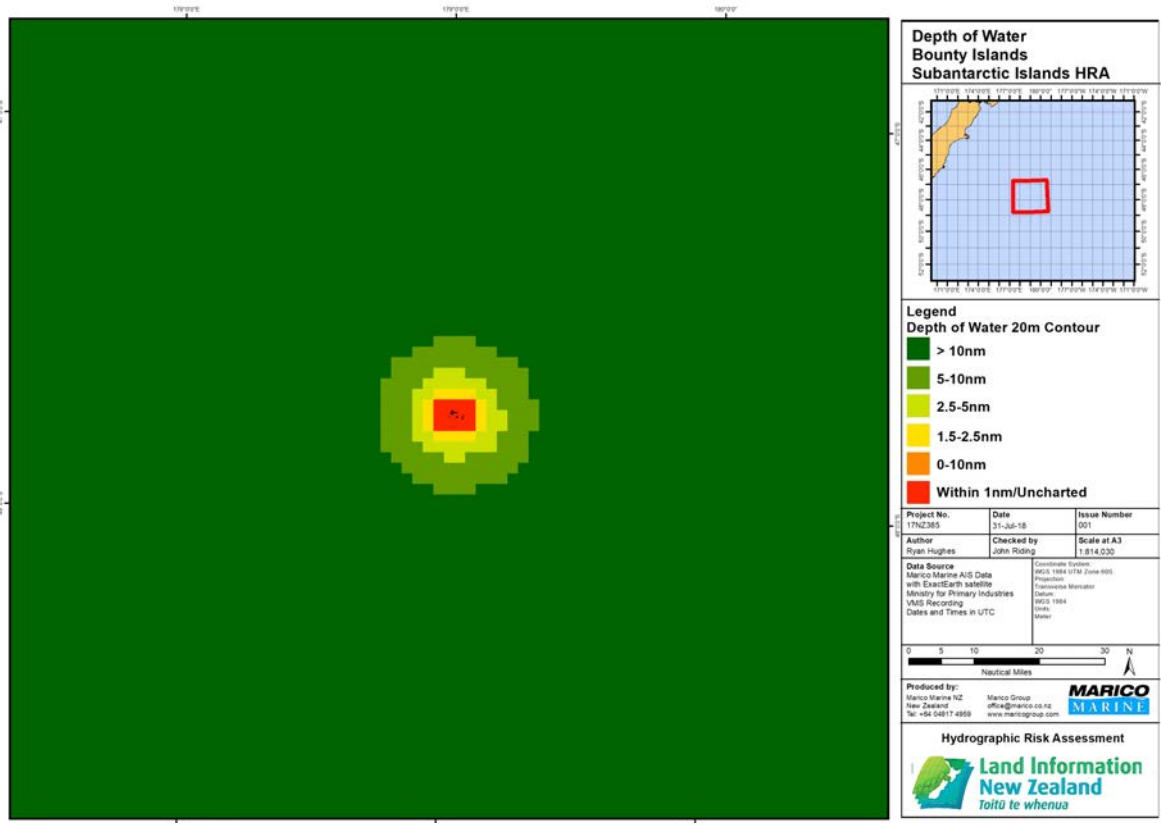


Figure Reference: 17NZ385_RMC_DOW_Bounty_v1

Figure 67, Depth of Water, Bounty Islands

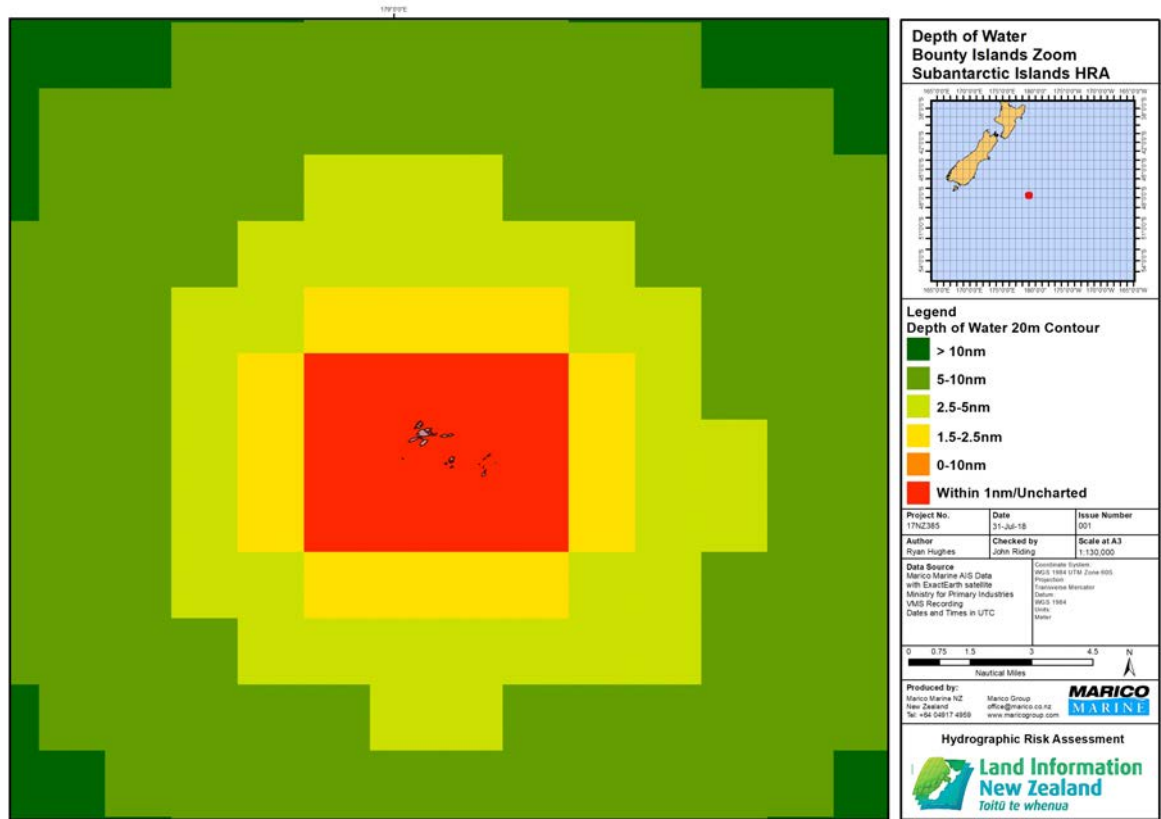


Figure Reference: 17NZ385_RMC_DOW_Bounty_Zoom_v1

Figure 68, Depth of Water, Bounty Islands Zoom

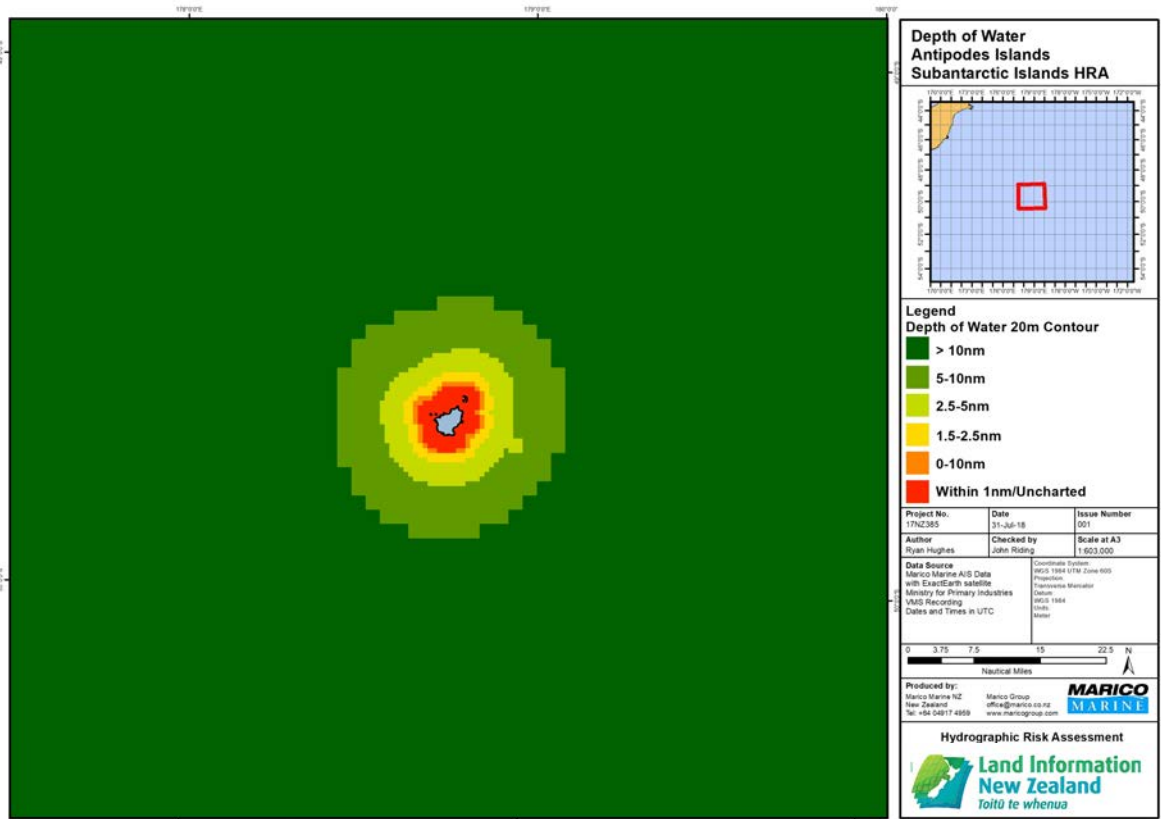


Figure Reference: 17NZ385_RMC_DOW_Antipodes_v1

Figure 69, Depth of Water, Antipodes Islands

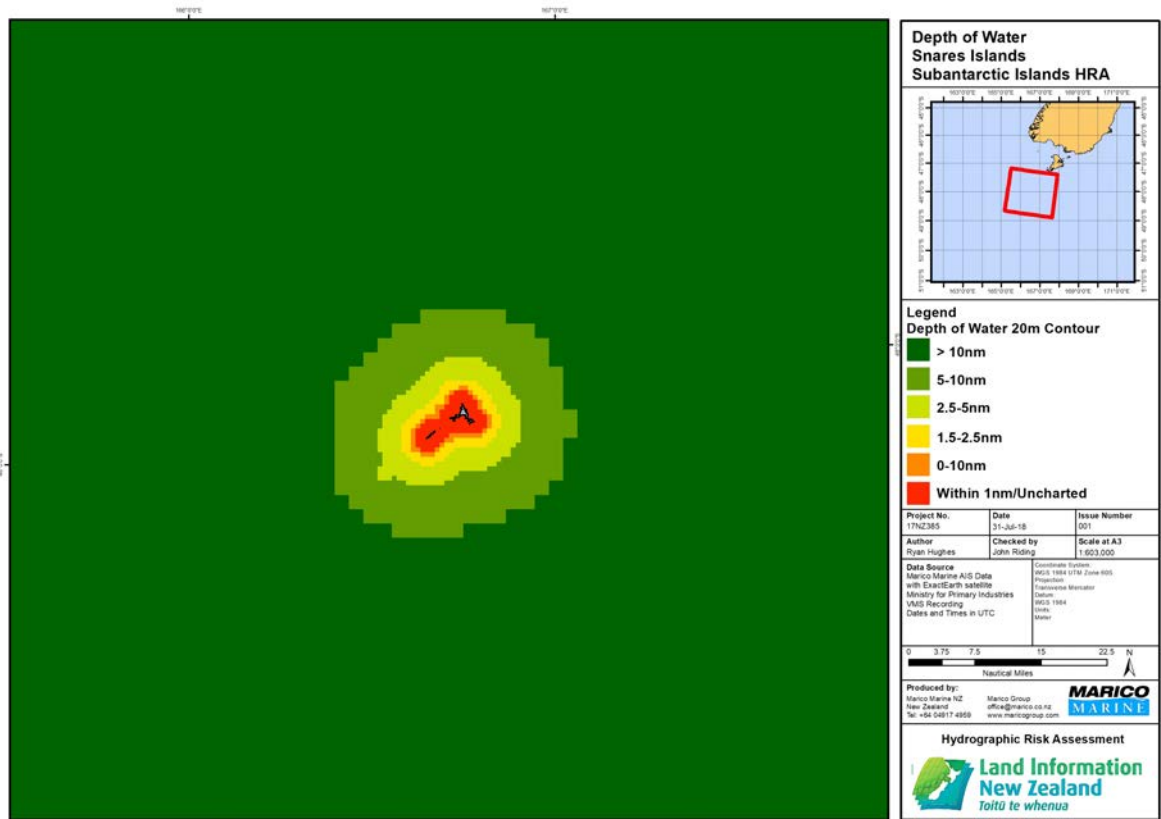


Figure Reference: 17NZ385_RMC_DOW_Snares_v1

Figure 70, Depth of Water, Snares Islands

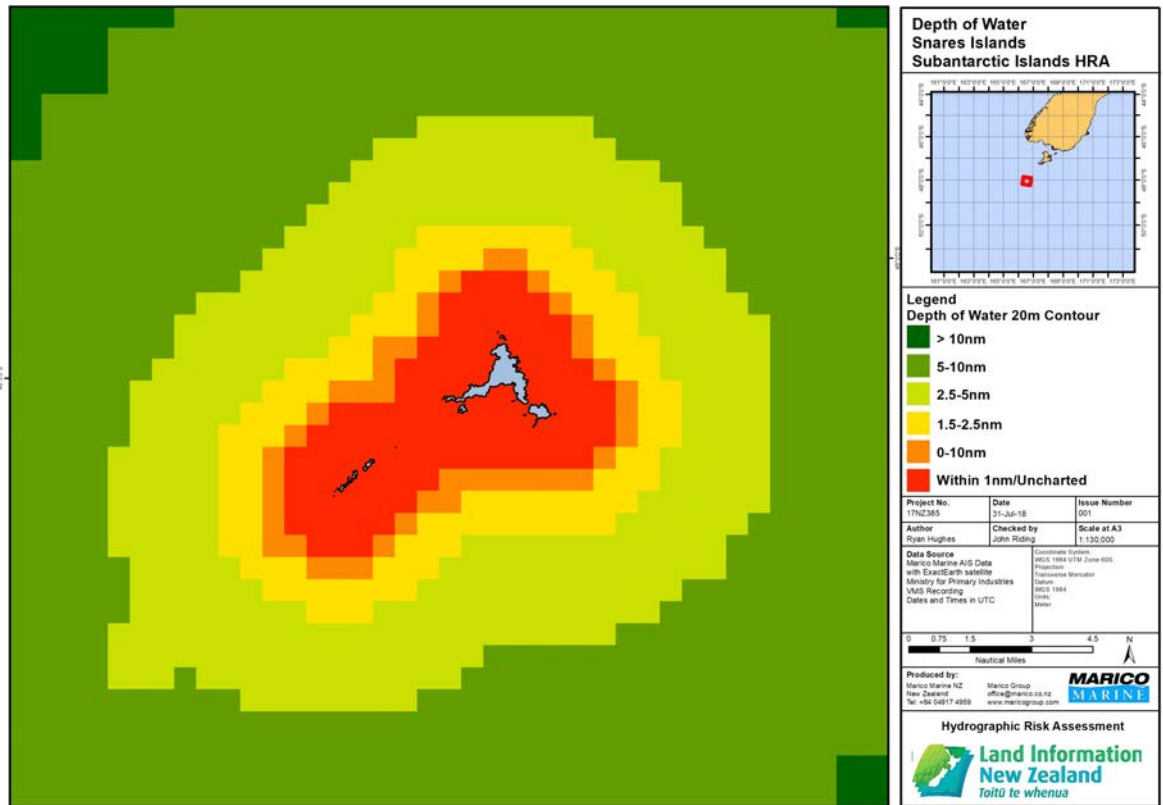


Figure Reference: 17NZ385_RMC_DOW_Snares_Zoom_v1

Figure 71, Depth of Water, Snares Islands Zoom

2.3 METOCEAN

2.3.1 PREVAILING WAVE/WIND

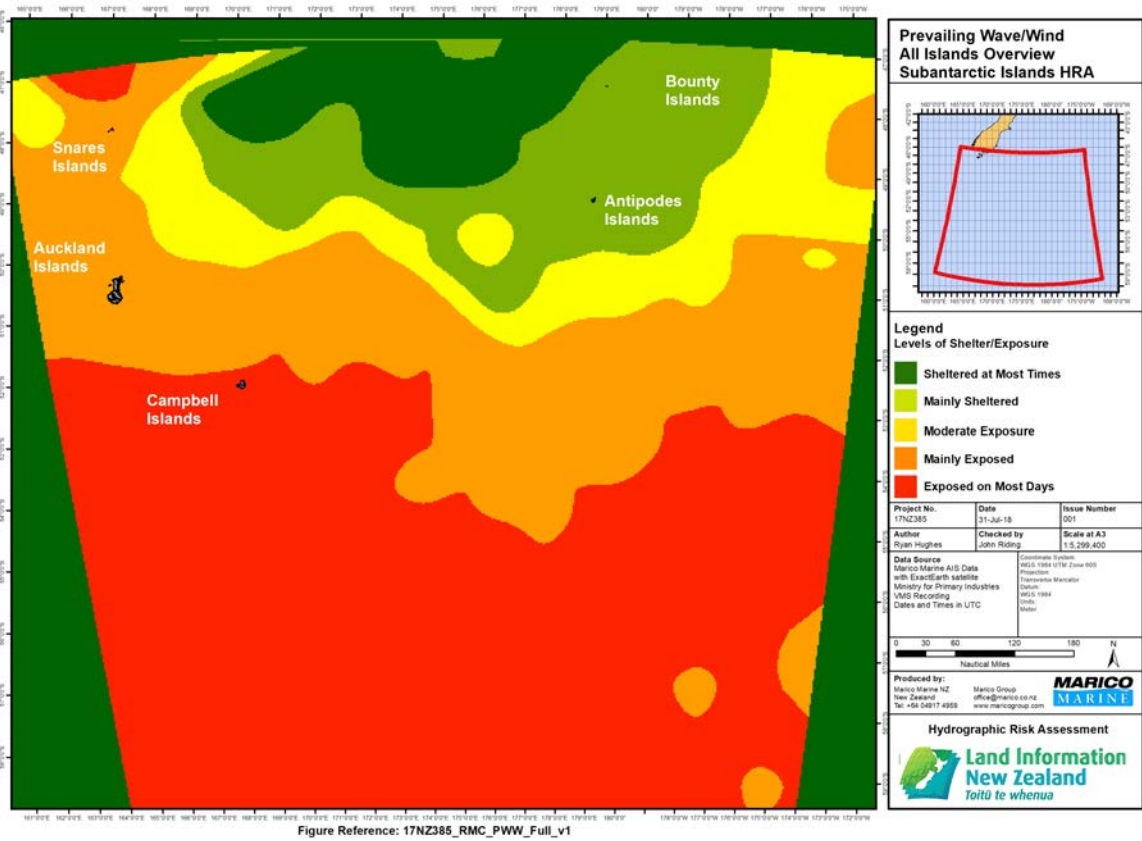


Figure 72, Prevailing Wave/Wind, All Islands Overview

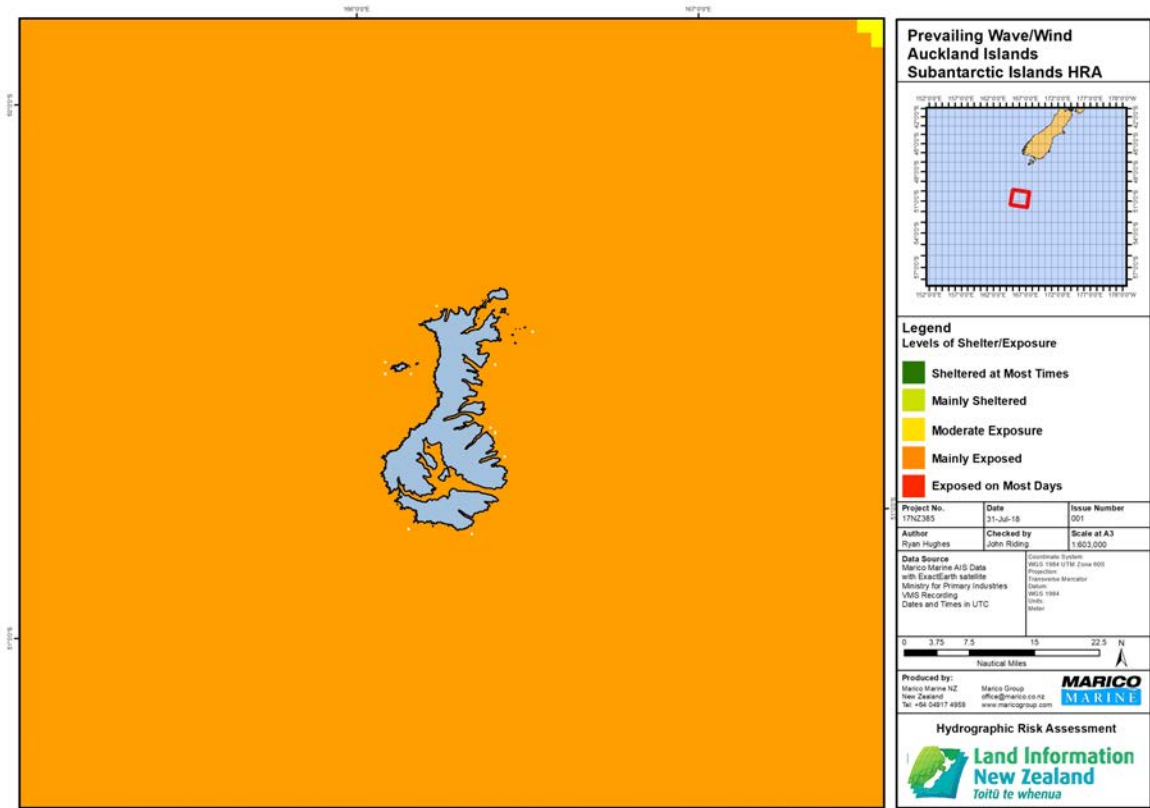


Figure Reference: 17NZ385_RMC_PWW_Auckland_v1

Figure 73, Prevailing Wave/Wind, Auckland Islands

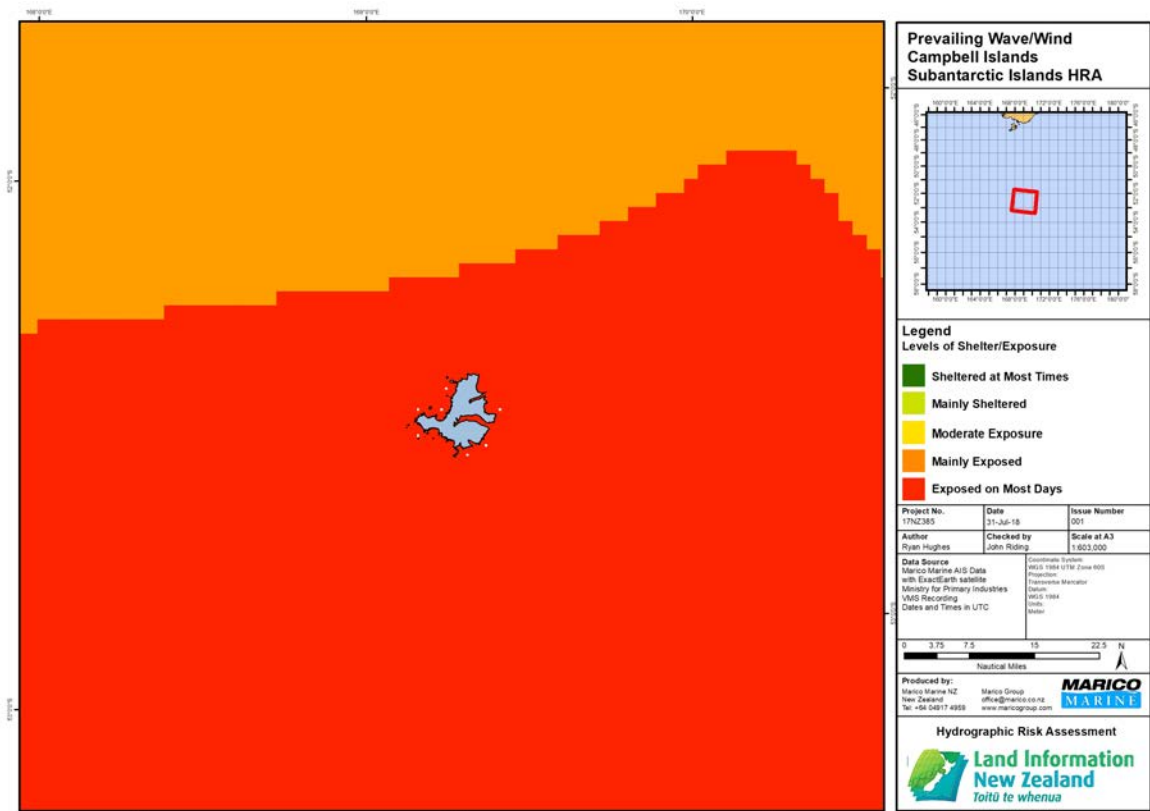


Figure Reference: 17NZ385_RMC_PWW_Campbell_v1

Figure 74, Prevailing Wave/Wind, Campbell Islands

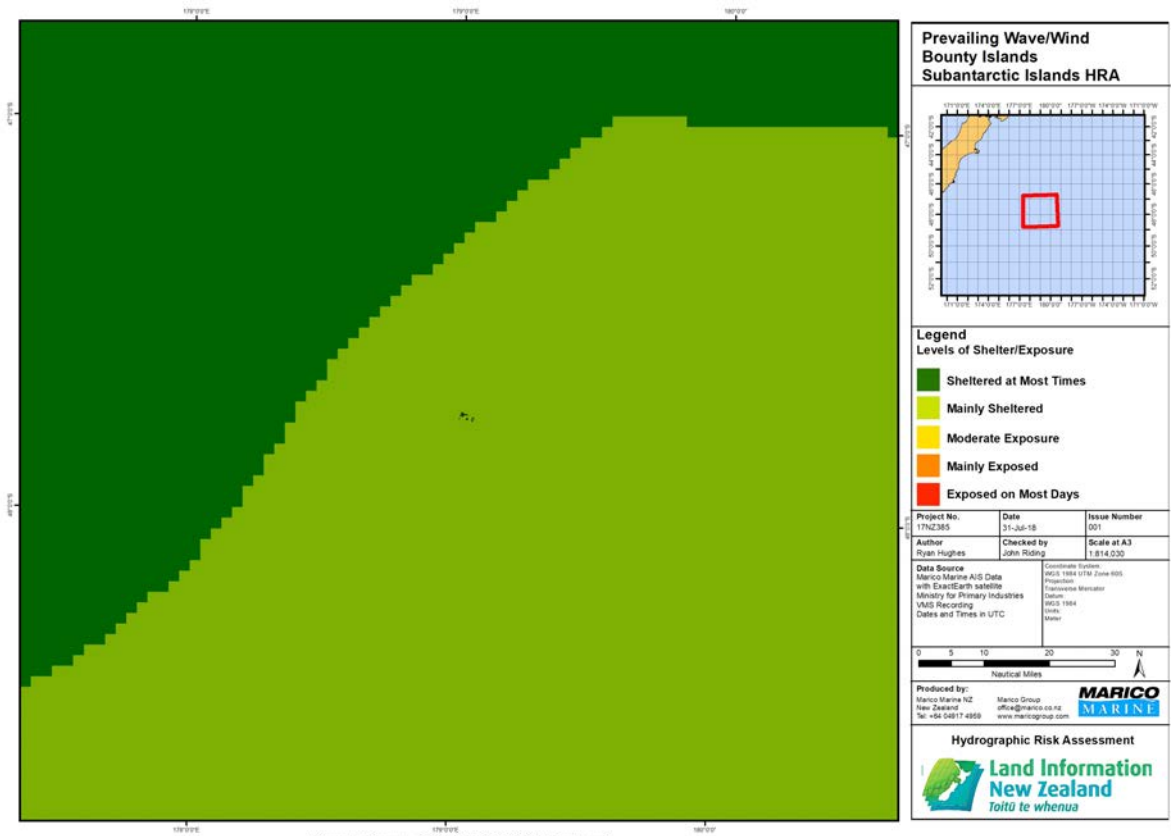


Figure Reference: 17NZ385_RMC_PWW_Bounty_v1

Figure 75, Prevailing Wave/Wind, Bounty Islands

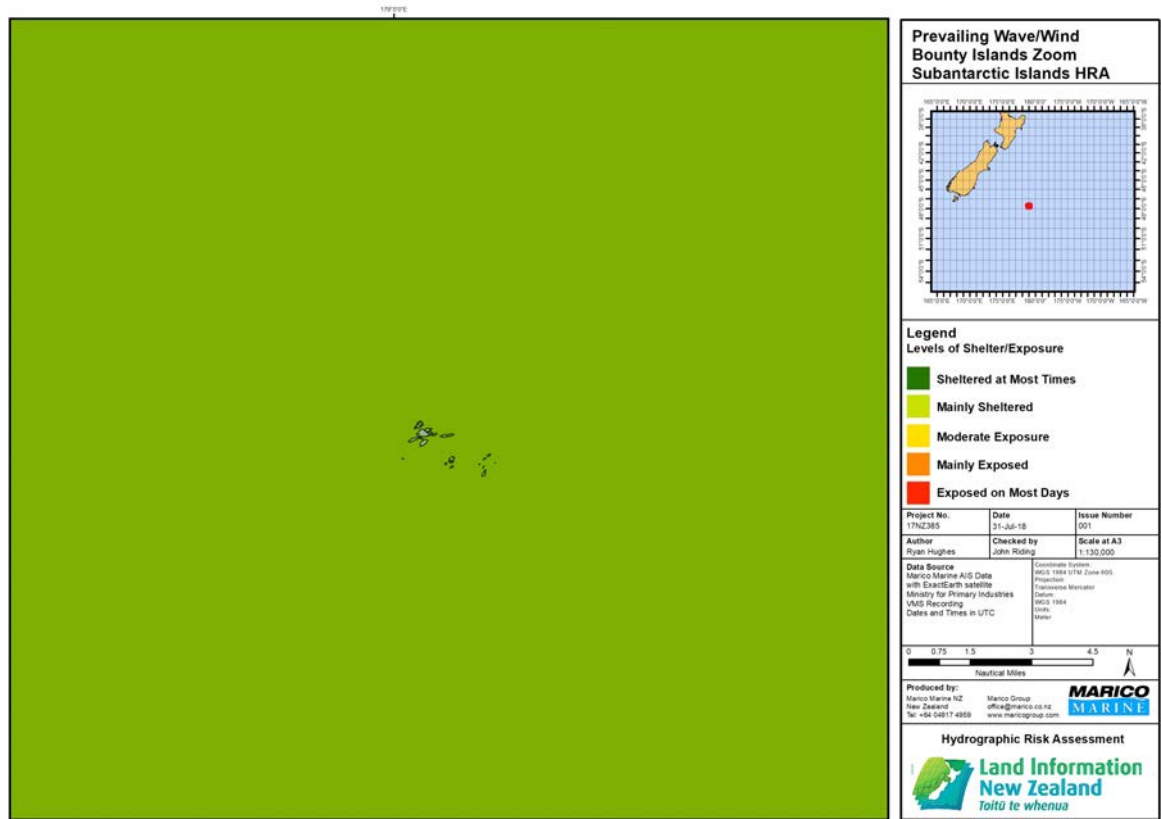


Figure Reference: 17NZ385_RMC_PWW_Bounty_Zoom_v1

Figure 76, Prevailing Wave/Wind, Bounty Islands Zoom

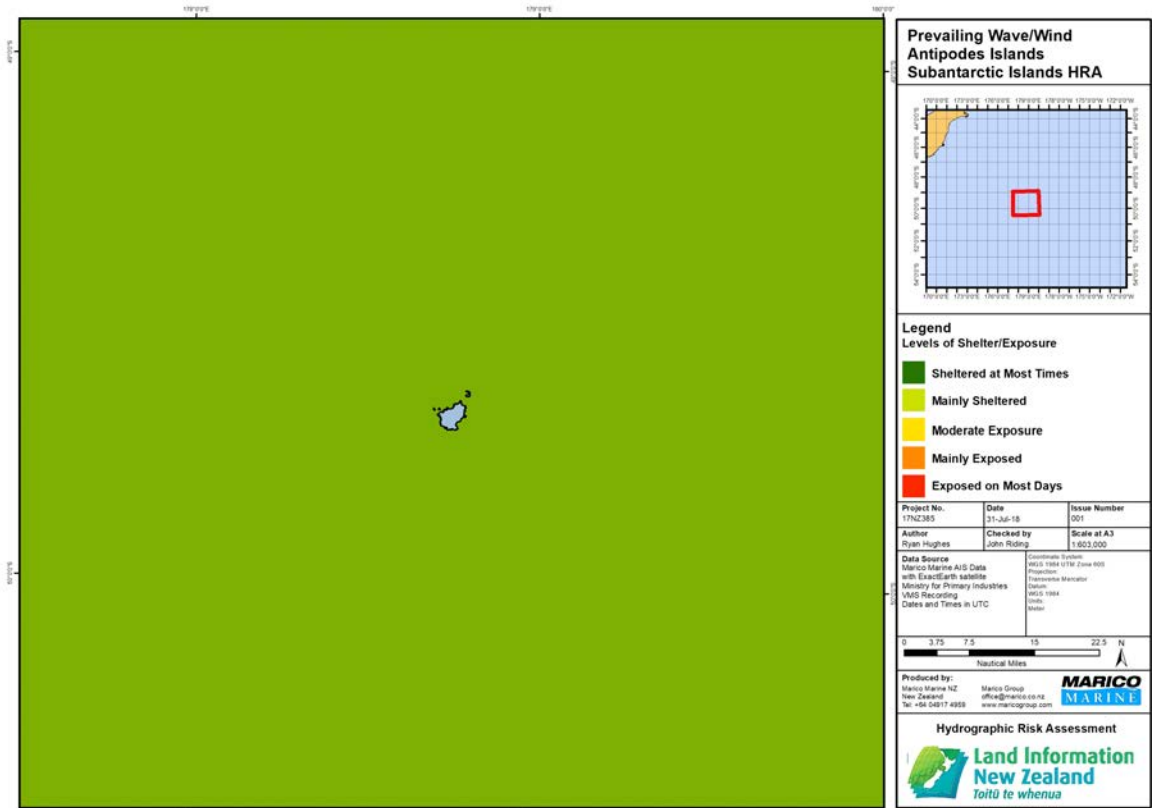


Figure Reference: 17NZ385_RMC_PWW_Antipodes_v1

Figure 77, Prevailing Wave/Wind, Antipodes Islands

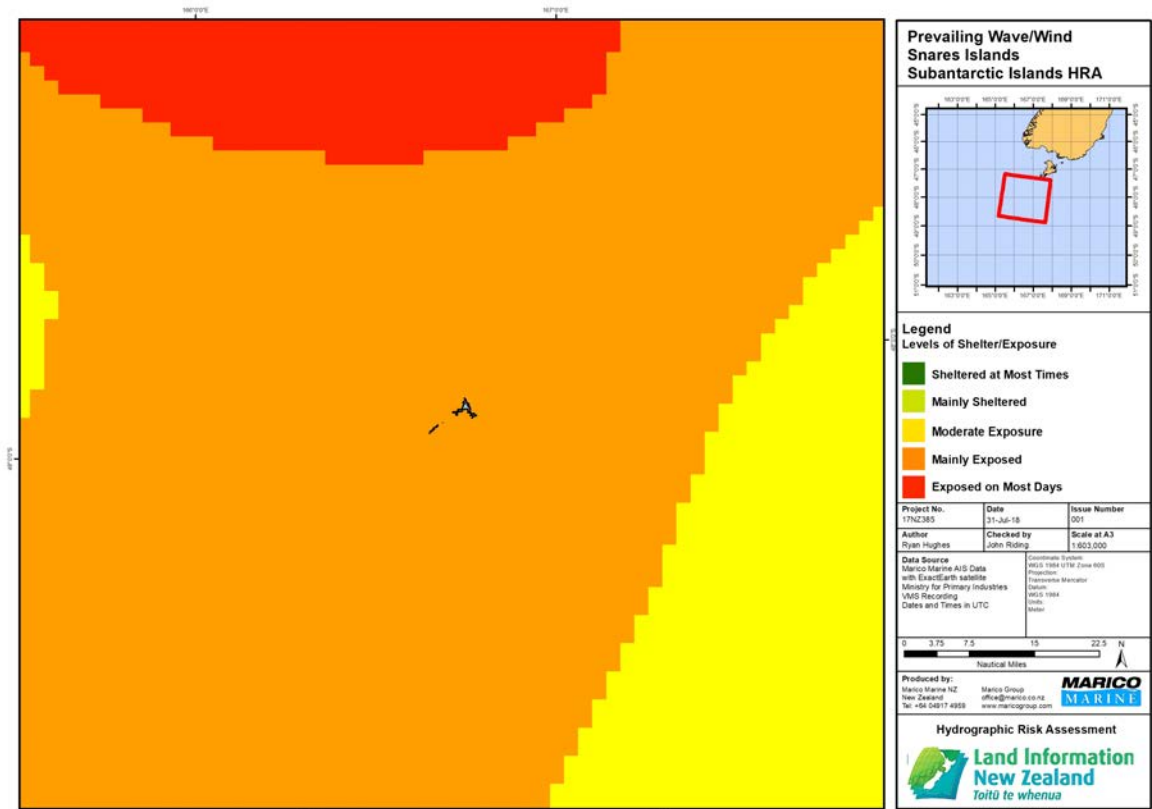


Figure Reference: 17NZ385_RMC_PWW_Snares_v1

Figure 78, Prevailing Wave/Wind, Snares Islands

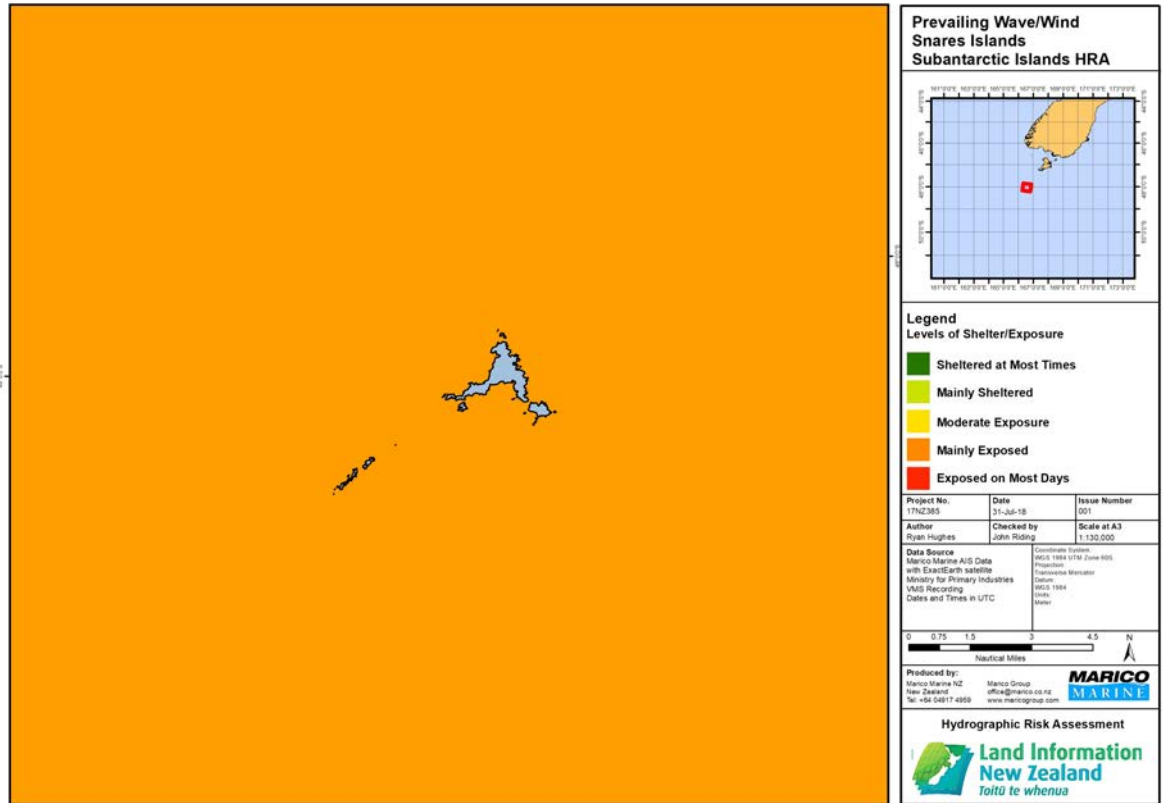


Figure Reference: 17NZ385_RMC_PWW_Snares_Zoom_v1

Figure 79, Prevailing Wave/Wind, Snares Islands Zoom

2.4 NAVIGATIONAL HAZARDS

2.4.1 KNOWN SEA MOUNTS

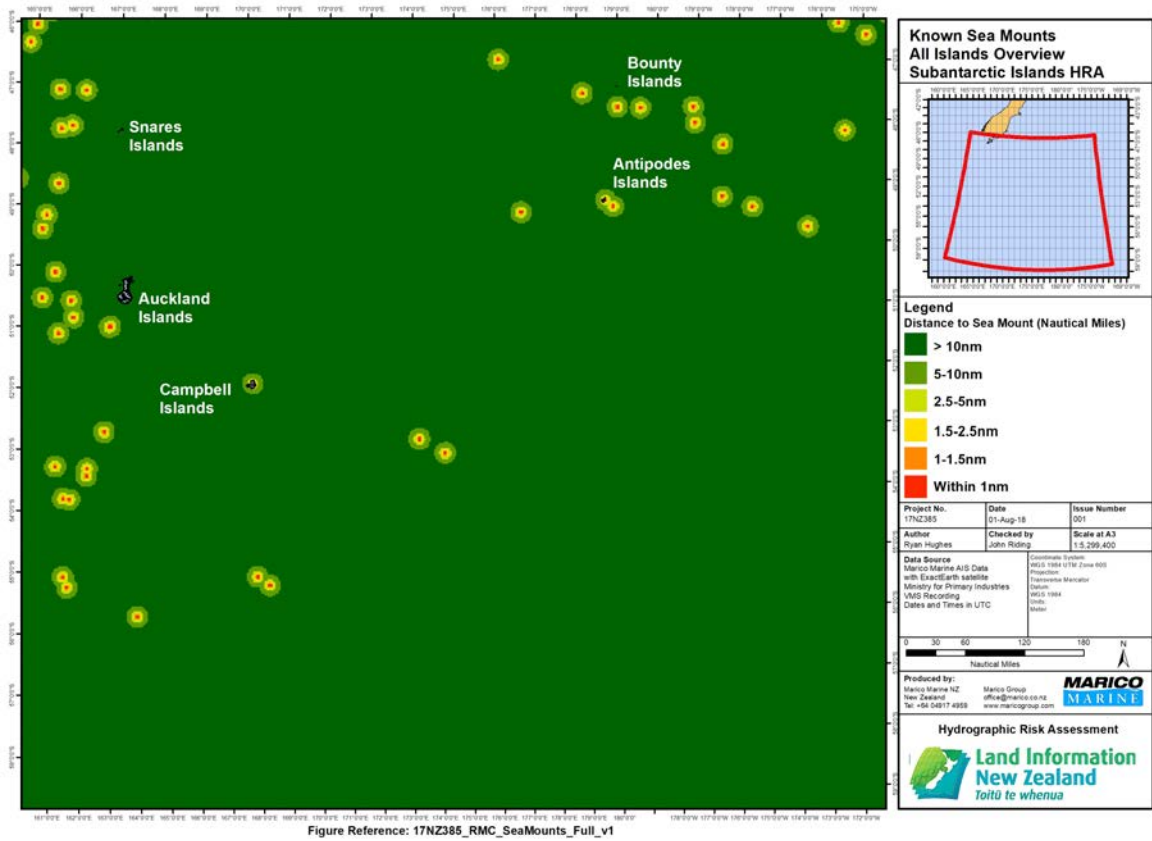


Figure 80, Known Sea Mounts, All Islands Overview

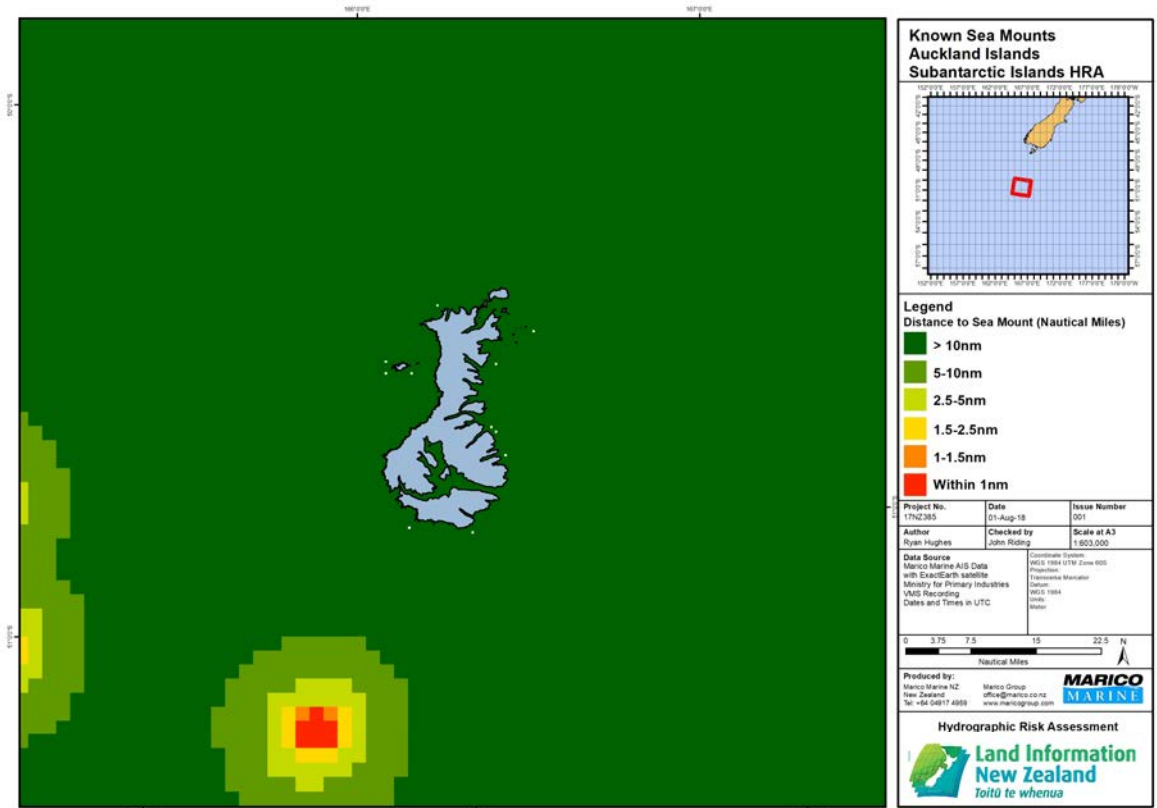


Figure Reference: 17NZ385_RMC_SeaMounts_Auckland_v1

Figure 81, Known Sea Mounts, Auckland Islands

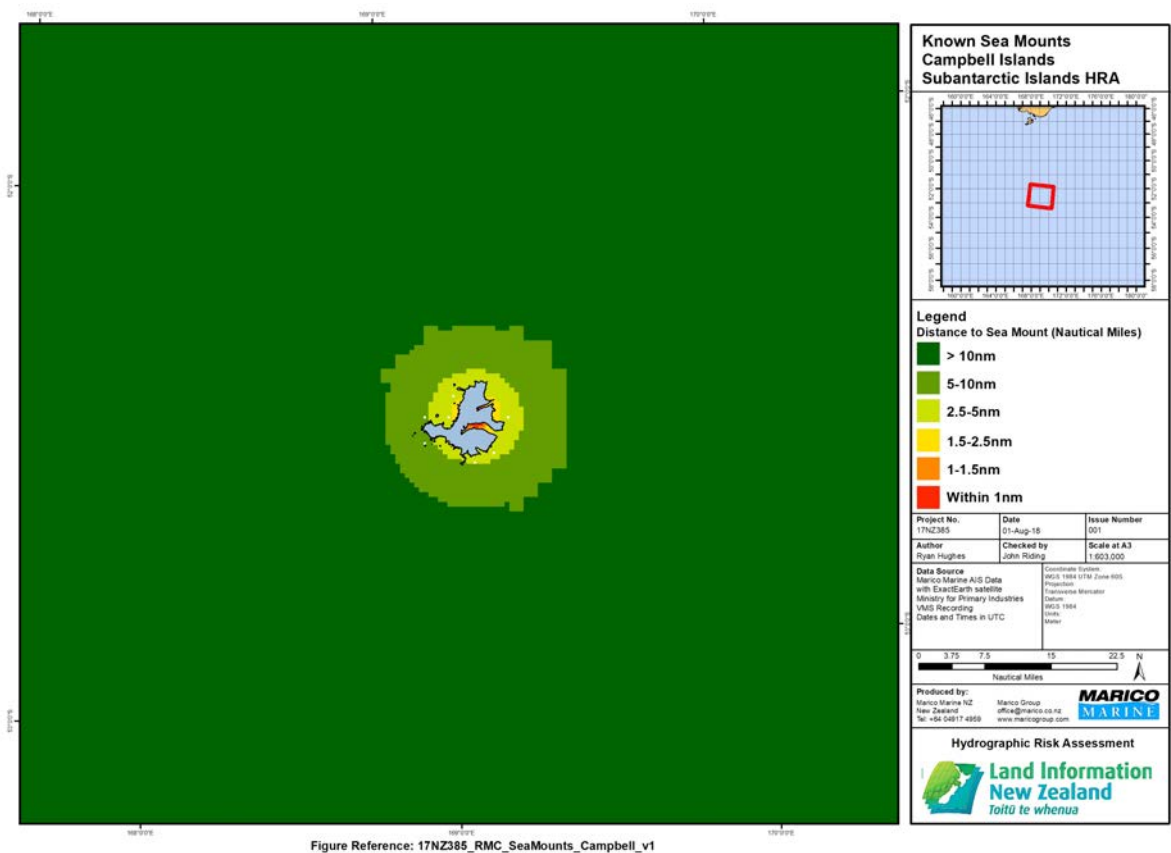


Figure Reference: 17NZ385_RMC_SeaMounts_Campbell_v1

Figure 82, Known Sea Mounts, Campbell Islands

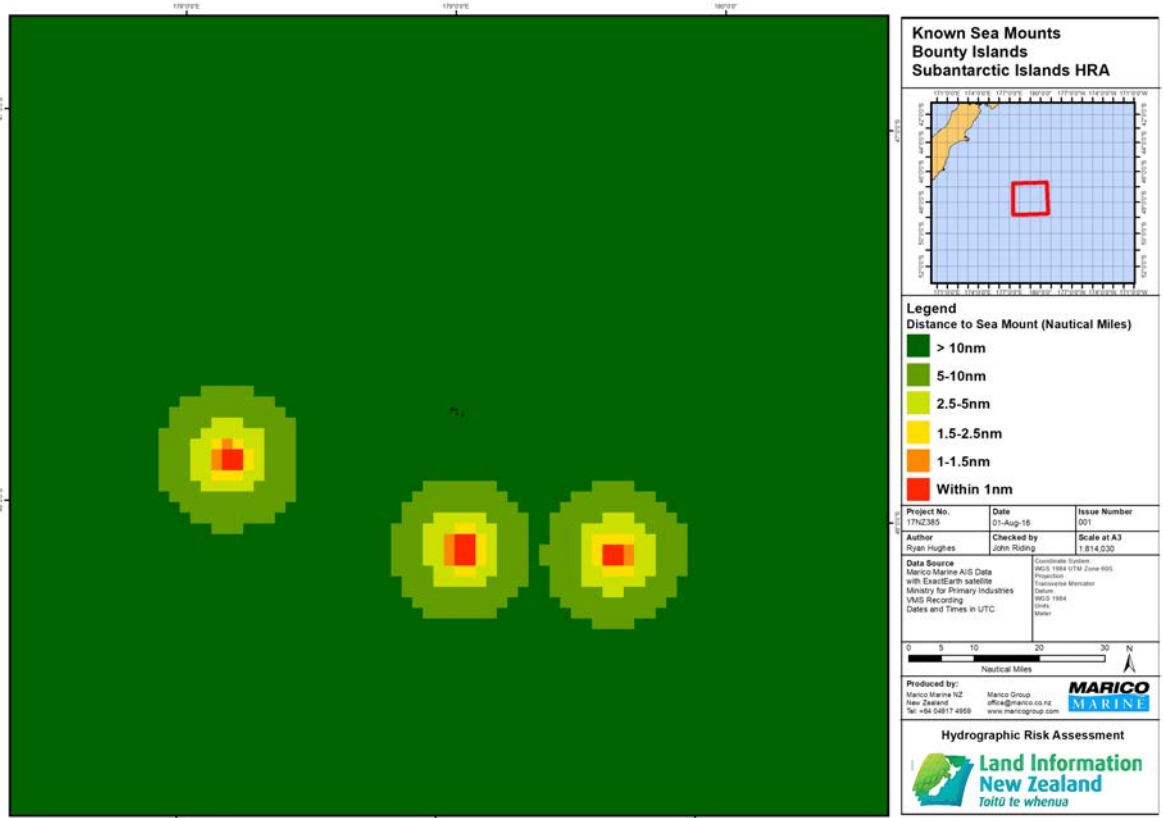


Figure Reference: 17NZ385_RMC_SeaMounts_Bounty_v1

Figure 83, Known Sea Mounts, Bounty Islands

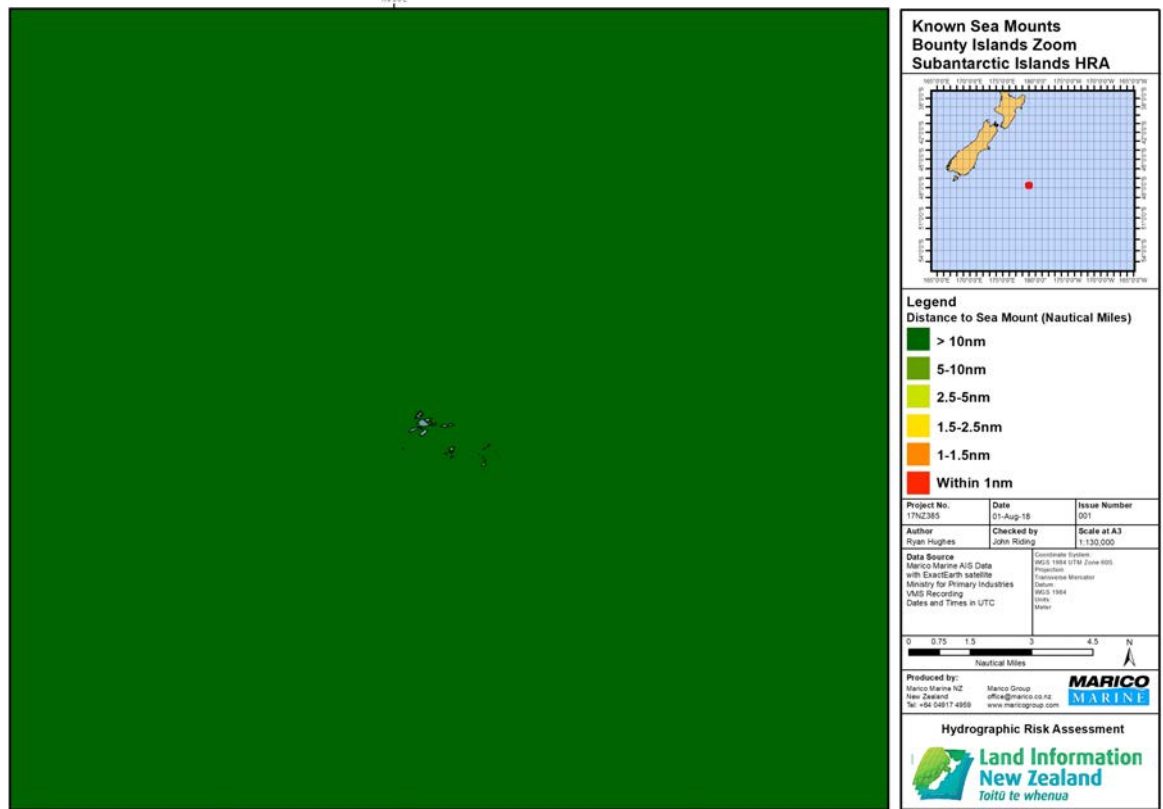


Figure Reference: 17NZ385_RMC_SeaMounts_Bounty_Zoom_v1

Figure 84, Known Sea Mounts, Bounty Islands Zoom

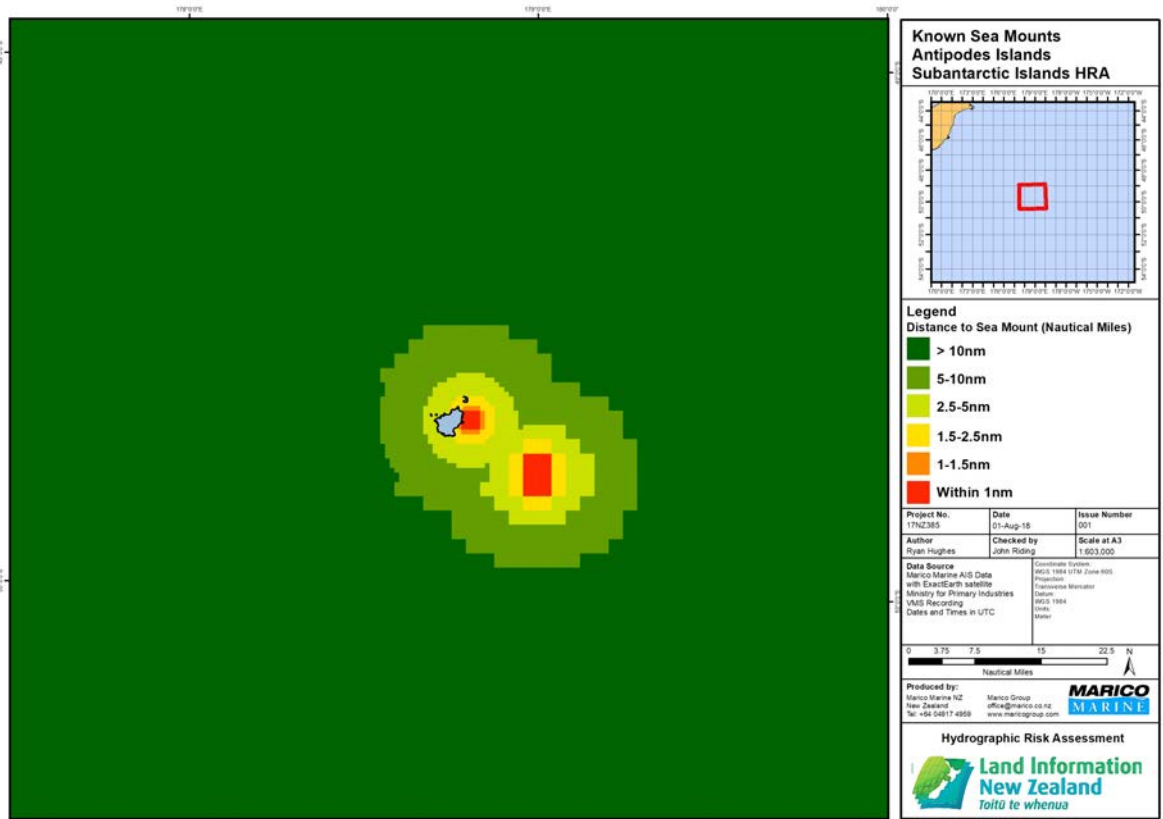


Figure Reference: 17NZ385_RMC_SeaMounts_Antipodes_v1

Figure 85, Known Sea Mounts, Antipodes Islands

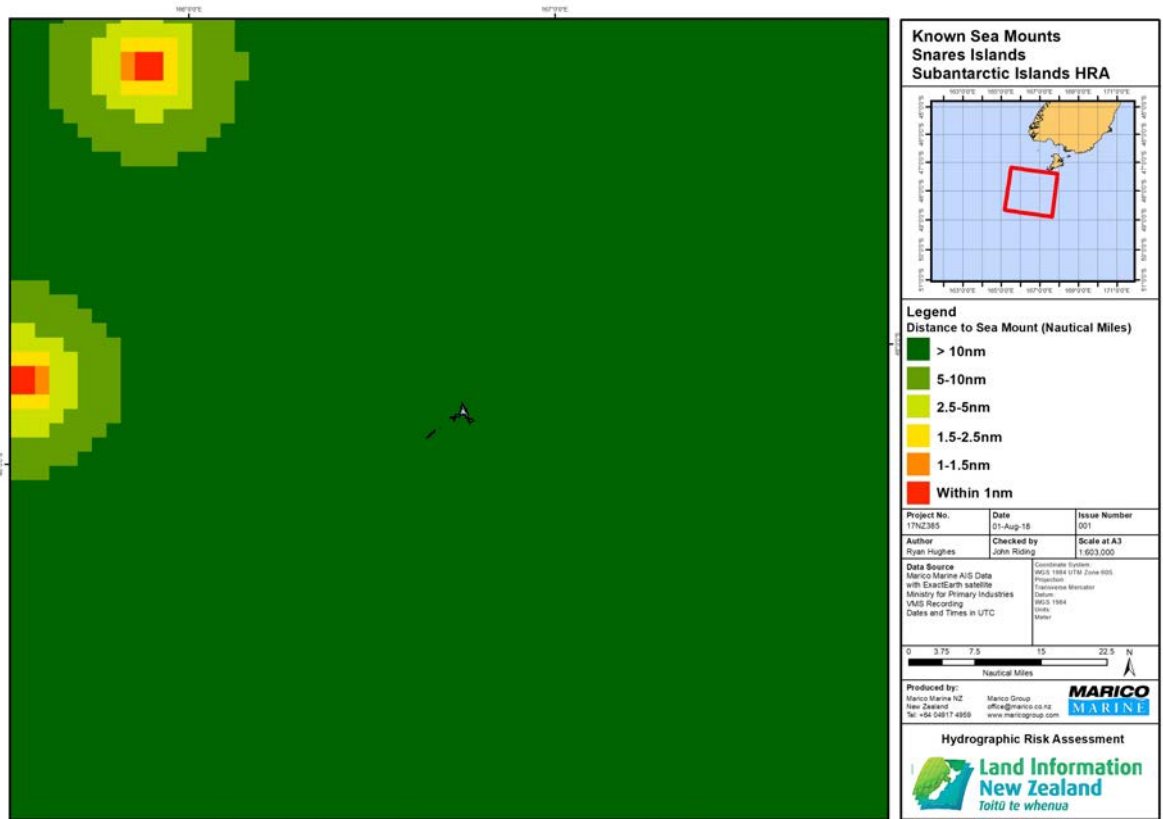


Figure Reference: 17NZ385_RMC_SeaMounts_Snares_v1

Figure 86, Known Sea Mounts, Snares Islands

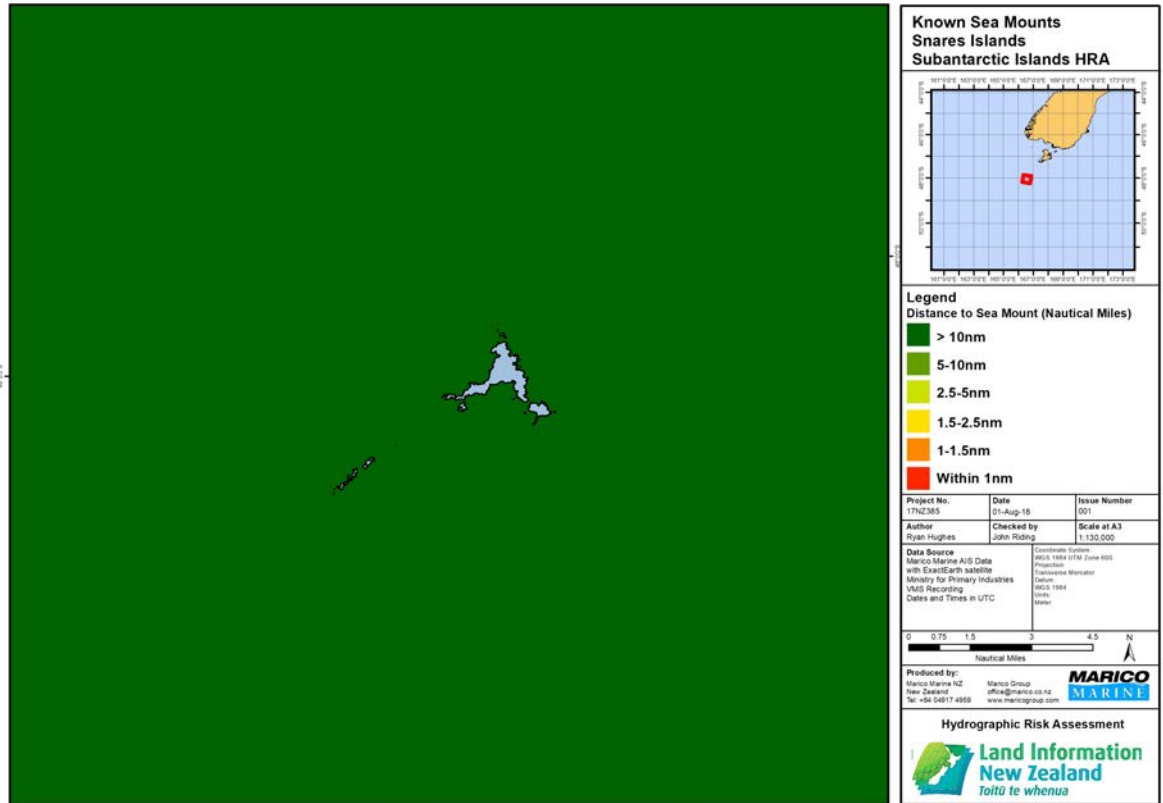


Figure Reference: 17NZ385_RMC_SeaMounts_Snares_Zoom_v1

Figure 87, Known Sea Mounts, Snares Islands Zoom

2.4.2 CALVING ICE – AFTER RELEASE

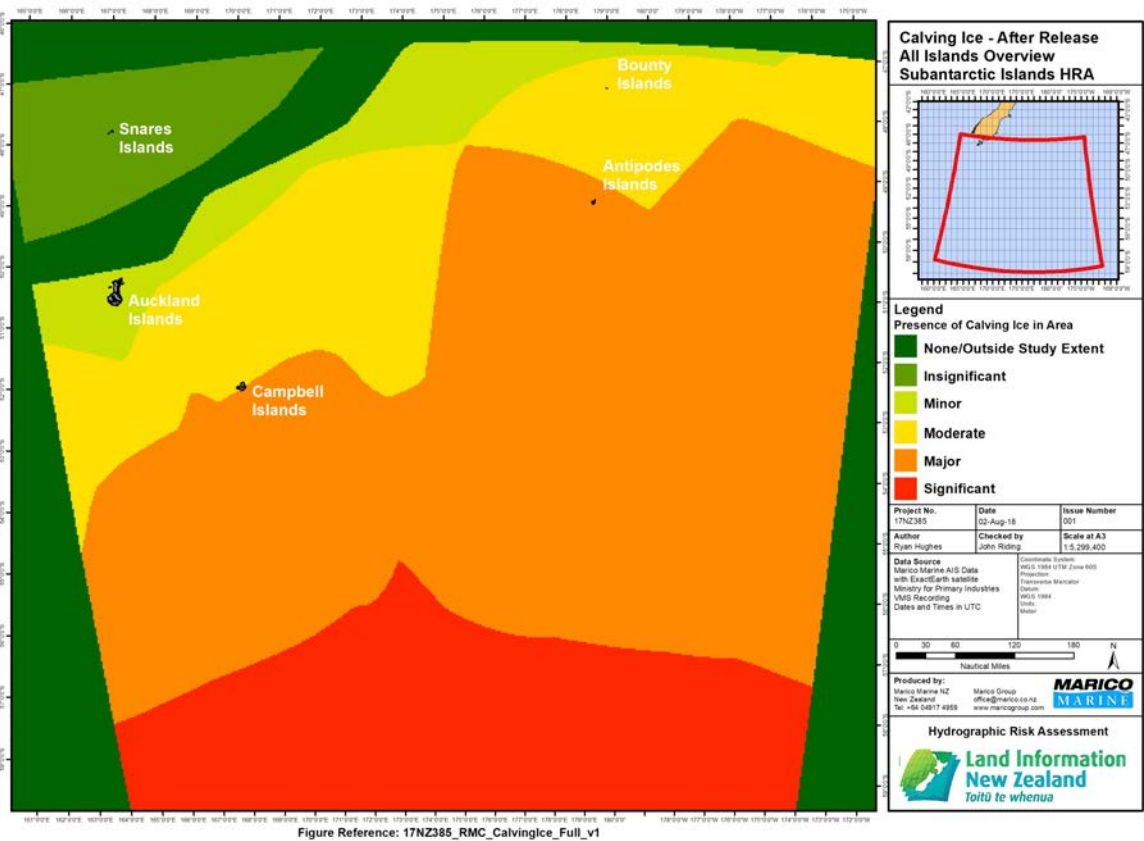


Figure 88, Calving Ice – After Release, All Islands Overview

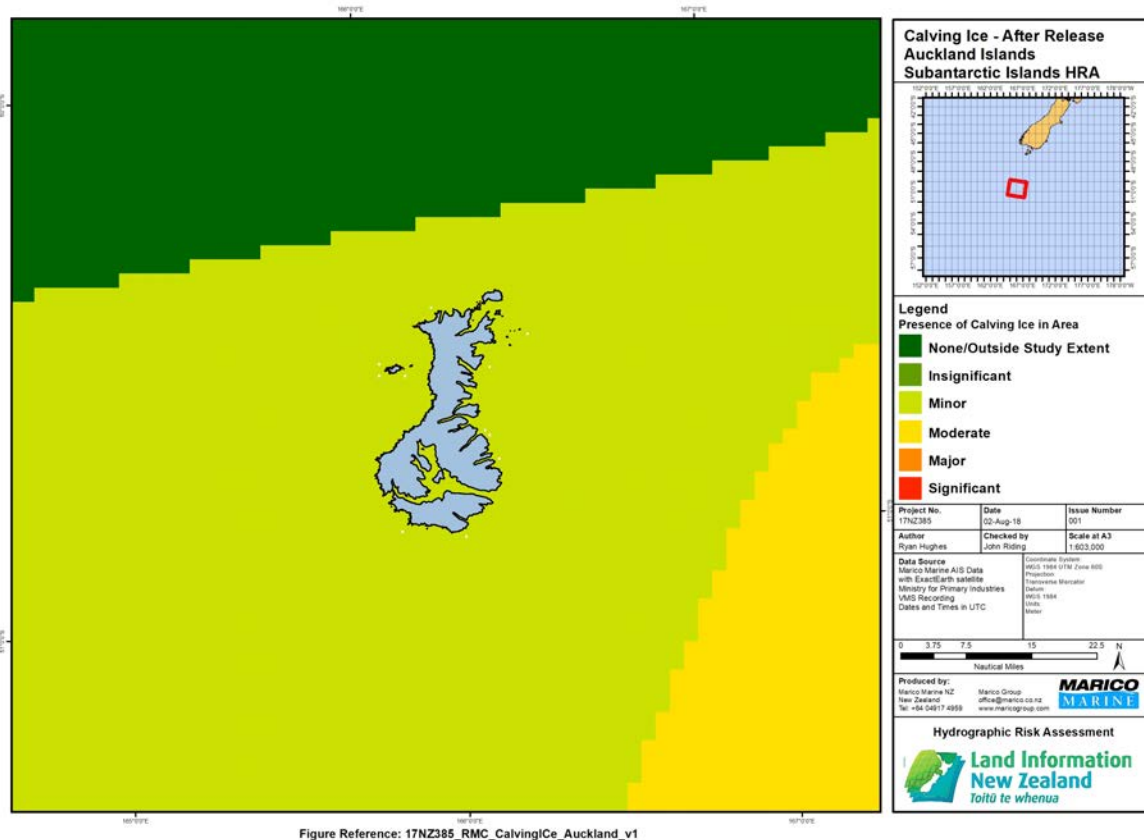


Figure 89, Calving Ice – After Release, Auckland Islands

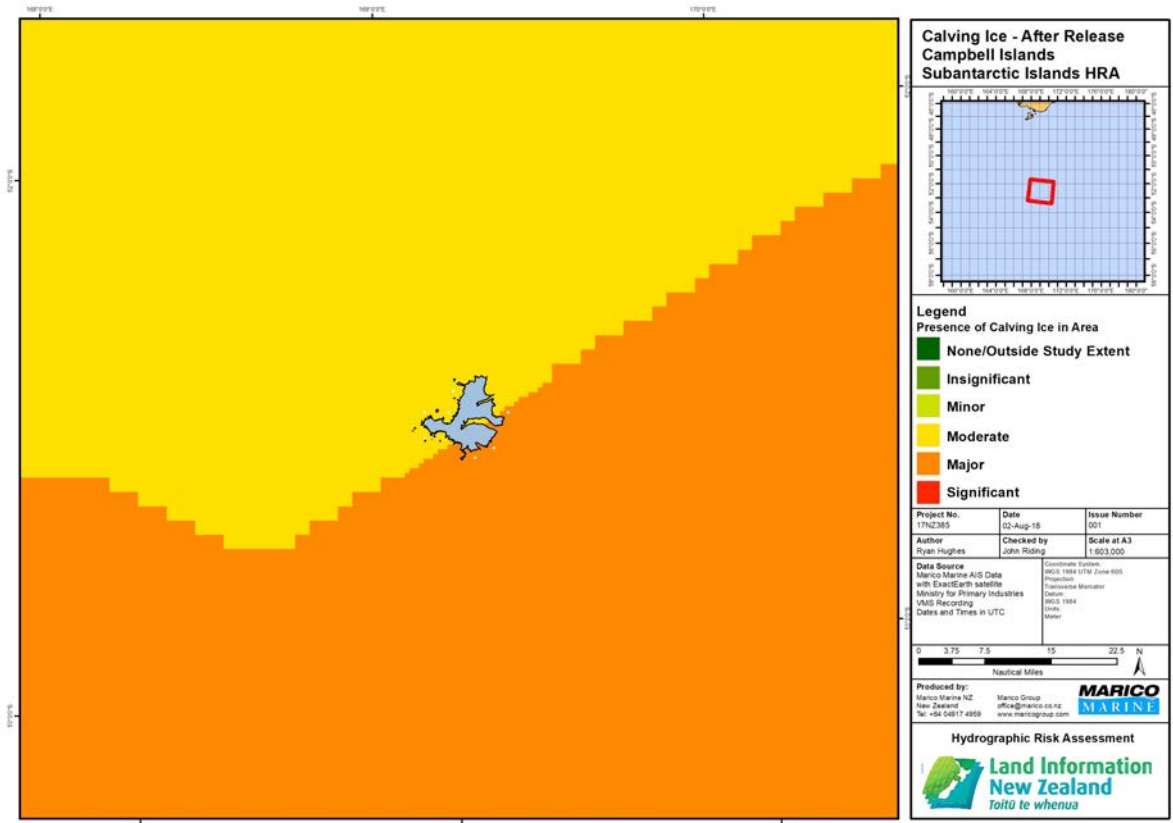


Figure Reference: 17NZ385_RMC_CalvingIce_Campbell_v1

Figure 90, Calving Ice – After Release, Campbell Islands

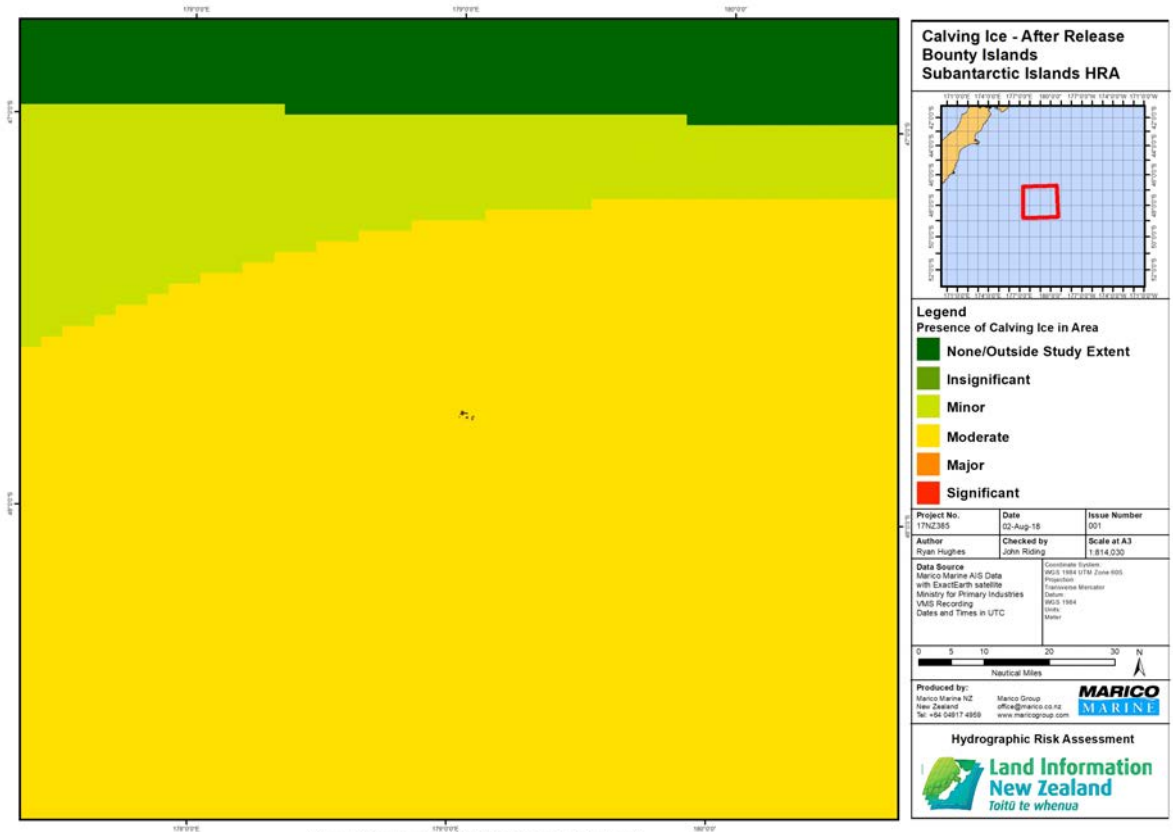
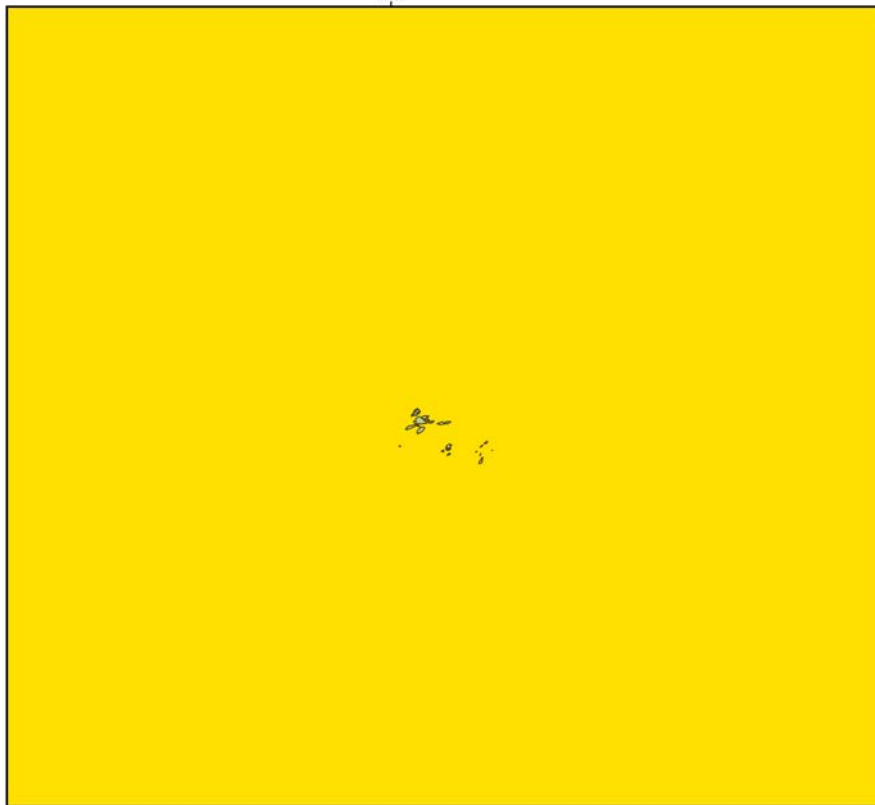


Figure Reference: 17NZ385_RMC_CalvingIce_Bounty_v1

Figure 91, Calving Ice – After Release, Bounty Islands



**Calving Ice - After Release
Bounty Islands Zoom
Subantarctic Islands HRA**

Legend
Presence of Calving Ice in Area

- None/Outside Study Extent
- Insignificant
- Minor
- Moderate
- Major
- Significant

Project No. 17NZ385	Date 02-Aug-18	Issue Number 001
Author Ryan Hughes	Checked by John Riding	Scale at A3 1:130,000

Data Source
Marico-Marine AIS Data with ExactEarth satellite Ministry for Primary Industries VMS Recording Dates and Times in UTC

Coordinate System
GCS 1984 UTM Zone 60S
Projection
Transverse Mercator
Datum
GCS 1984
Units
Meter

0 0.75 1.5 3 4.5 N
Nautical Miles

Produced by:
Marico Marine NZ
New Zealand
Tel: +64 54817 4959

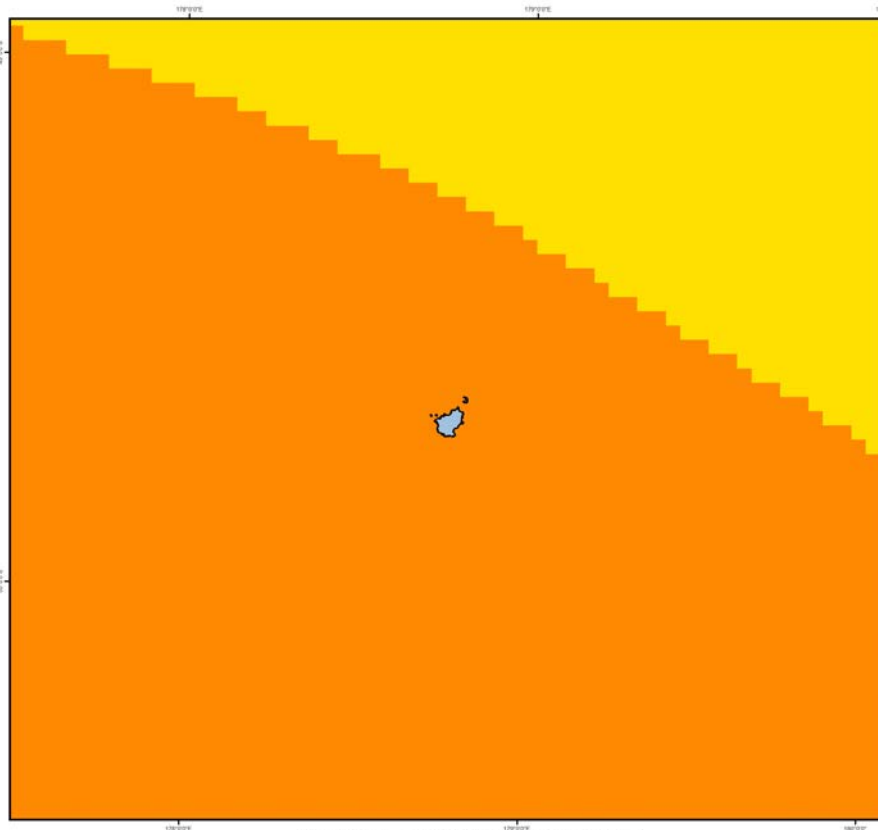
Marico Group
office@marico.co.nz
www.maricogroup.com

Hydrographic Risk Assessment

Land Information
New Zealand
Teitū te whenua

Figure Reference: 17NZ385_RMC_CalvingIce_Bounty_Zoom_v1

Figure 92, Calving Ice – After Release, Bounty Islands Zoom



**Calving Ice - After Release
Antipodes Islands
Subantarctic Islands HRA**

Legend
Presence of Calving Ice in Area

- None/Outside Study Extent
- Insignificant
- Minor
- Moderate
- Major
- Significant

Project No. 17NZ385	Date 02-Aug-18	Issue Number 001
Author Ryan Hughes	Checked by John Riding	Scale at A3 1:603,000

Data Source
Marico-Marine AIS Data with ExactEarth satellite Ministry for Primary Industries VMS Recording Dates and Times in UTC

Coordinate System
GCS 1984 UTM Zone 60S
Projection
Transverse Mercator
Datum
GCS 1984
Units
Meter

0 3.75 7.5 15 22.5 N
Nautical Miles

Produced by:
Marico Marine NZ
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Hydrographic Risk Assessment

Land Information
New Zealand
Teitū te whenua

Figure Reference: 17NZ385_RMC_CalvingIce_Antipodes_v1

Figure 93, Calving Ice – After Release, Antipodes Islands

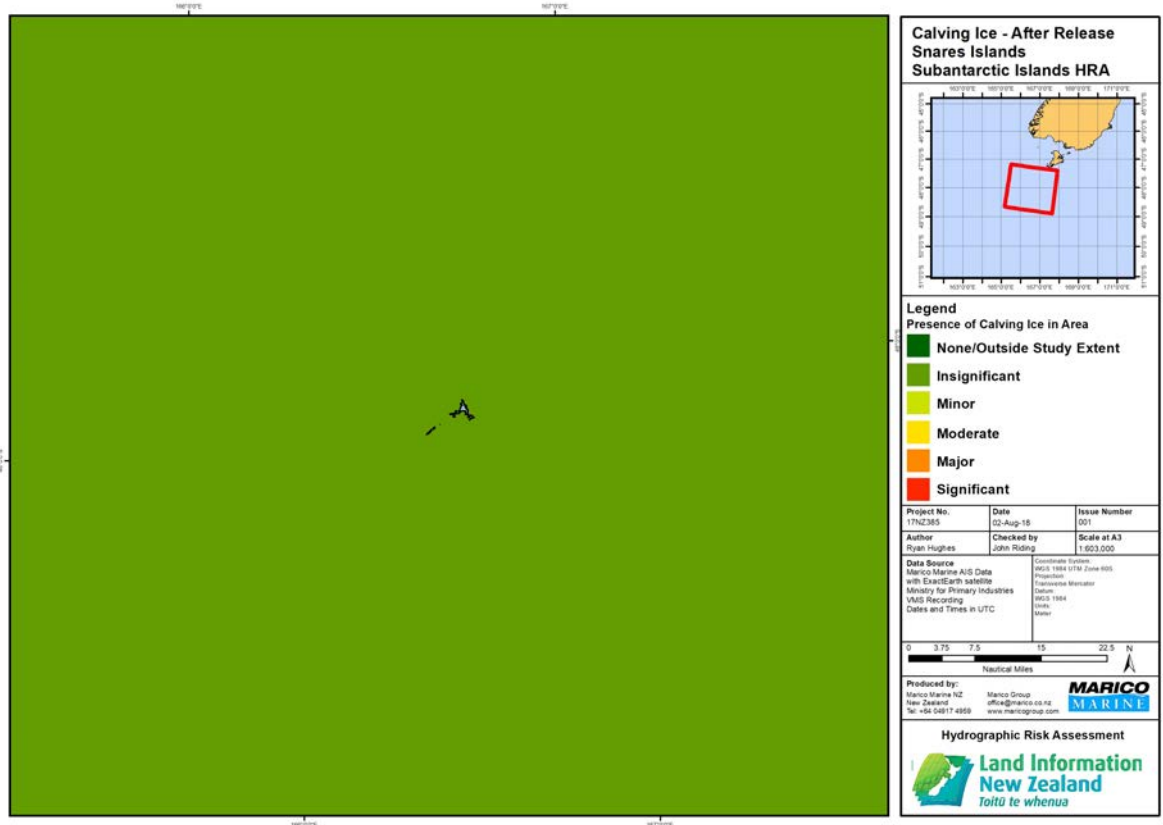


Figure Reference: 17NZ385_RMC_CalvingIce_Snares_v1

Figure 94, Calving Ice – After Release, Snares Islands

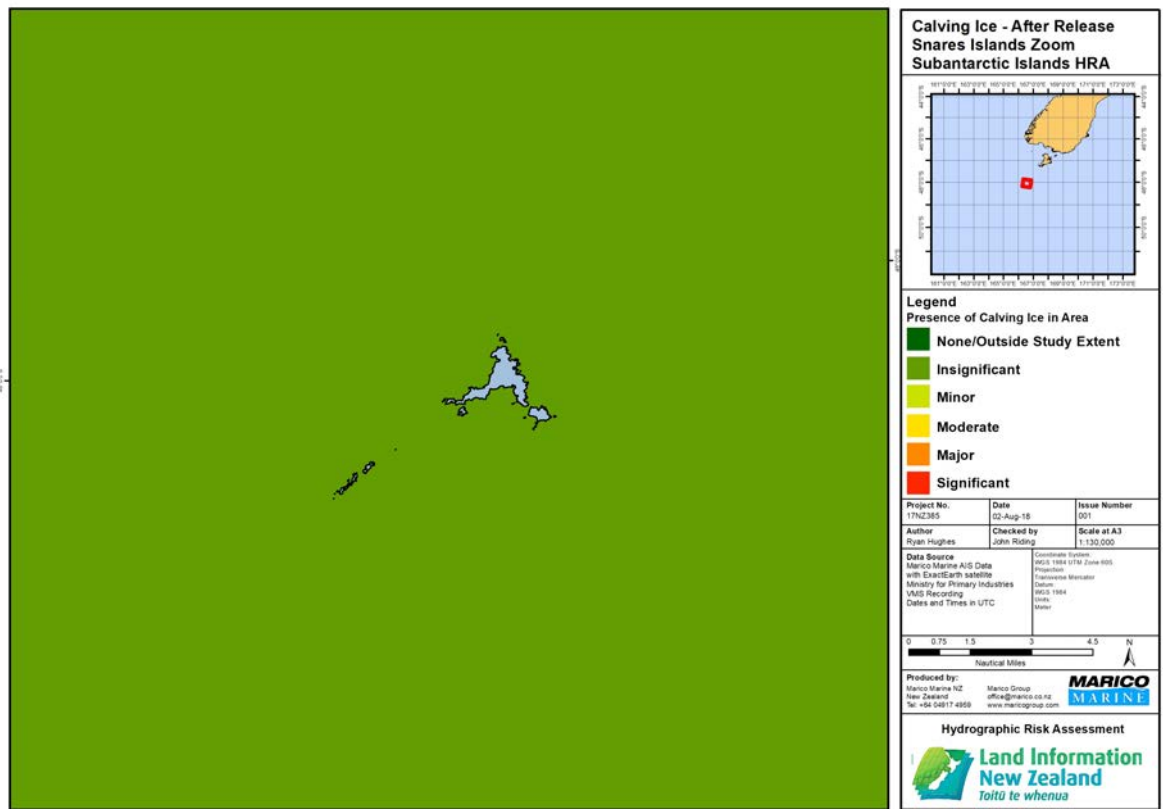


Figure Reference: 17NZ385_RMC_CalvingIce_Snares_Zoom_v1

Figure 95, Calving Ice – After Release, Snares Islands Zoom

2.4.3 ISOLATED DANGERS – ROCKS/WRECKS/ETC.

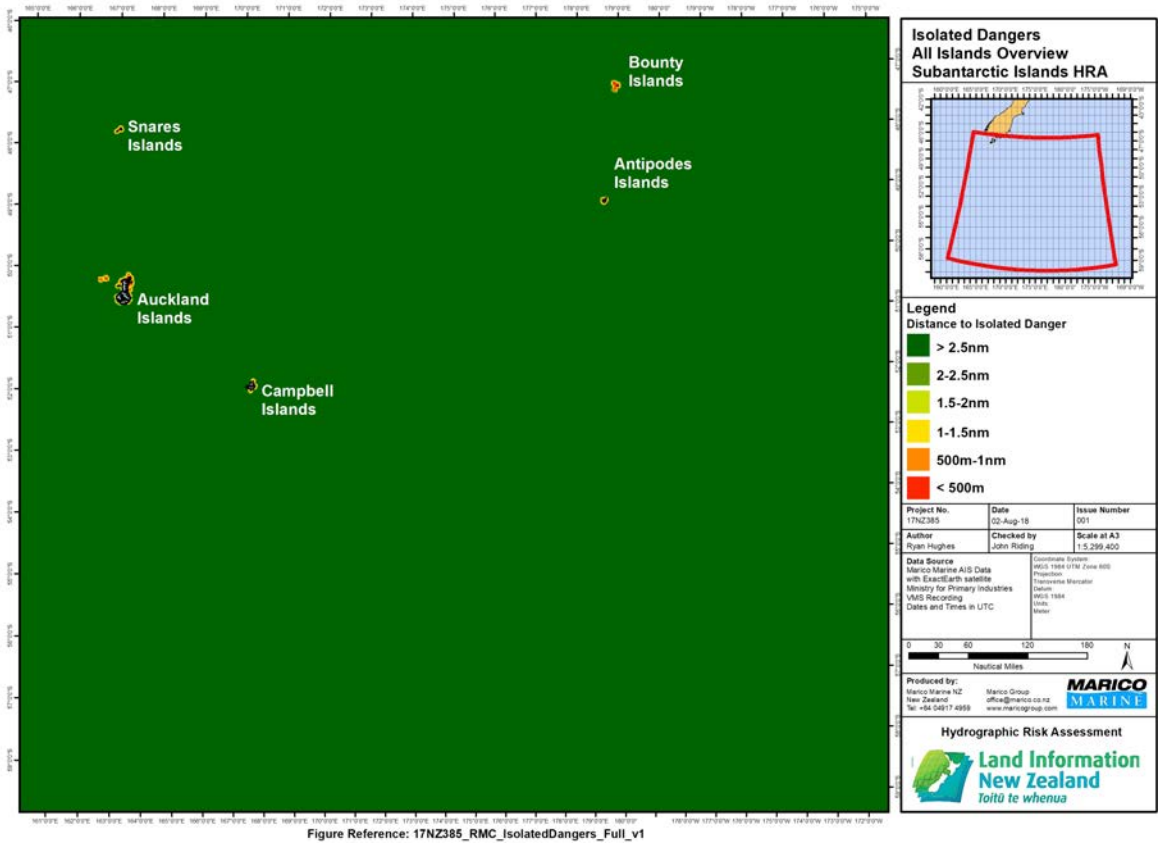


Figure 96, Isolated Dangers, All Islands Overview

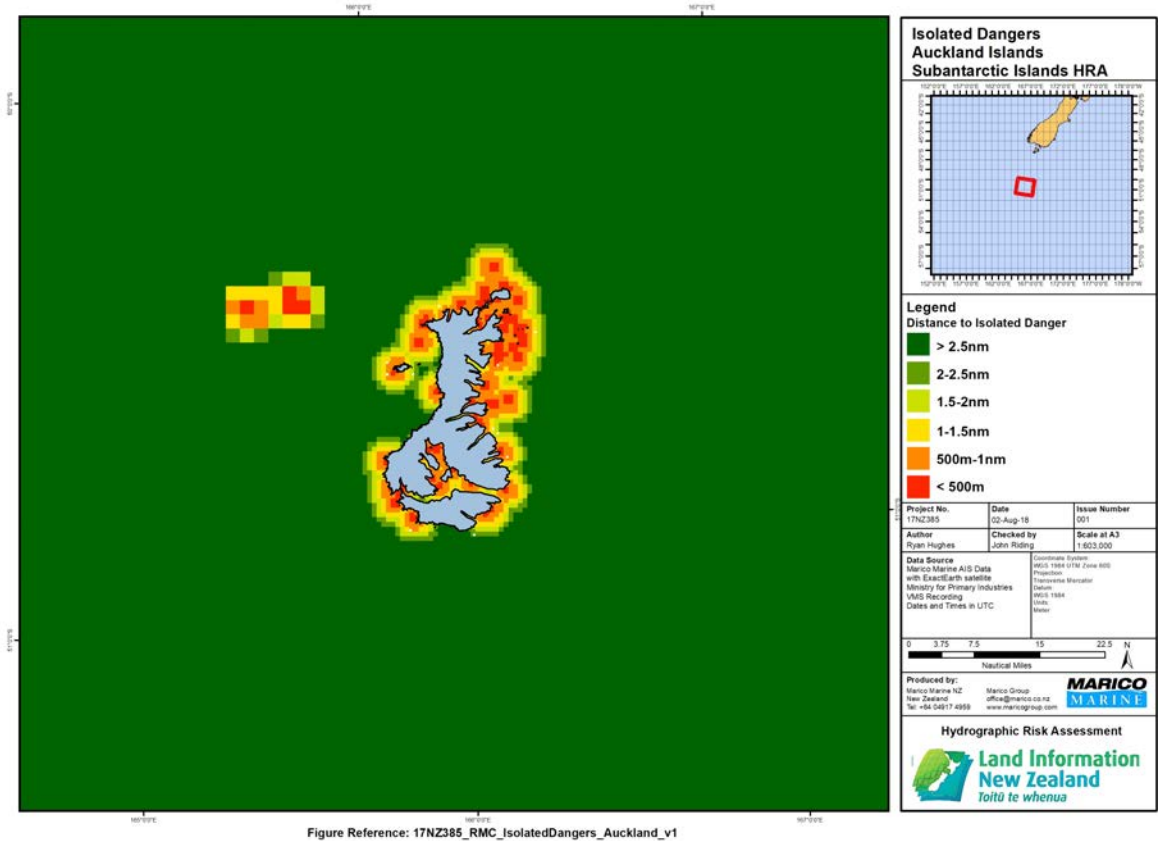


Figure 97, Isolated Dangers, Auckland Islands

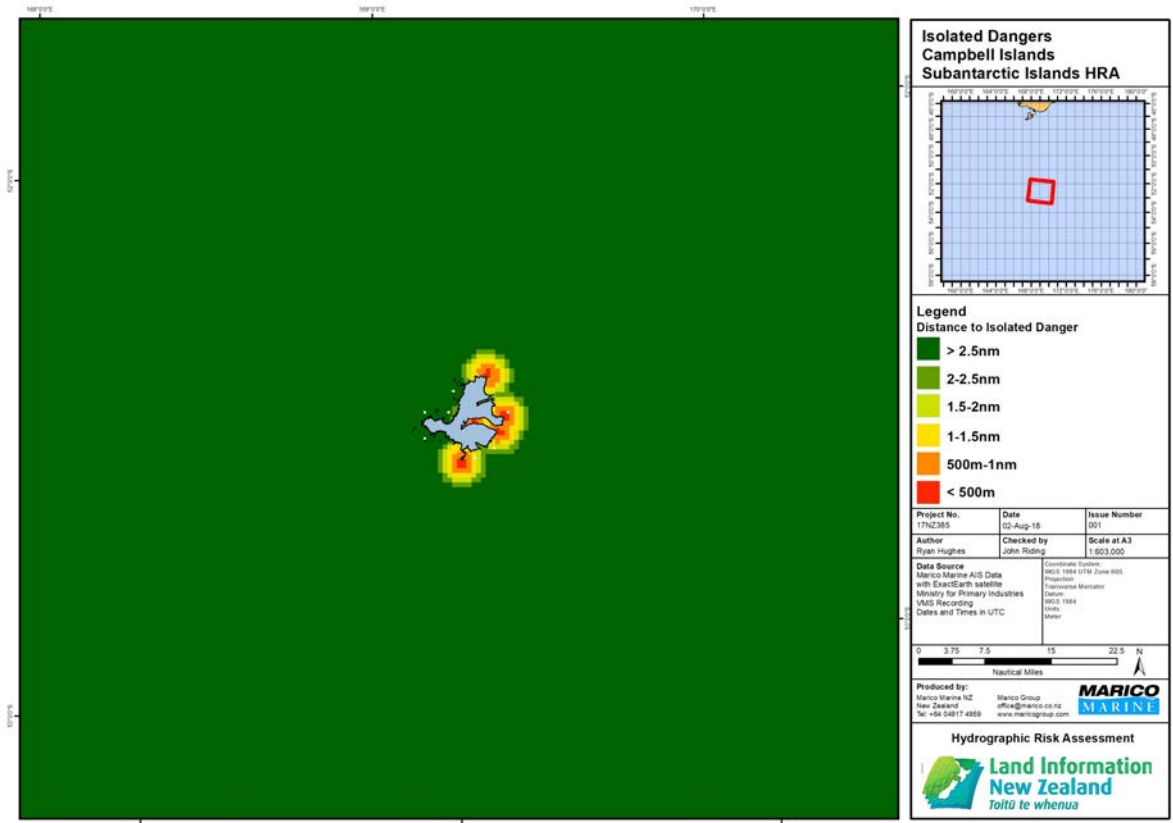


Figure Reference: 17NZ385_RMC_IsolatedDangers_Campbell_v1

Figure 98, Isolated Dangers, Campbell Islands

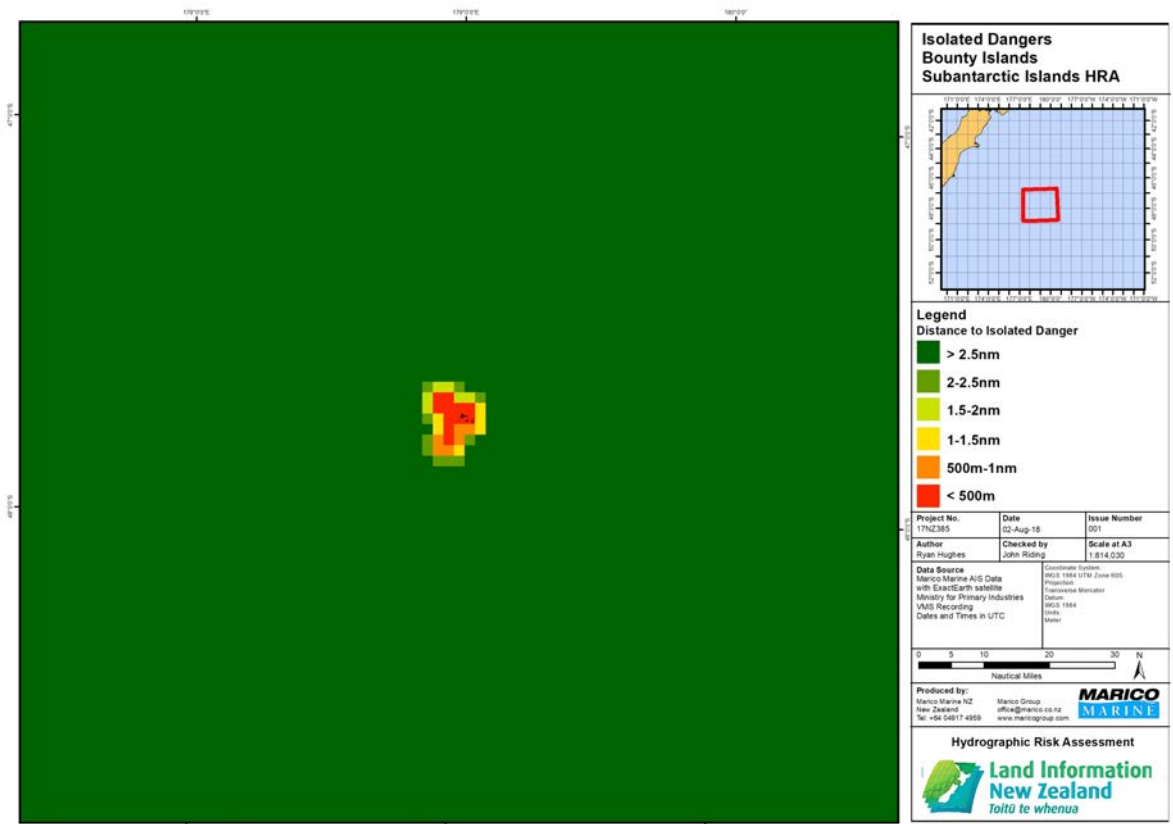


Figure Reference: 17NZ385_RMC_IsolatedDangers_Bounty_v1

Figure 99, Isolated Dangers, Bounty Islands

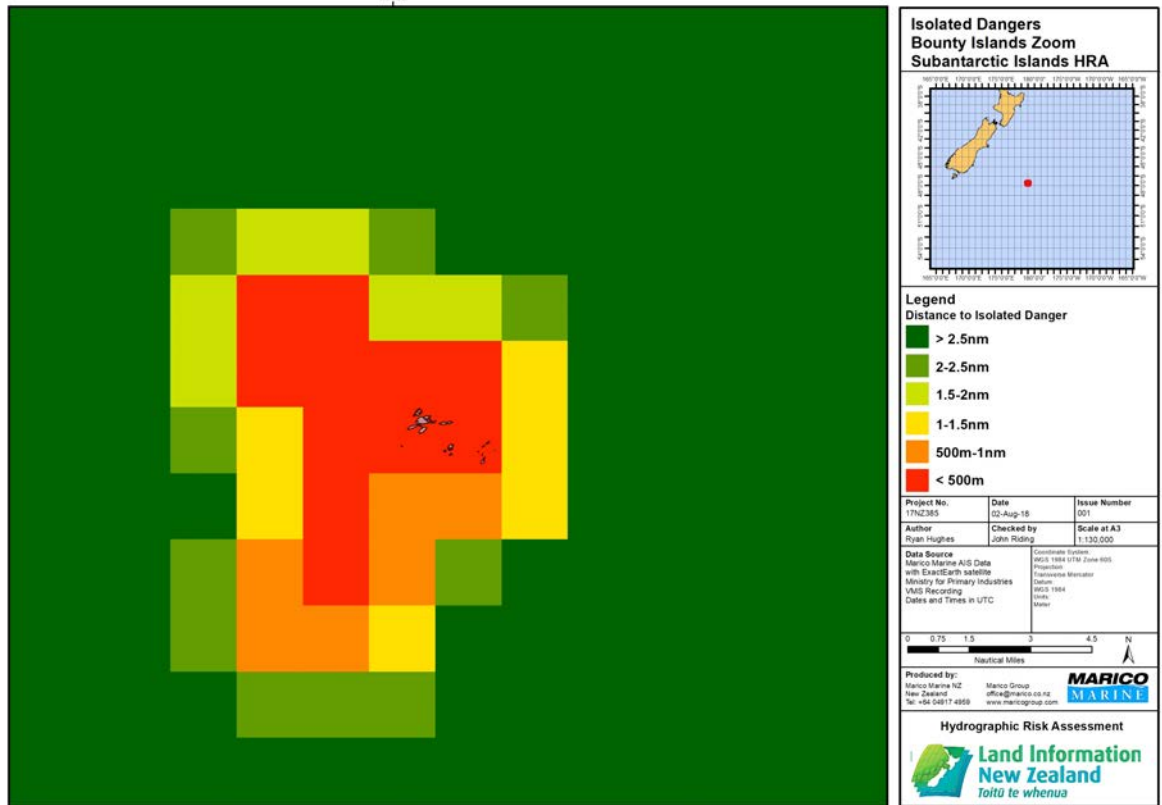


Figure Reference: 17NZ385_RMC_IsolatedDangers_Bounty_Zoom_v1

Figure 100, Isolated Dangers, Bounty Islands Zoom

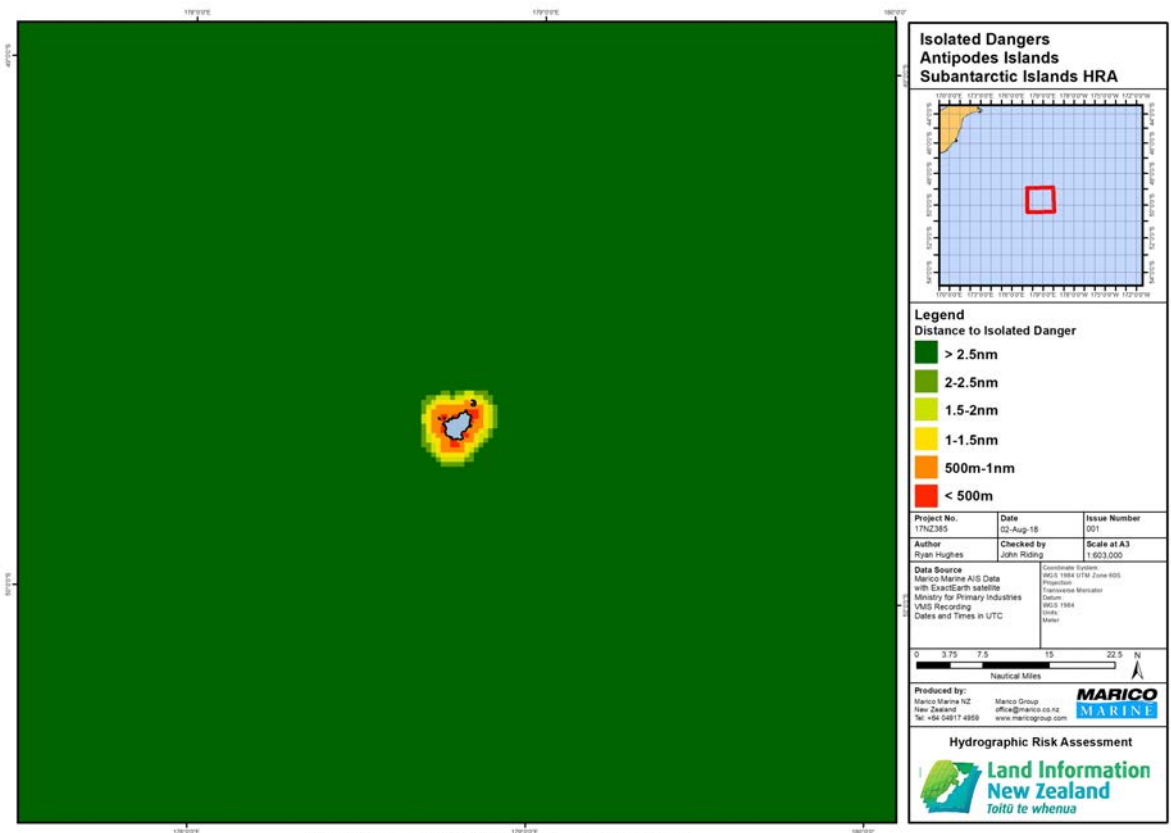


Figure Reference: 17NZ385_RMC_IsolatedDangers_Antipodes_v1

Figure 101, Isolated Dangers, Antipodes Islands

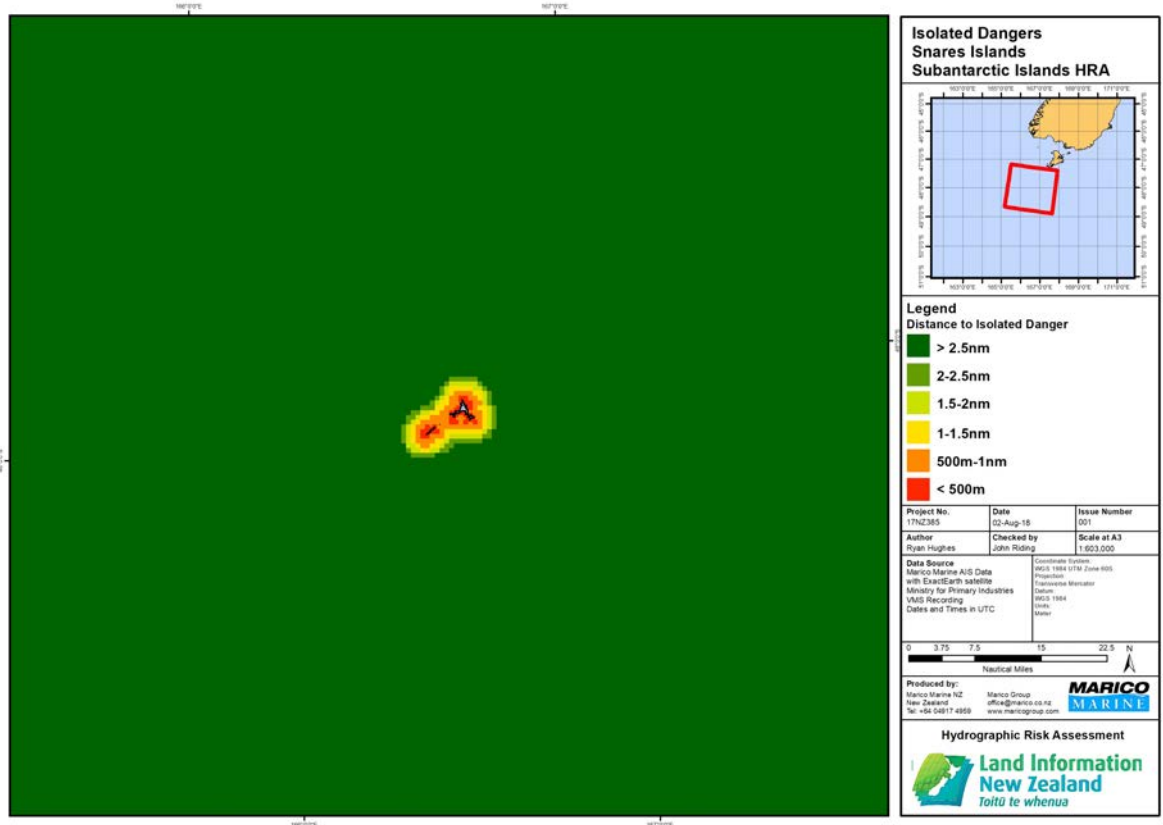


Figure Reference: 17NZ385_RMC_IsolatedDangers_Snares_v1

Figure 102, Isolated Dangers, Snares Islands

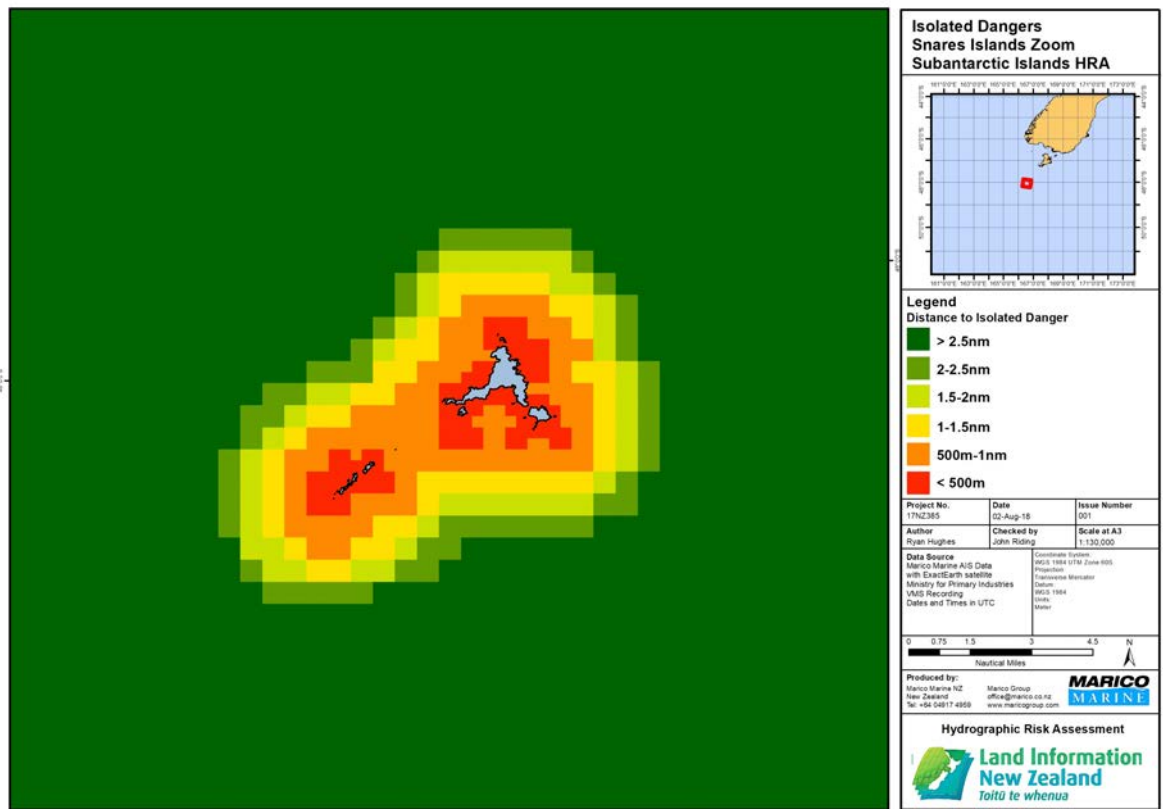


Figure Reference: 17NZ385_RMC_IsolatedDangers_Snares_Zoom_v1

Figure 103, Isolated Dangers, Snares Islands Zoom

2.4.4 CHARTED TIDAL HAZARDS

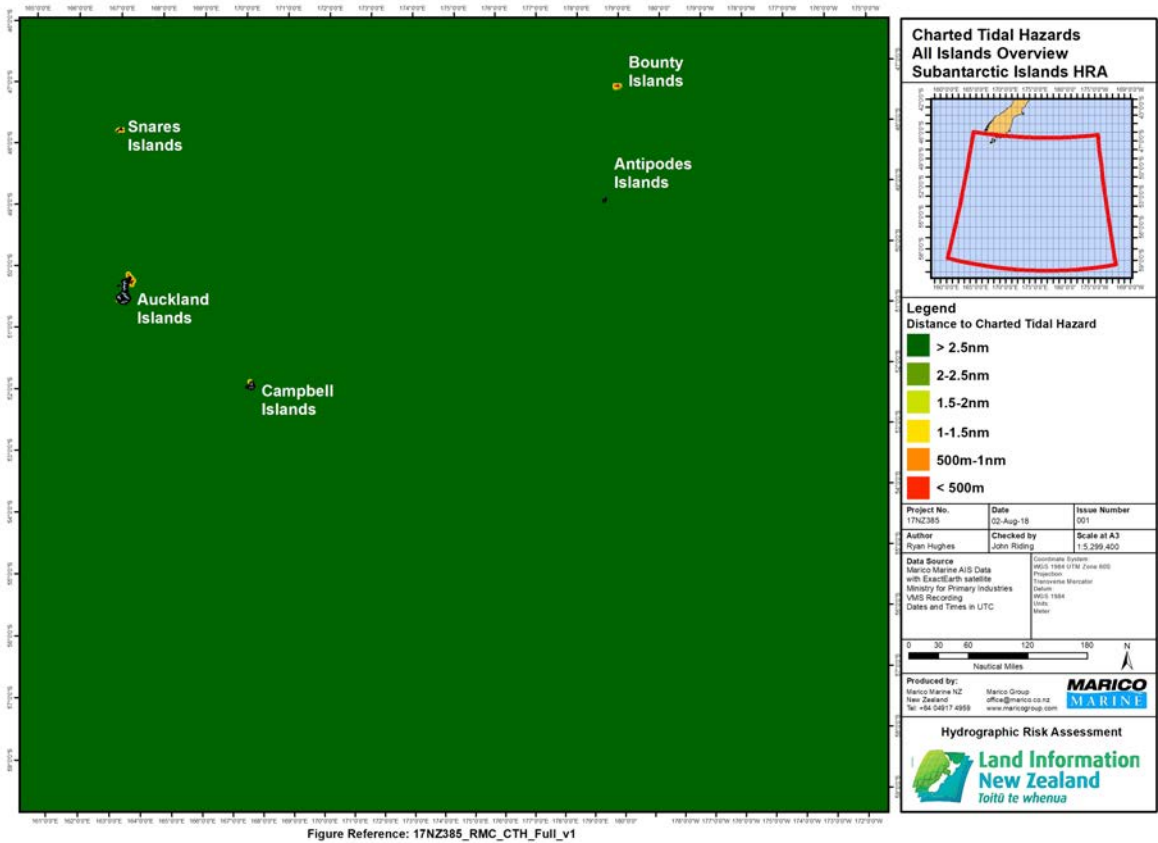


Figure 104, Charted Tidal Hazards, All Islands Overview

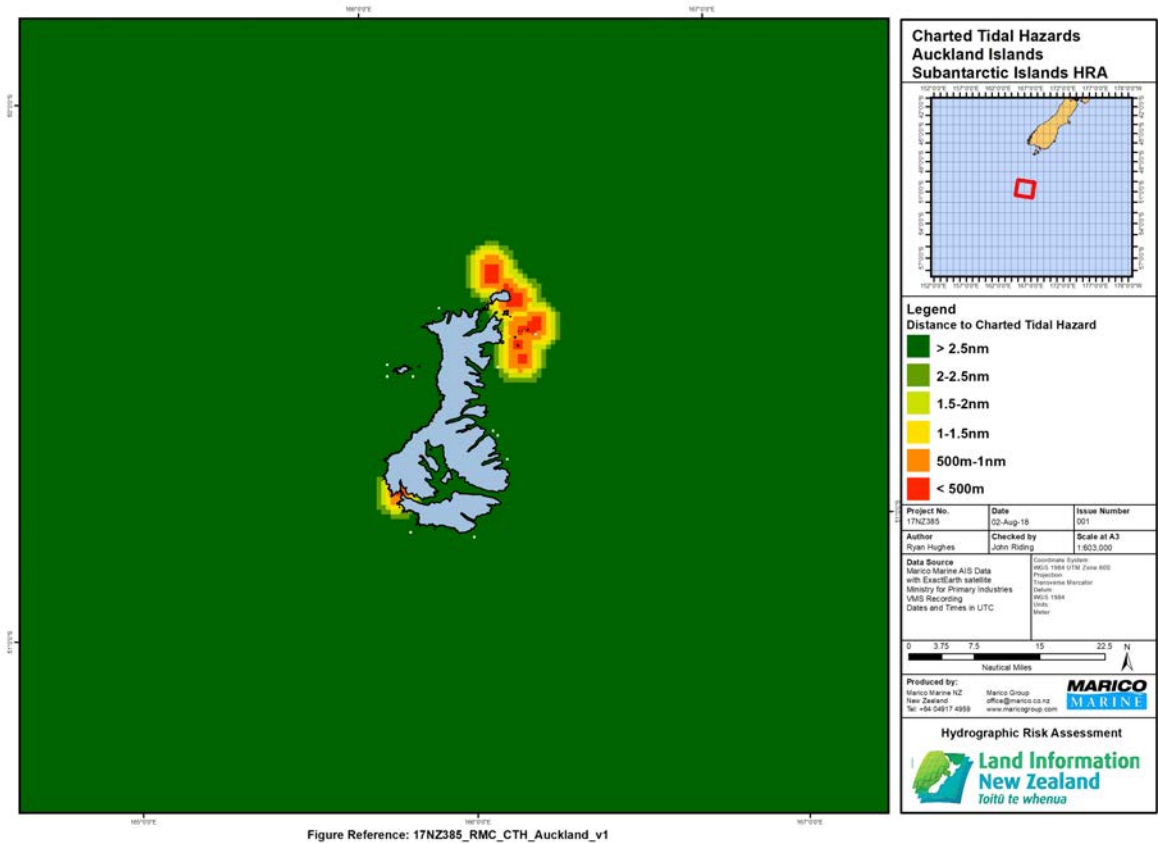


Figure 105, Charted Tidal Hazards, Auckland Islands

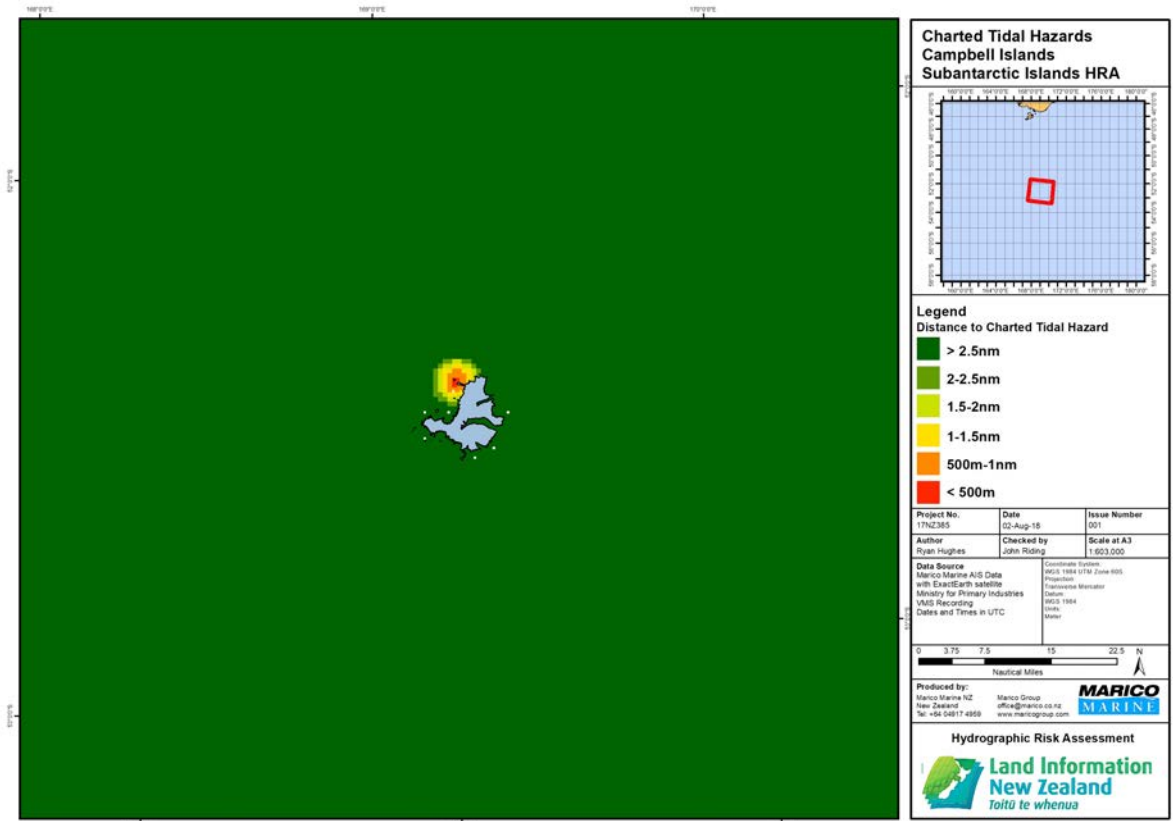


Figure Reference: 17NZ385_RMC_CTH_Campbell_v1

Figure 106, Charted Tidal Hazards, Campbell Islands

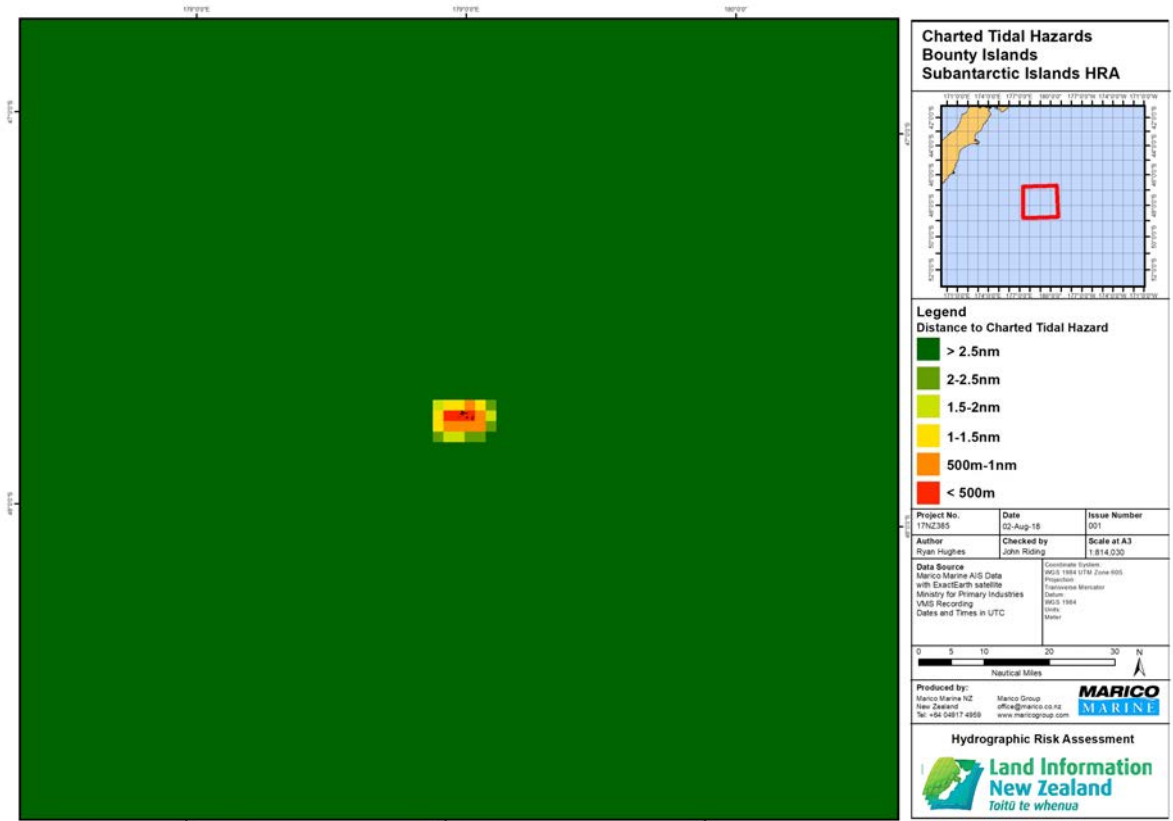


Figure Reference: 17NZ385_RMC_CTH_Bounty_v1

Figure 107, Charted Tidal Hazards, Bounty Islands

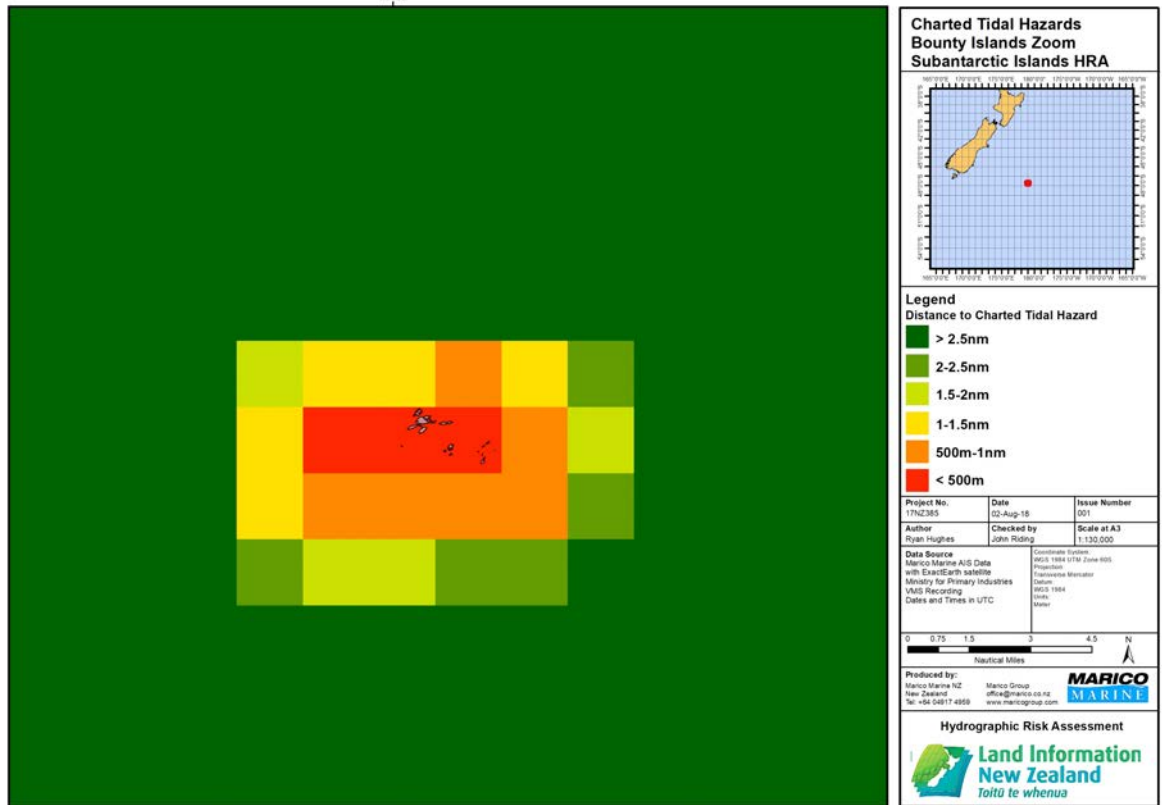


Figure Reference: 17NZ385_RMC_CTH_Bounty_Zoom_v1

Figure 108, Charted Tidal Hazards, Bounty Islands Zoom

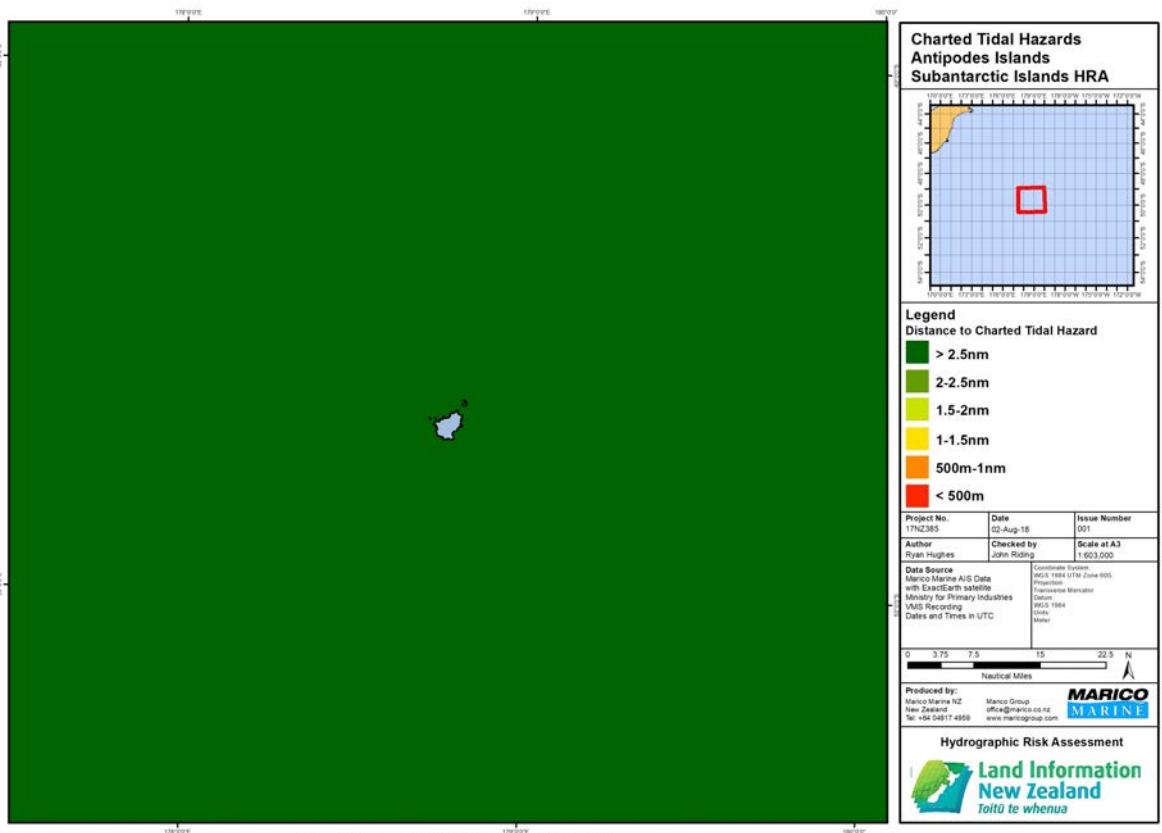


Figure Reference: 17NZ385_RMC_CTH_Antipodes_v1

Figure 109, Charted Tidal Hazards, Antipodes Islands

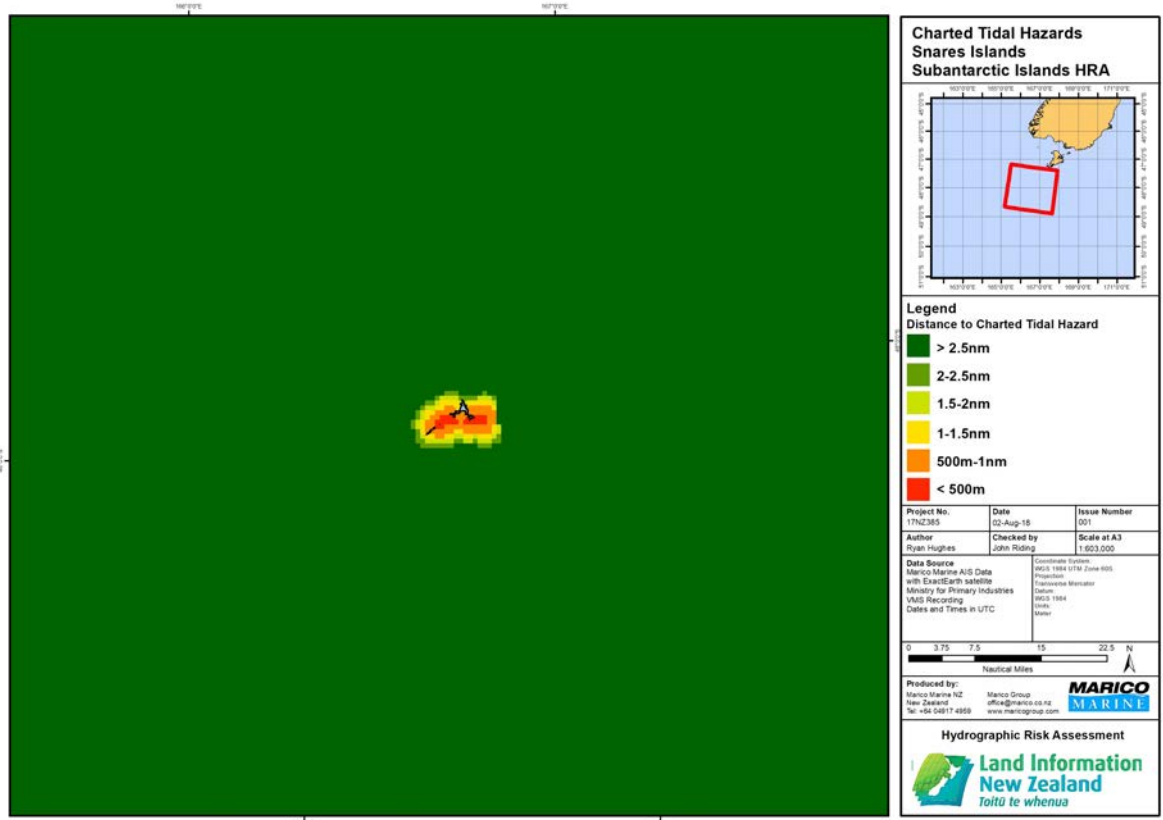


Figure Reference: 17NZ385_RMC_CTH_Snares_v1

Figure 110, Charted Tidal Hazards, Snares Islands

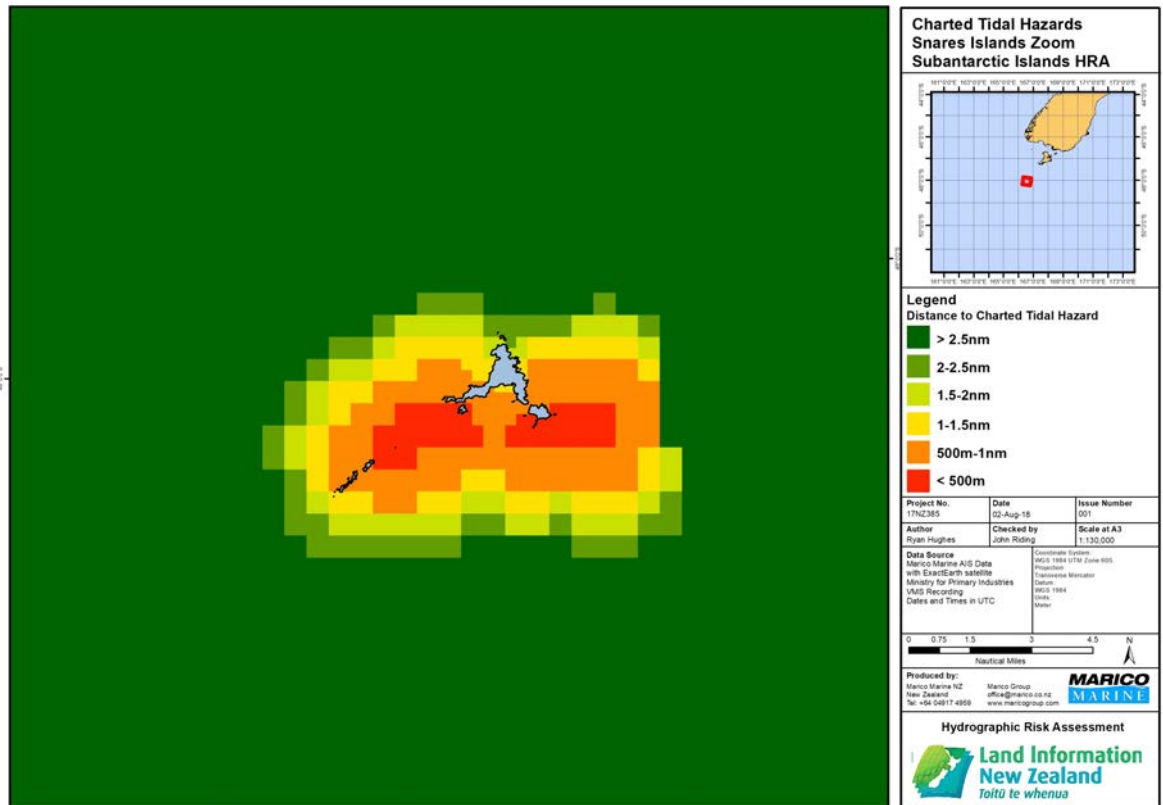


Figure Reference: 17NZ385_RMC_CTH_Snares_Zoom_v1

Figure 111, Charted Tidal Hazards, Snares Islands Zoom

3 CONSEQUENCE CRITERIA

3.1 ENVIRONMENTALLY SENSITIVE CRITERIA (POLLUTION IMPACT ONLY)

3.1.1 ECOLOGICAL SUBSET VALUE 9/10

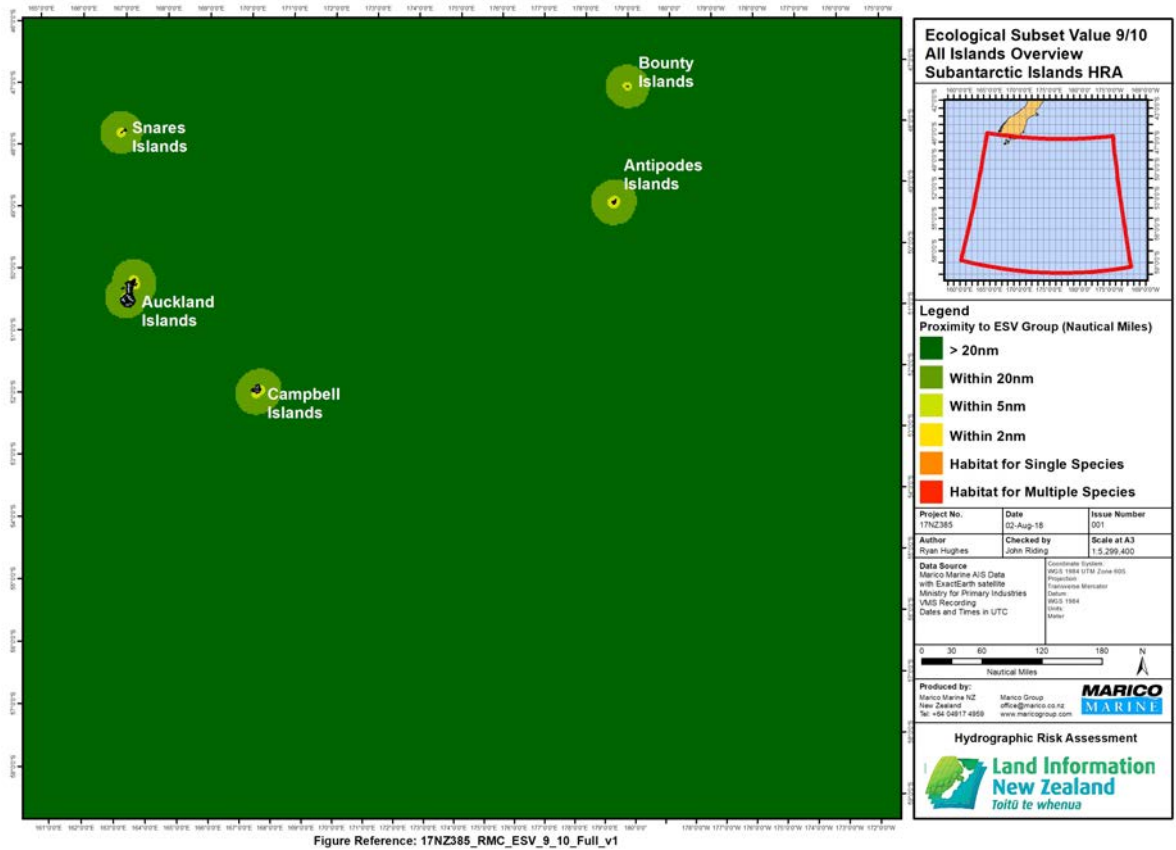


Figure 112, Ecological Subset Value 9/10, All Islands Overview

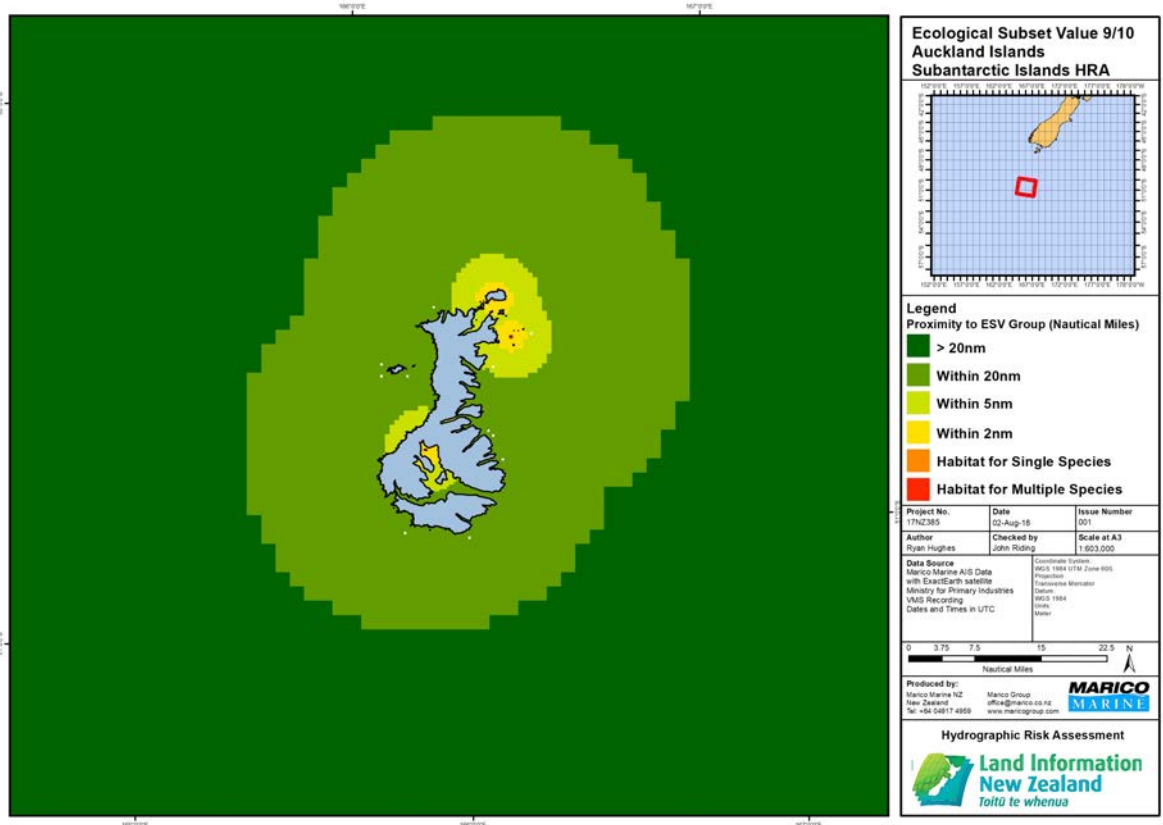


Figure Reference: 17NZ385_RMC_ESV_9_10_Auckland_v1

Figure 113, Ecological Subset Value 9/10, Auckland Islands

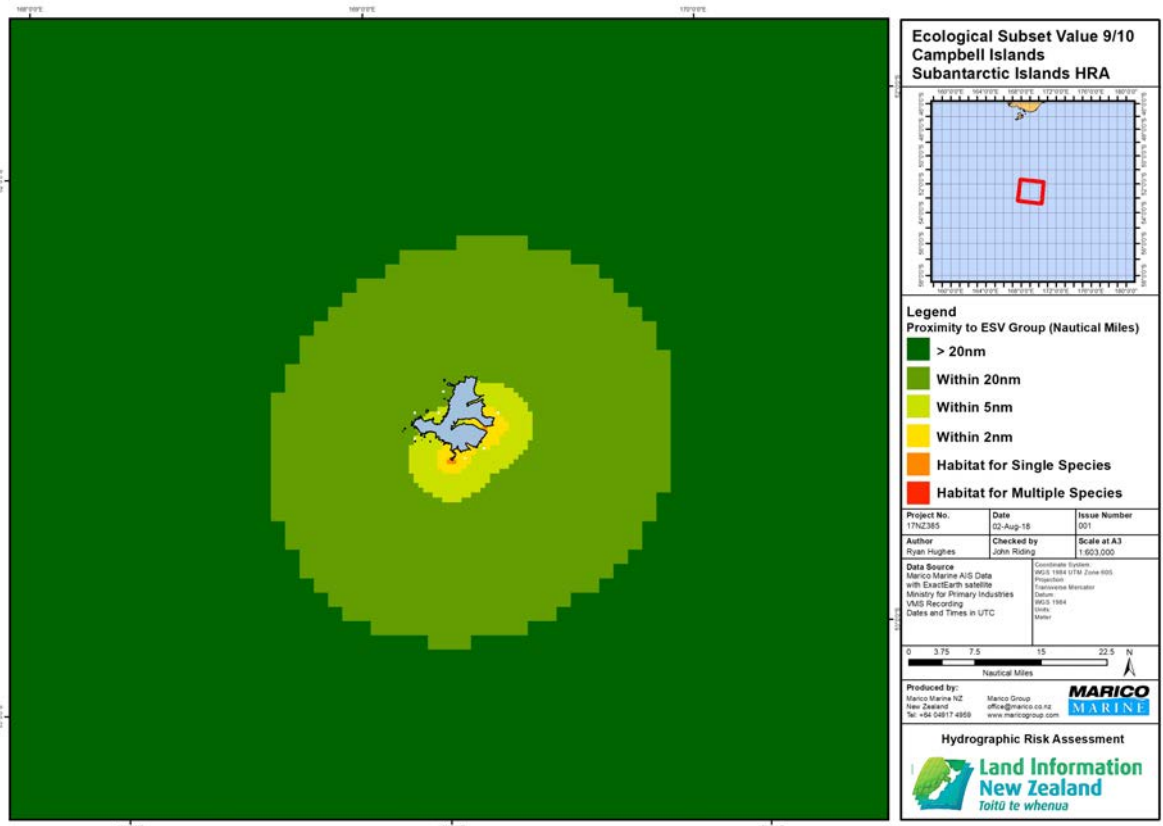


Figure Reference: 17NZ385_RMC_ESV_9_10_Campbell_v1

Figure 114, Ecological Subset Value 9/10, Campbell Islands

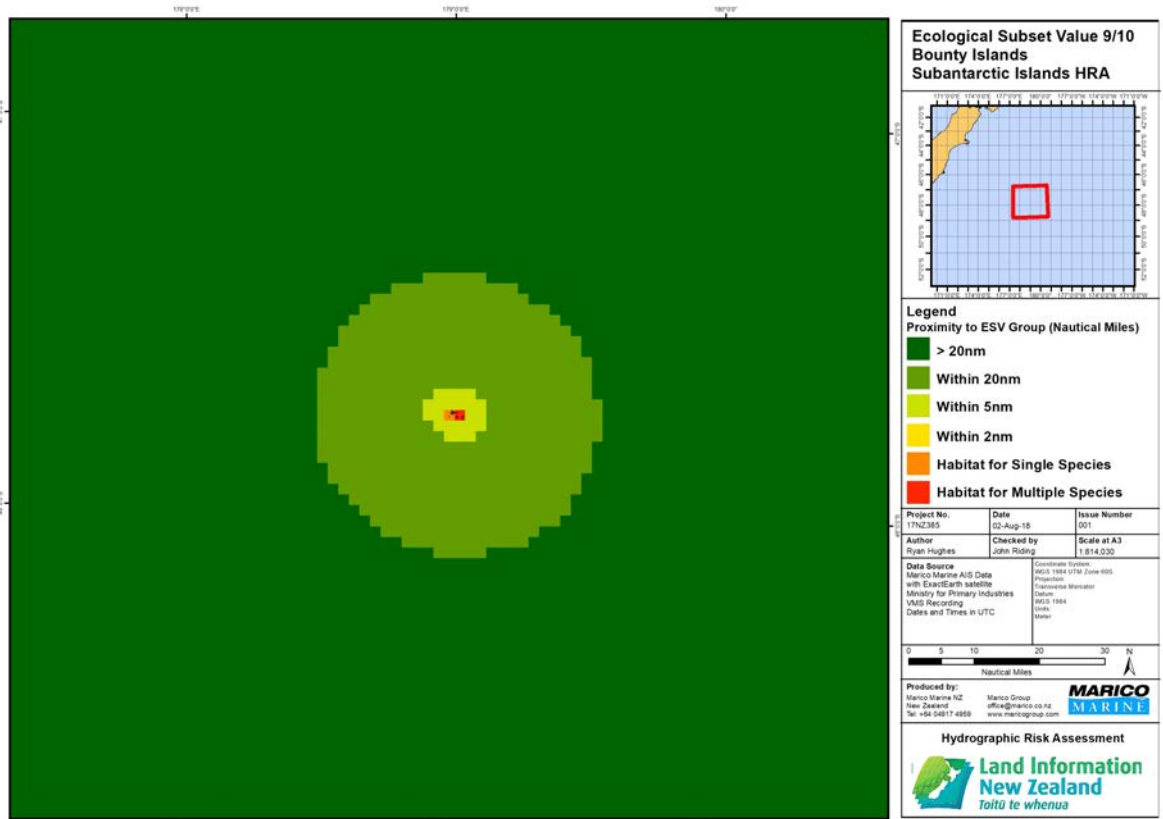


Figure Reference: 17NZ385_RMC_ESV_9_10_Bounty_v1

Figure 115, Ecological Subset Value 9/10, Bounty Islands

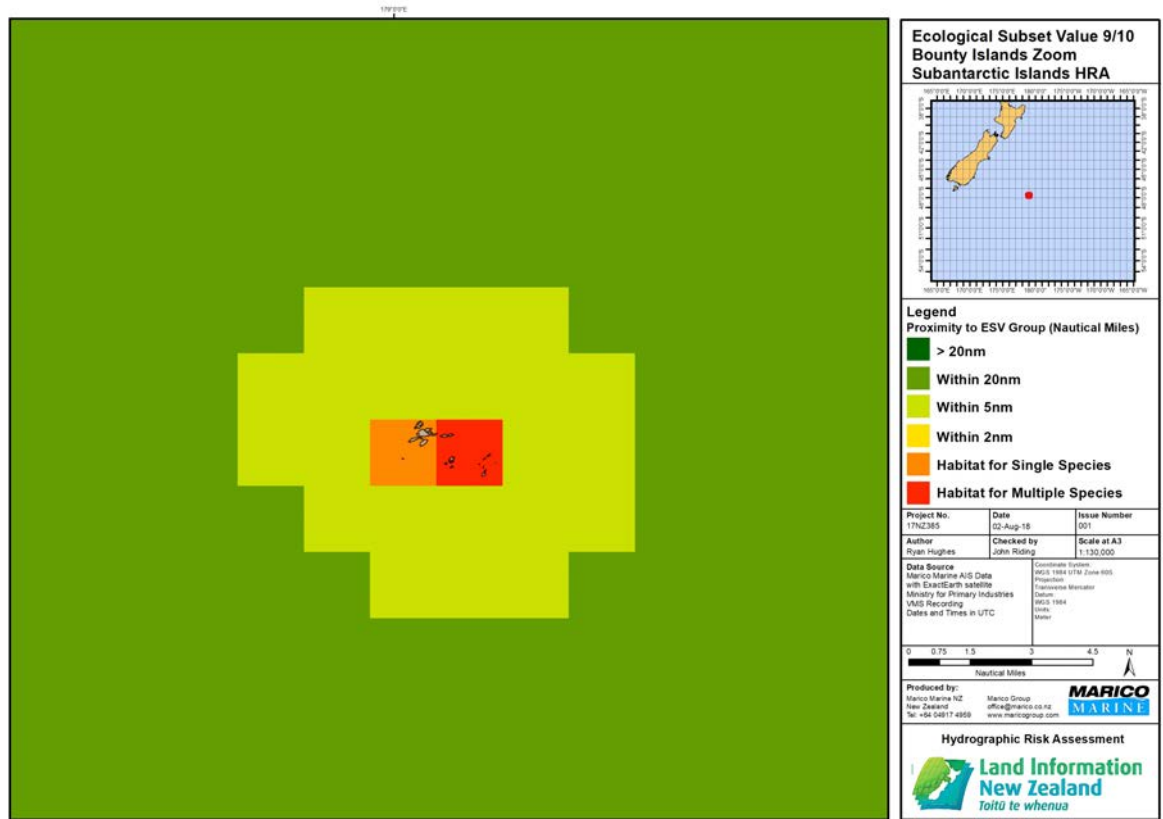


Figure Reference: 17NZ385_RMC_ESV_9_10_Bounty_Zoom_v1

Figure 116, Ecological Subset Value 9/10, Bounty Islands Zoom

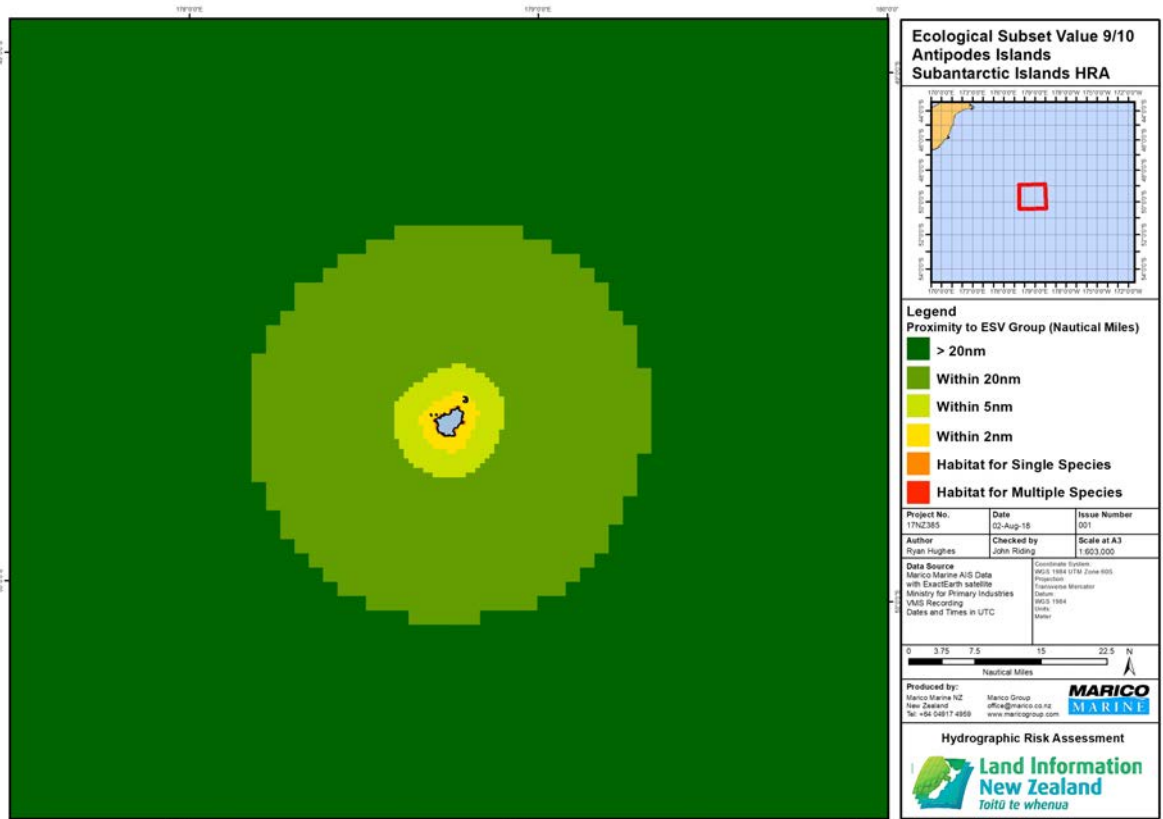


Figure Reference: 17NZ385_RMC_ESV_9_10_Antipodes_v1

Figure 117, Ecological Subset Value 9/10, Antipodes Islands

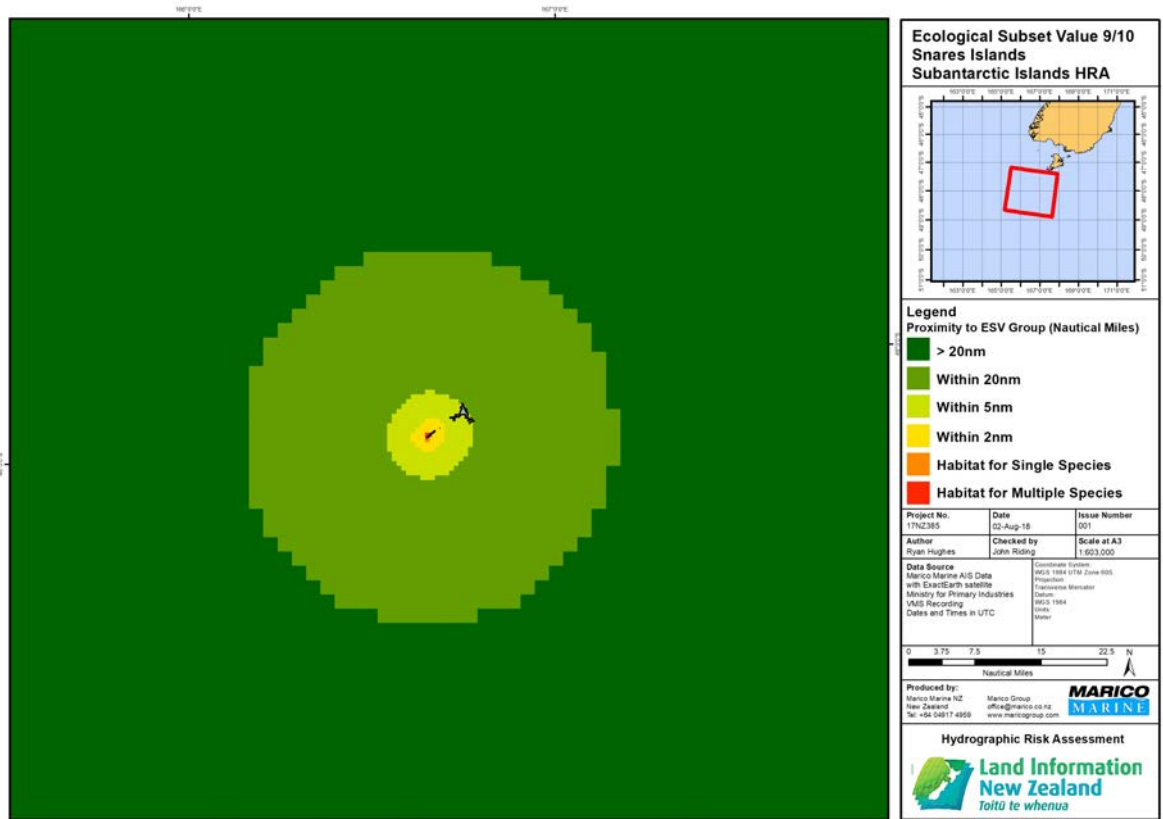


Figure Reference: 17NZ385_RMC_ESV_9_10_Snares_v1

Figure 118, Ecological Subset Value 9/10, Snares Islands

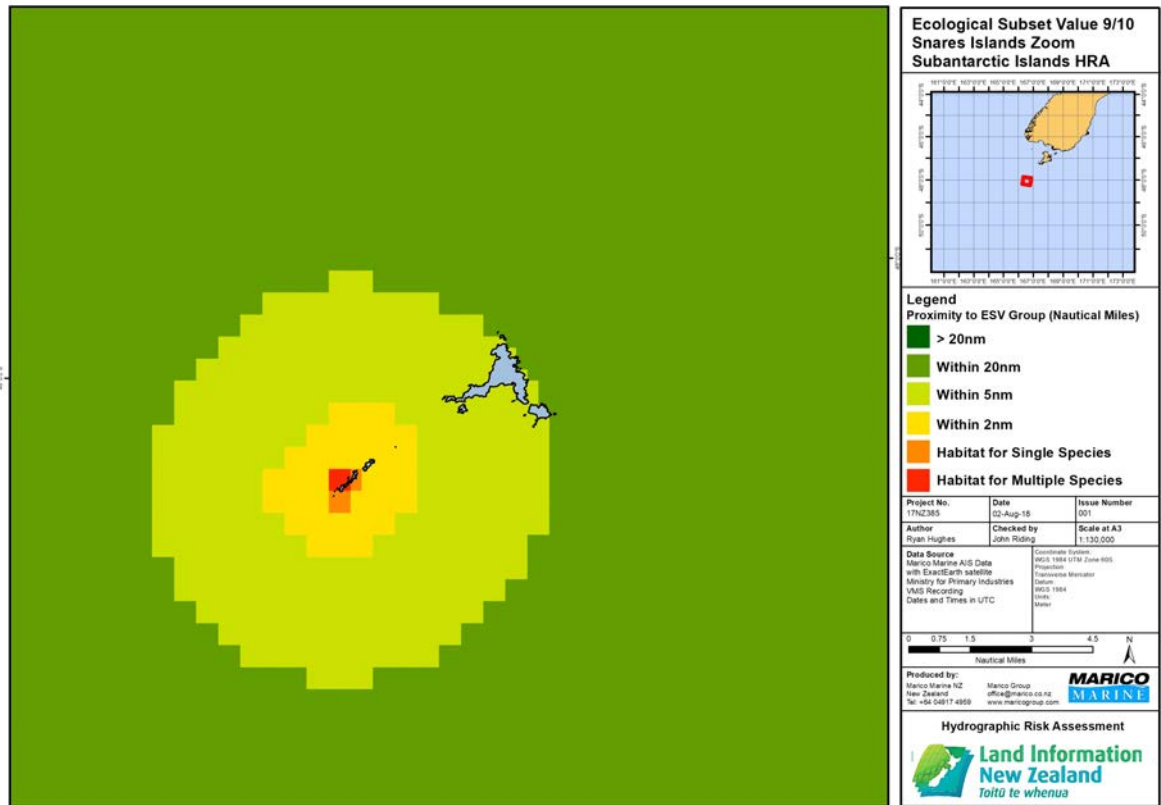


Figure Reference: 17NZ385_RMC_ESV_9_10_Snares_Zoom_v1

Figure 119, Ecological Subset Value 9/10, Snares Islands Zoom

3.1.2 ECOLOGICAL SUBSET VALUE 7/8

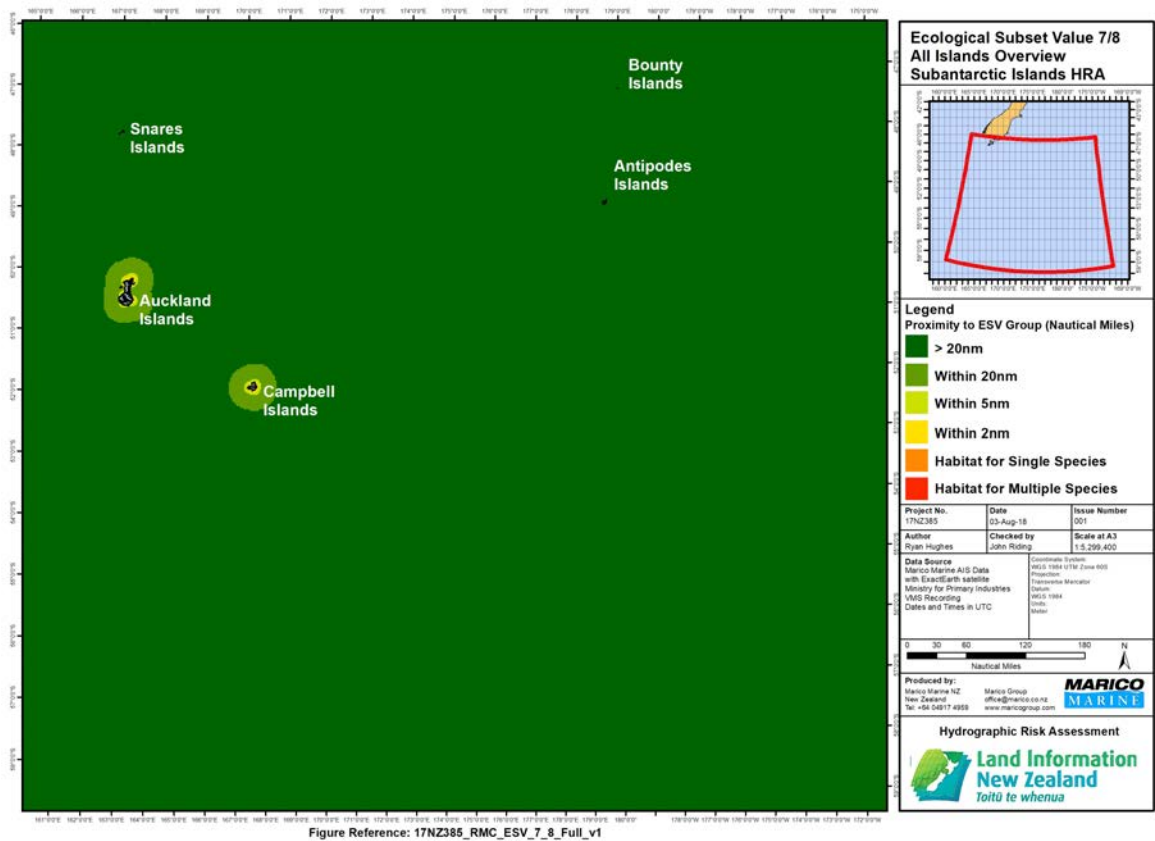


Figure 120, Ecological Subset Value 7/8, All Islands Overview

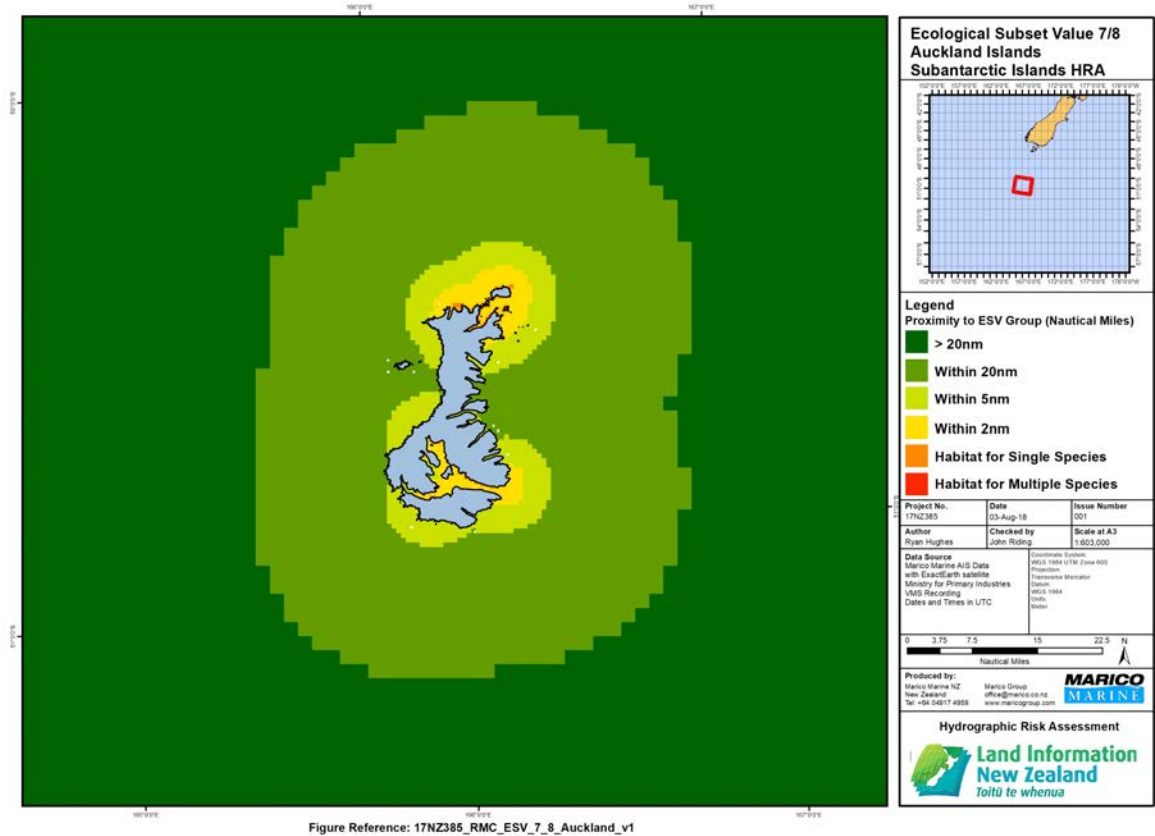


Figure 121, Ecological Subset Value 7/8, Auckland Islands

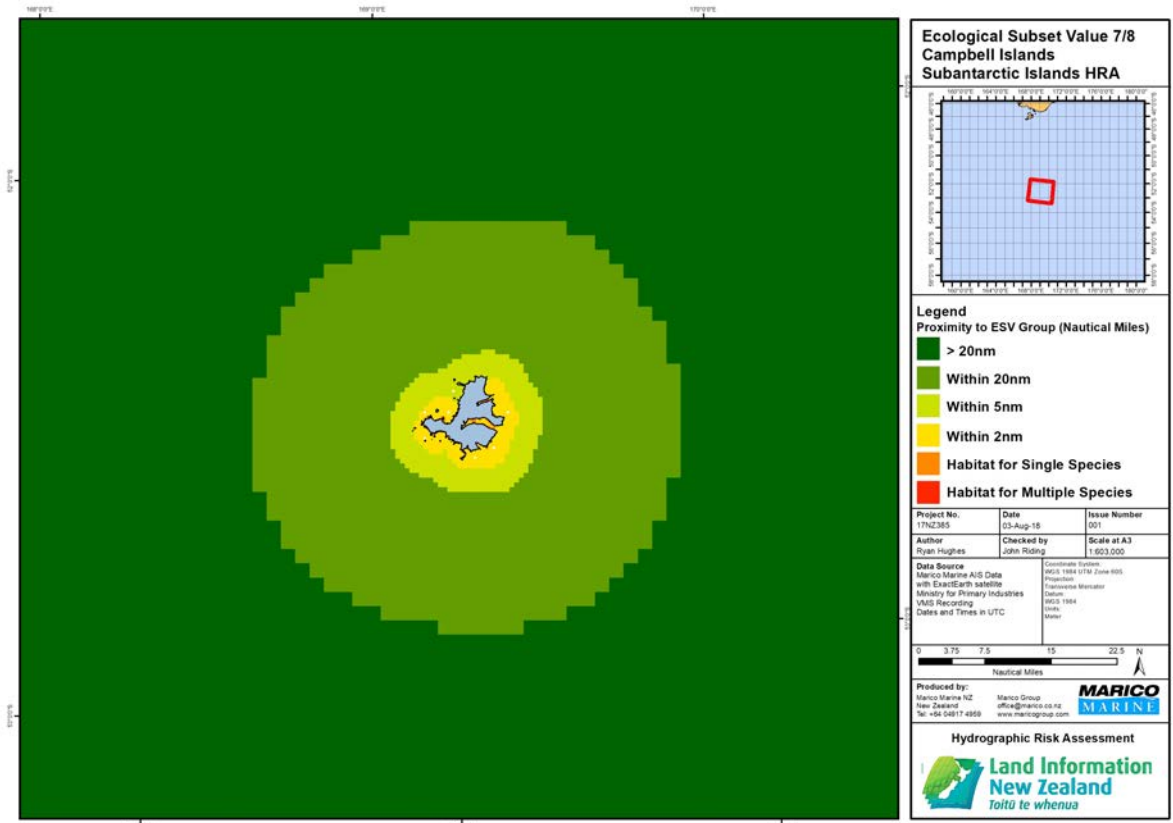


Figure Reference: 17NZ385_RMC_ESV_7_8_Campbell_v1

Figure 122, Ecological Subset Value 7/8, Campbell Islands

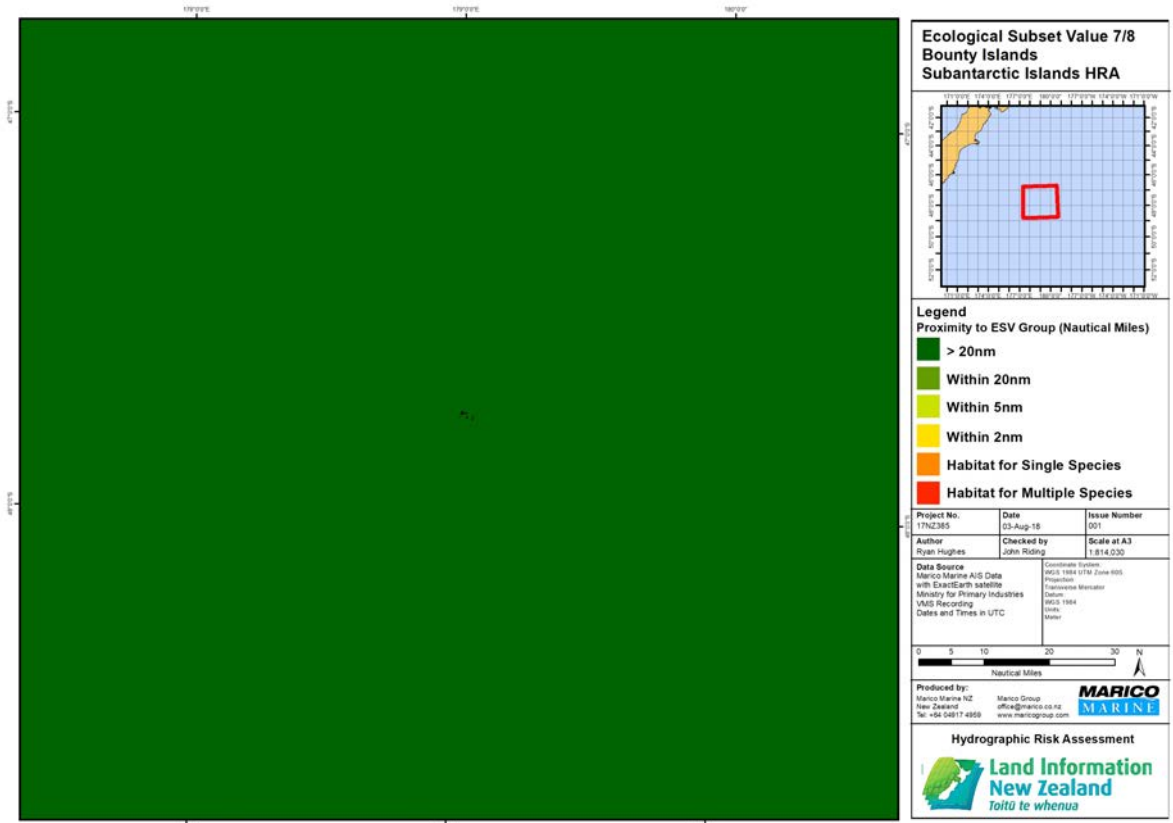


Figure Reference: 17NZ385_RMC_ESV_7_8_Bounty_v1

Figure 123, Ecological Subset Value 7/8, Bounty Islands

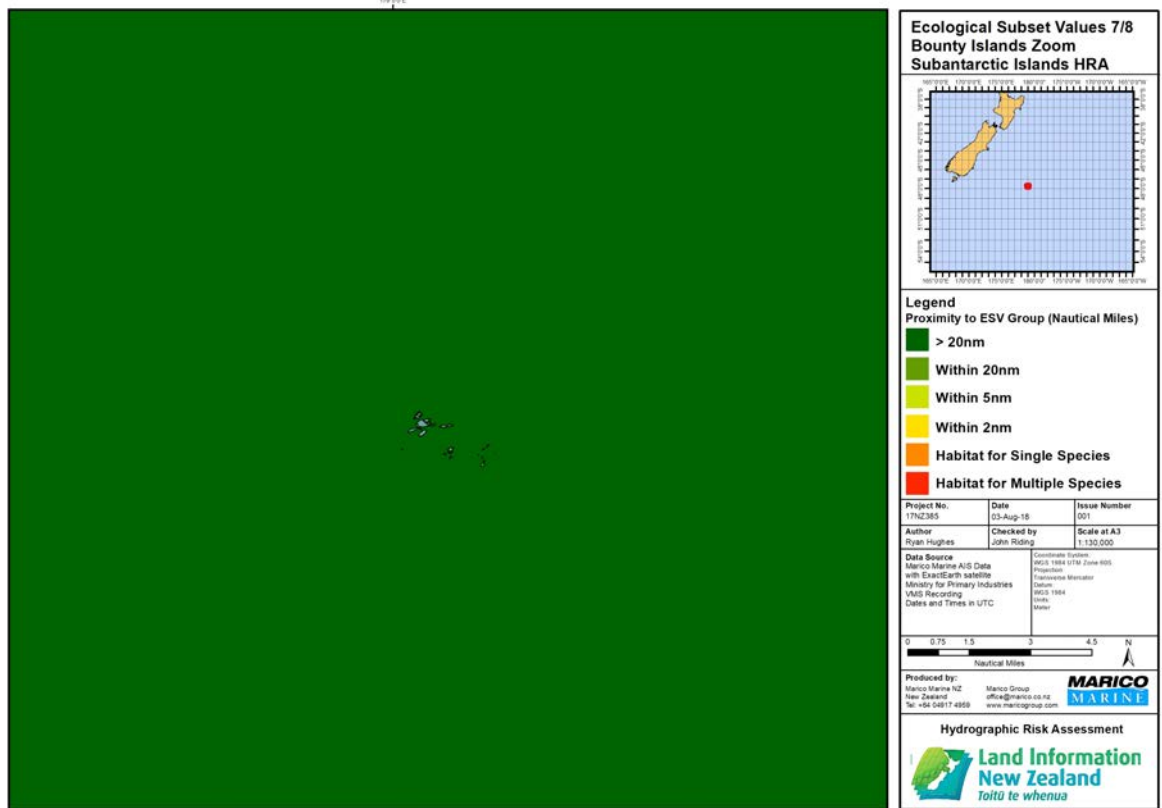


Figure Reference: 17NZ385_RMC_ESV_7_8_Bounty_Zoom_v1

Figure 124, Ecological Subset Values 7/8, Bounty Islands Zoom

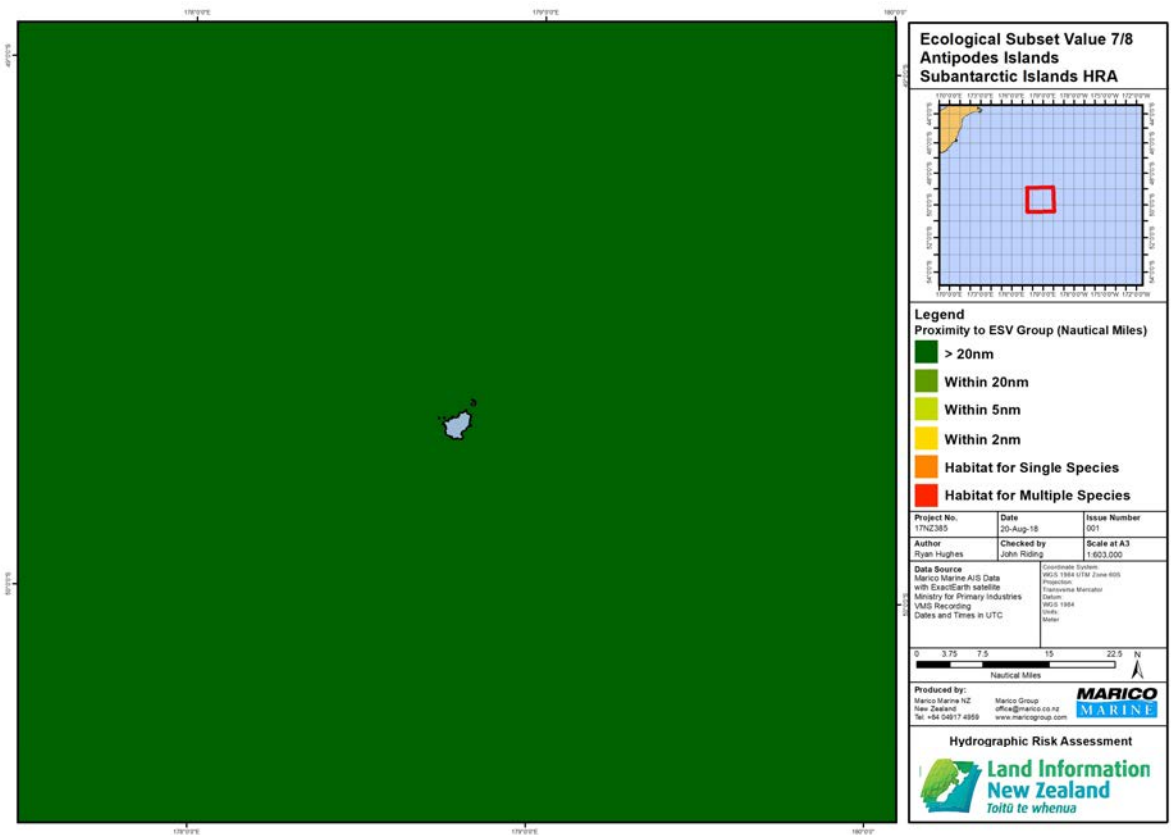


Figure Reference: 17NZ385_RMC_ESV_7_8_Antipodes_v1

Figure 125, Ecological Subset Value 7/8, Antipodes Islands

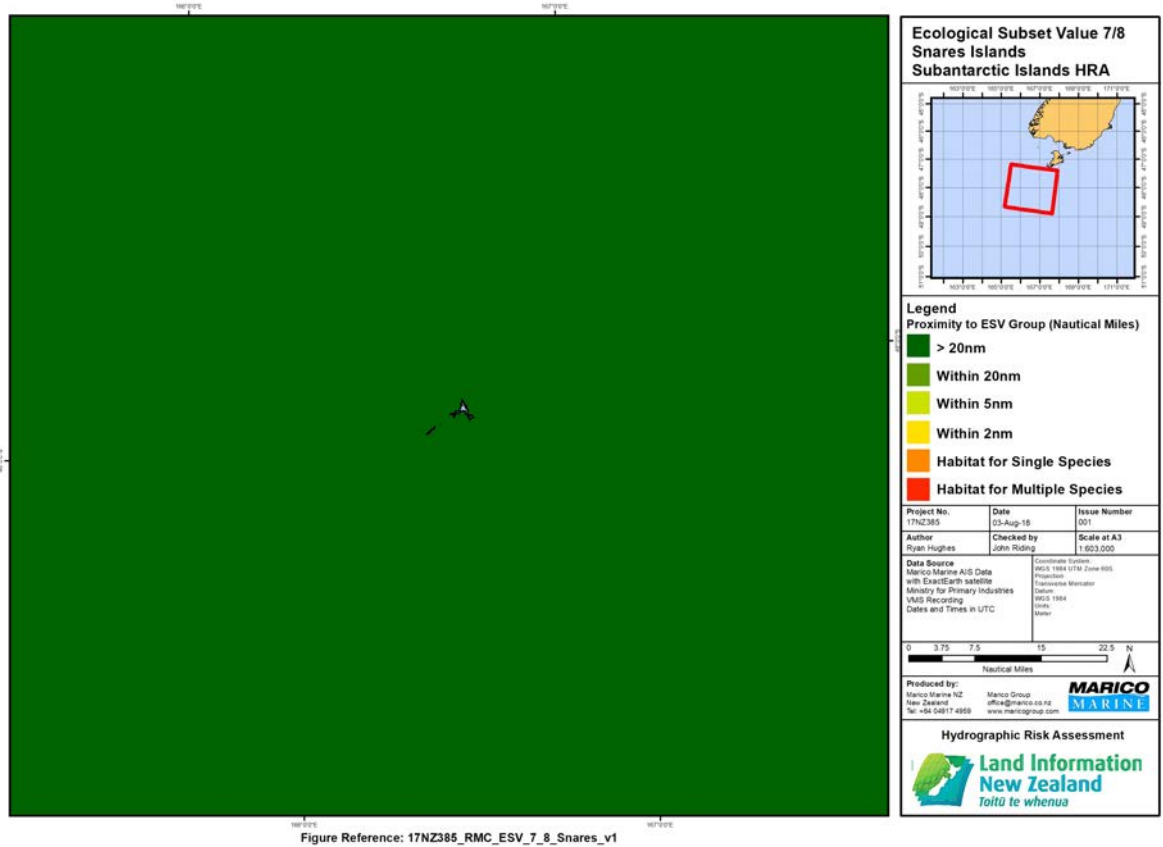


Figure Reference: 17NZ385_RMC_ESV_7_8_Snares_v1

Figure 126, Ecological Subset Value 7/8, Snares Islands

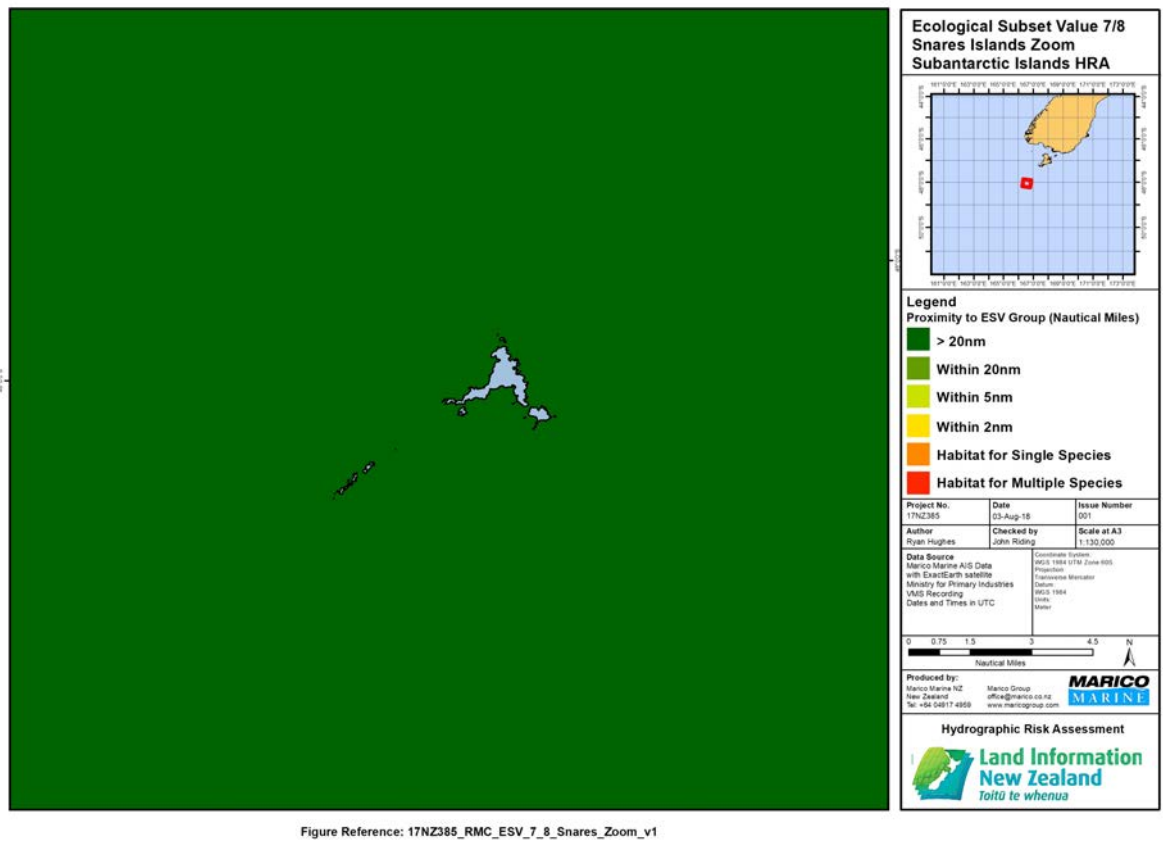


Figure Reference: 17NZ385_RMC_ESV_7_8_Snares_Zoom_v1

Figure 127, Ecological Subset Value 7/8, Snares Islands Zoom

3.1.3 ECOLOGICAL SUBSET VALUE 5/6

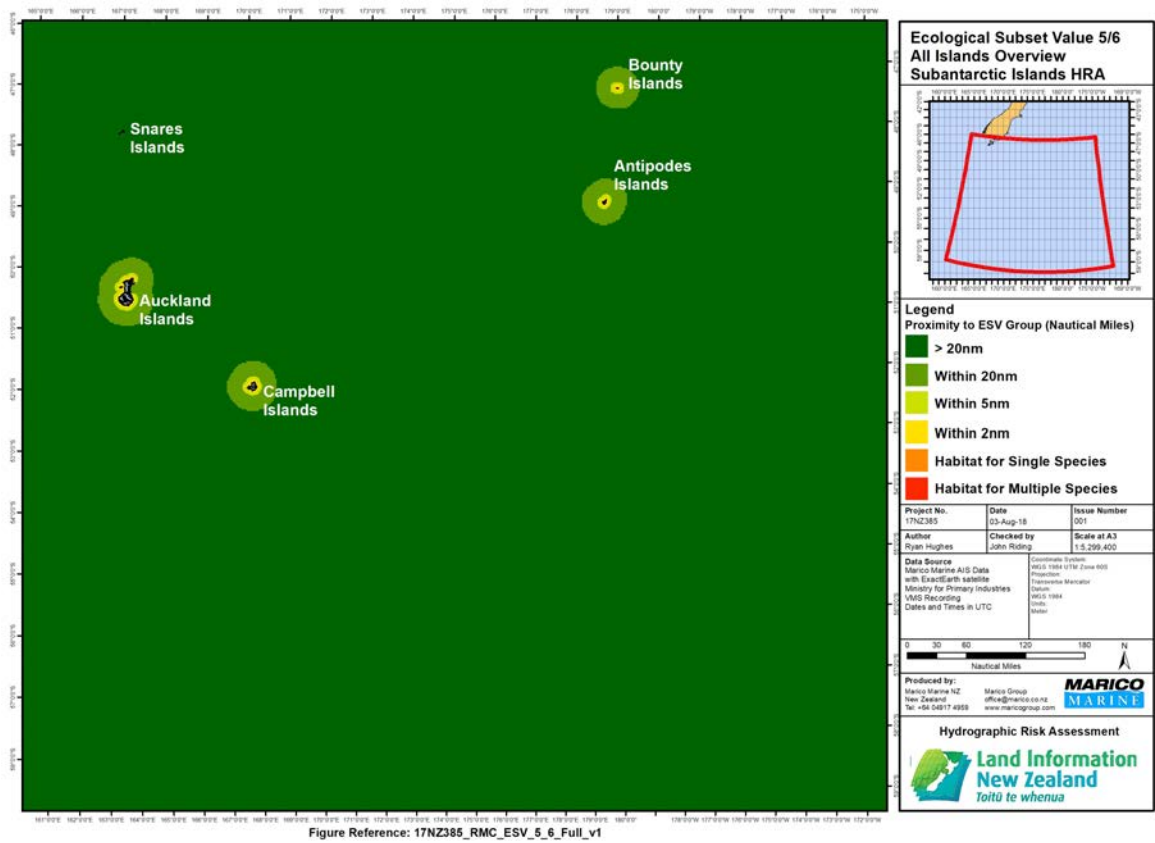


Figure 128, Ecological Subset Value 5/6, All Islands Overview

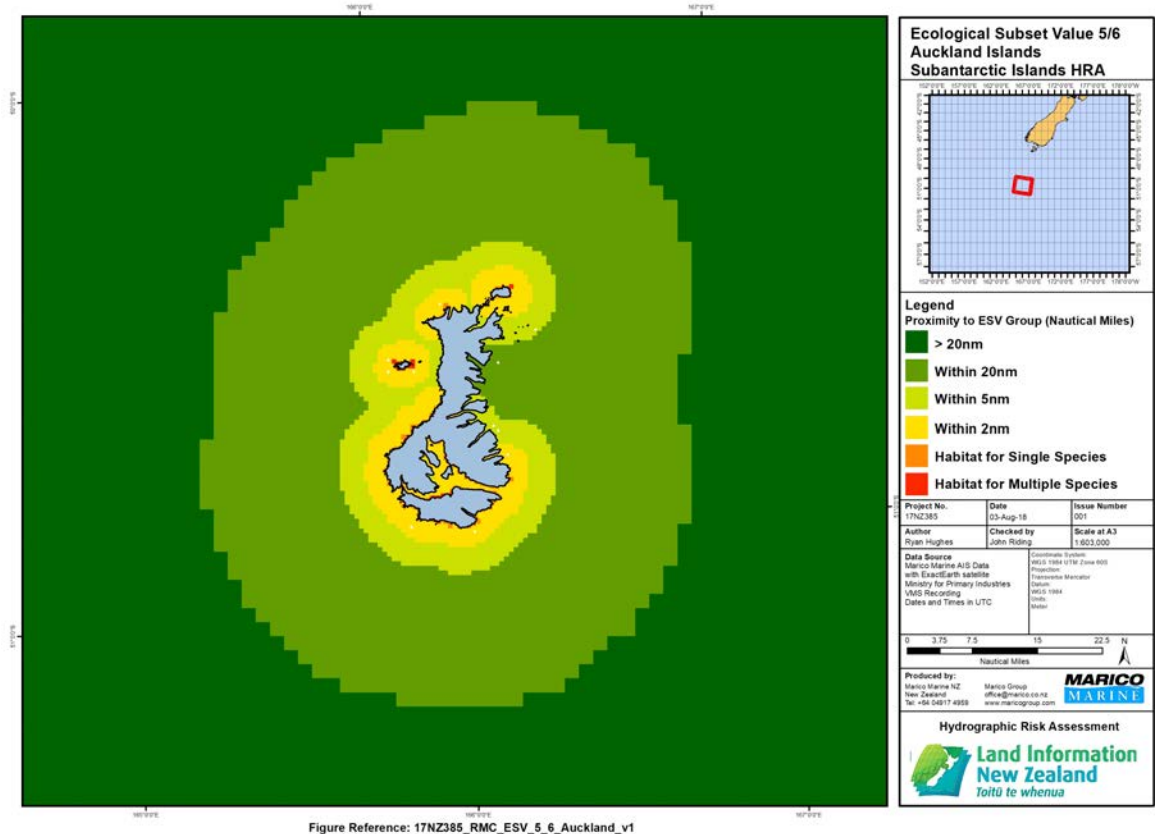


Figure 129, Ecological Subset Value 5/6, Auckland Islands

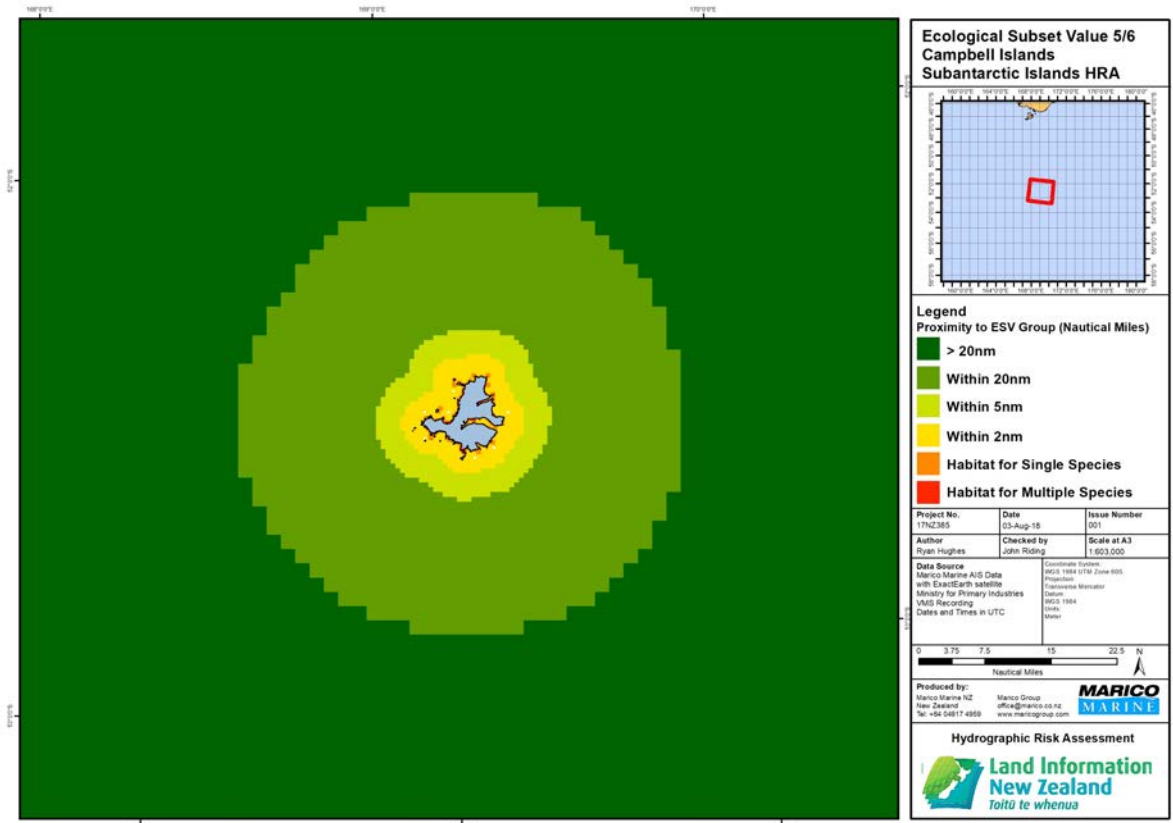


Figure Reference: 17NZ385_RMC_ESV_5_6_Campbell_v1

Figure 130, Ecological Subset Value 5/6, Campbell Islands

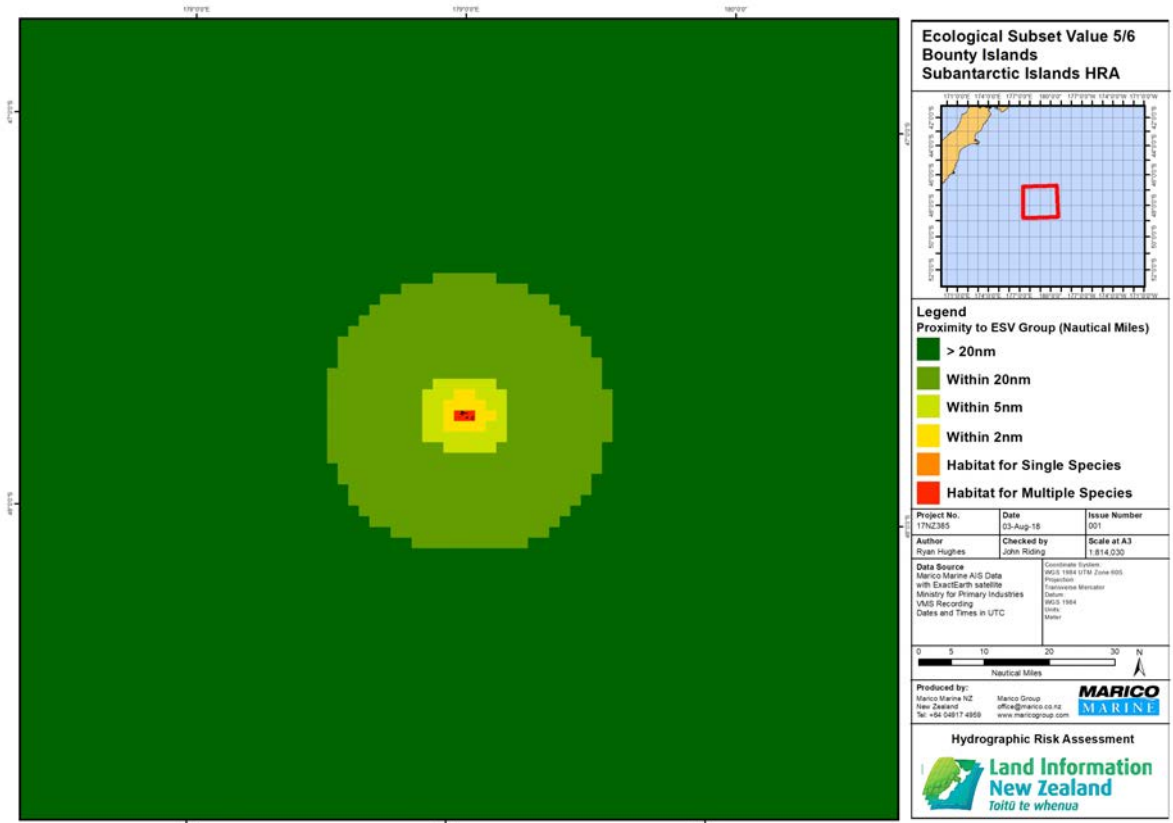


Figure Reference: 17NZ385_RMC_ESV_5_6_Bounty_v1

Figure 131, Ecological Subset Value 5/6, Bounty Islands

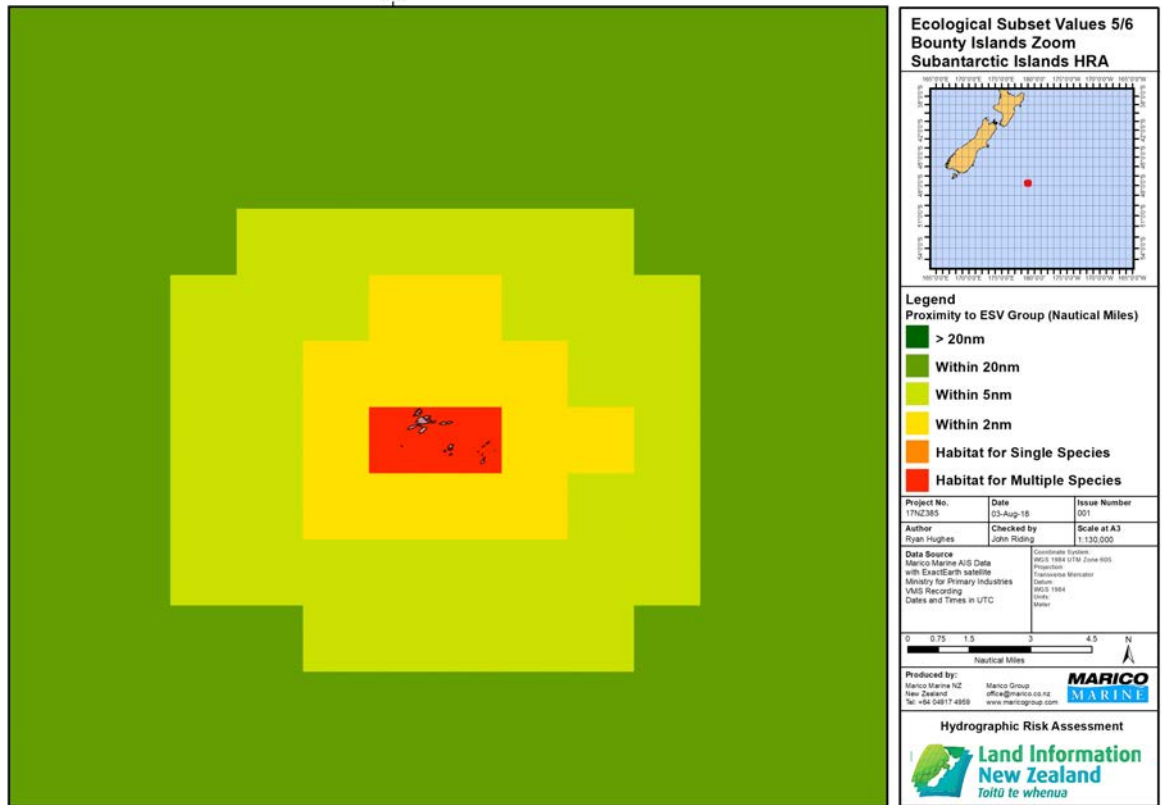


Figure Reference: 17NZ385_RMC_ESV_5_6_Bounty_Zoom_v1

Figure 132, Ecological Subset Value 5/6, Bounty Islands Zoom

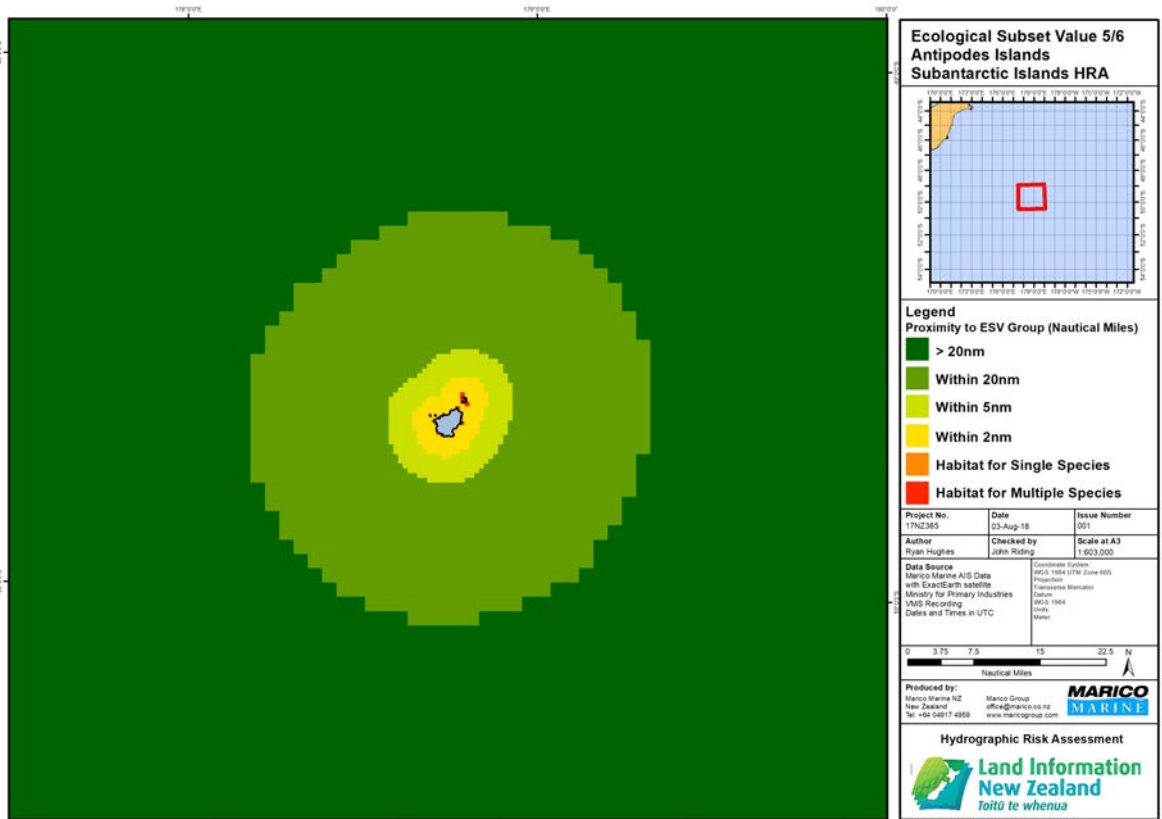


Figure Reference: 17NZ385_RMC_ESV_5_6_Antipodes_v1

Figure 133, Ecological Subset Value 5/6, Antipodes Islands

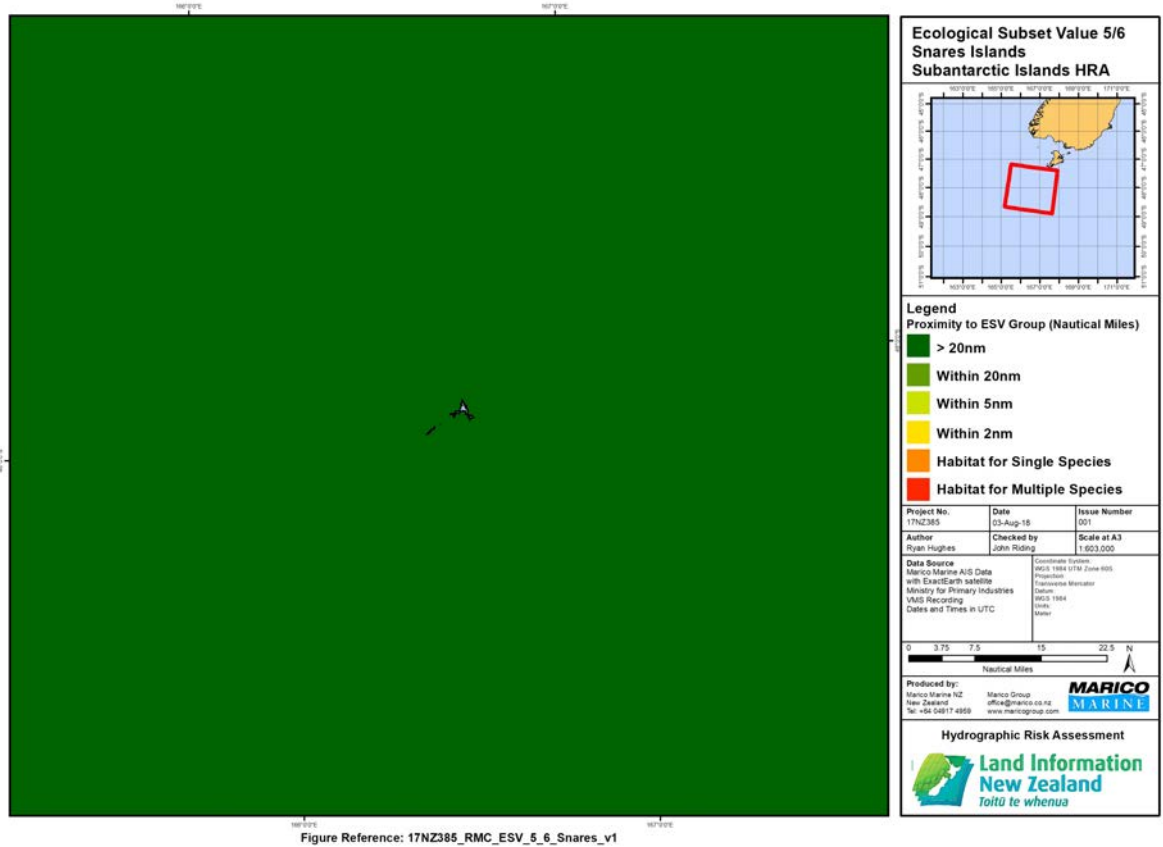


Figure Reference: 17NZ385_RMC_ESV_5_6_Snares_v1

Figure 134, Ecological Subset Value 5/6, Snares Islands

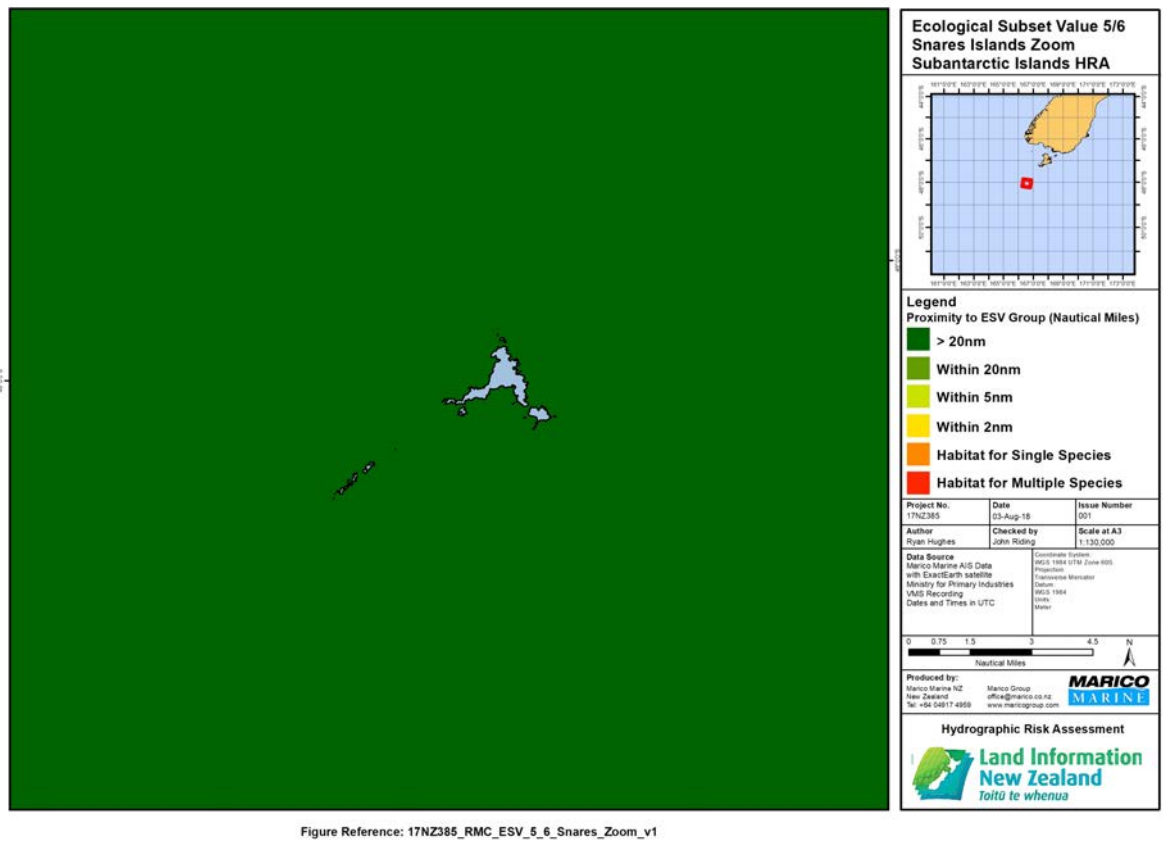


Figure Reference: 17NZ385_RMC_ESV_5_6_Snares_Zoom_v1

Figure 135, Ecological Subset Value 5/6, Snares Islands Zoom

3.1.4 ECOLOGICAL SUBSET VALUE 3/4

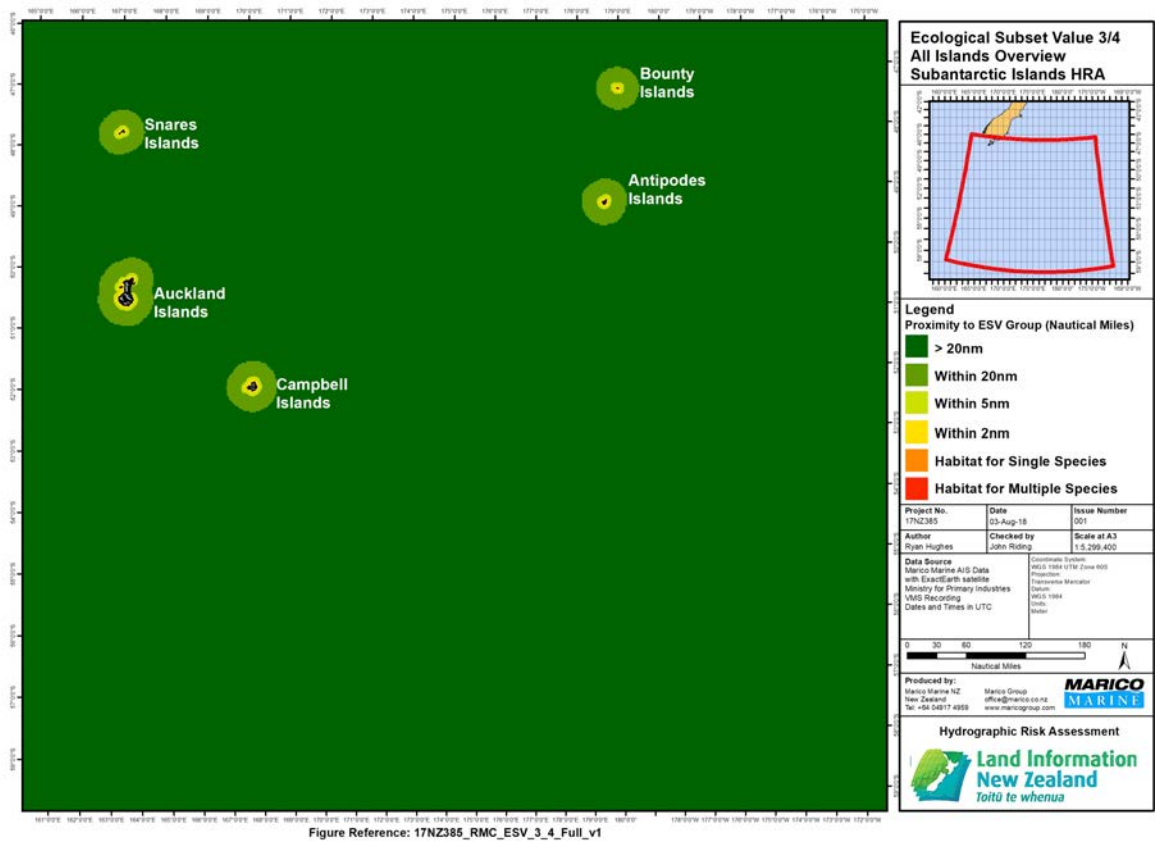


Figure 136, Ecological Subset Value 3/4, All Islands Overview

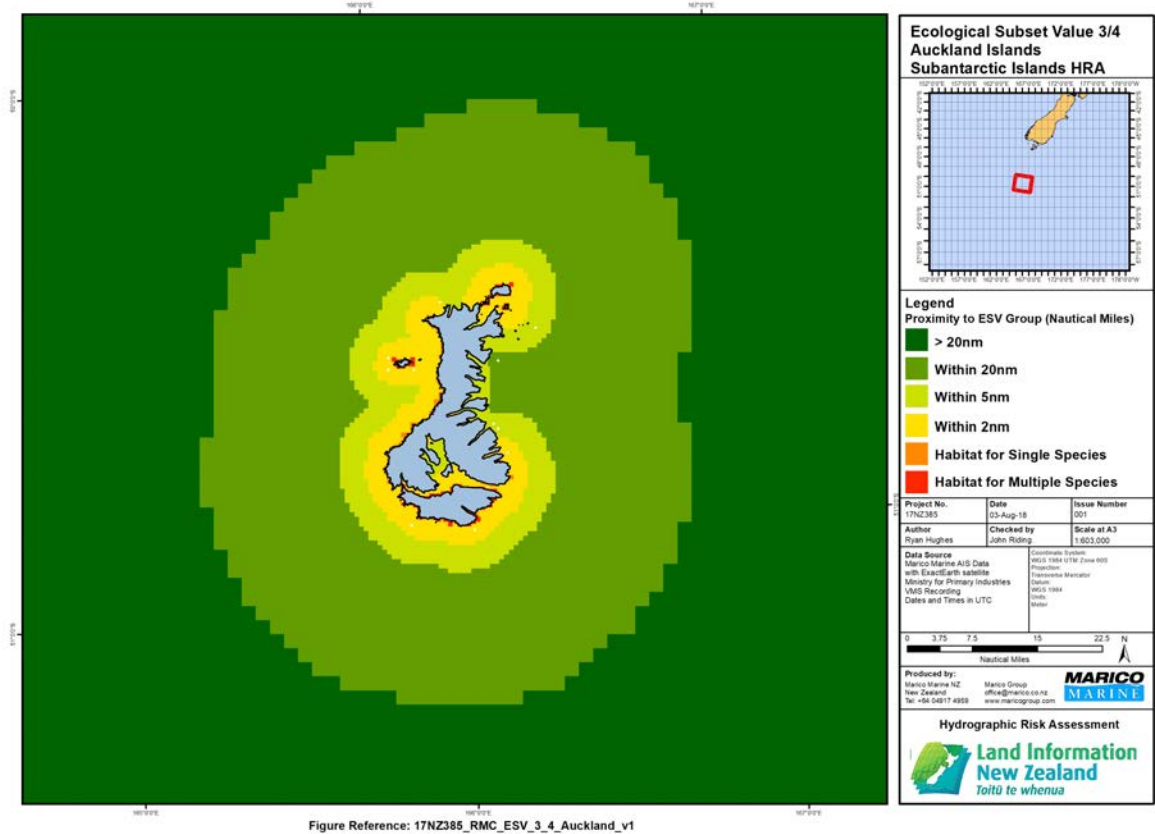


Figure 137, Ecological Subset Value 3/4, Auckland Islands

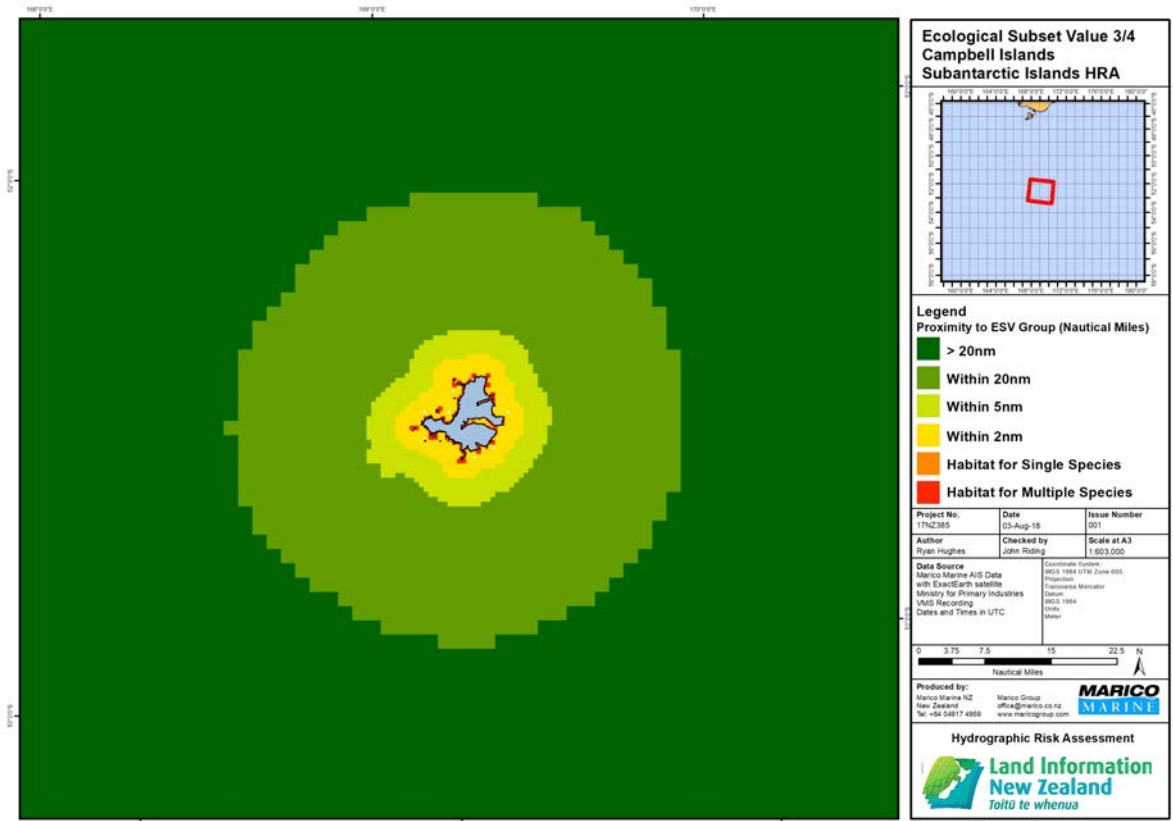


Figure Reference: 17NZ385_RMC_ESV_3_4_Campbell_v1

Figure 138, Ecological Subset Value 3/4, Campbell Islands

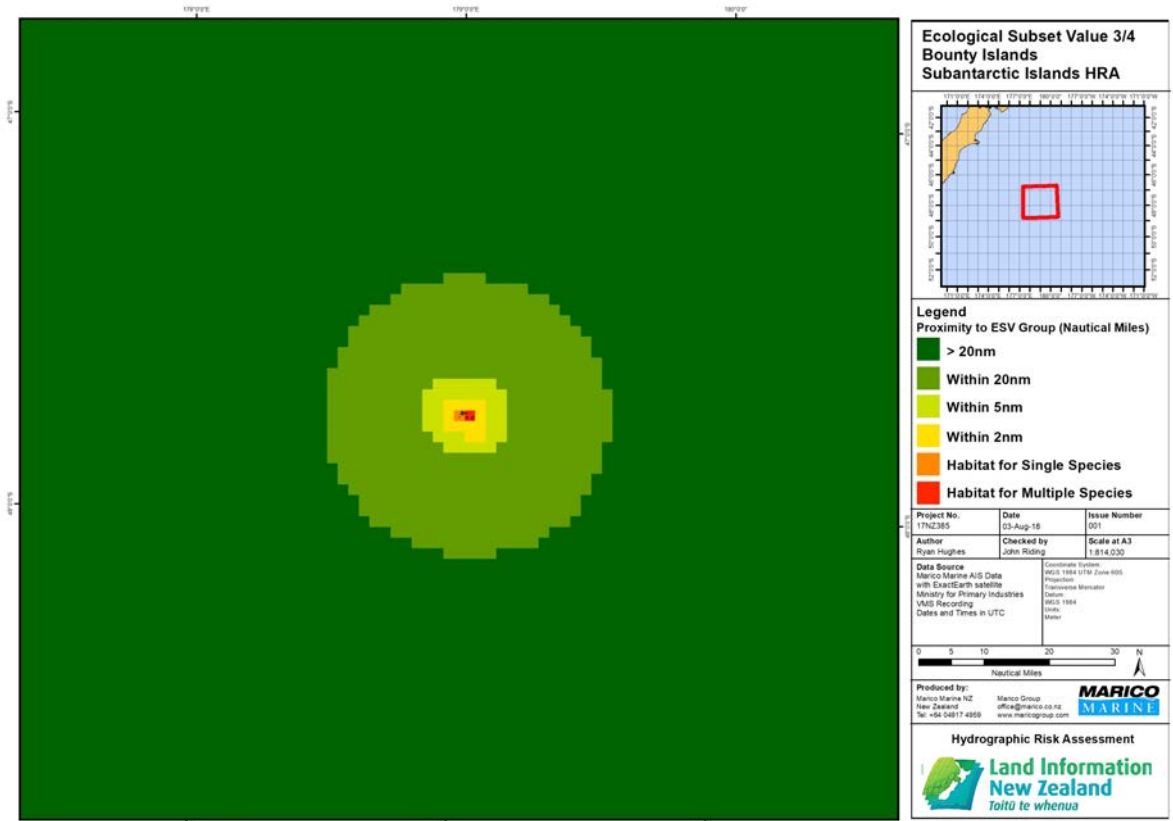


Figure Reference: 17NZ385_RMC_ESV_3_4_Bounty_v1

Figure 139, Ecological Subset Value 3, Bounty Islands

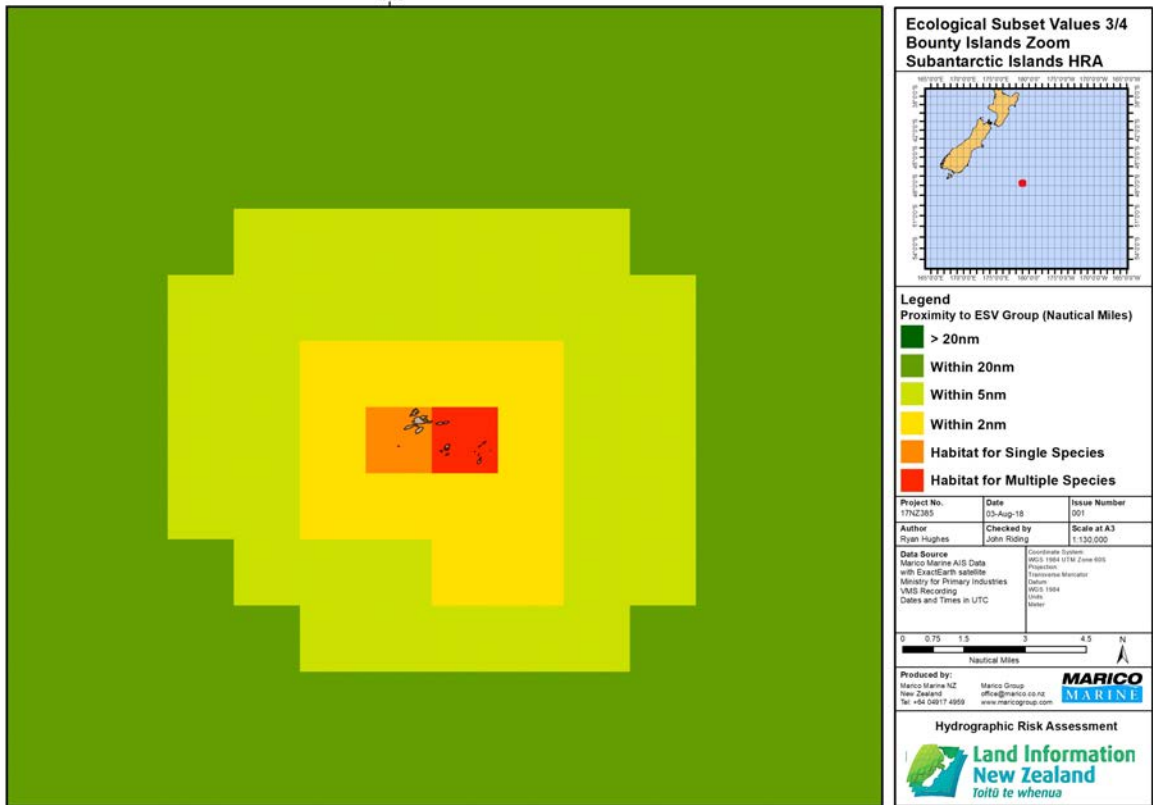


Figure Reference: 17NZ385_RMC_ESV_3_4_Bounty_Zoom_v1

Figure 140, Ecological Subset Value 3/4, Bounty Islands Zoom

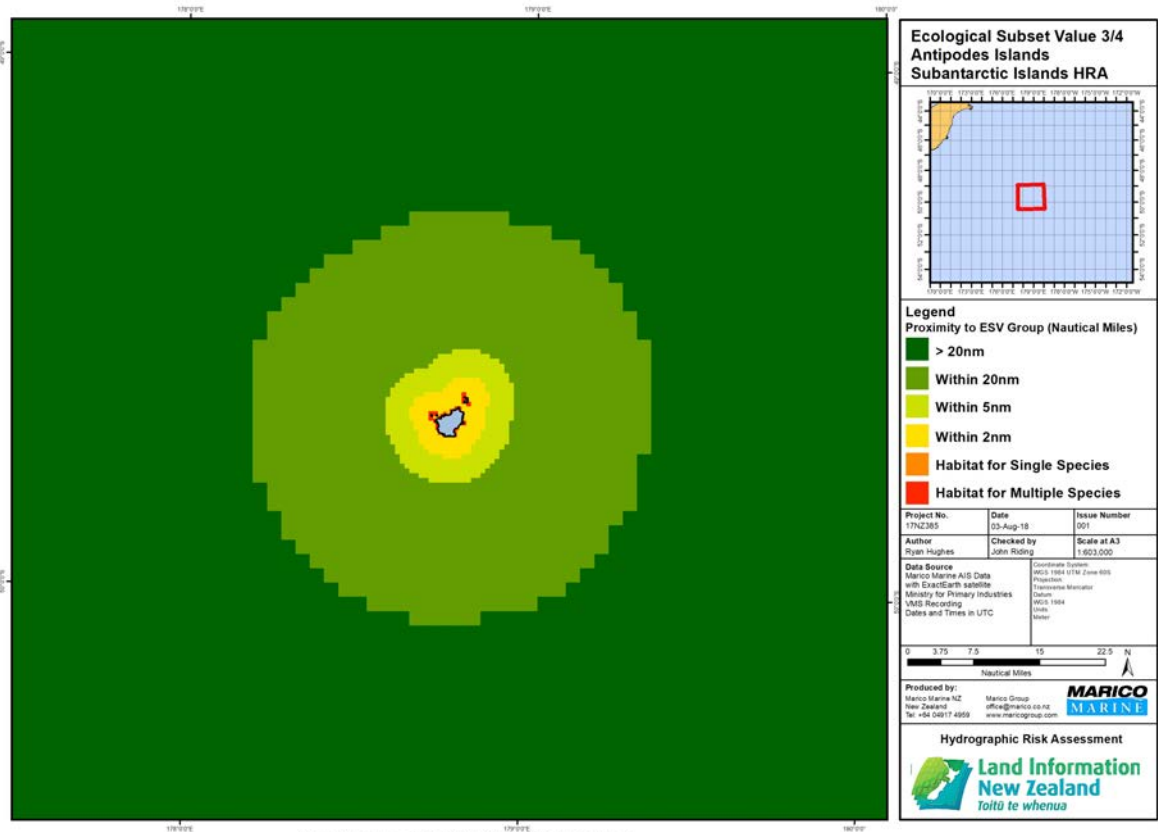


Figure Reference: 17NZ385_RMC_ESV_3_4_Antipodes_v1

Figure 141, Ecological Subset Value 3/4, Antipodes Islands

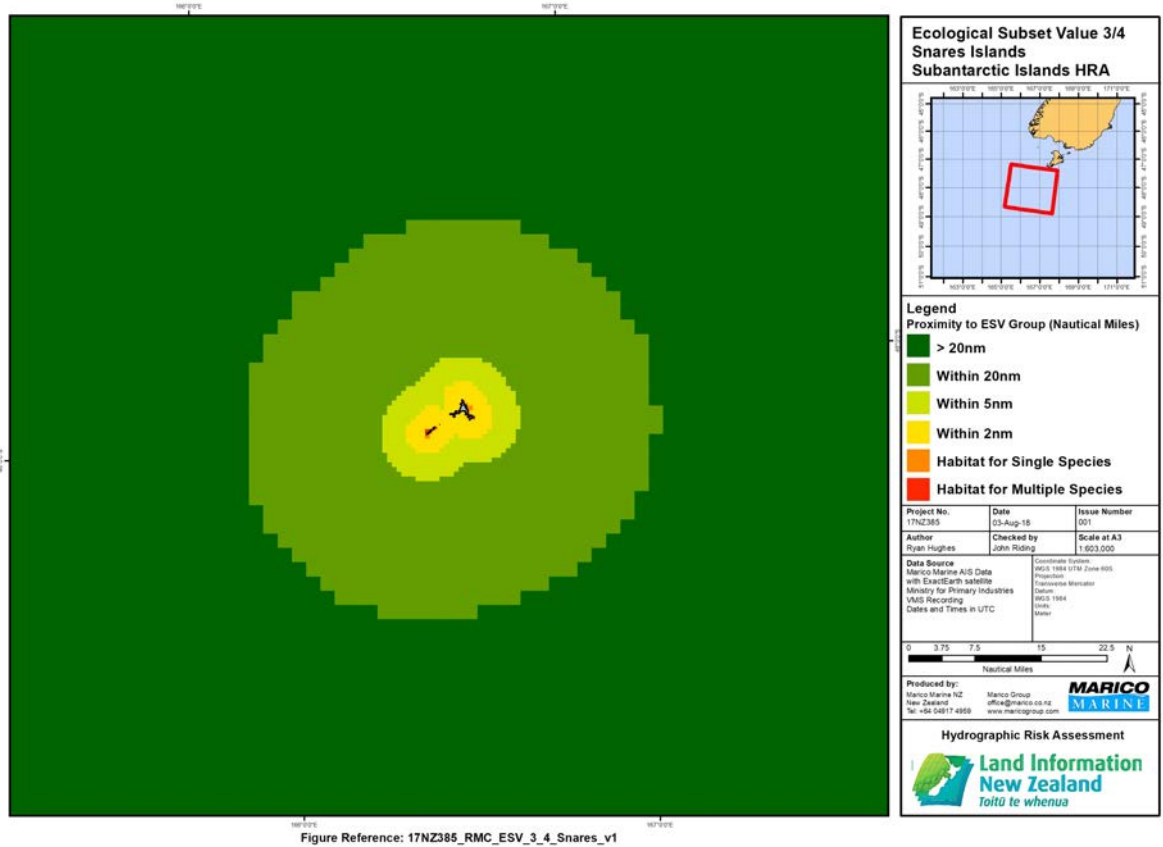


Figure 142, Ecological Subset Value 3/4, Snares Islands

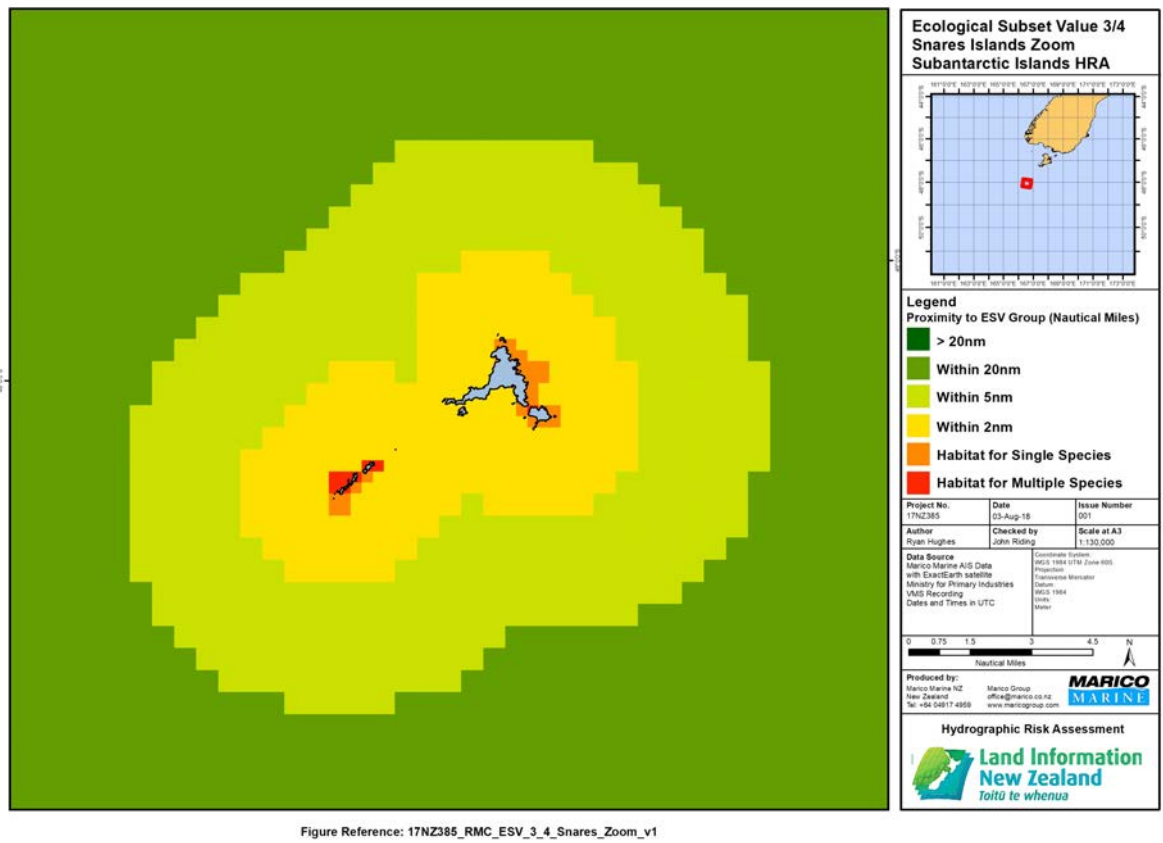


Figure 143, Ecological Subset Value 3/4, Snares Islands Zoom

3.1.5 ECOLOGICAL SUBSET VALUE 1/2

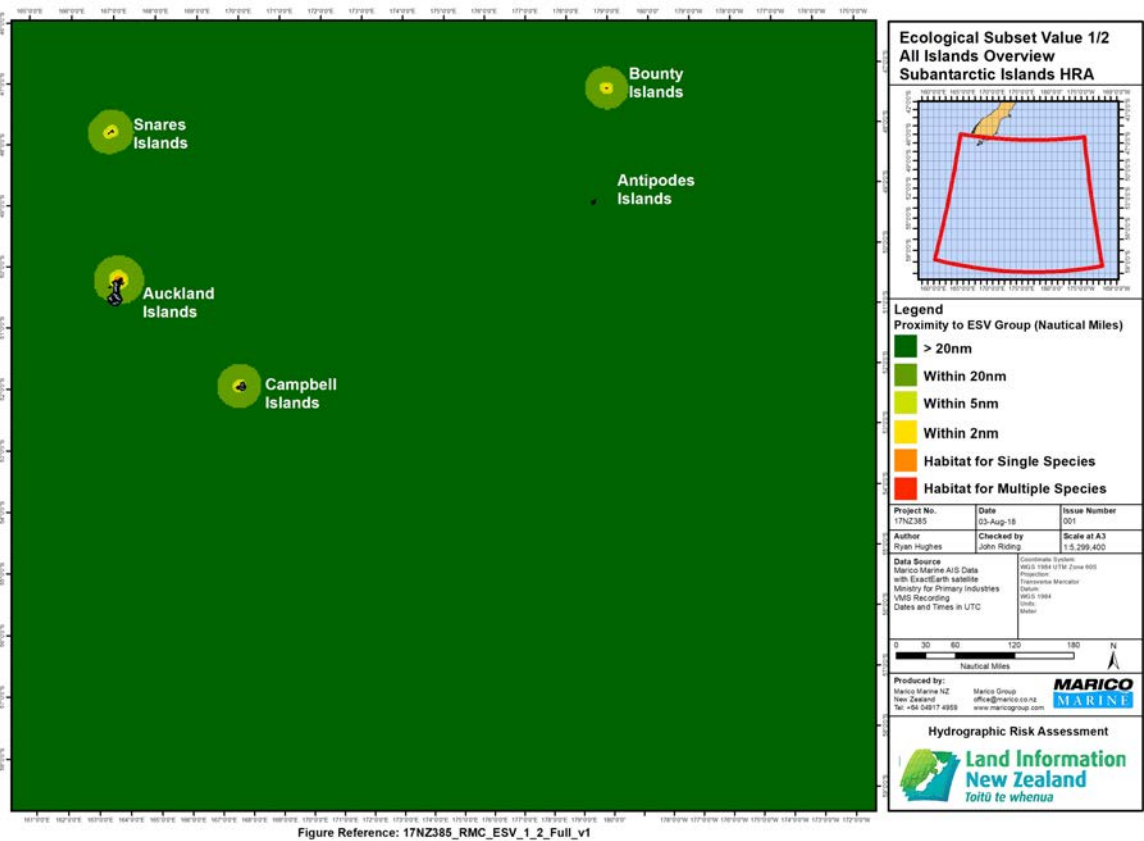


Figure 144, Ecological Subset Value 1/2, All Islands Overview

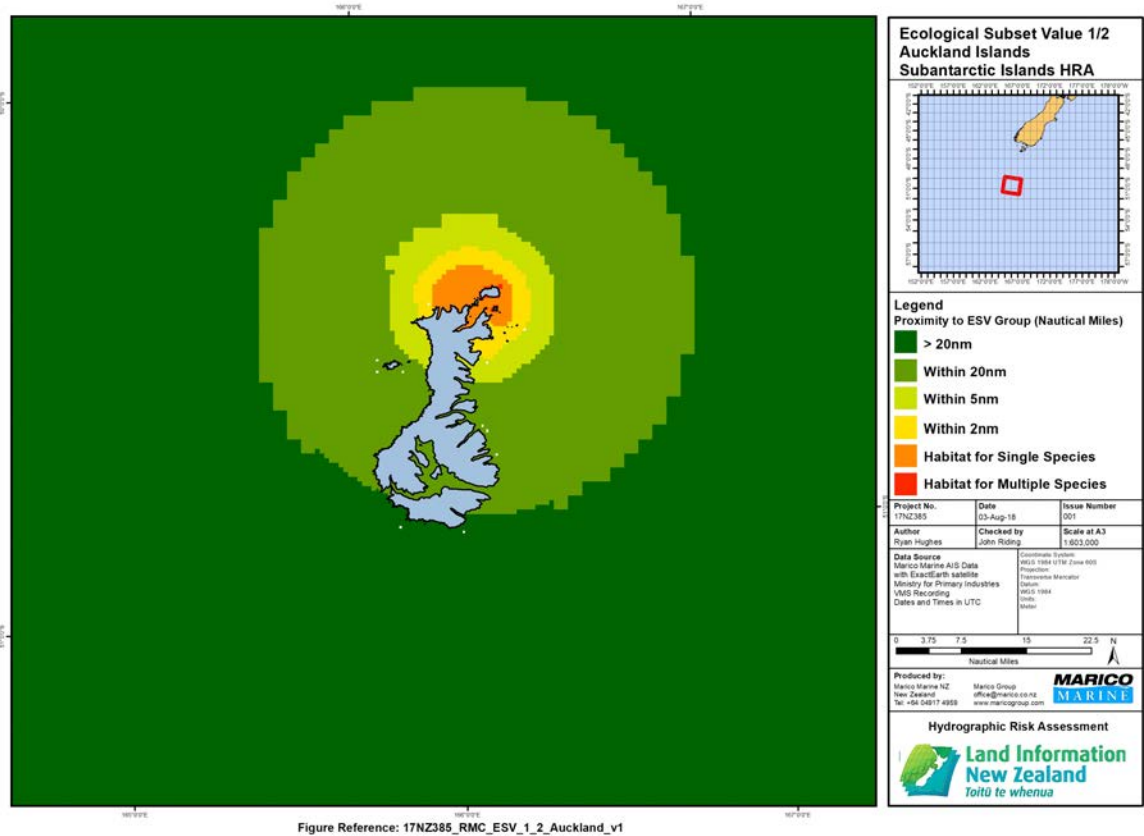


Figure 145, Ecological Subset Value 1/2, Auckland Islands

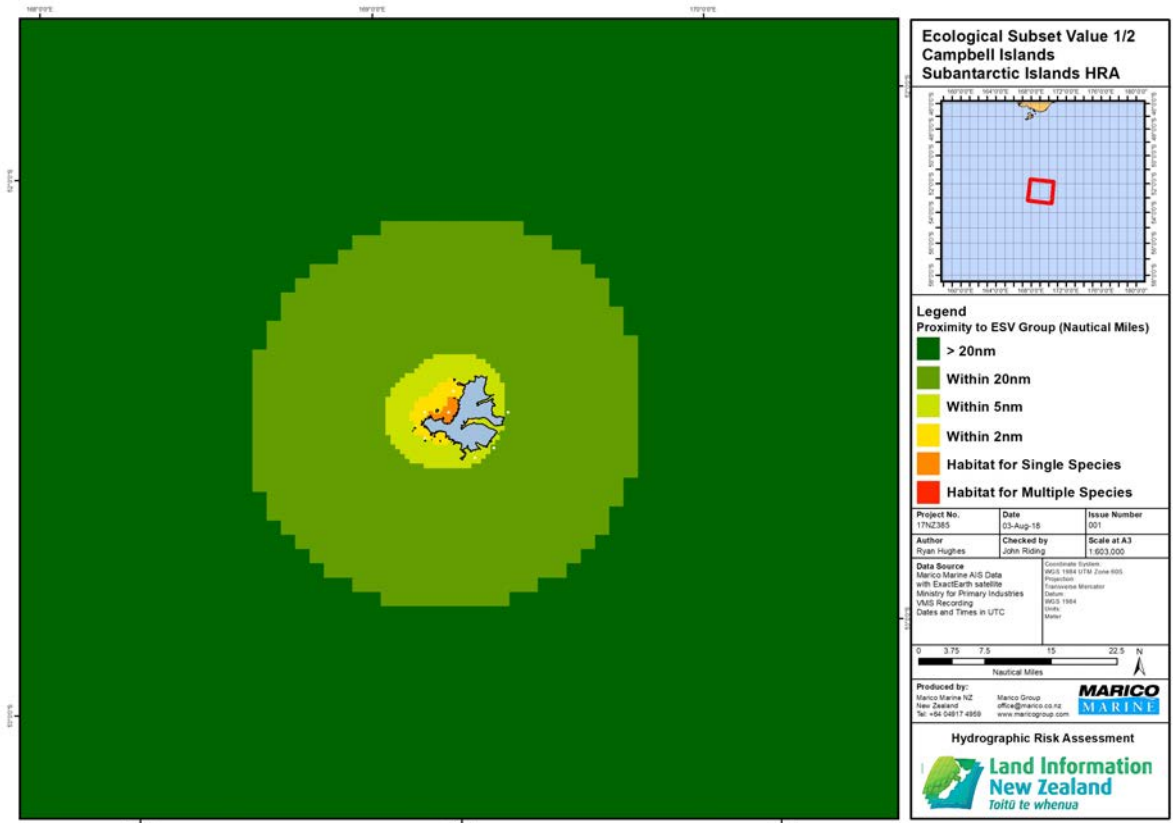


Figure Reference: 17NZ385_RMC_ESV_1_2_Campbell_v1

Figure 146, Ecological Subset Value 1/2, Campbell Islands

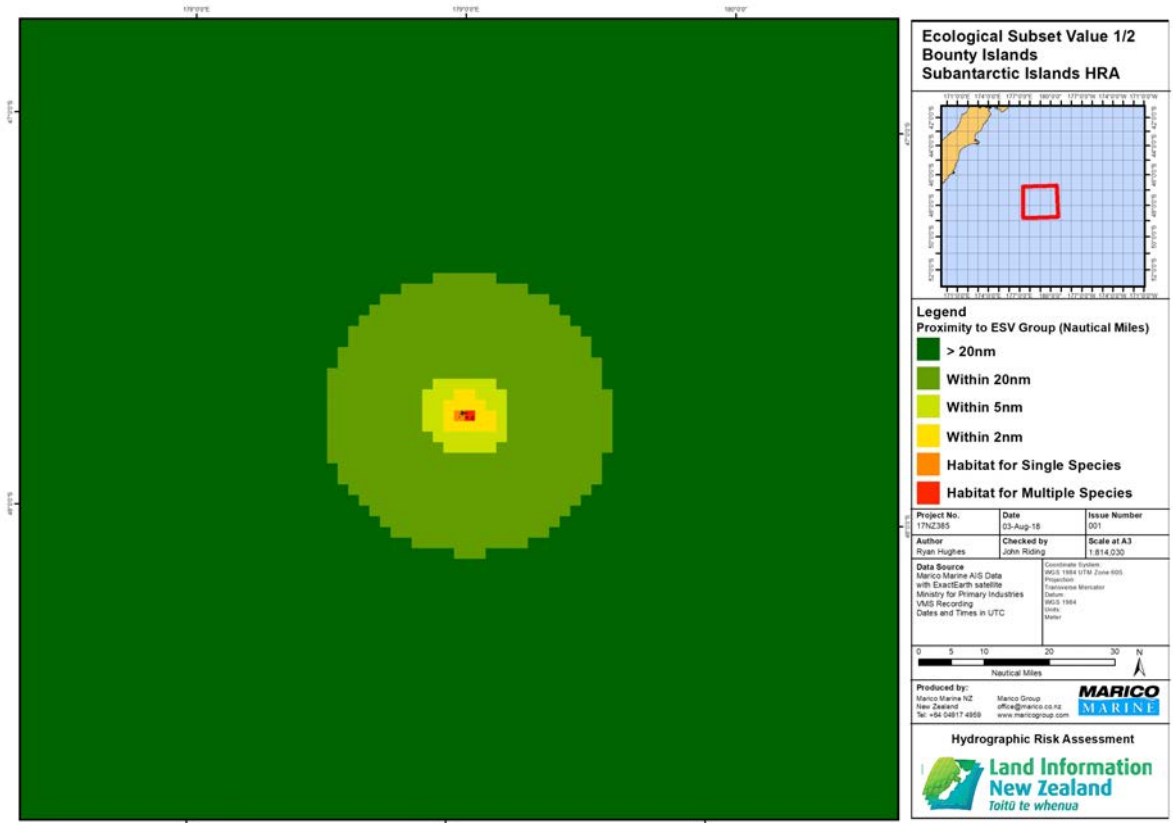


Figure Reference: 17NZ385_RMC_ESV_1_2_Bounty_v1

Figure 147, Ecological Subset Value 1/2, Bounty Islands

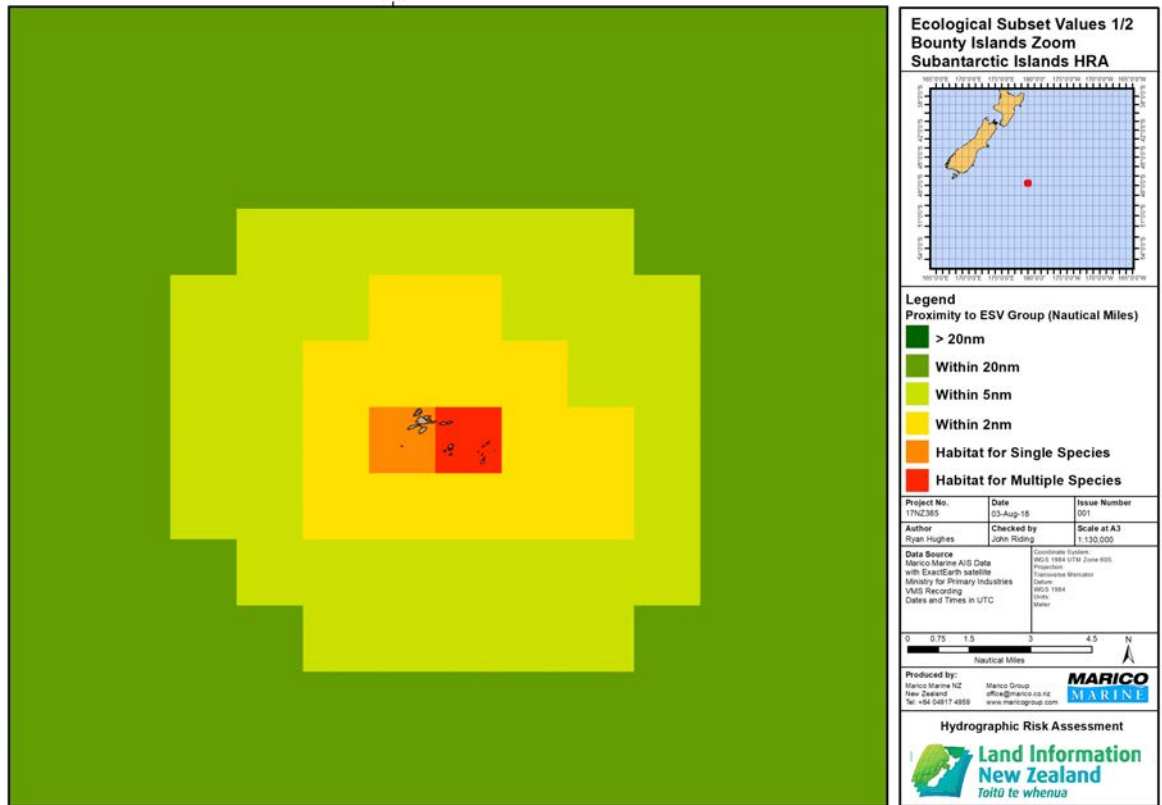


Figure Reference: 17NZ385_RMC_ESV_1_2_Bounty_Zoom_v1

Figure 148, Ecological Subset Value 1/2, Bounty Islands Zoom

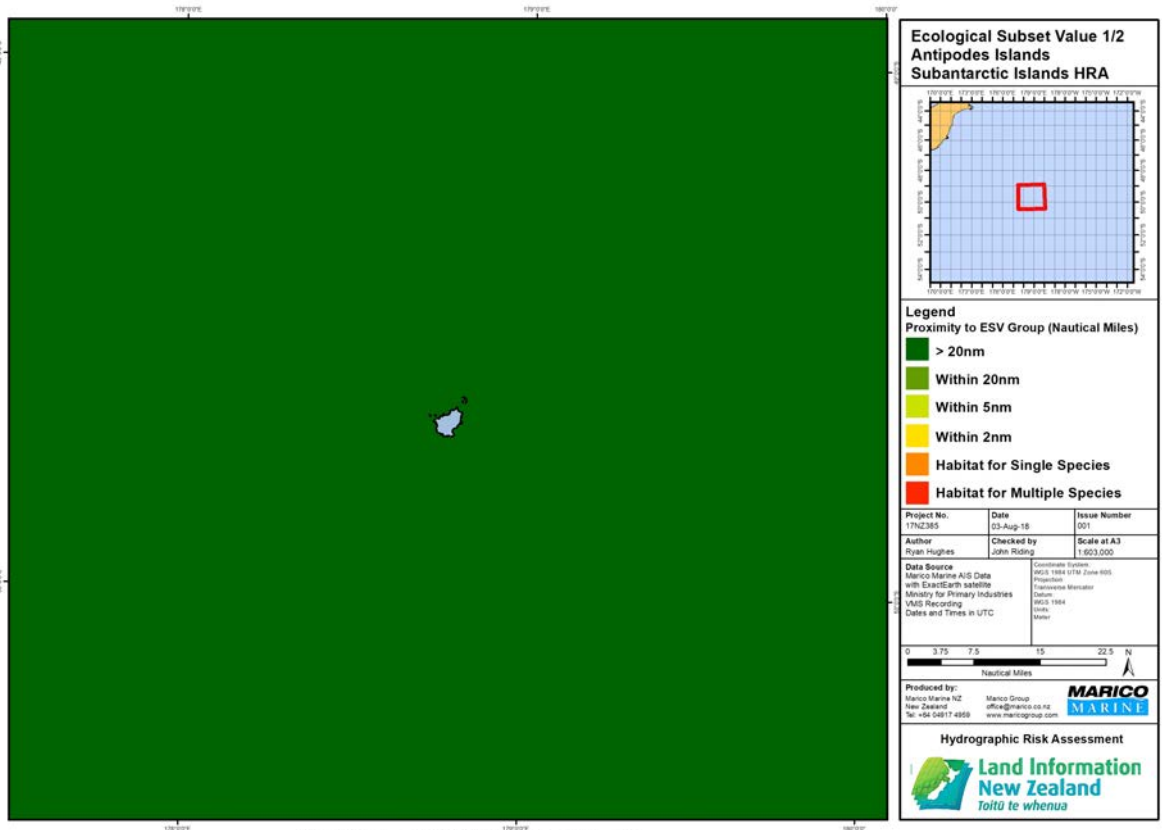


Figure Reference: 17NZ385_RMC_ESV_1_2_Antipodes_v1

Figure 149, Ecological Subset Value 1/2, Antipodes Islands

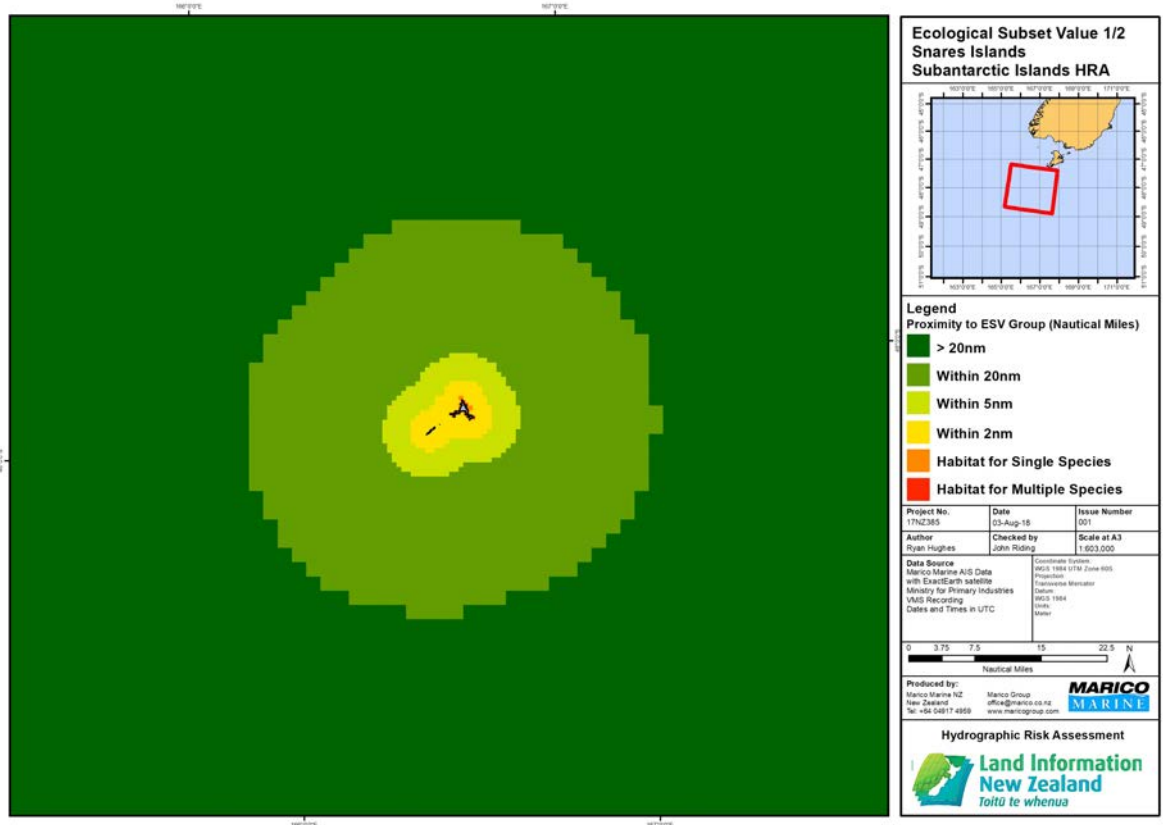


Figure Reference: 17NZ385_RMC_ESV_1_2_Snares_v1

Figure 150, Ecological Subset Value 1/2, Snares Islands

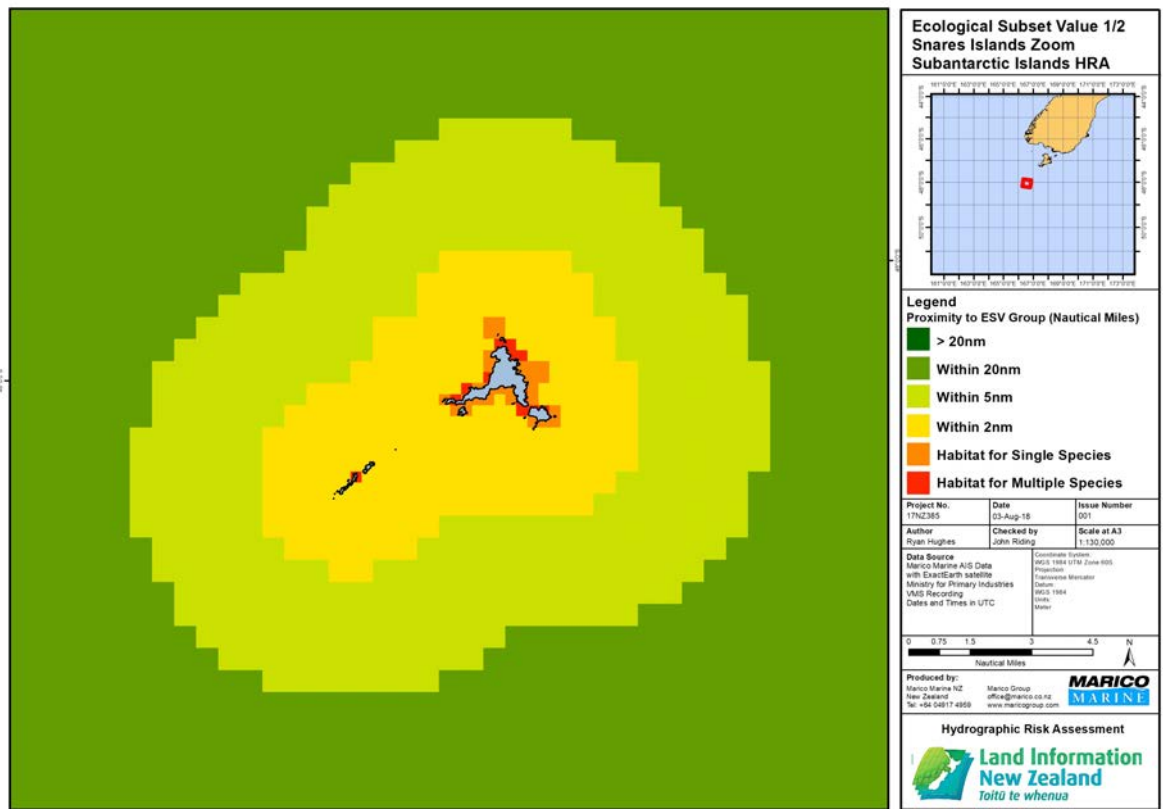


Figure Reference: 17NZ385_RMC_ESV_1_2_Snares_Zoom_v1

Figure 151, Ecological Subset Value 1/2, Snares Islands Zoom

3.1.6 HABITATS

3.1.6.1 PROXIMITY TO LARGE REEF

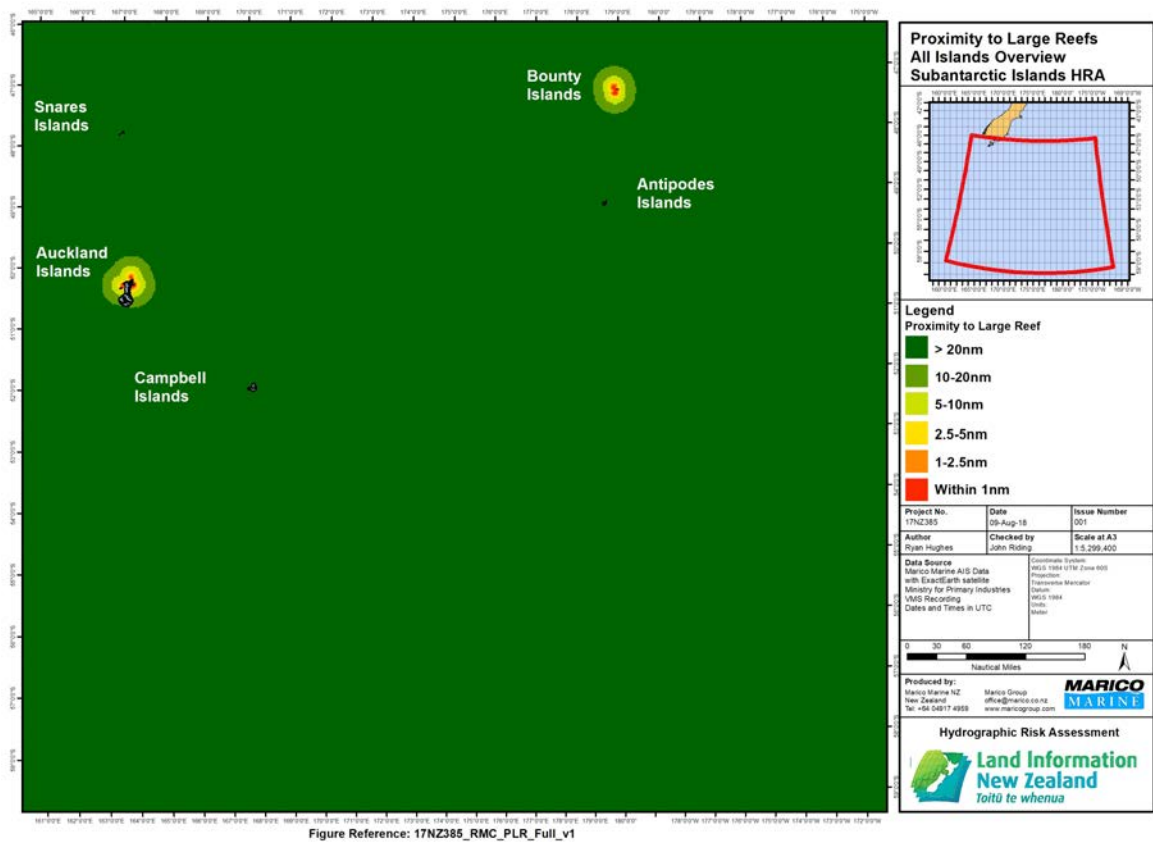


Figure Reference: 17NZ385_RMC_PLR_Full_v1

Figure 152, Proximity to Large Reef, All Islands Overview

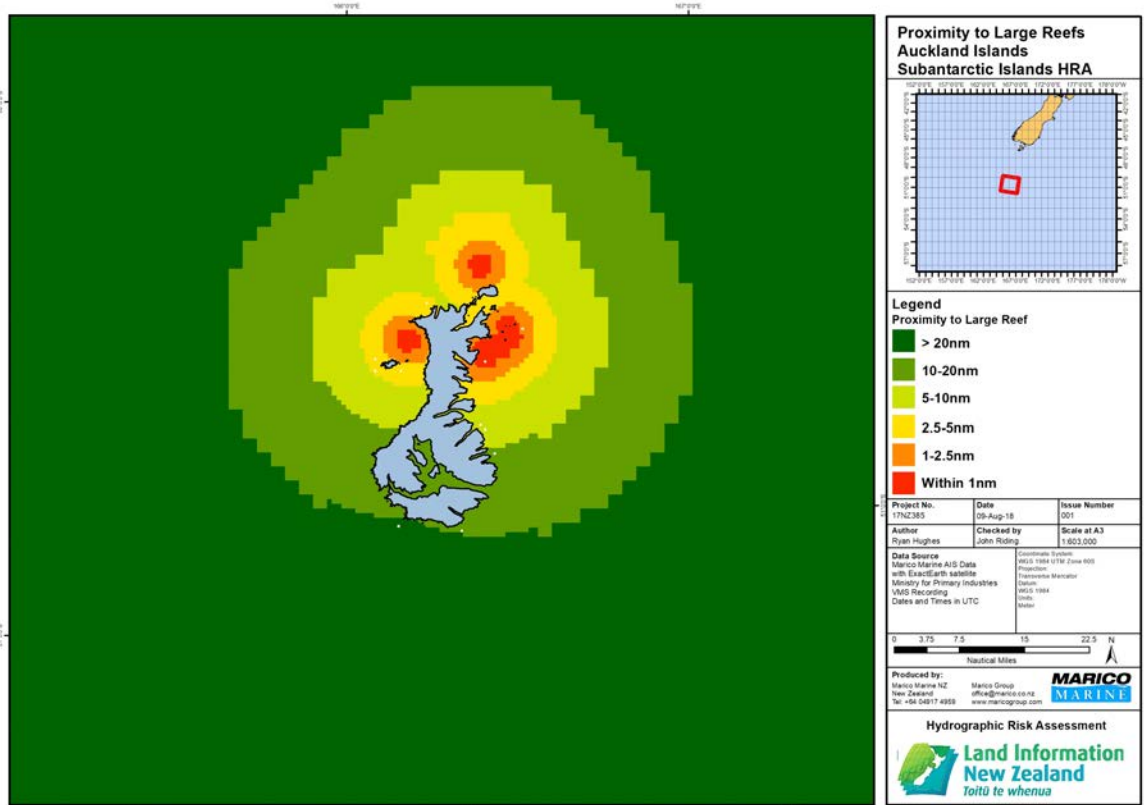


Figure Reference: 17NZ385_RMC_PLR_Auckland_v1

Figure 153, Proximity to Large Reef, Auckland Islands

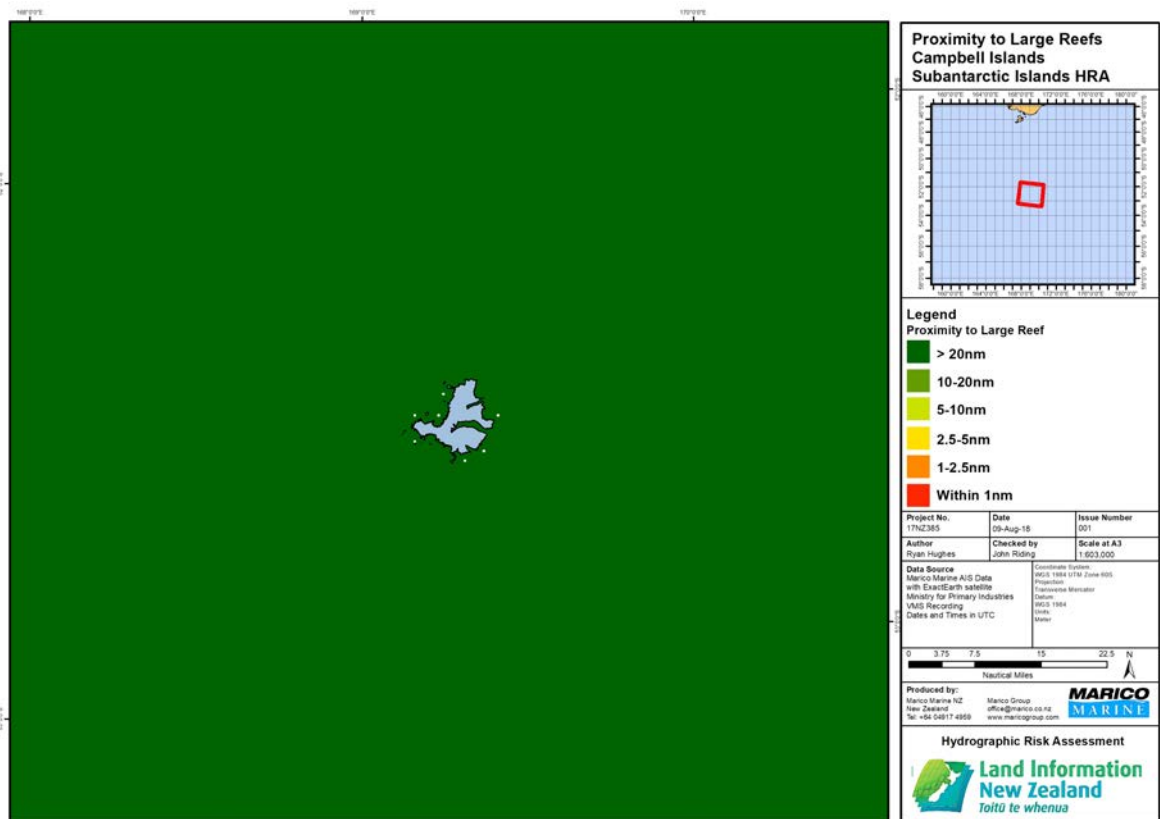


Figure Reference: 17NZ385_RMC_PLR_Campbell_v1

Figure 154, Proximity to Large Reef, Campbell Islands

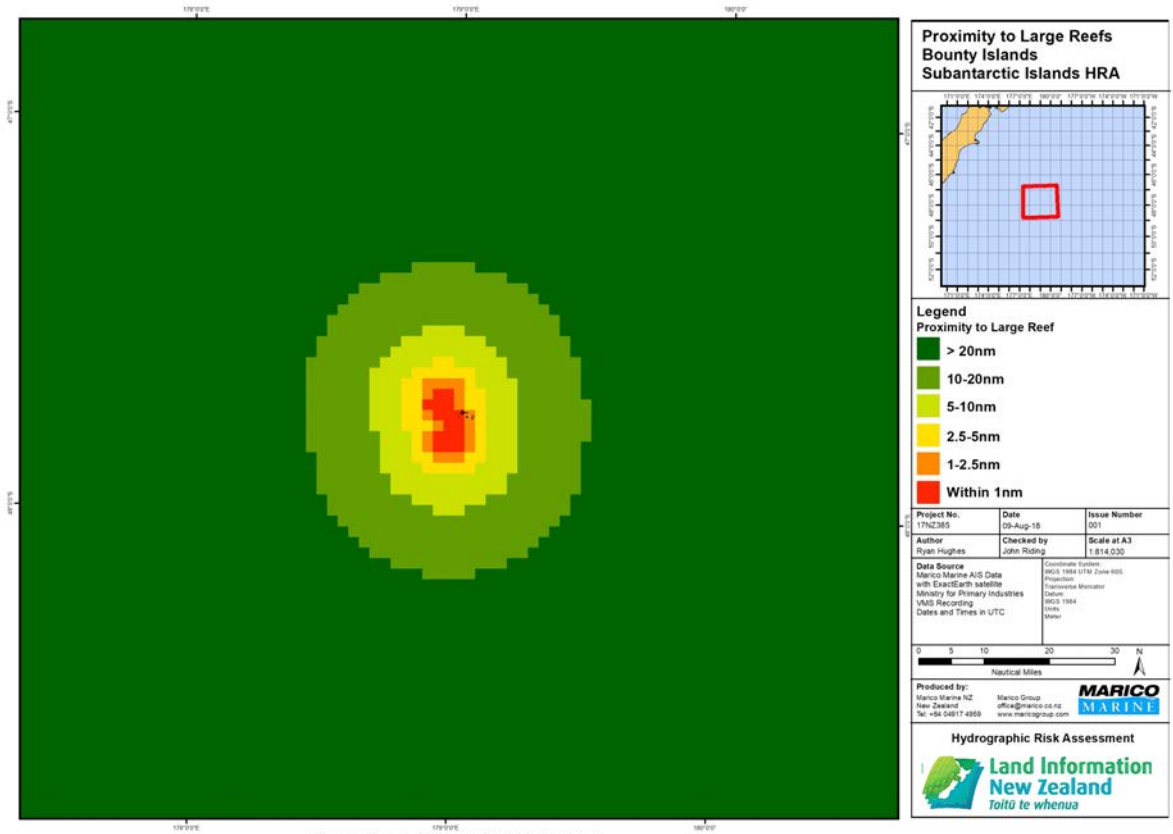


Figure Reference: 17NZ385_RMC_PLR_Bounty_v1

Figure 155, Proximity to Large Reef, Bounty Islands

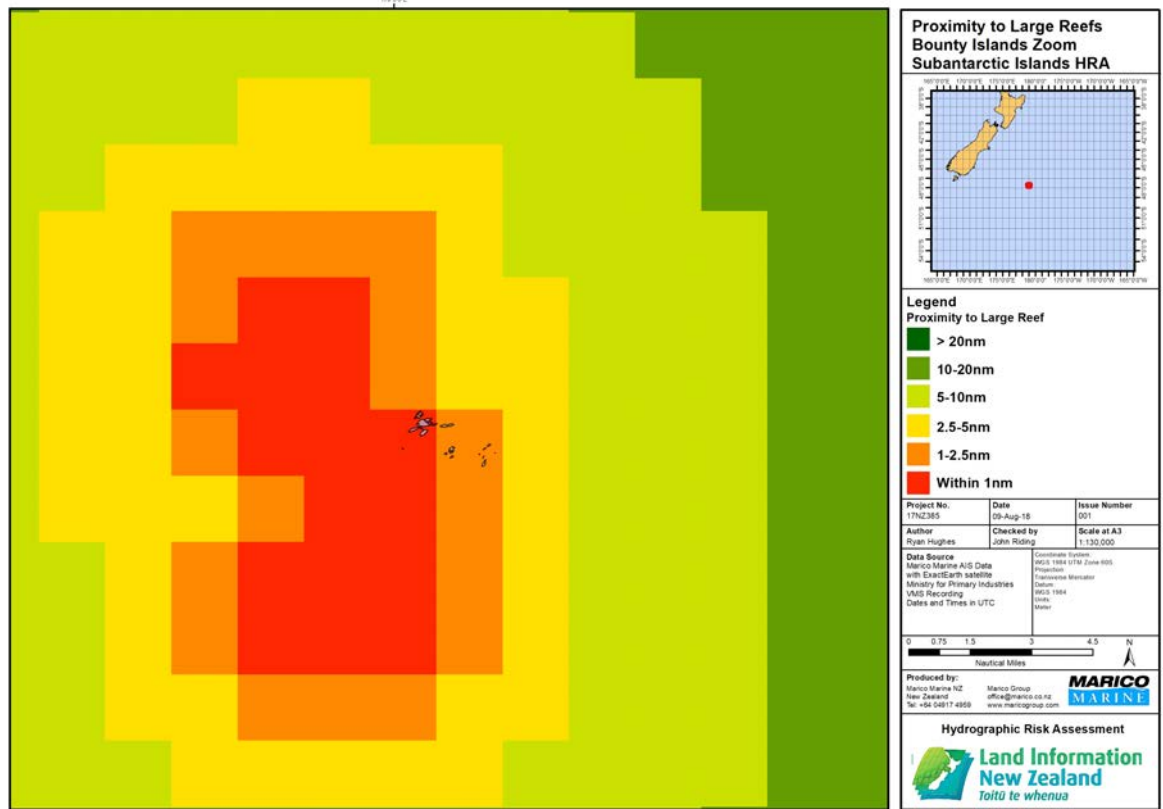


Figure Reference: 17NZ385_RMC_PLR_Bounty_Zoom_v1

Figure 156, Proximity to Large Reef, Bounty Islands Zoom

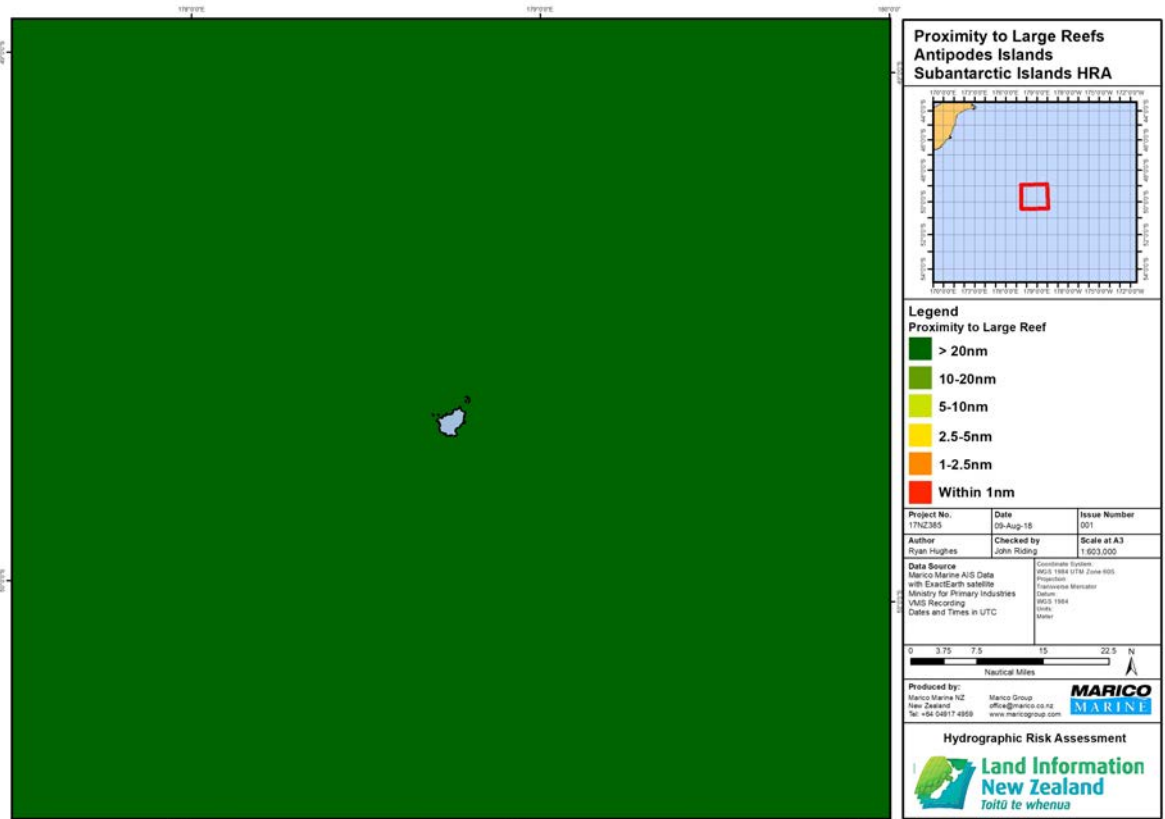


Figure Reference: 17NZ385_RMC_PLR_Antipodes_v1

Figure 157, Proximity to Large Reef, Antipodes Islands

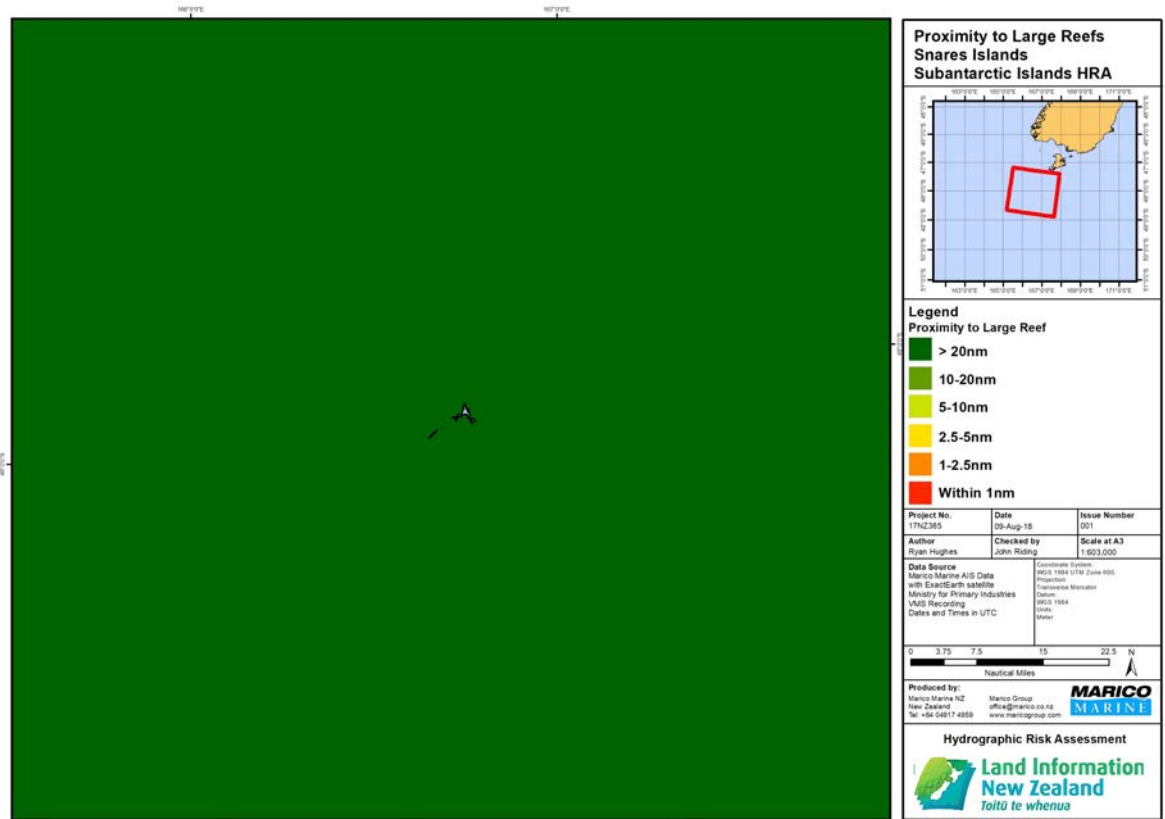


Figure Reference: 17NZ385_RMC_PLR_Snares_v1

Figure 158, Proximity to Large Reef, Snares Islands

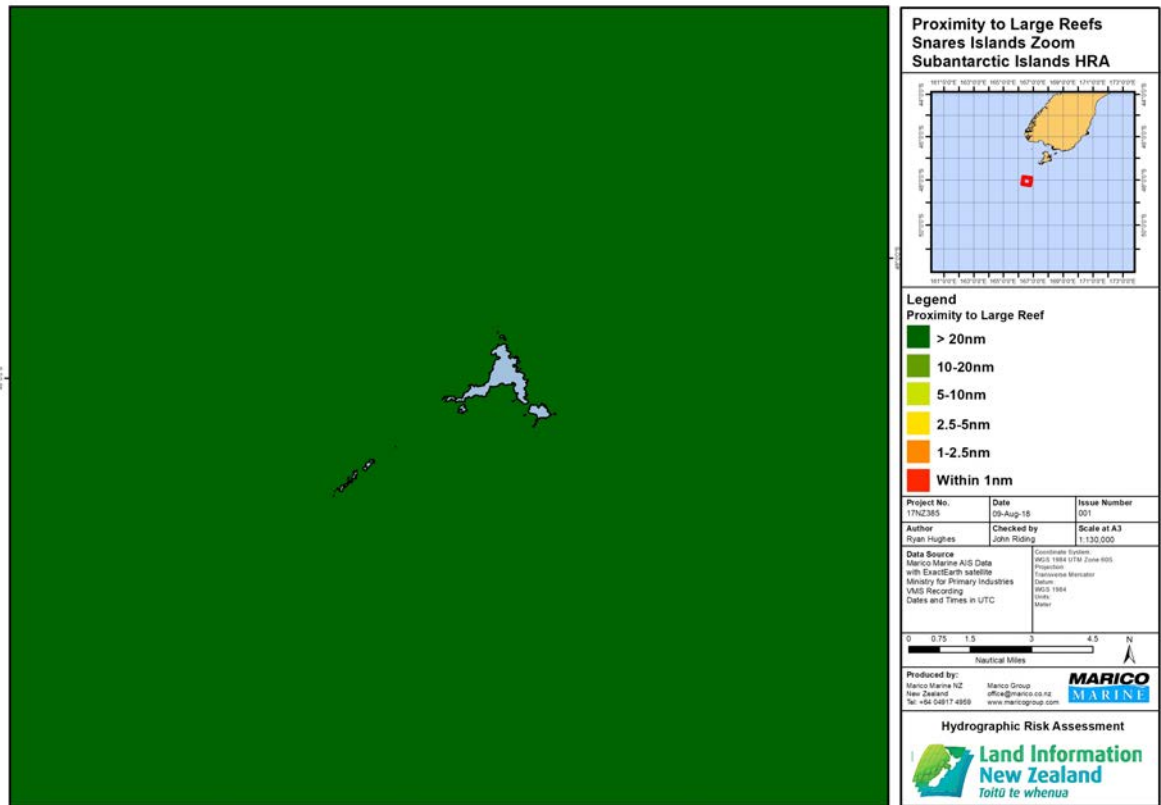


Figure Reference: 17NZ385_RMC_PLR_Snares_Zoom_v1

Figure 159, Proximity to Large Reef, Snares Islands Zoom

3.1.7 ENVIRONMENTAL PROTECTION

3.1.7.1 WORLD HERITAGE SITE

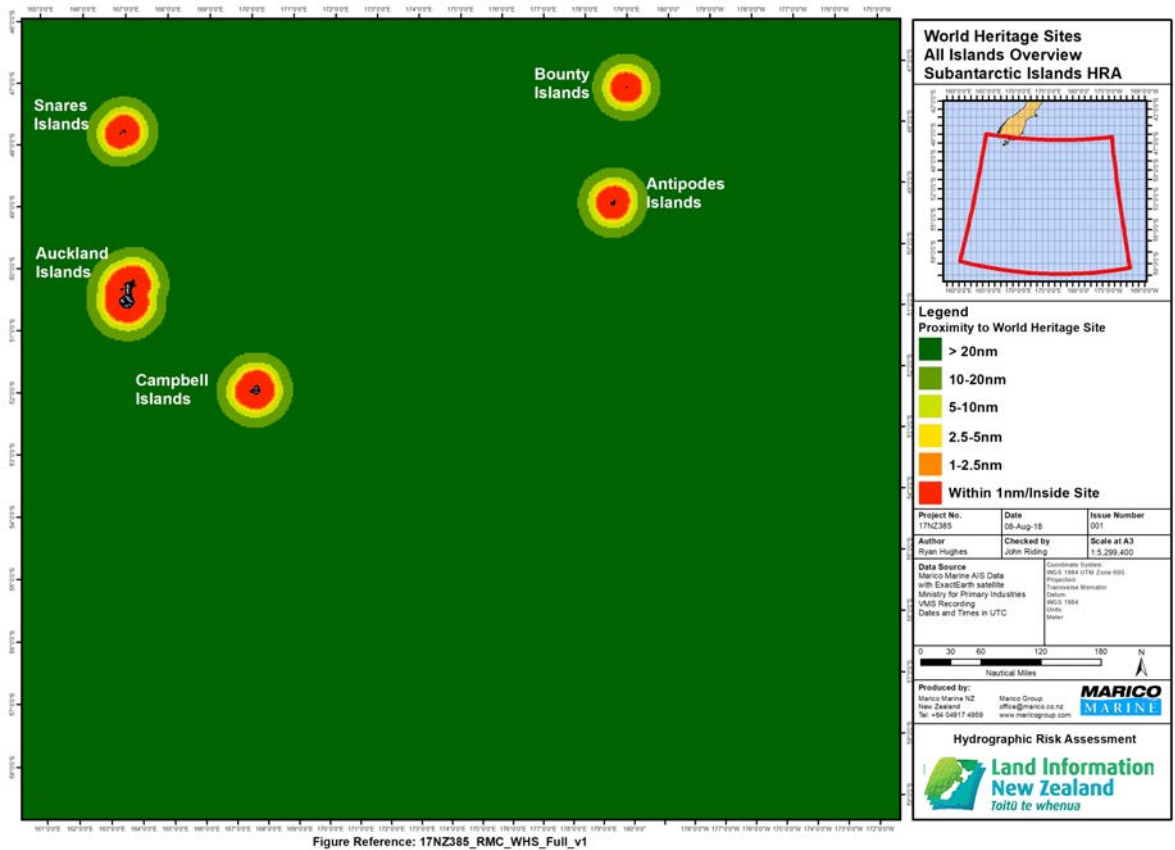


Figure Reference: 17NZ385_RMC_WHS_Full_v1

Figure 160, World Heritage Sites, All Islands Overview

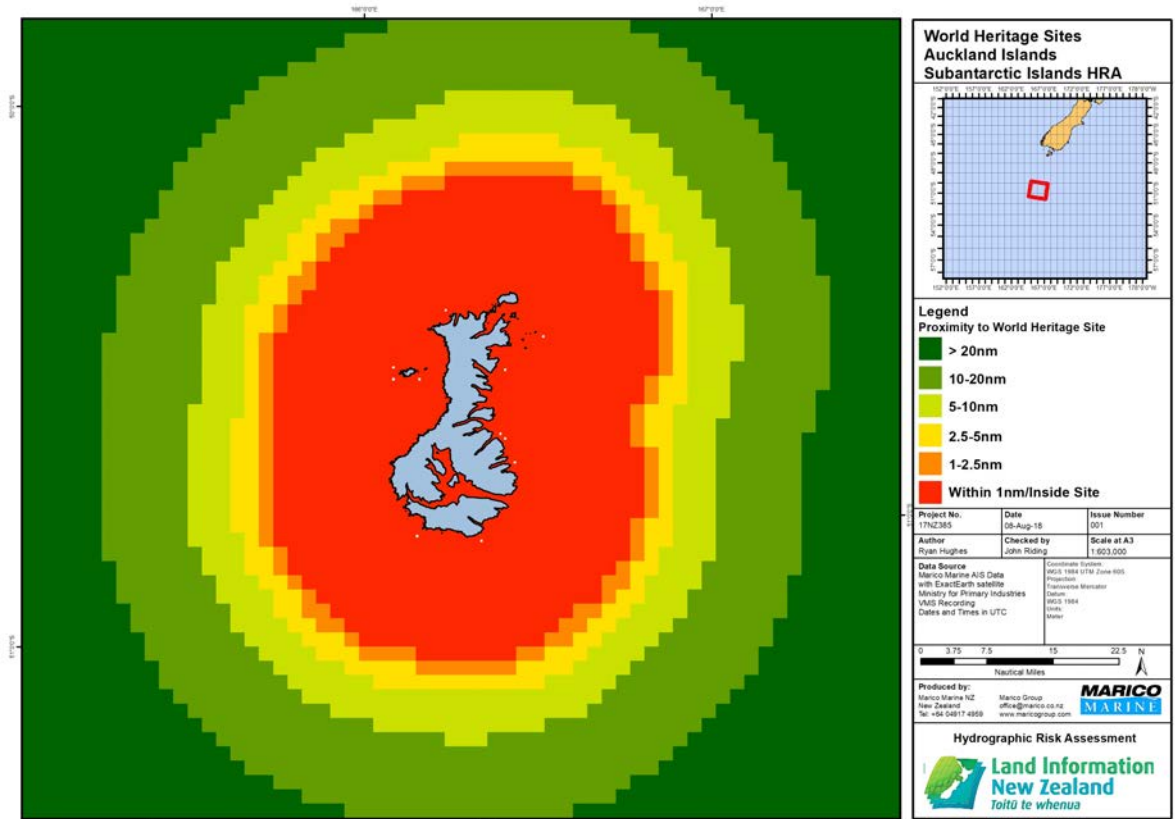


Figure Reference: 17NZ385_RMC_WHS_Auckland_v1

Figure 161, World Heritage Sites, Auckland Islands

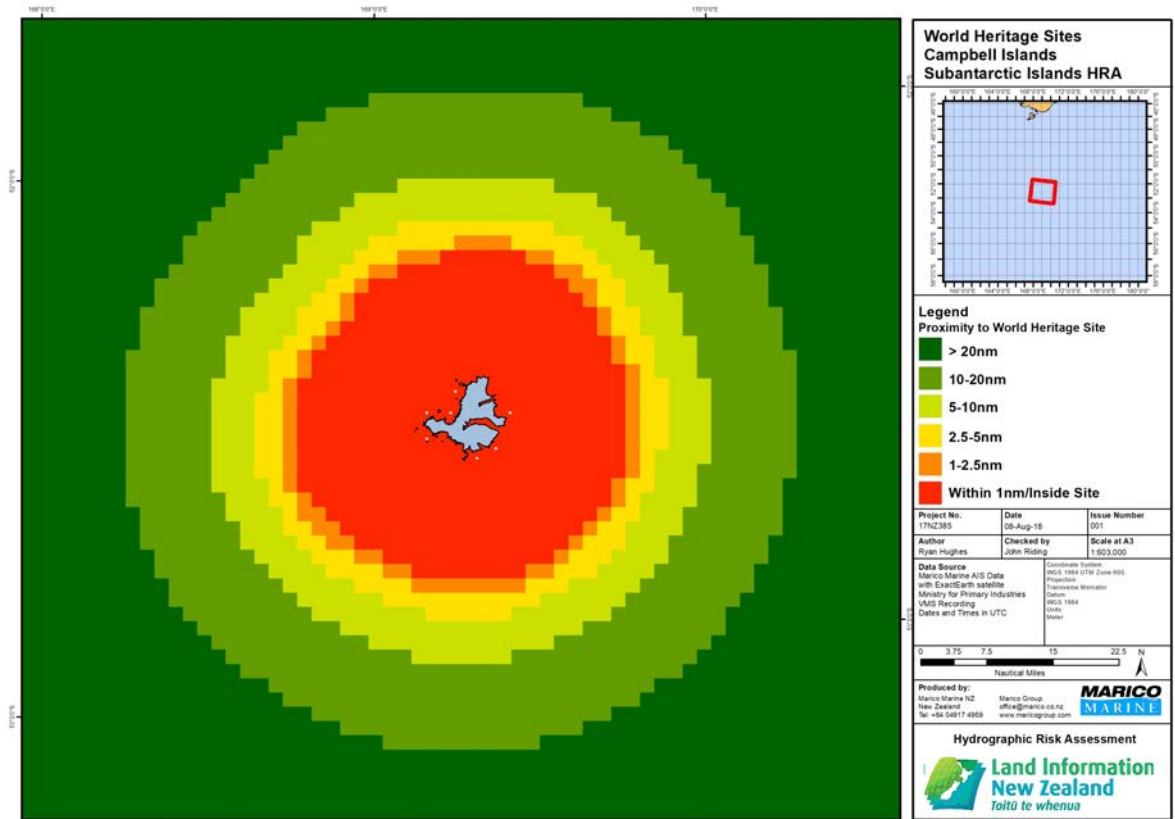


Figure Reference: 17NZ385_RMC_WHS_Campbell_v1

Figure 162, World Heritage Sites, Campbell Islands

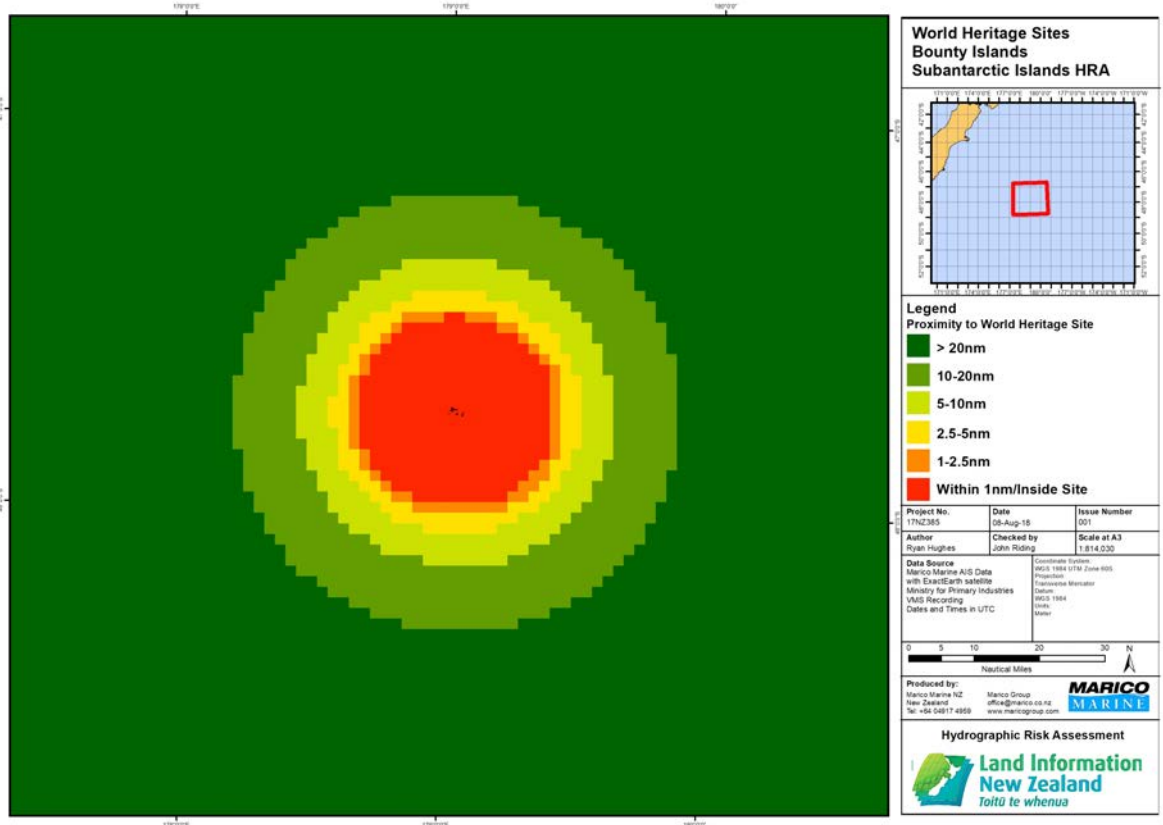


Figure Reference: 17NZ385_RMC_WHS_Bounty_v1

Figure 163, World Heritage Sites, Bounty Islands

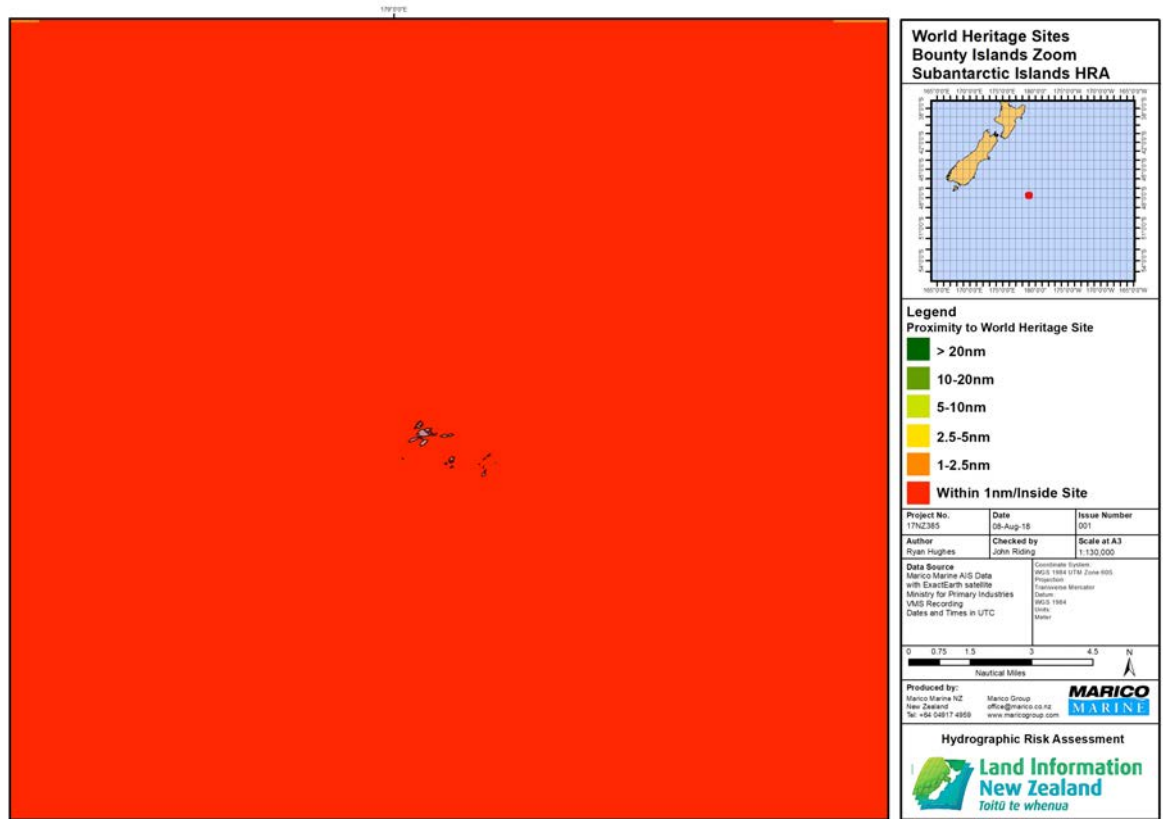


Figure Reference: 17NZ385_RMC_WHS_Bounty_Zoom_v1

Figure 164, World Heritage Sites, Bounty Islands Zoom

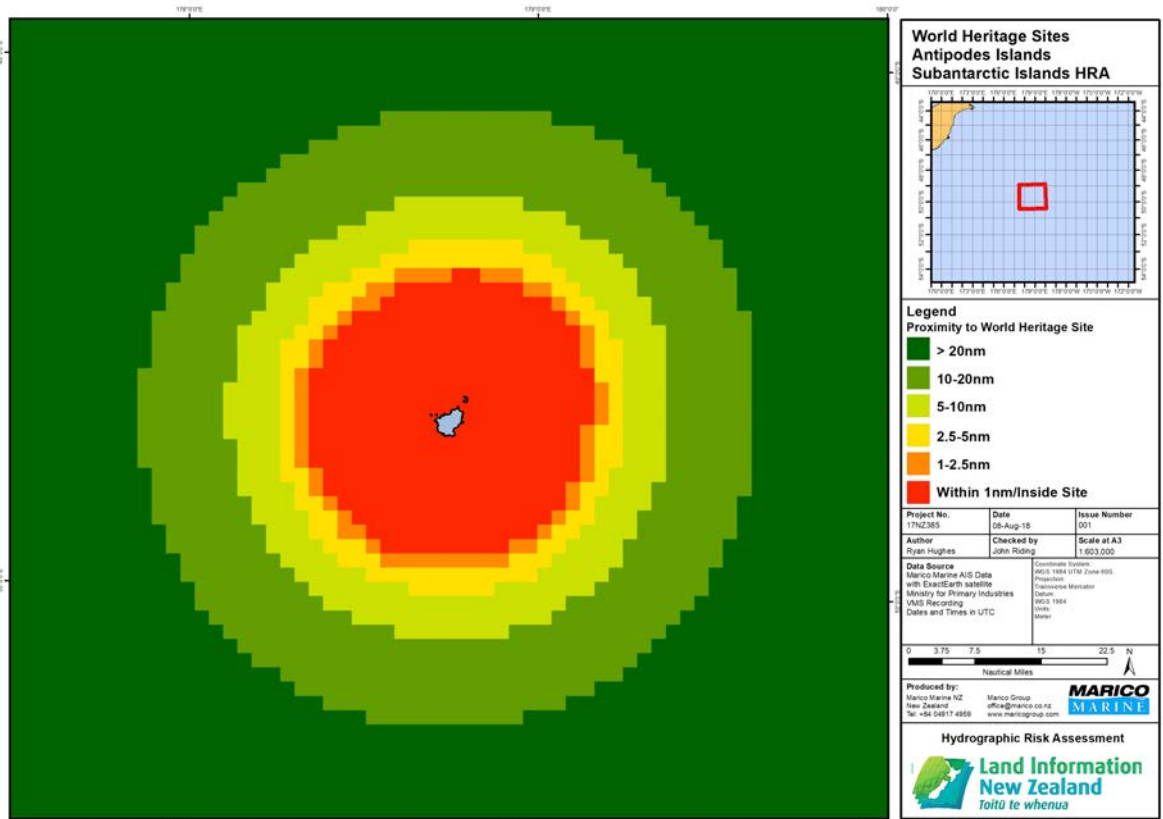


Figure Reference: 17NZ385_RMC_WHS_Antipodes_v2

Figure 165, World Heritage Sites, Antipodes Islands

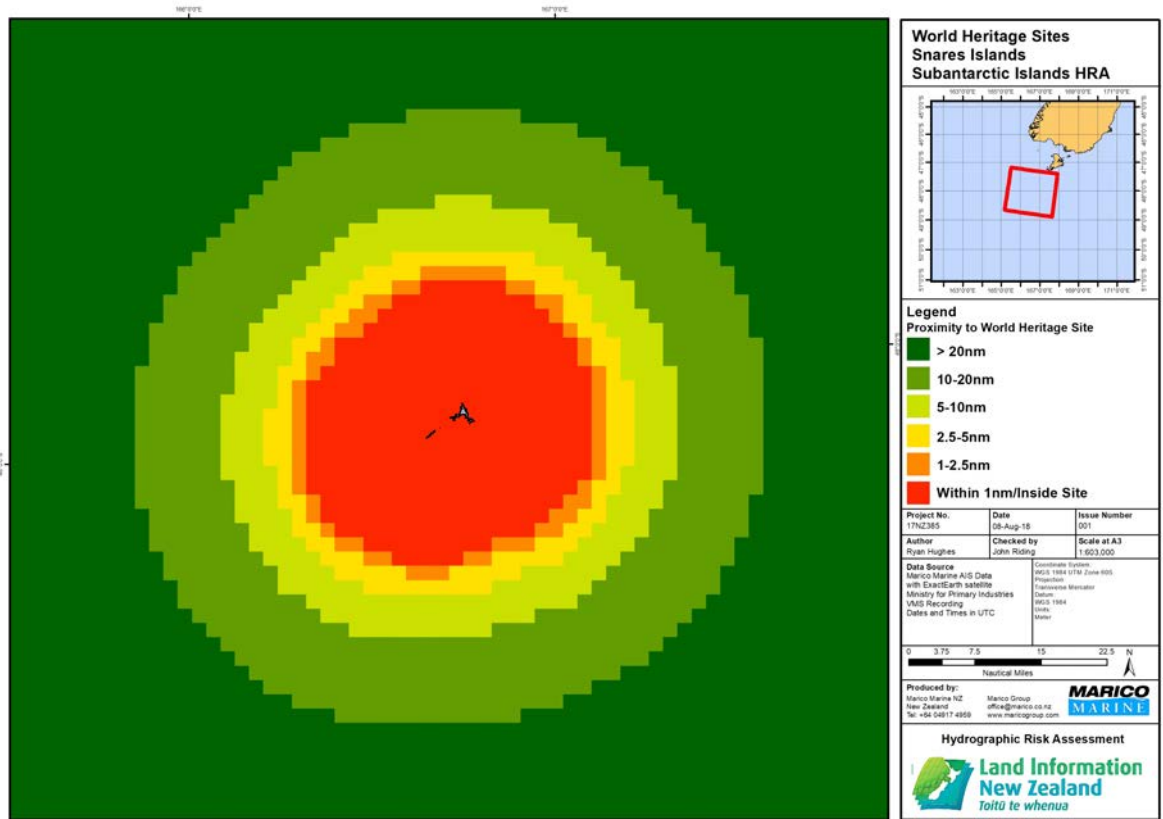


Figure Reference: 17NZ385_RMC_WHS_Snares_v1

Figure 166, World Heritage Sites, Snares Islands

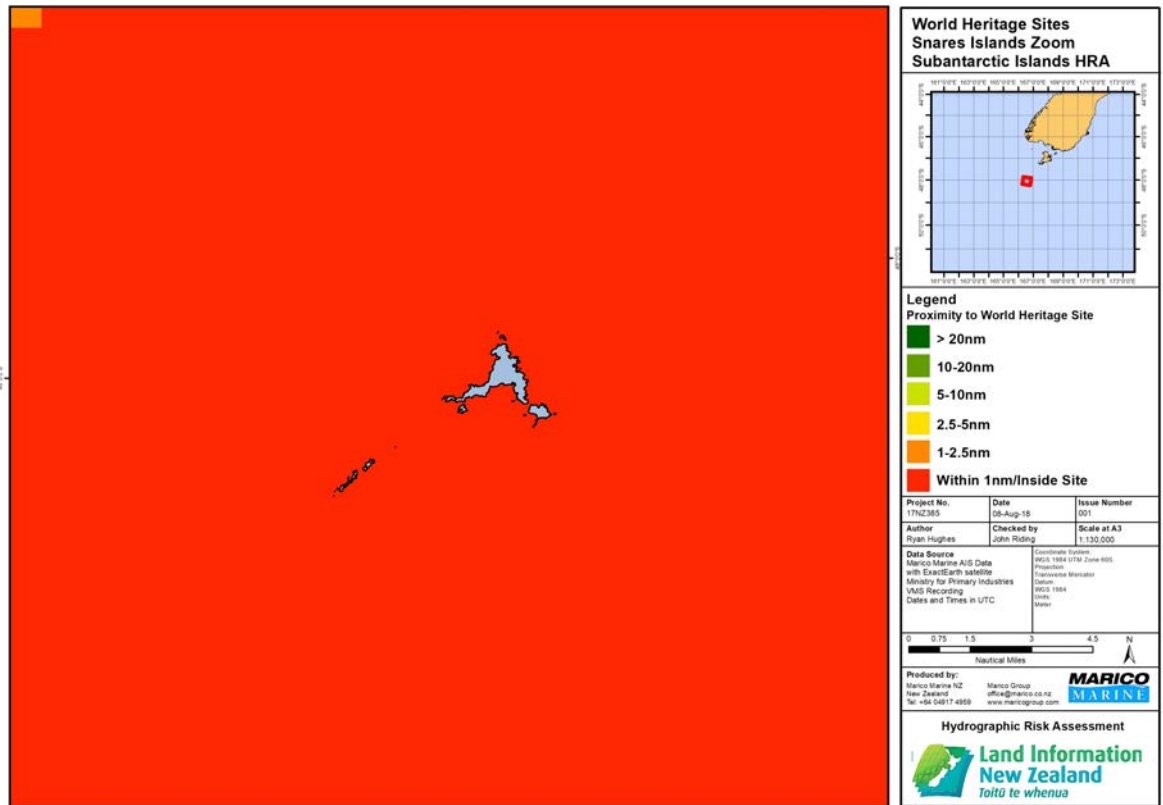


Figure Reference: 17NZ385_RMC_WHS_Snares_Zoom_v1

Figure 167, World Heritage Sites, Snares Islands Zoom

3.1.7.2 VESSEL ACCESS RESTRICTIONS

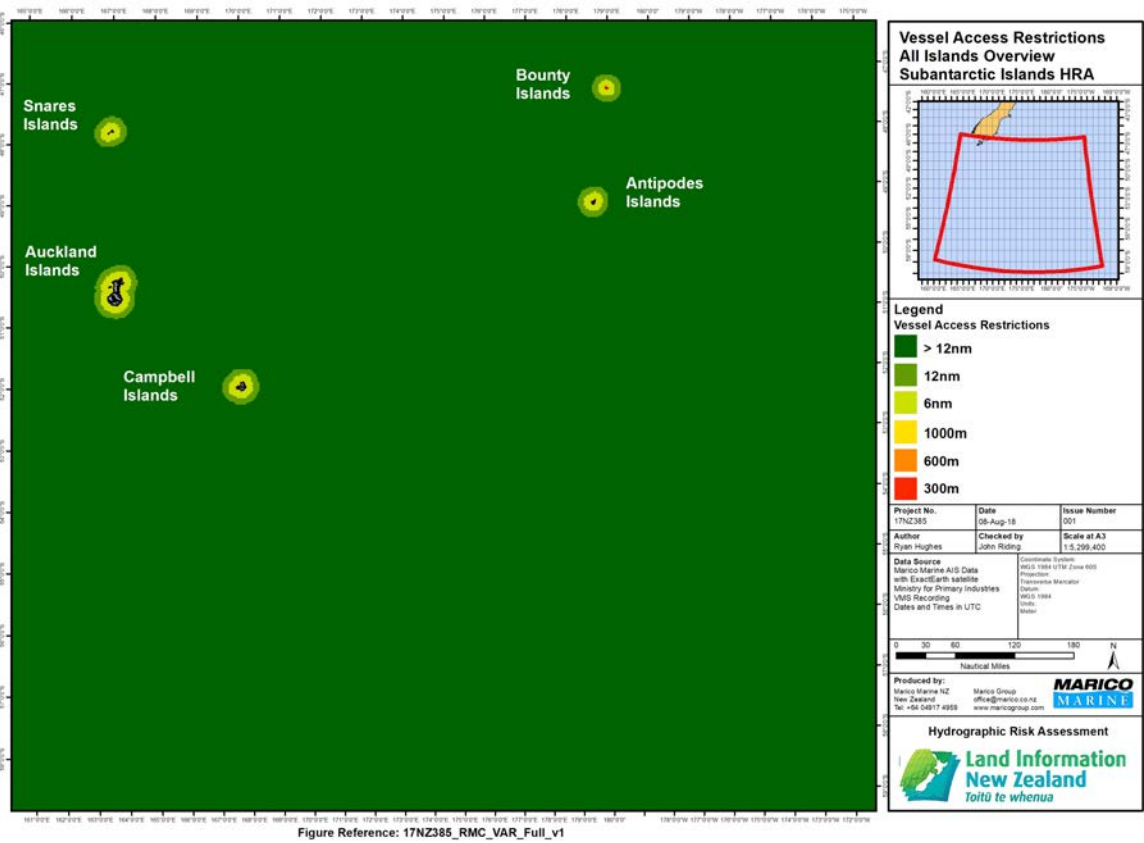


Figure 168, Vessel Access Restrictions, All Islands Overview

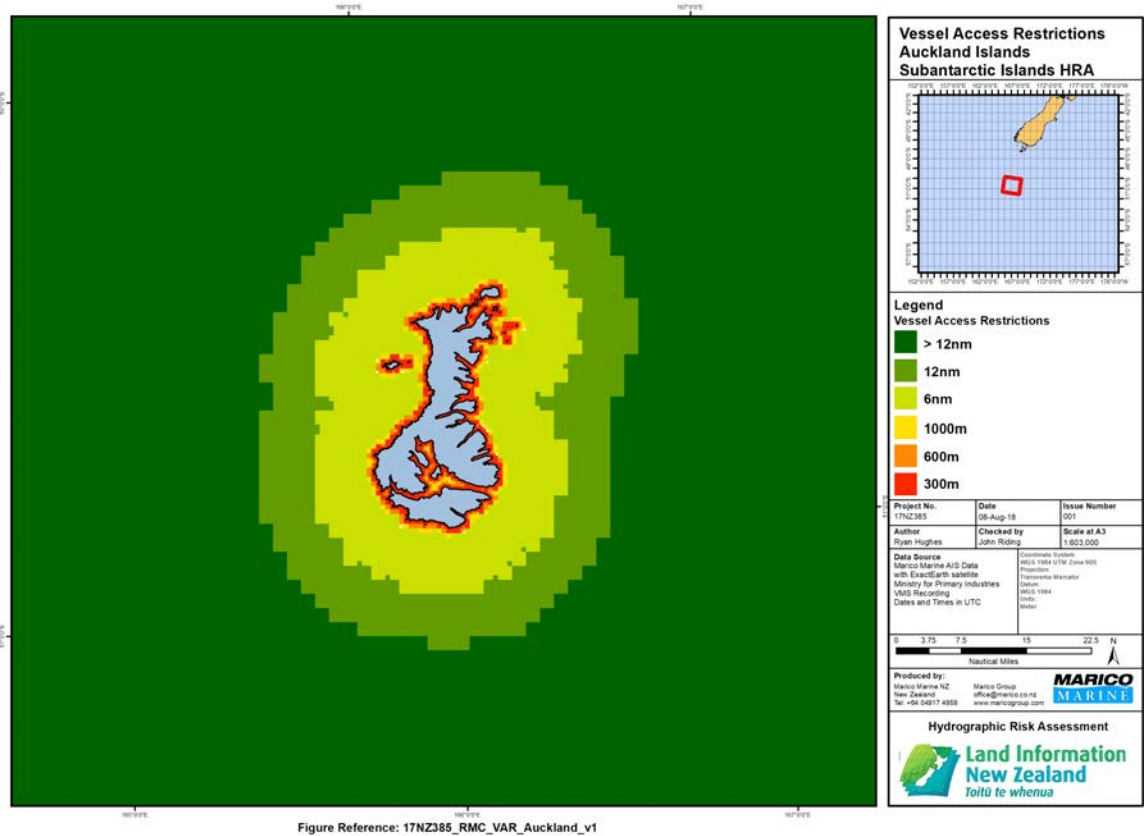


Figure 169, Vessel Access Restrictions, Auckland Islands

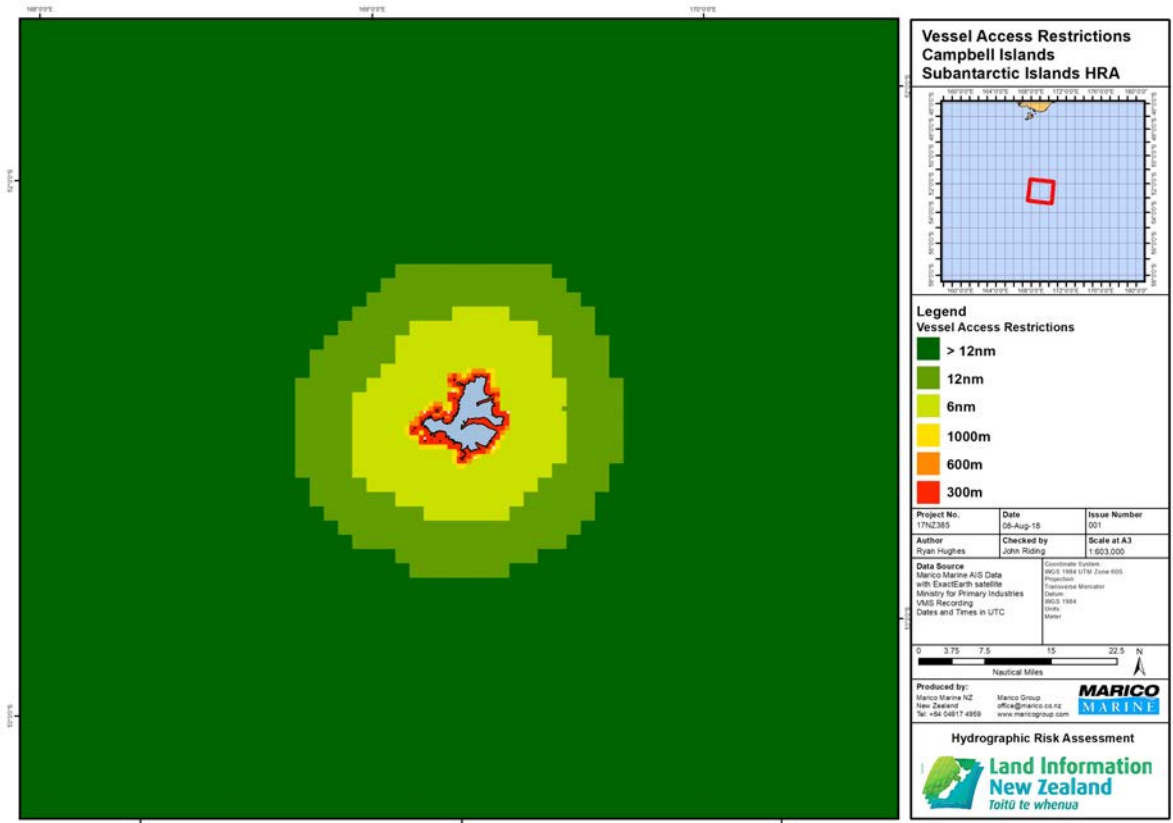


Figure Reference: 17NZ385_RMC_VAR_Campbell_v1

Figure 170, Vessel Access Restrictions, Campbell Islands

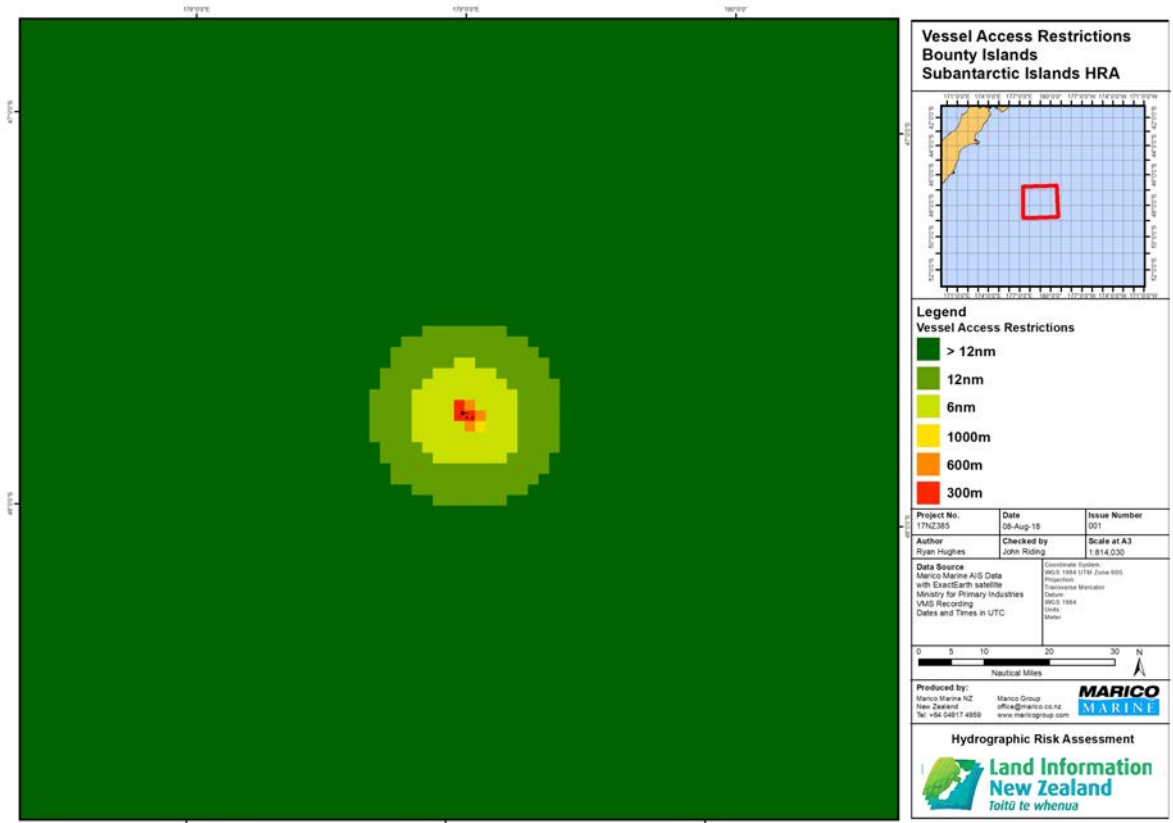


Figure Reference: 17NZ385_RMC_VAR_Bounty_v1

Figure 171, Vessel Access Restrictions, Bounty Islands

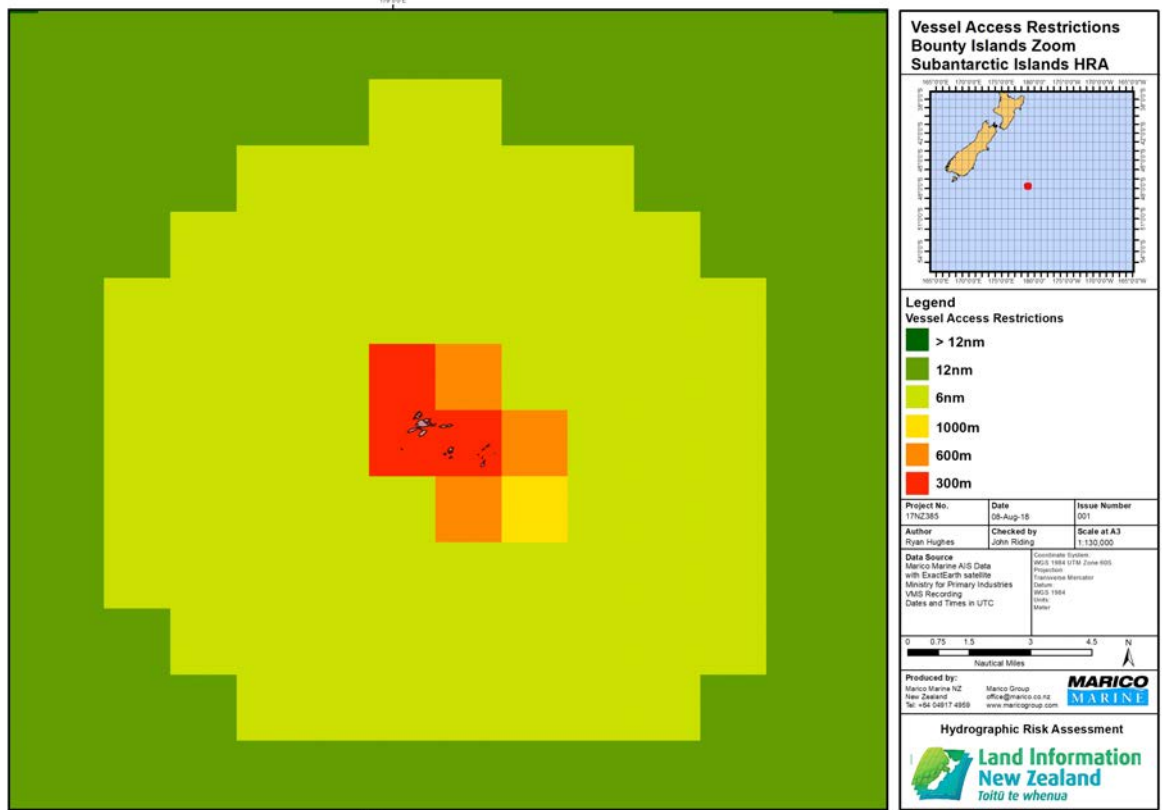


Figure Reference: 17NZ385_RMC_VAR_Bounty_Zoom_v1

Figure 172, Vessel Access Restrictions, Bounty Islands Zoom

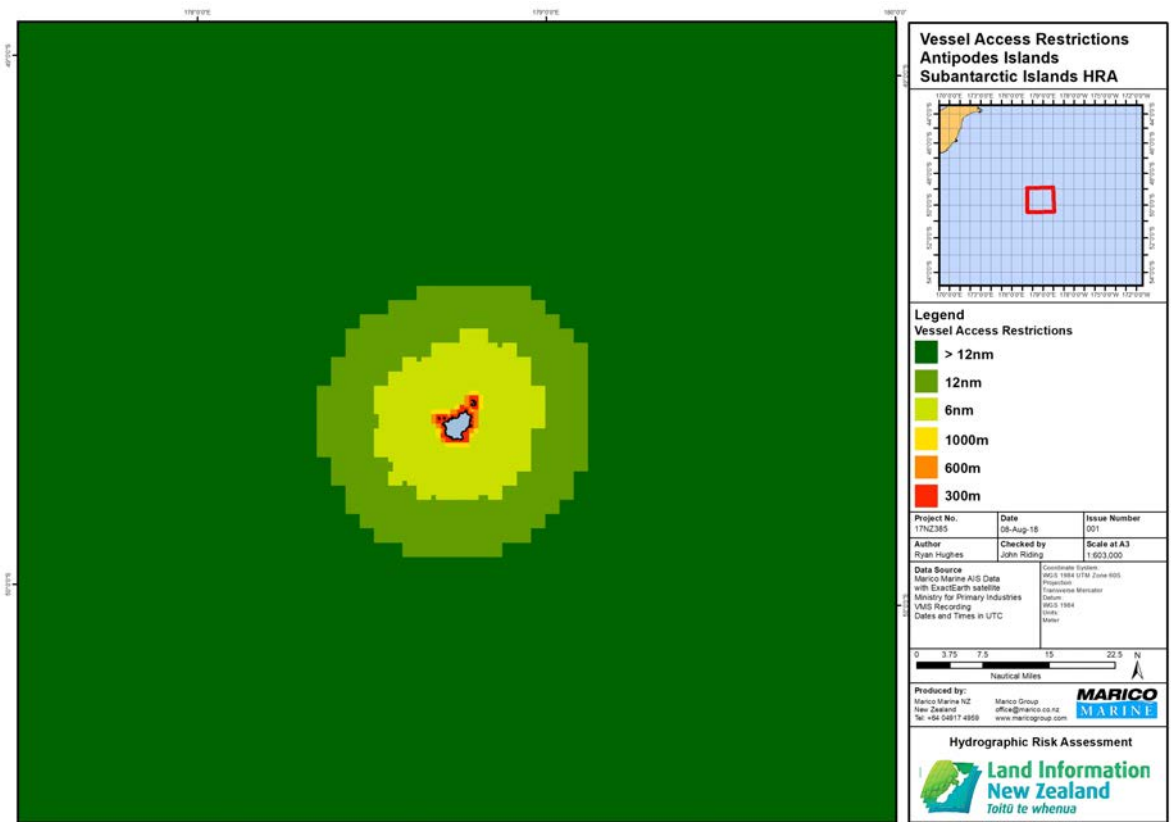


Figure Reference: 17NZ385_RMC_VAR_Antipodes_v1

Figure 173, Vessel Access Restrictions, Antipodes Islands

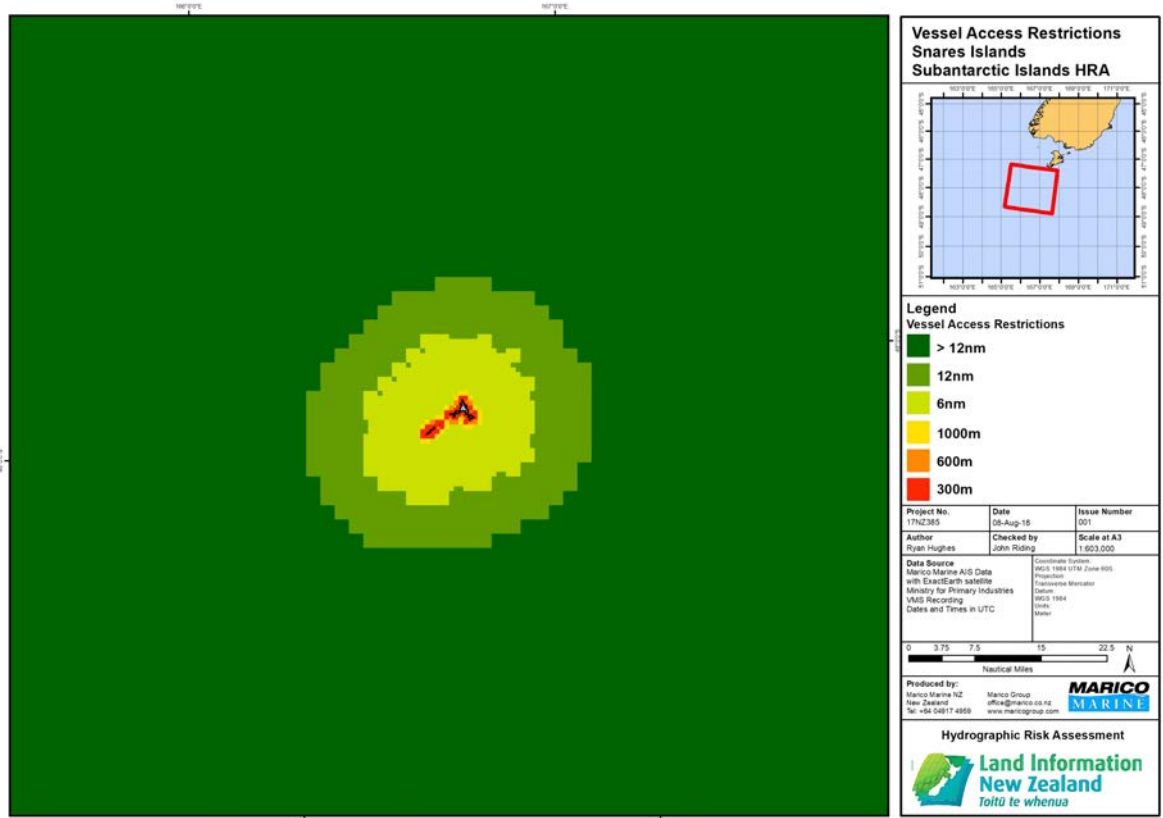


Figure Reference: 17NZ385_RMC_VAR_Snares_v1

Figure 174, Vessel Access Restrictions, Snares Islands

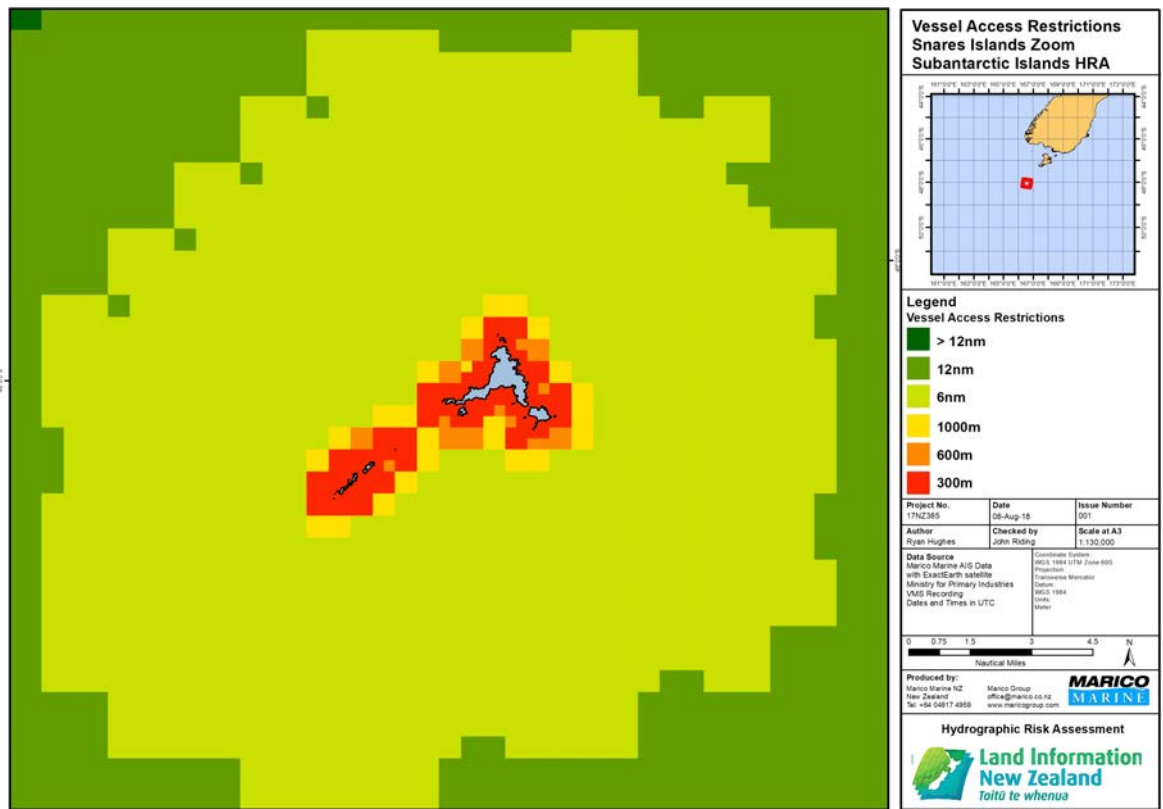


Figure Reference: 17NZ385_RMC_VAR_Snares_Zoom_v1

Figure 175, Vessel Access Restrictions, Snares Islands Zoom

3.1.7.3 PROXIMITY TO MARINE PROTECTED AREA

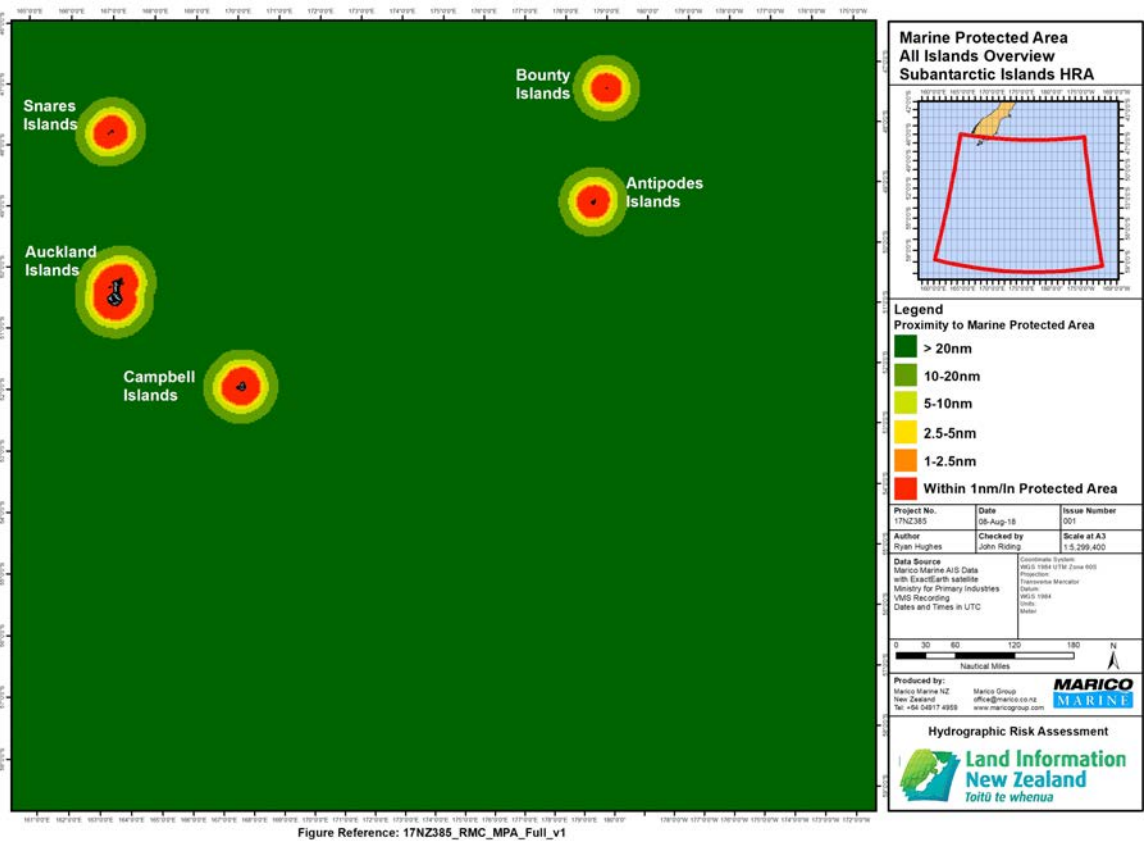


Figure 176, Proximity to Marine Protected Areas, All Islands Overview

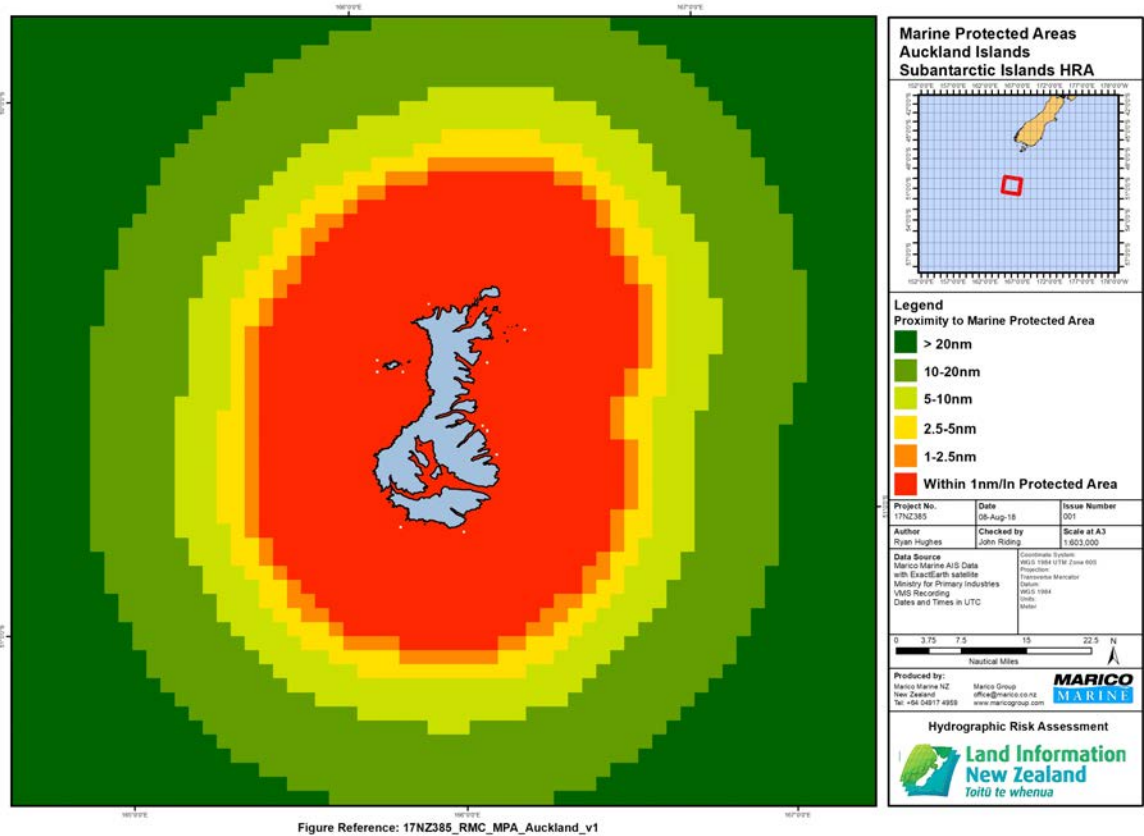


Figure 177, Proximity to Marine Protected Areas, Auckland Islands

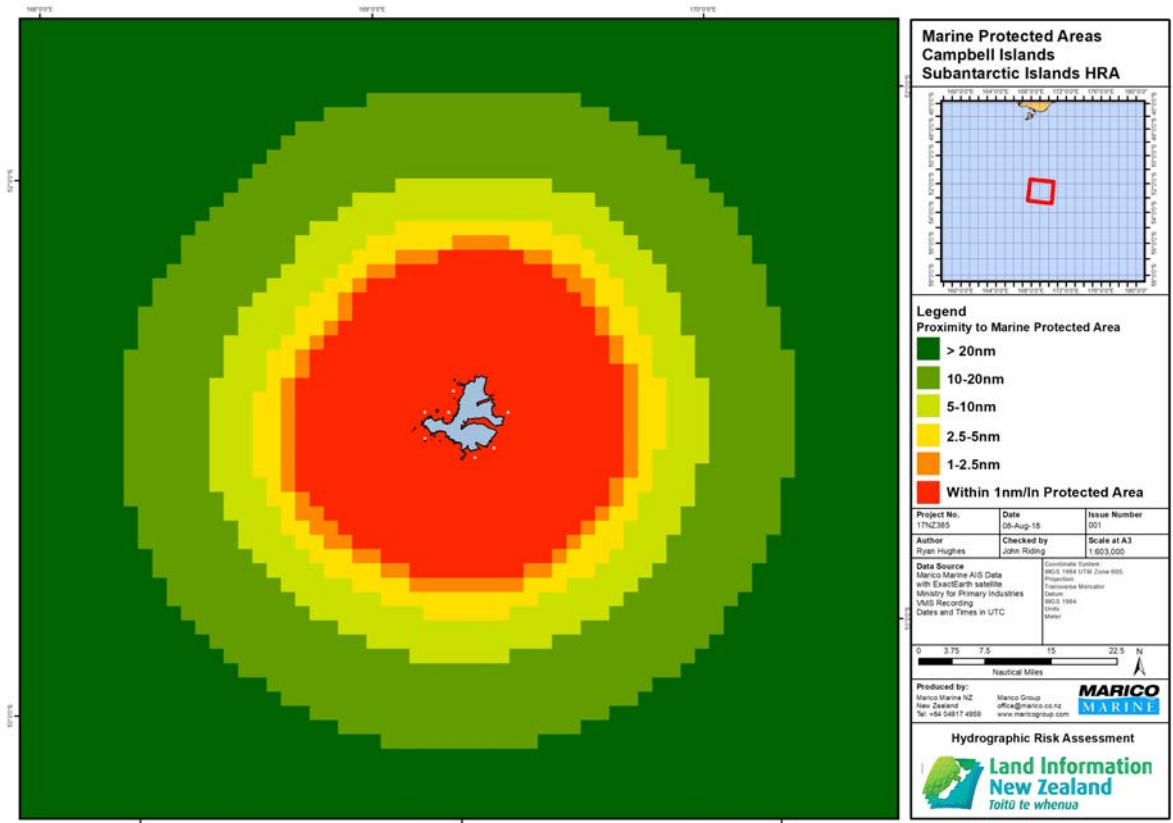


Figure Reference: 17NZ385_RMC_MPA_Campbell_v1

Figure 178, Proximity to Marine Protected Areas, Campbell Islands

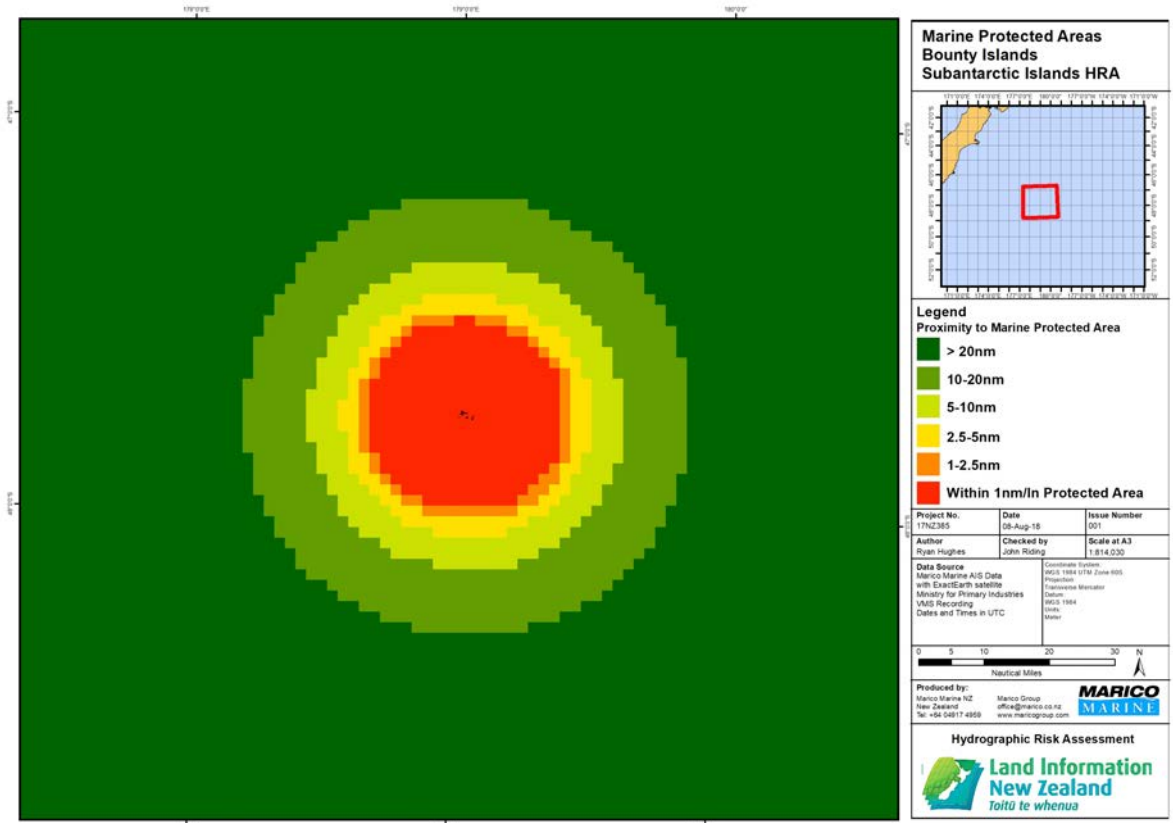


Figure Reference: 17NZ385_RMC_MPA_Bounty_v1

Figure 179, Proximity to Marine Protected Areas, Bounty Islands

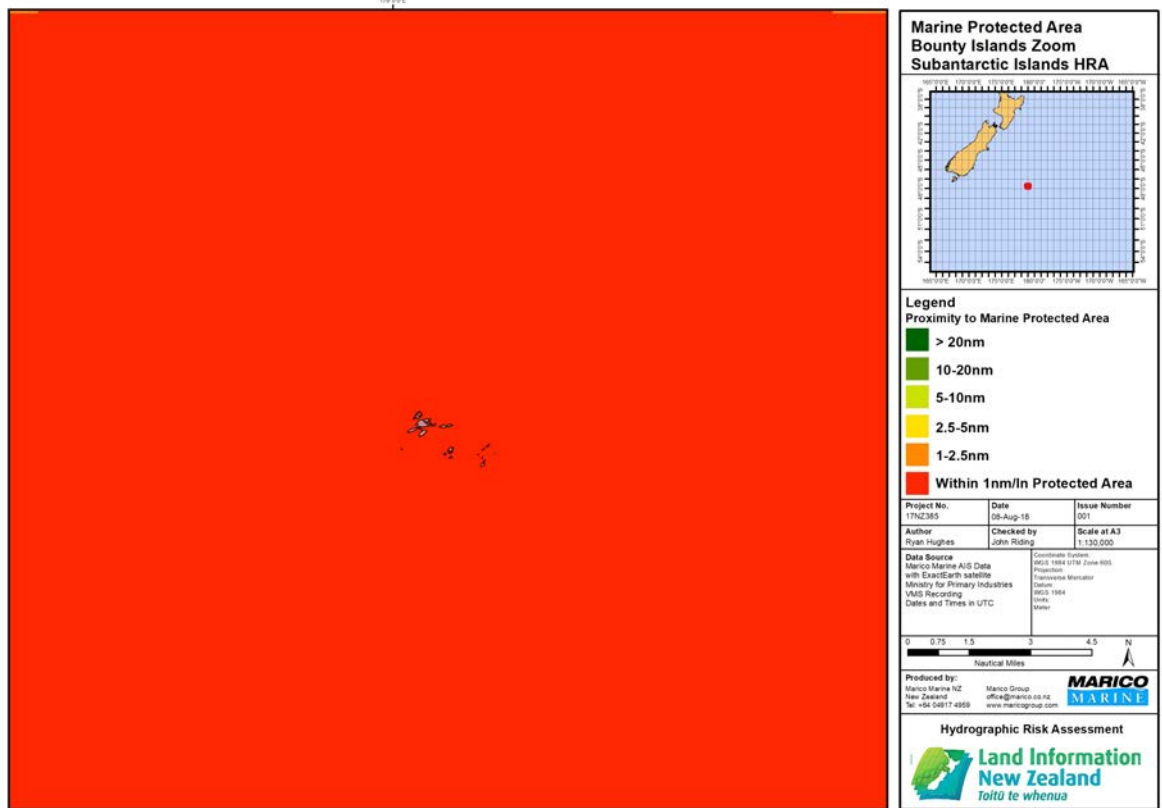


Figure Reference: 17NZ385_RMC_MPA_Bounty_Zoom_v1

Figure 180, Proximity to Marine Protected Areas, Bounty Islands Zoom

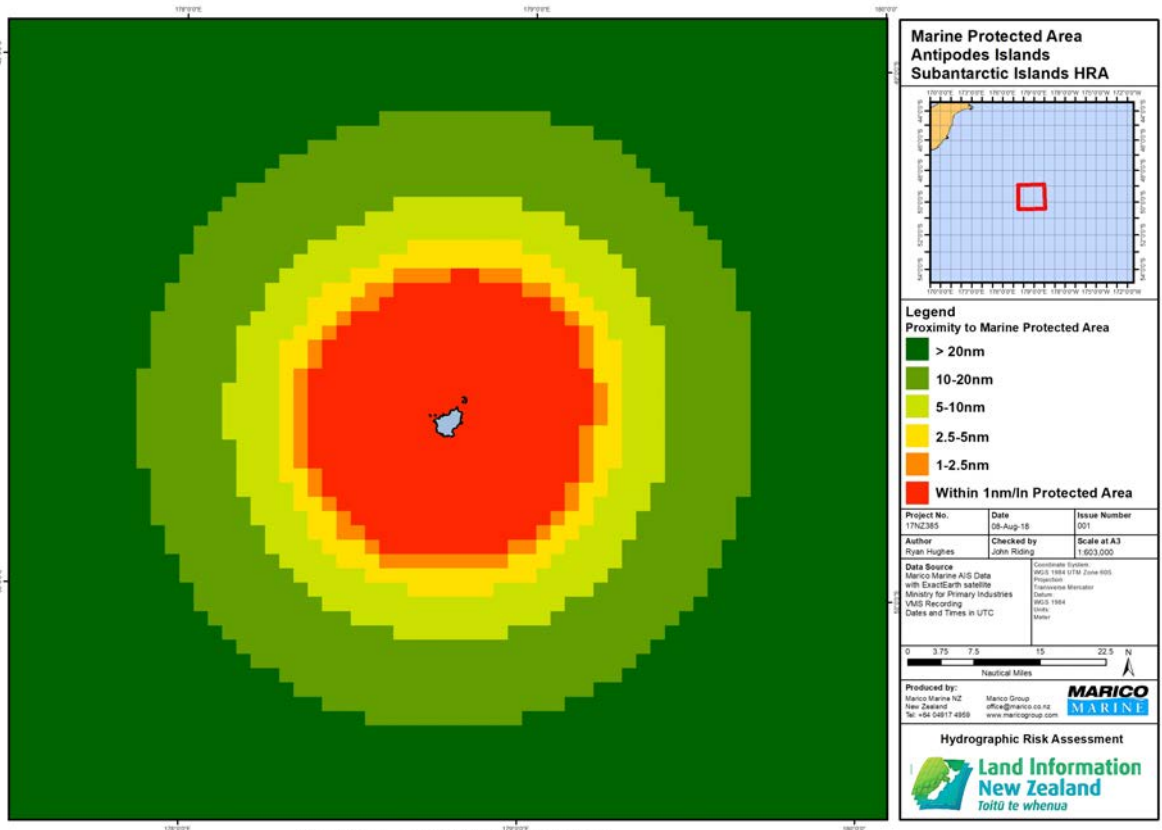


Figure Reference: 17NZ385_RMC_MPA_Antipodes_v1

Figure 181, Proximity to Marine Protected Areas, Antipodes Islands

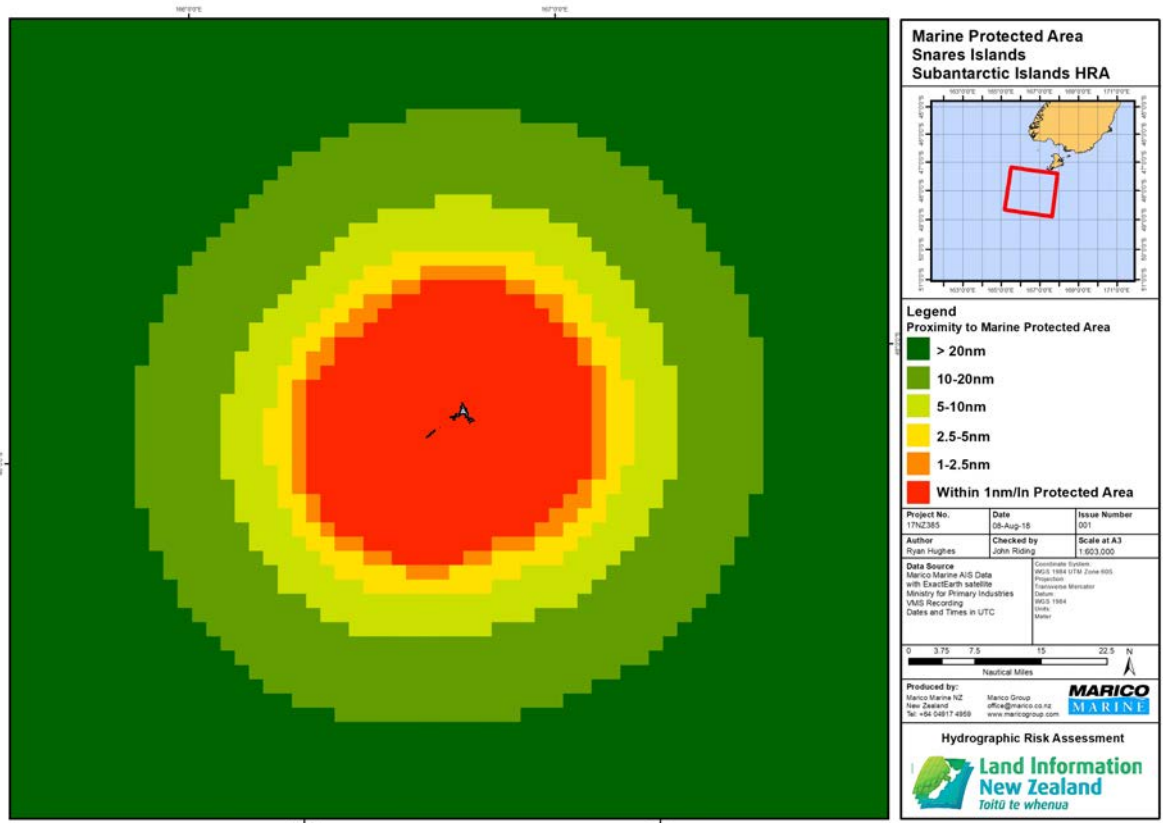


Figure Reference: 17NZ385_RMC_MPA_Snares_v1

Figure 182, Proximity to Marine Protected Areas, Snares Islands

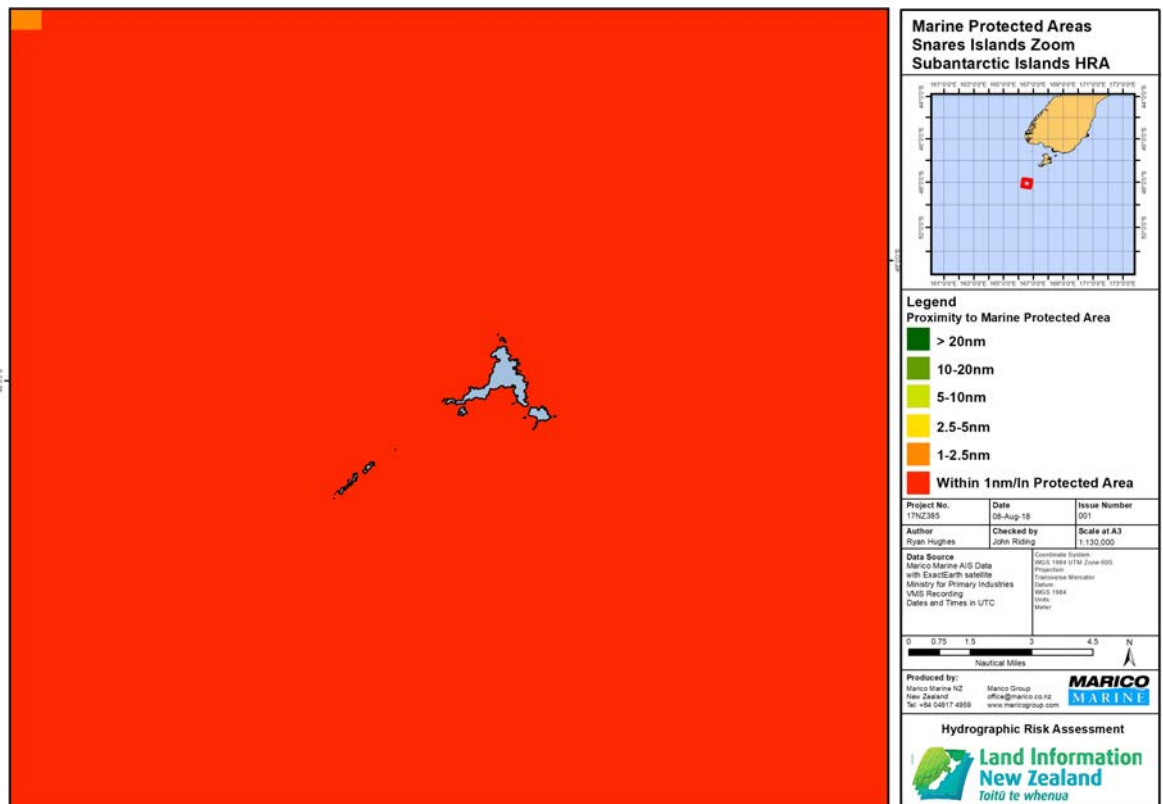


Figure Reference: 17NZ385_RMC_MPA_Snares_Zoom_v1

Figure 183, Proximity to Marine Protected Areas, Snares Islands Zoom

3.2 ECONOMICALLY SENSITIVE AREAS (ECONOMIC IMPACT ONLY)

3.2.1 FISHING GROUNDS

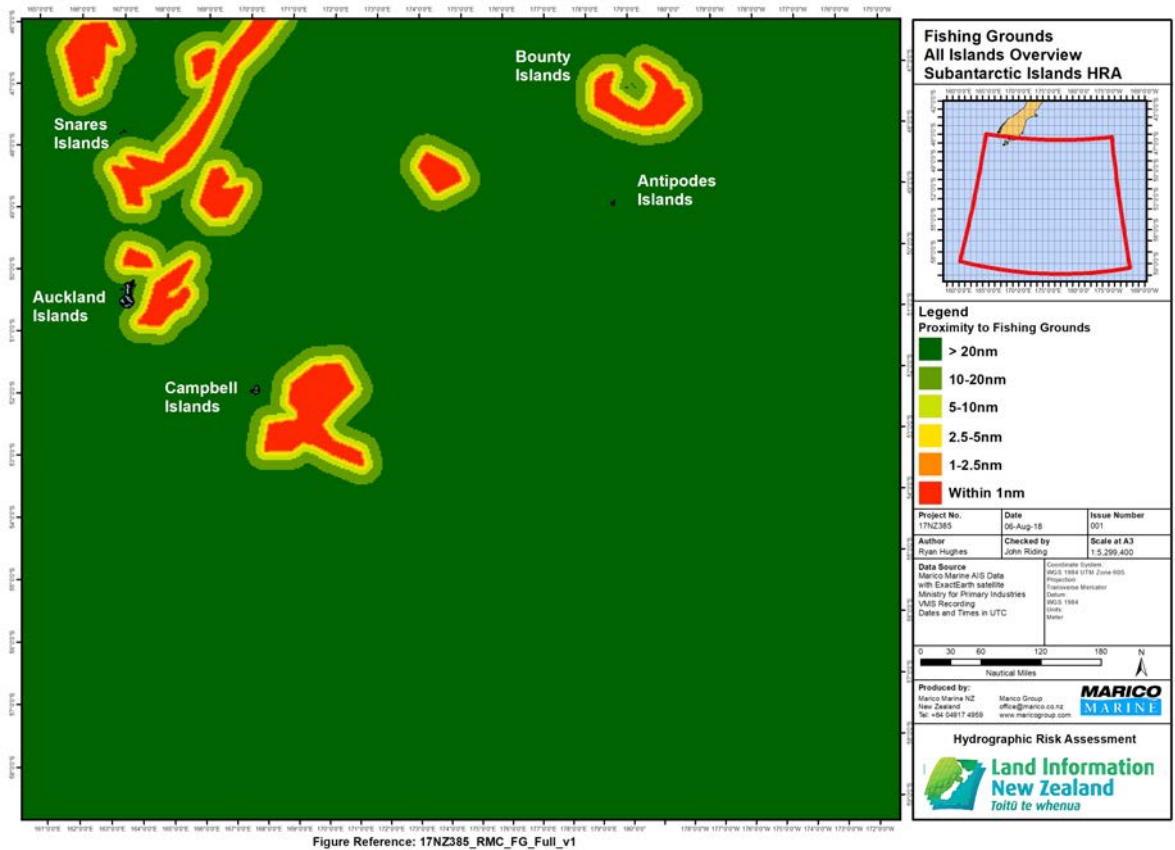


Figure Reference: 17NZ385_RMC_FG_Full_v1

Figure 184, Fishing Grounds, All Islands Overview

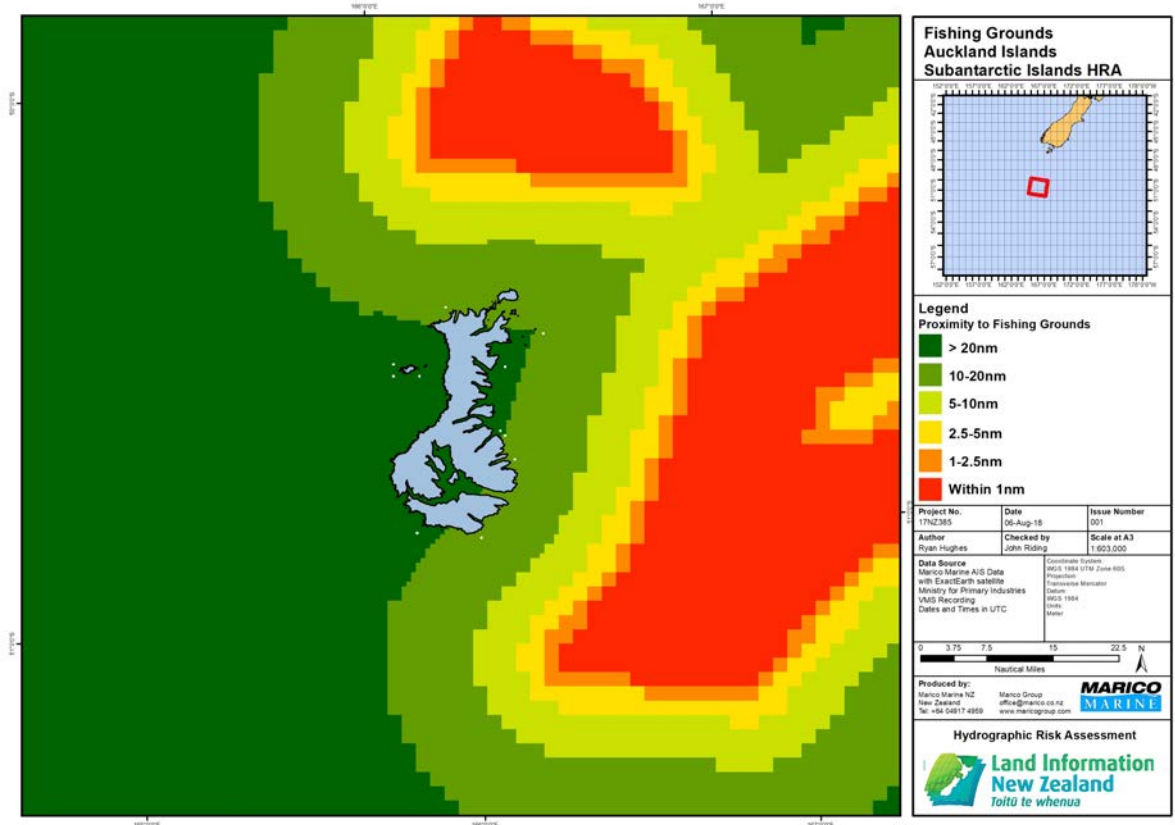


Figure Reference: 17NZ385_RMC_FG_Auckland_v1

Figure 185, Fishing Grounds, Auckland Islands

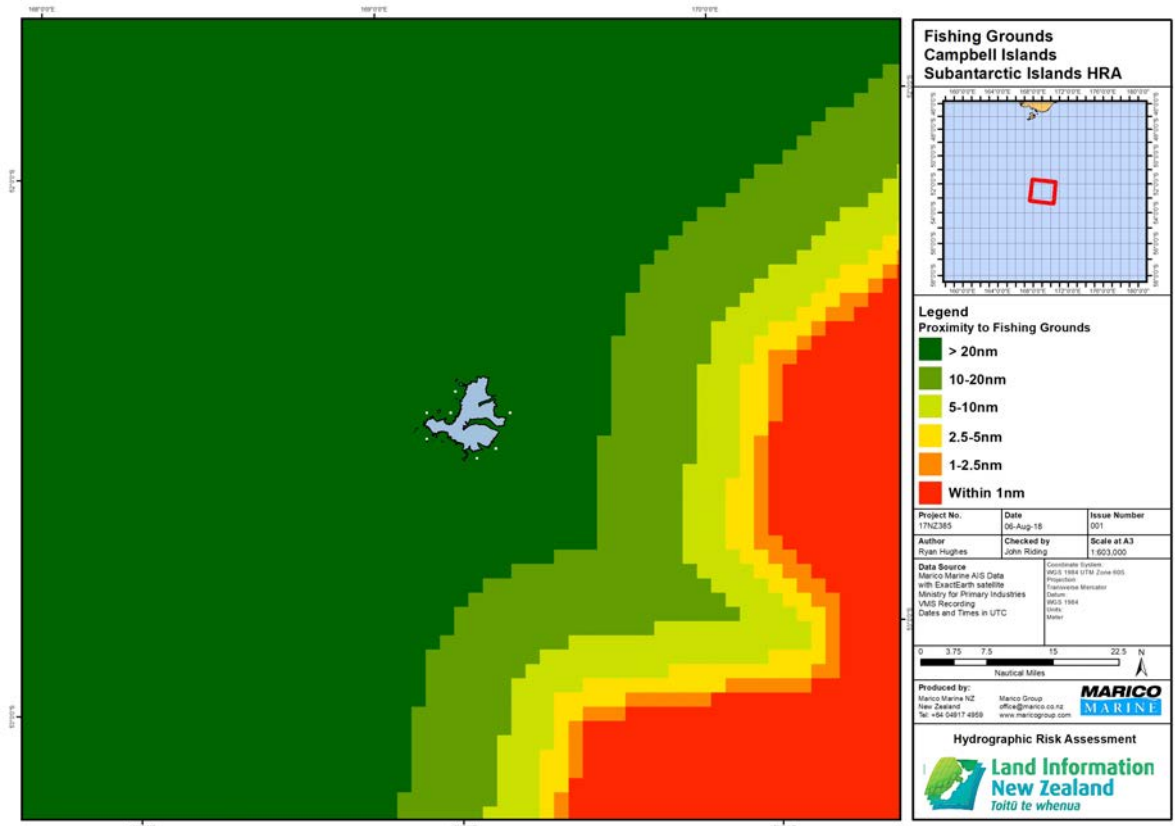


Figure Reference: 17NZ385_RMC_FG_Campbell_v1

Figure 186, Fishing Grounds, Campbell Islands

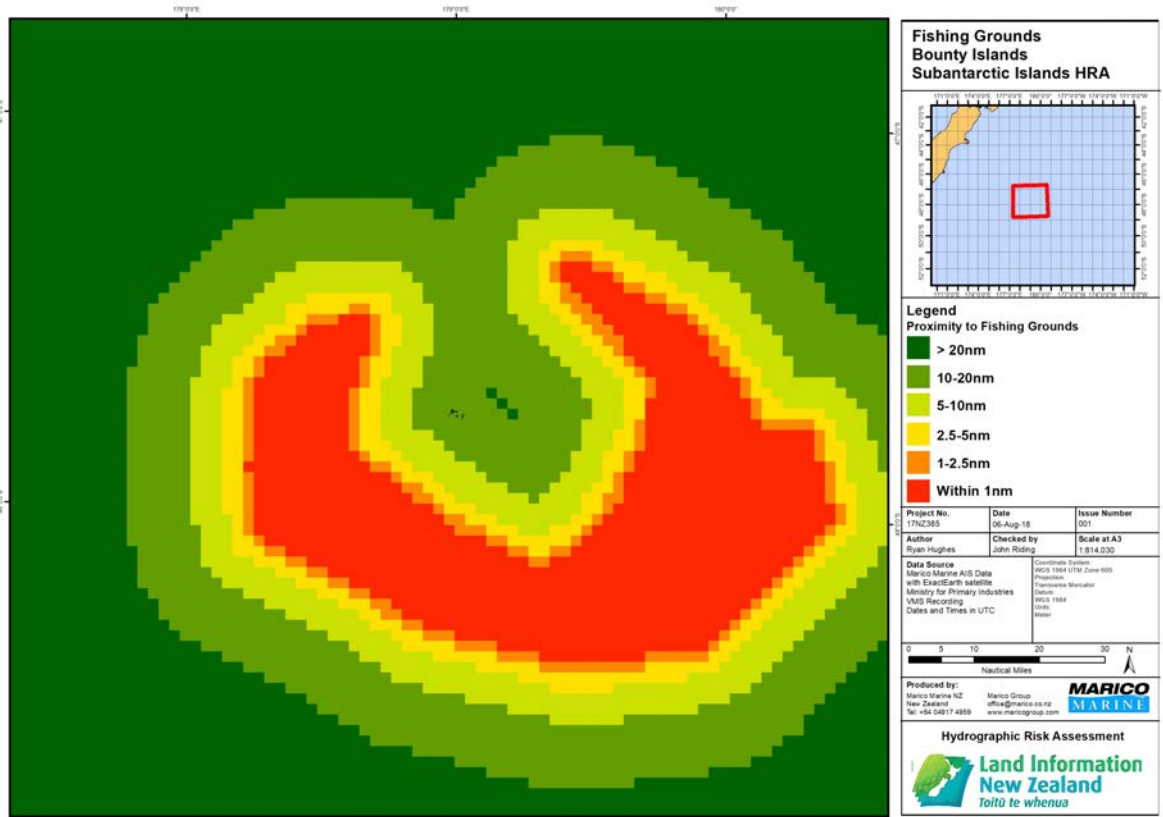


Figure Reference: 17NZ385_RMC_FG_Bounty_v1

Figure 187, Fishing Grounds, Bounty Islands

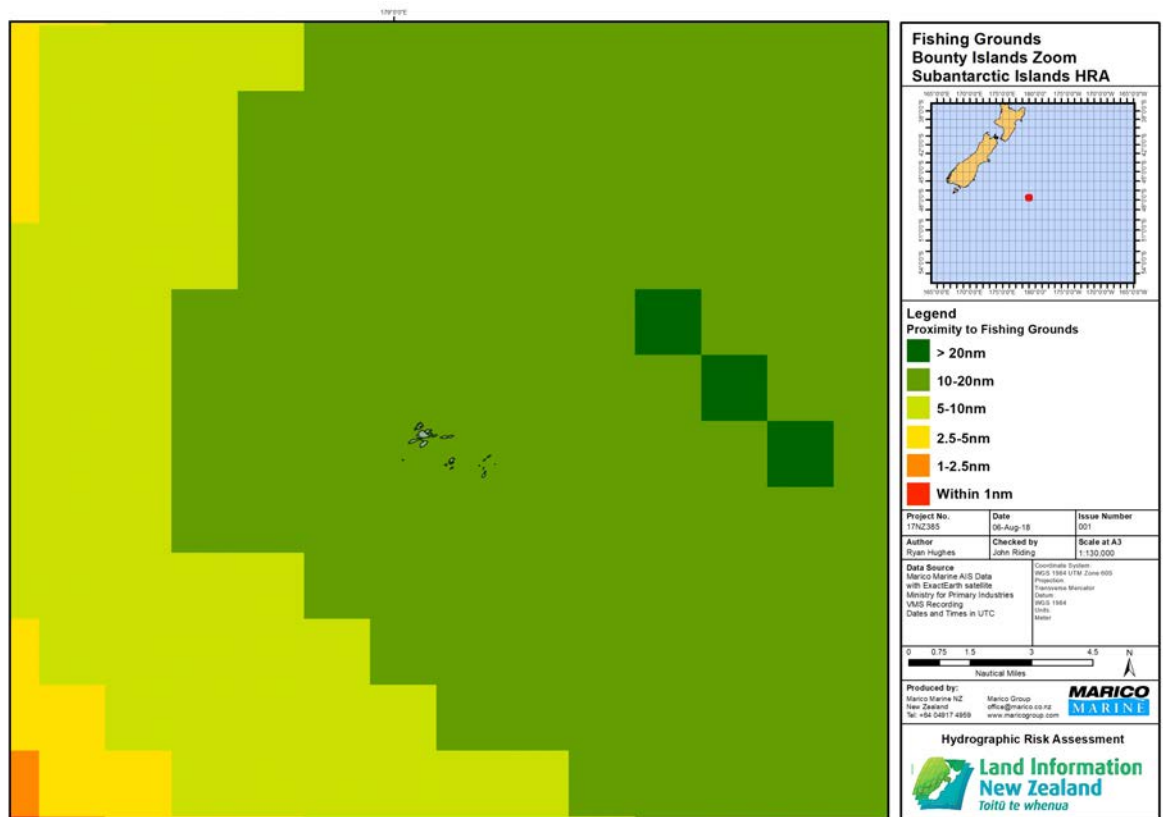


Figure Reference: 17NZ385_RMC_FG_Bounty_Zoom_v1

Figure 188, Fishing Grounds, Bounty Islands Zoom

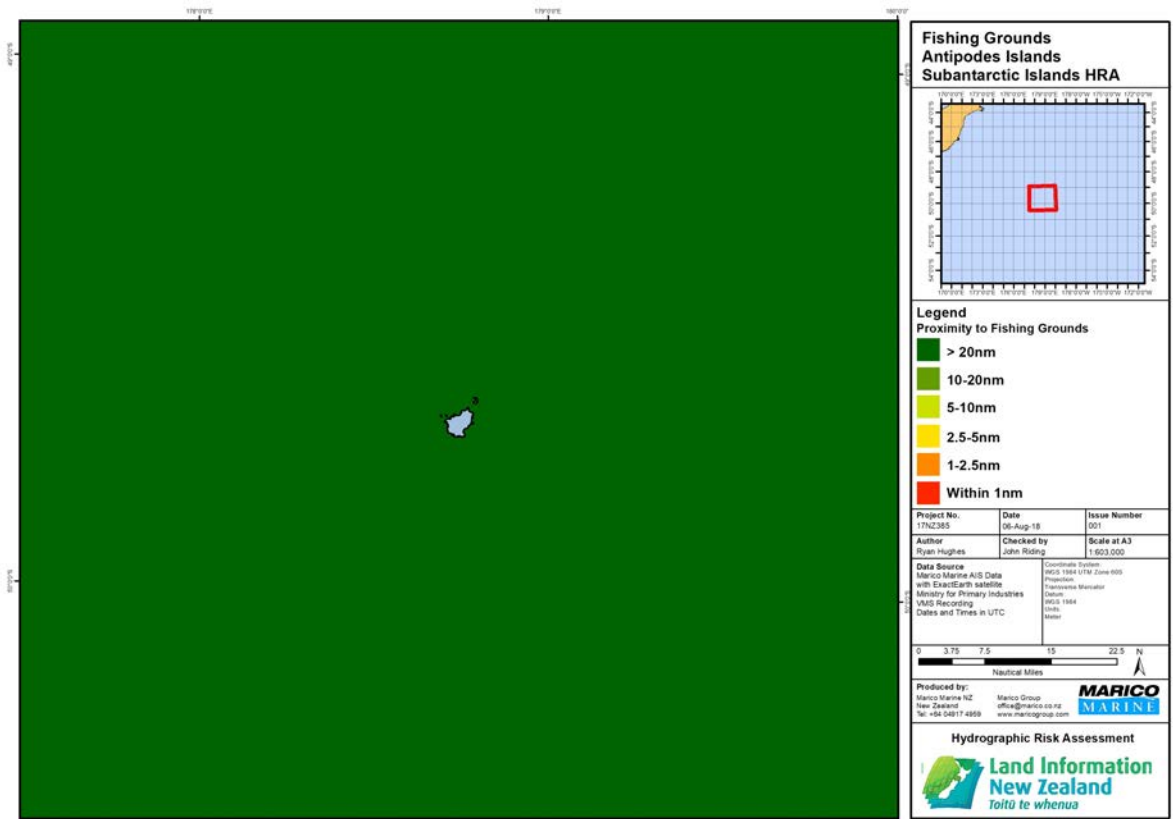


Figure Reference: 17NZ385_RMC_FG_Antipodes_v1

Figure 189, Fishing Grounds, Antipodes Islands

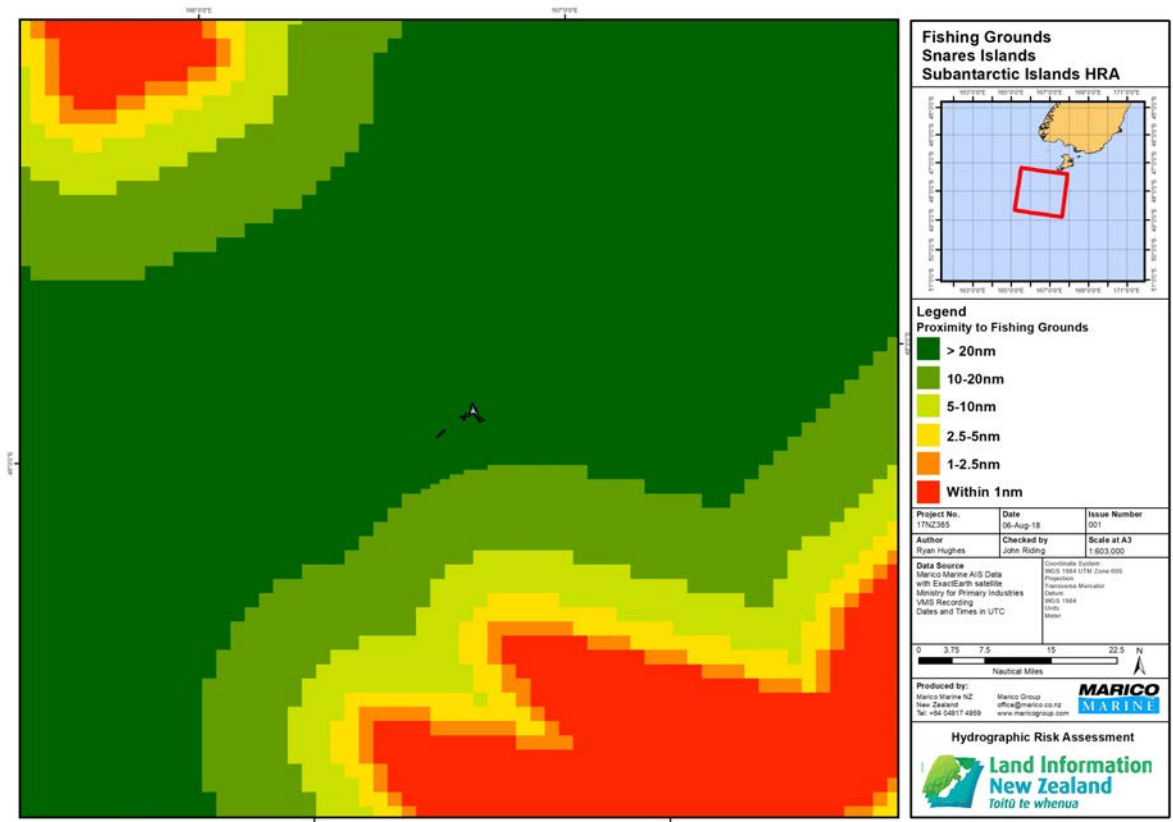


Figure Reference: 17NZ385_RMC_FG_Snares_v1

Figure 190, Fishing Grounds, Snares Islands

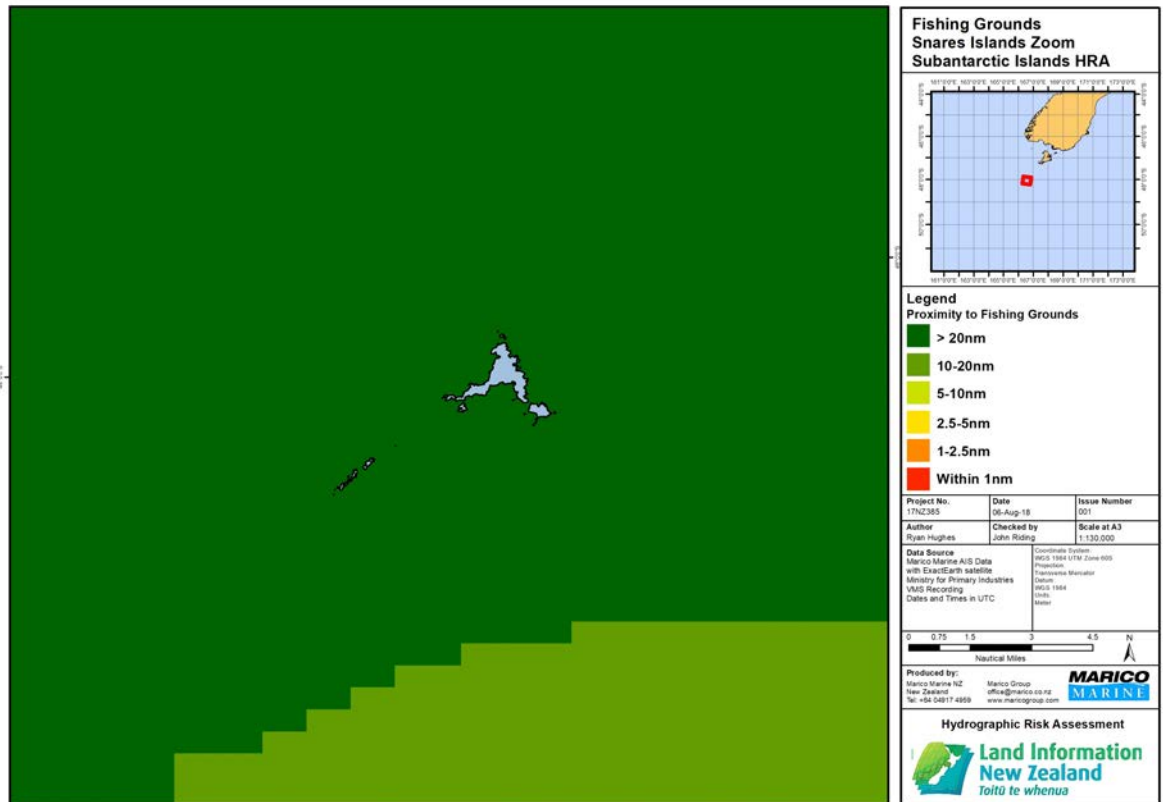


Figure Reference: 17NZ385_RMC_FG_Snares_Zoom_v1

Figure 191, Fishing Grounds, Snares Islands Zoom

3.2.2 TOURIST SITES

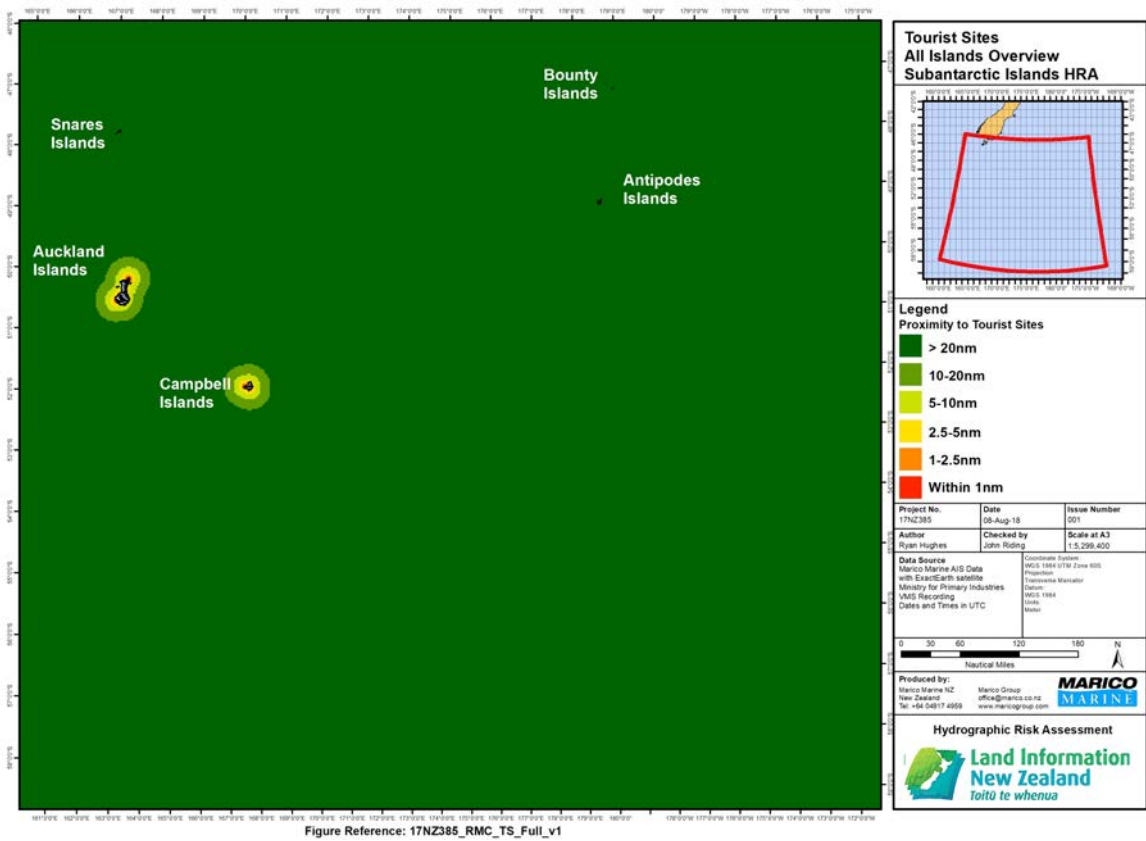


Figure Reference: 17NZ385_RMC_TS_Full_v1

Figure 192, Tourist Sites, All Islands Overview

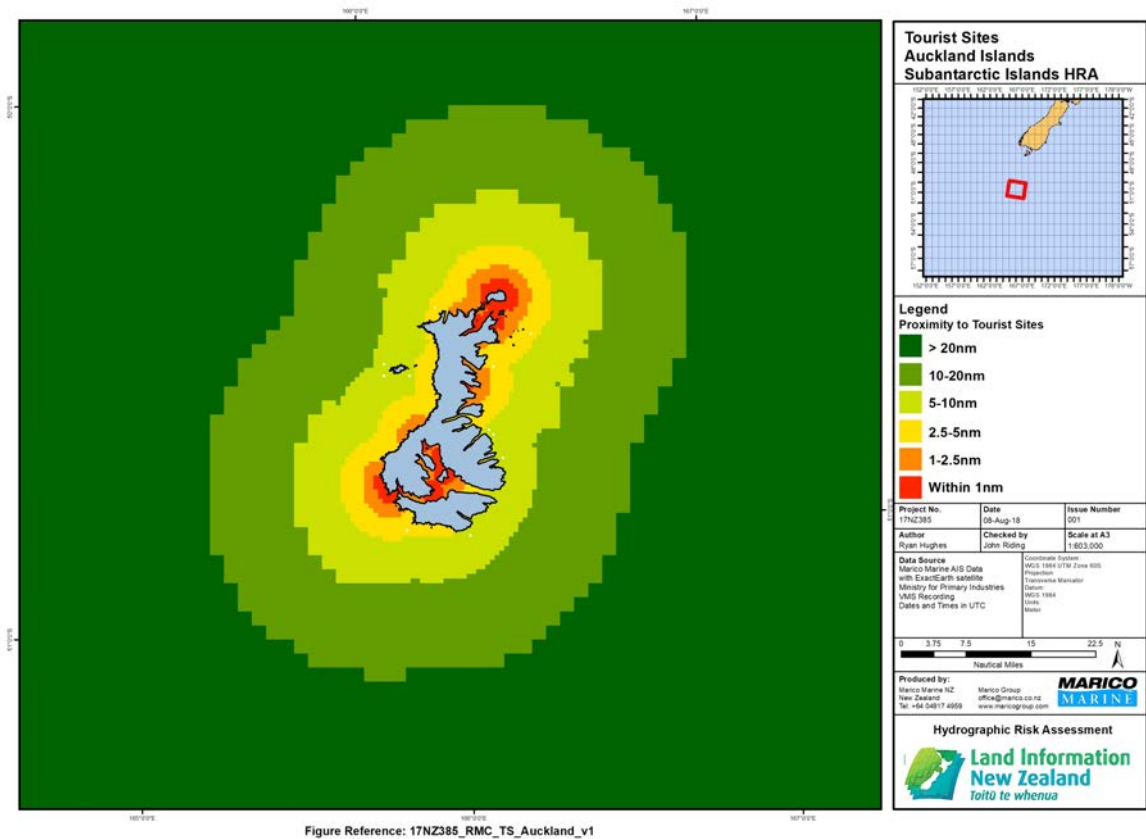


Figure Reference: 17NZ385_RMC_TS_Auckland_v1

Figure 193, Tourist Sites, Auckland Islands

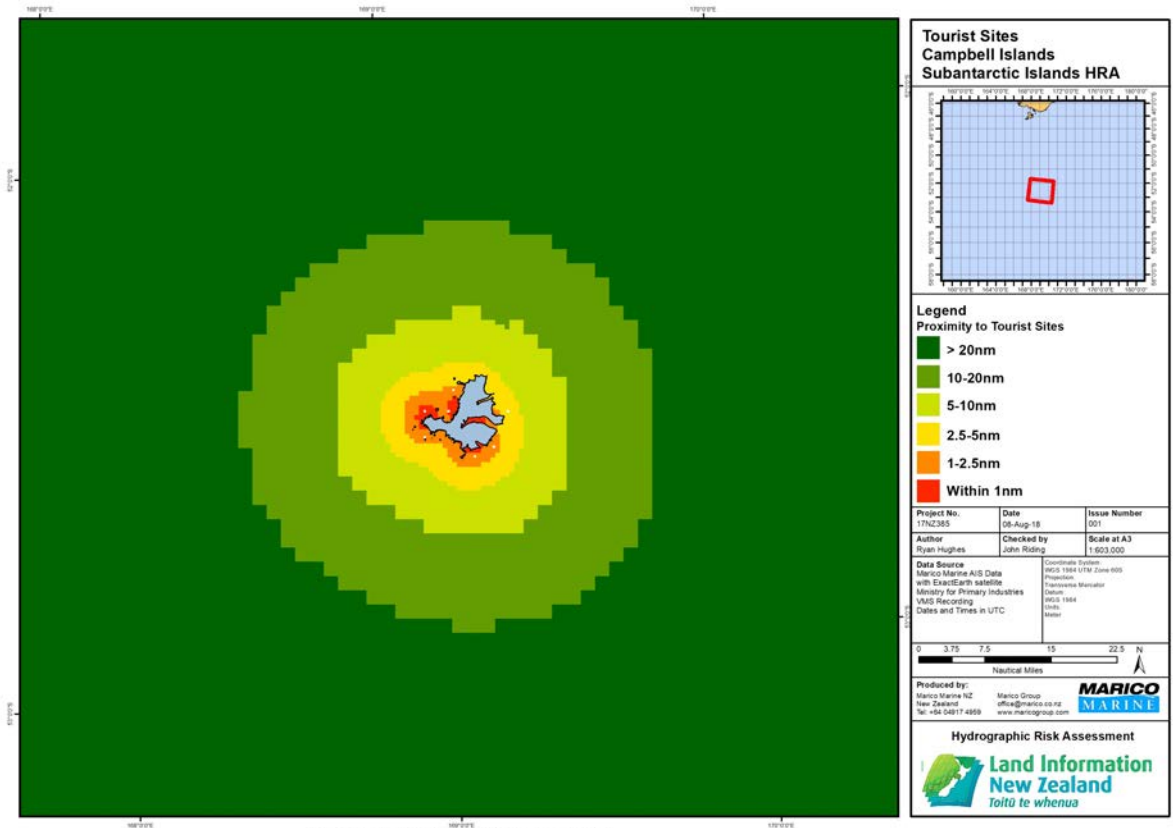


Figure Reference: 17NZ385_RMC_TS_Campbell_v1

Figure 194, Tourist Sites, Campbell Islands

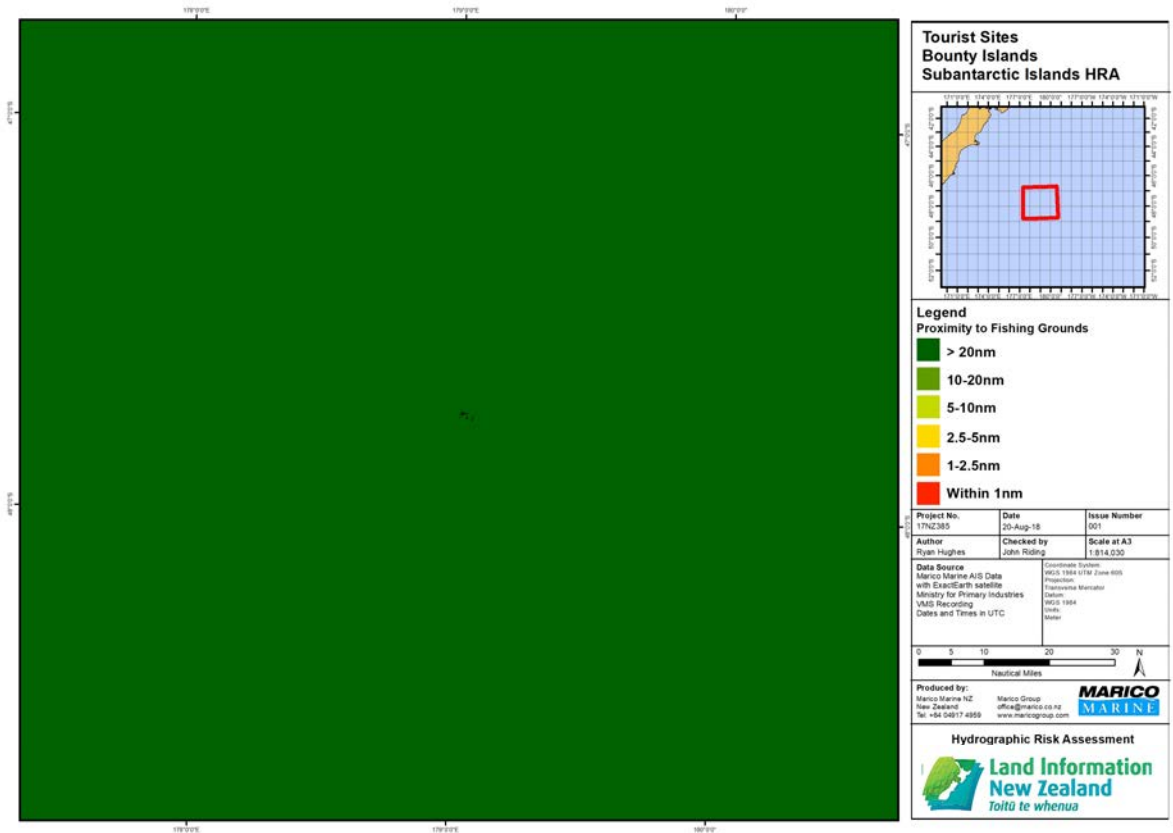


Figure Reference: 17NZ385_RMC_TS_Bounty_v1

Figure 195, Tourist Sites, Bounty Islands

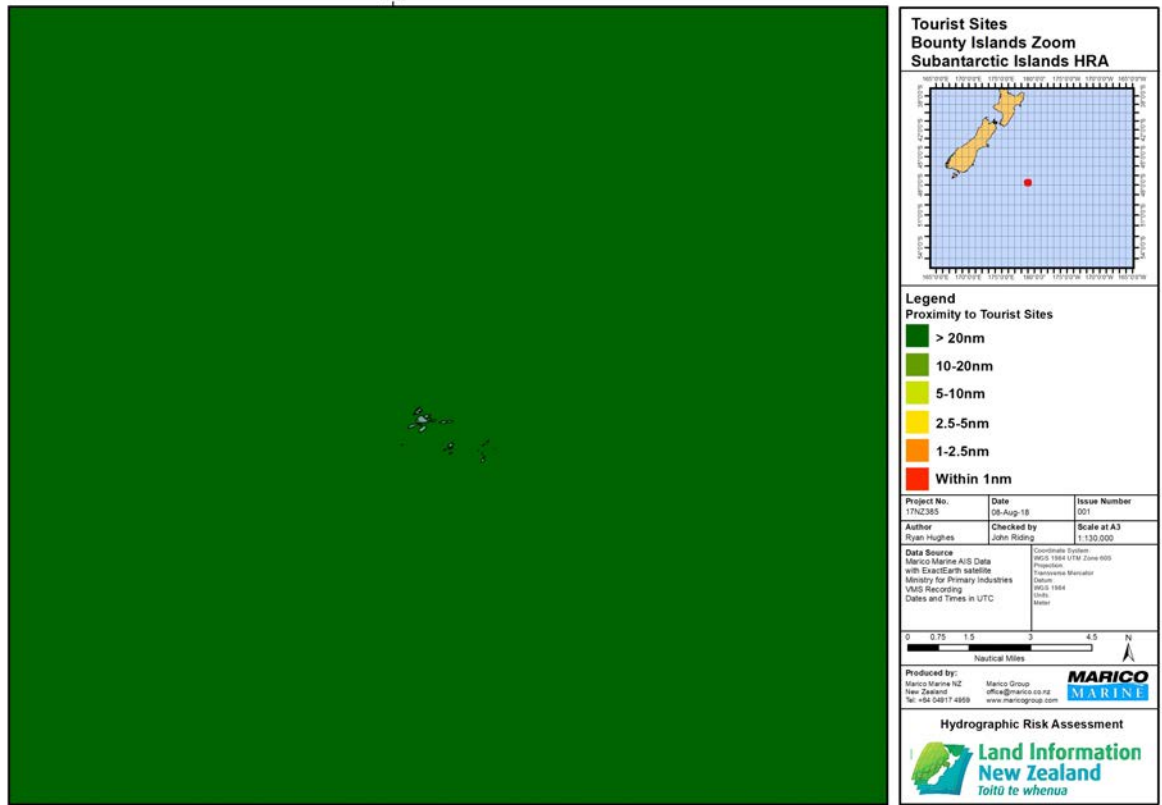


Figure Reference: 17NZ385_RMC_TS_Bounty_Zoom_v1

Figure 196, Tourist Sites, Bounty Islands Zoom

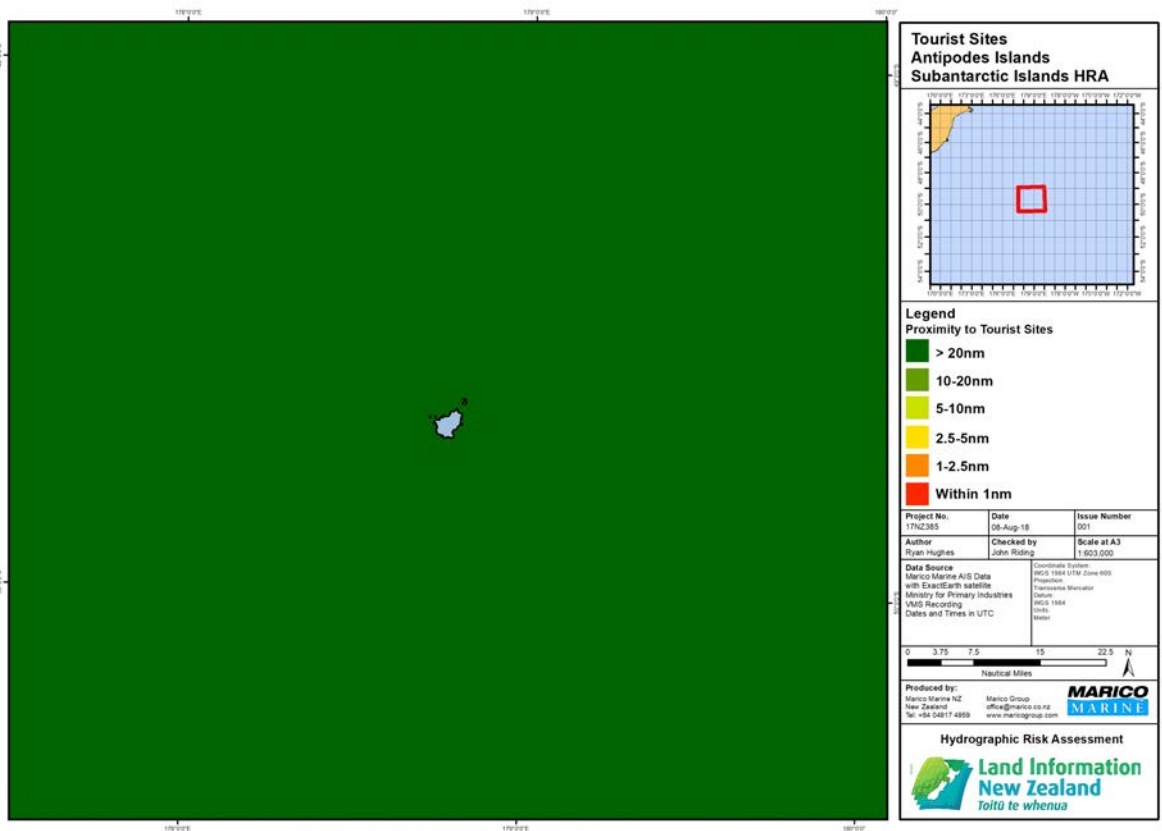


Figure Reference: 17NZ385_RMC_TS_Antipodes_v1

Figure 197, Tourist Sites, Antipodes Islands

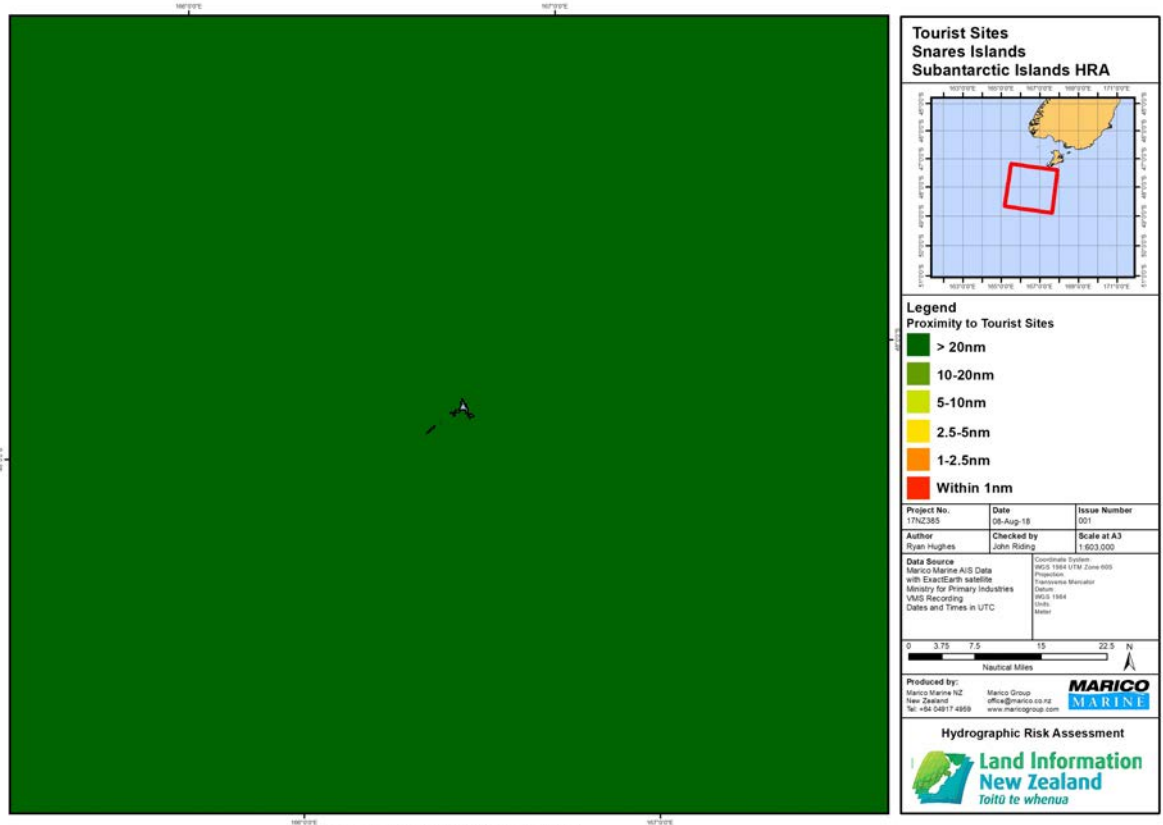


Figure Reference: 17NZ385_RMC_TS_Snares_v1

Figure 198, Tourist Sites, Snares Islands

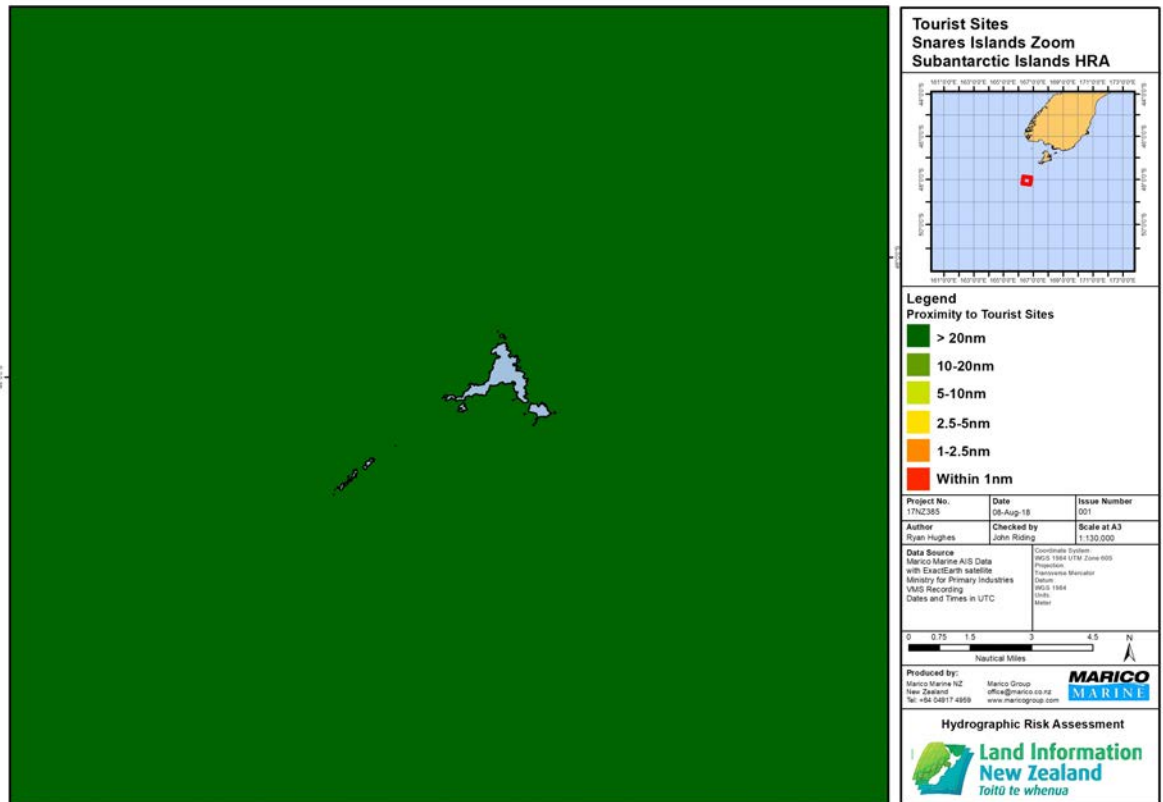


Figure Reference: 17NZ385_RMC_TS_Snares_Zoom_v1

Figure 199, Tourist Sites, Snares Islands Zoom

Annex D SEASONAL METEOROLOGICAL PLOTS

1 Antipodes Islands

1.1 Wave Height and Direction Statistics

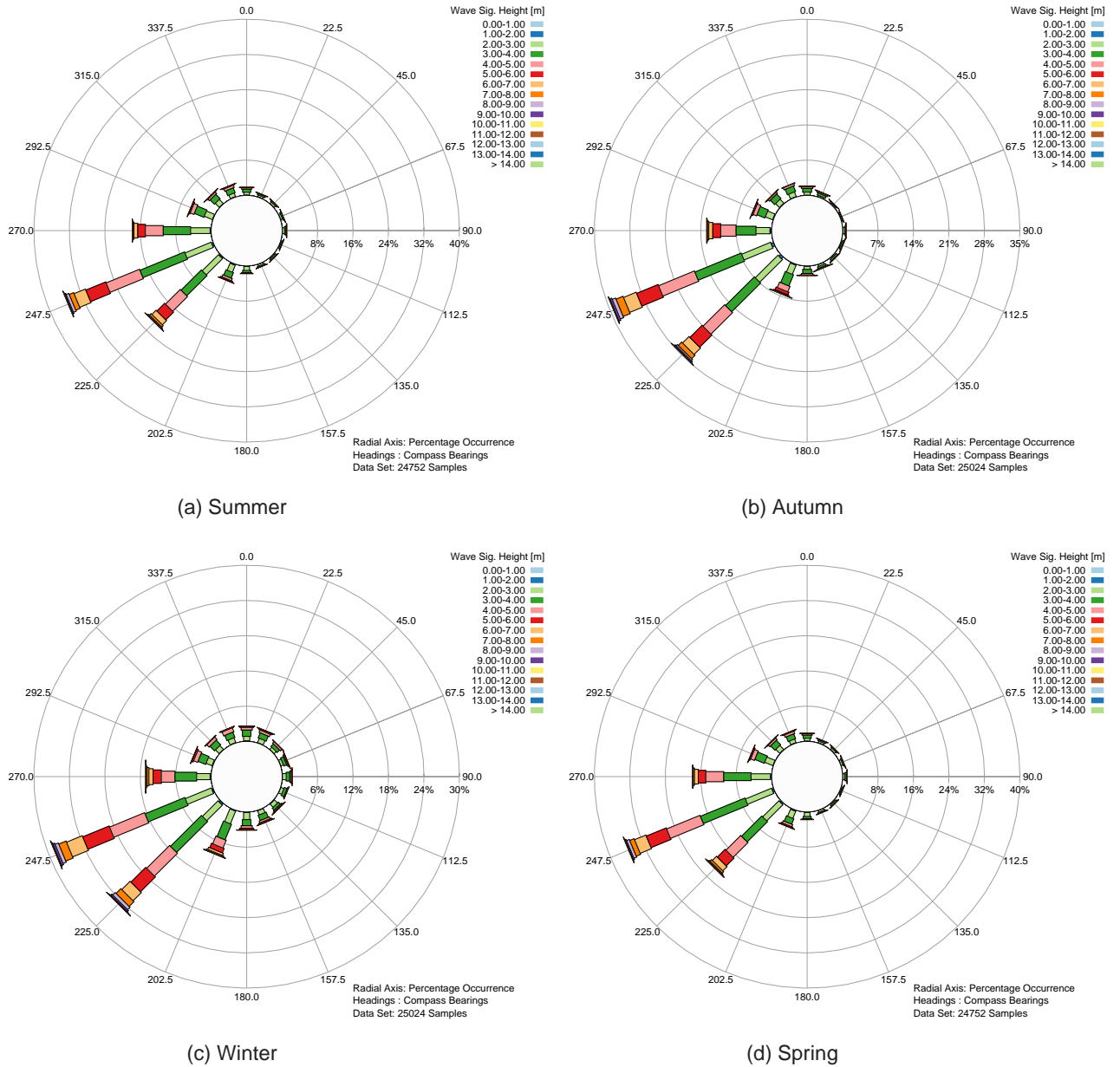


Figure 1.1: Antipodes Islands Hindcast Wave Statistics by Season

1.2 Wind Speed and Direction Statistics

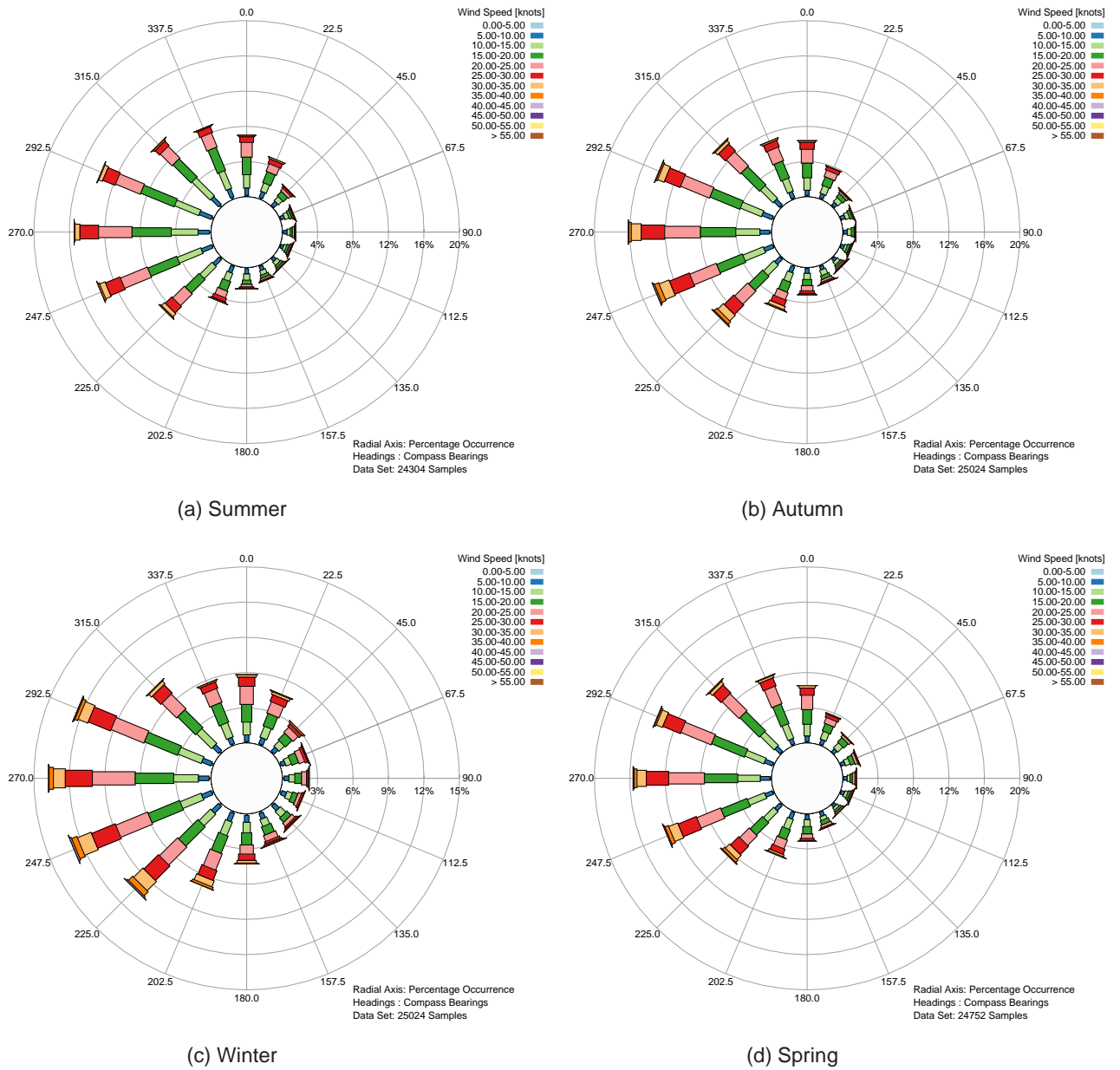


Figure 1.2: Antipodes Islands Hindcast Wind Statistics by Season

2 Auckland Islands

2.1 Wave Height and Direction Statistics

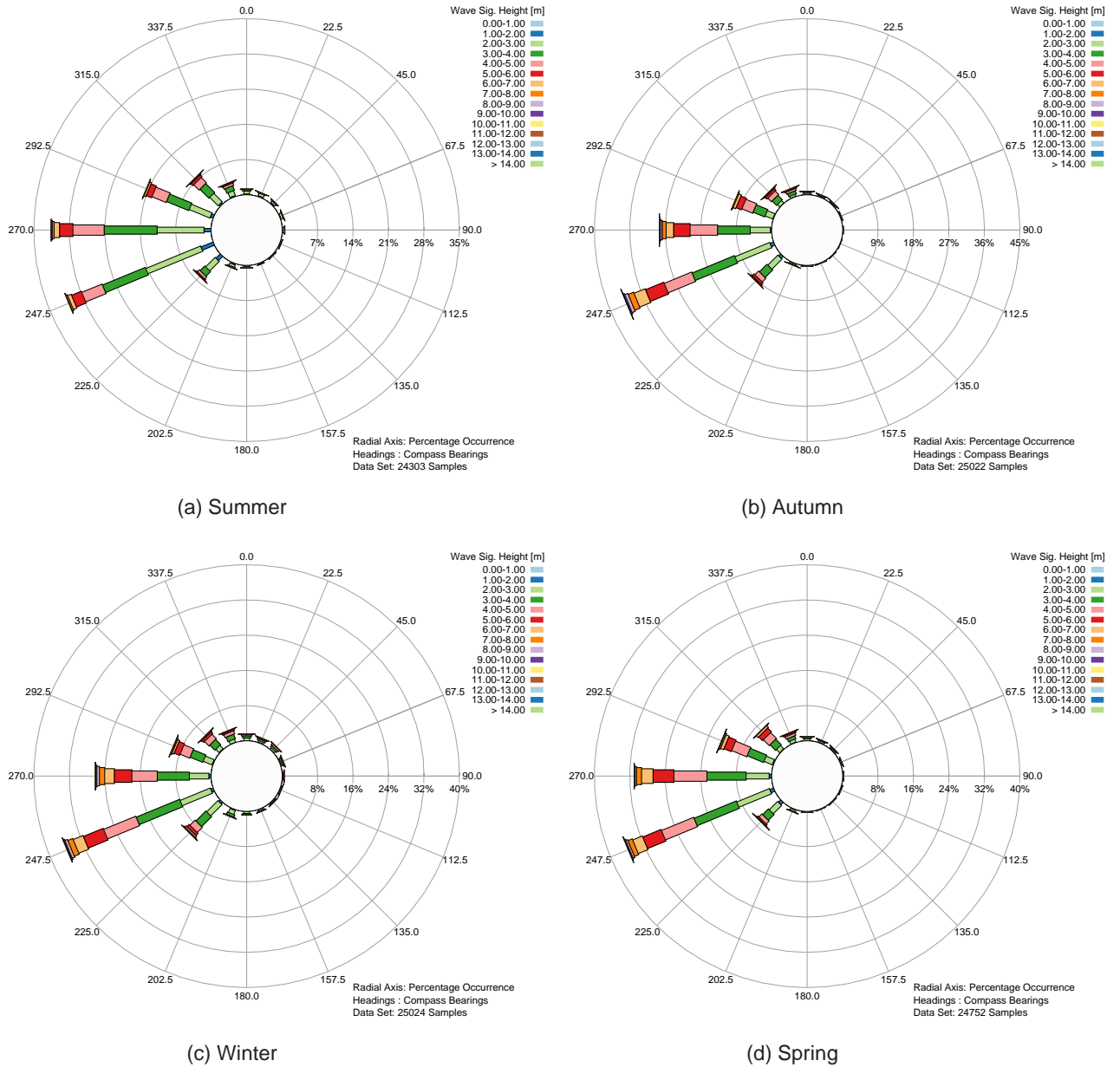


Figure 2.1: Auckland Islands Hindcast Wave Statistics by Season

2.2 Wind Speed and Direction Statistics

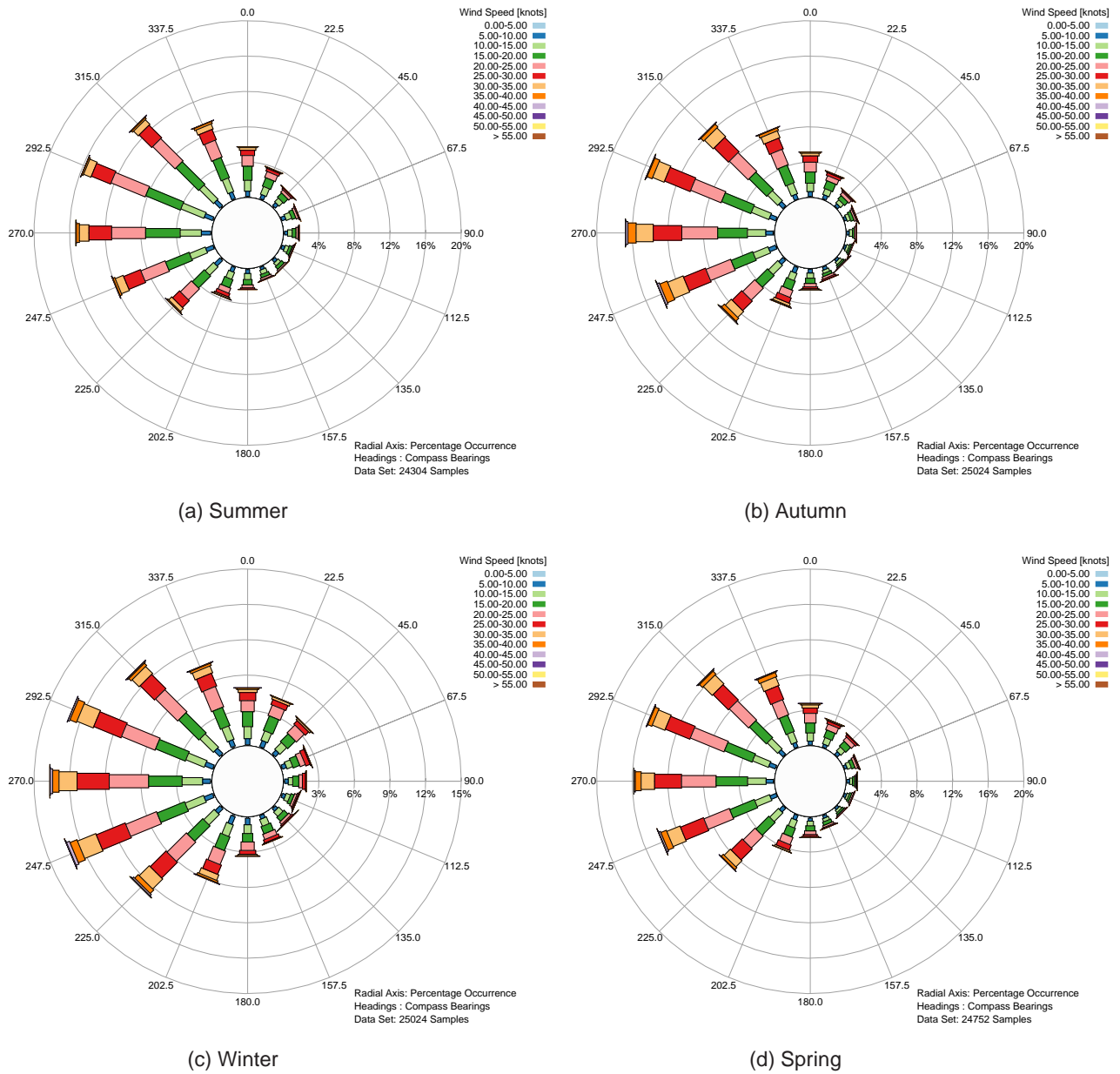


Figure 2.2: Auckland Islands Hindcast Wind Statistics by Season

3 Bounty Islands

3.1 Wave Height and Direction Statistics

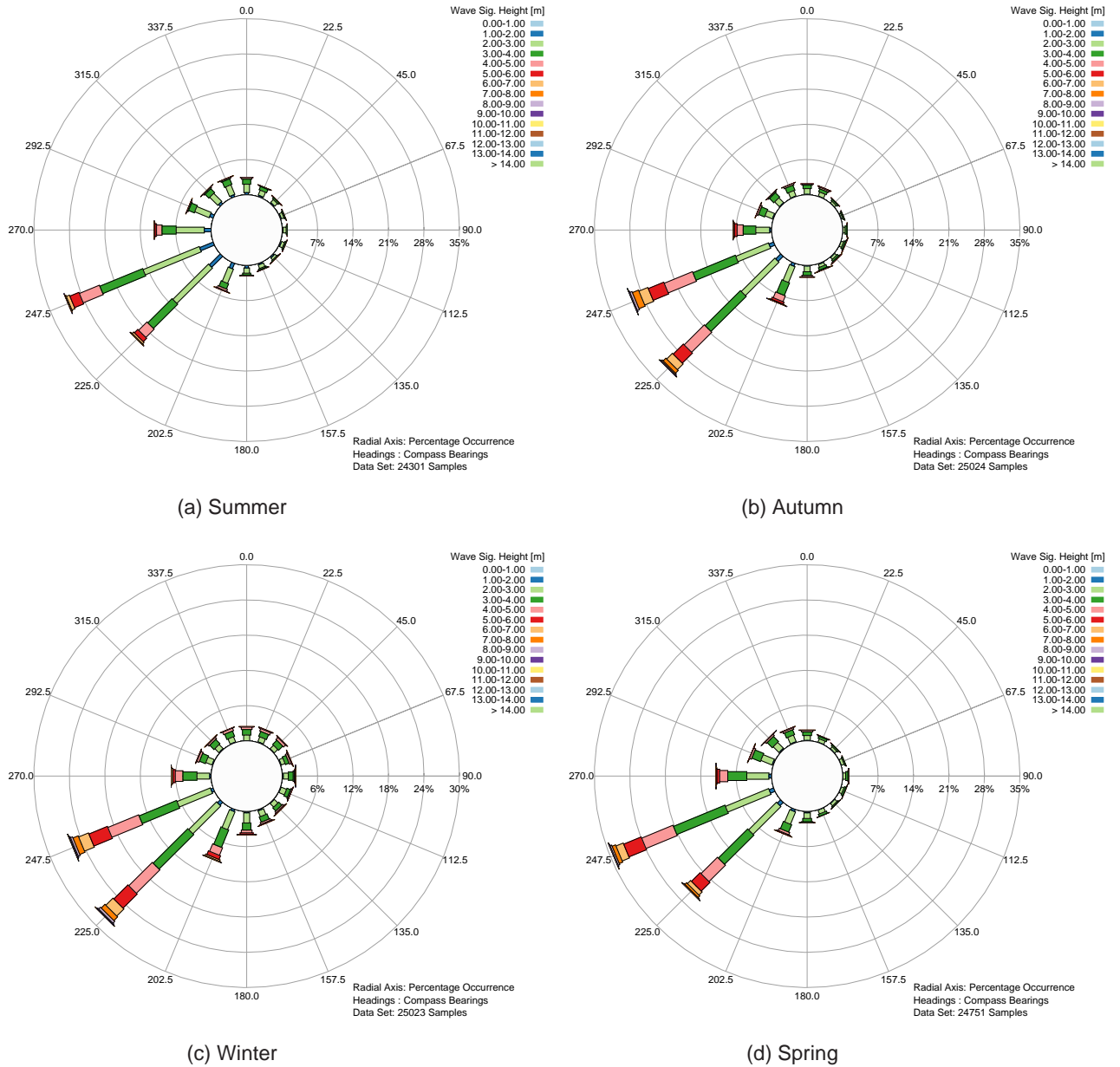
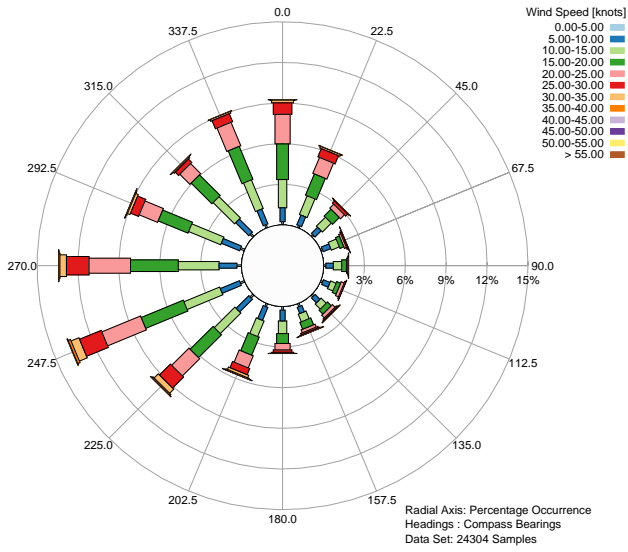
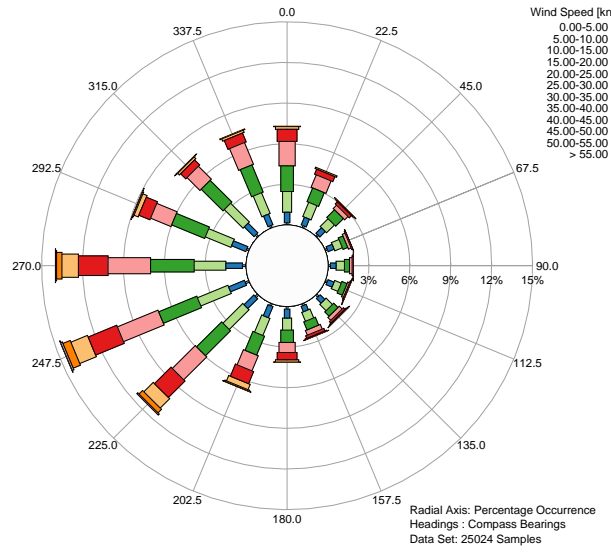


Figure 3.1: Bounty Islands Hindcast Wave Statistics by Season

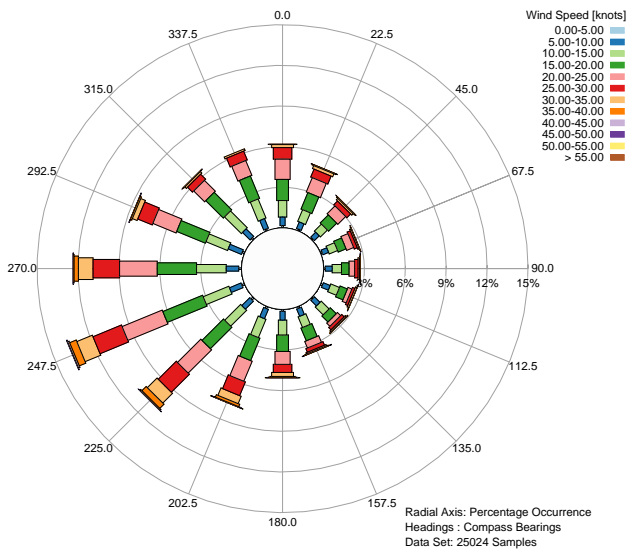
3.2 Wind Speed and Direction Statistics



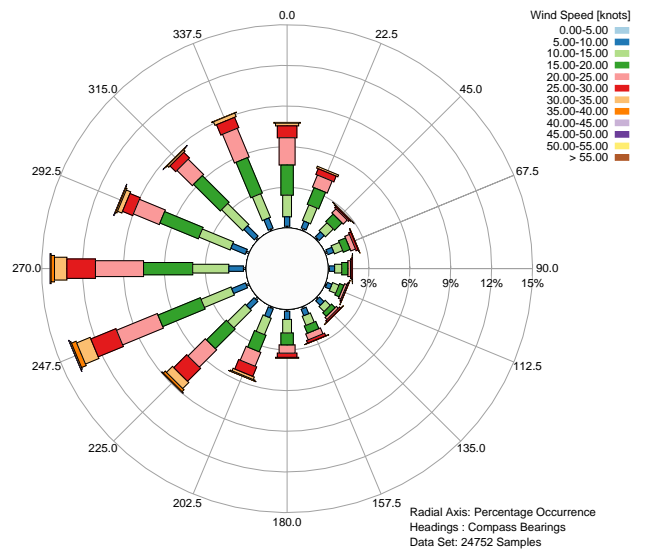
(a) Summer



(b) Autumn



(c) Winter



(d) Spring

Figure 3.2: Bounty Islands Hindcast Wind Statistics by Season

4 Campbell Islands

4.1 Wave Height and Direction Statistics

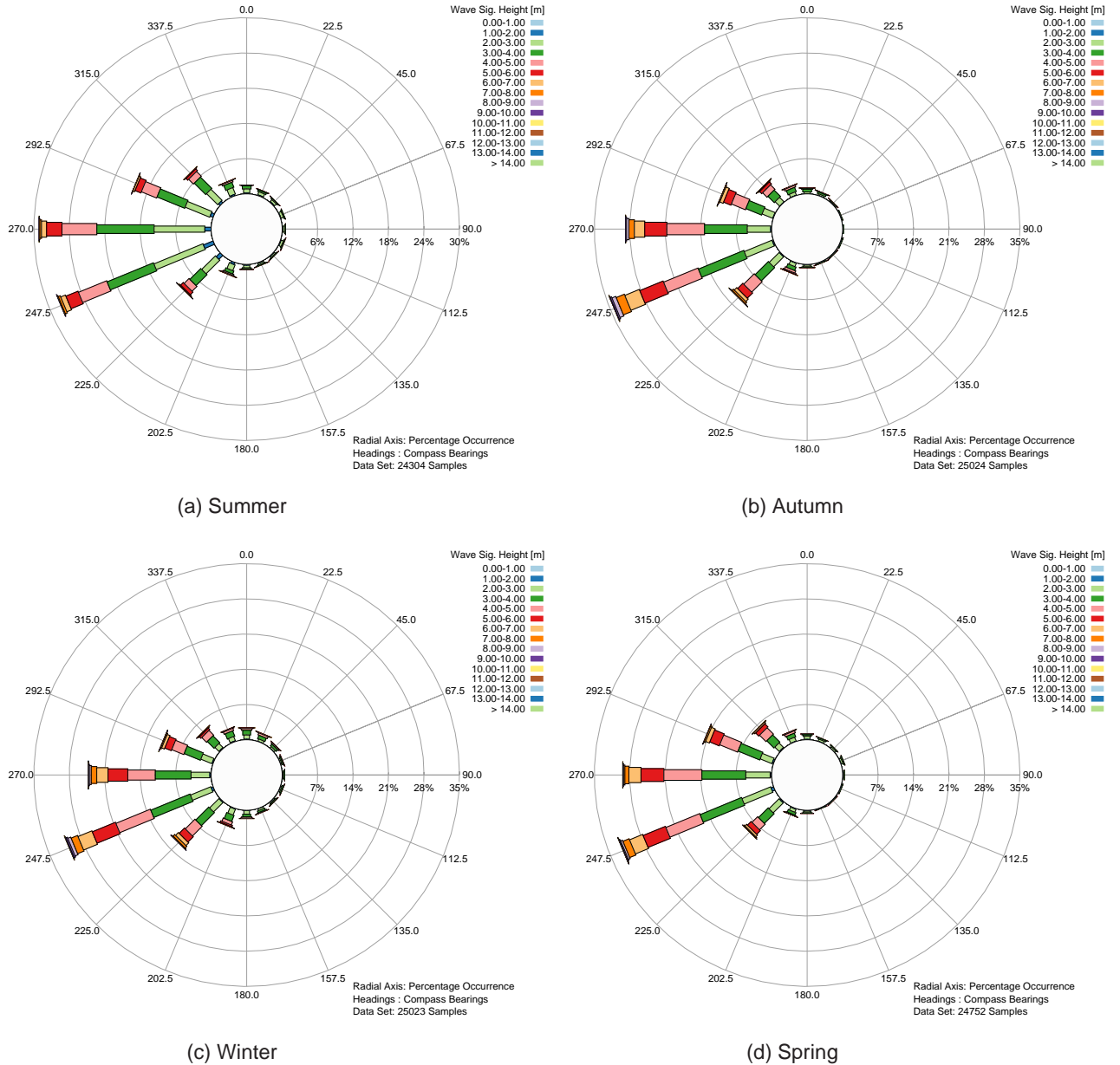


Figure 4.1: Campbell Islands Hindcast Wave Statistics by Season

4.2 Wind Speed and Direction Statistics

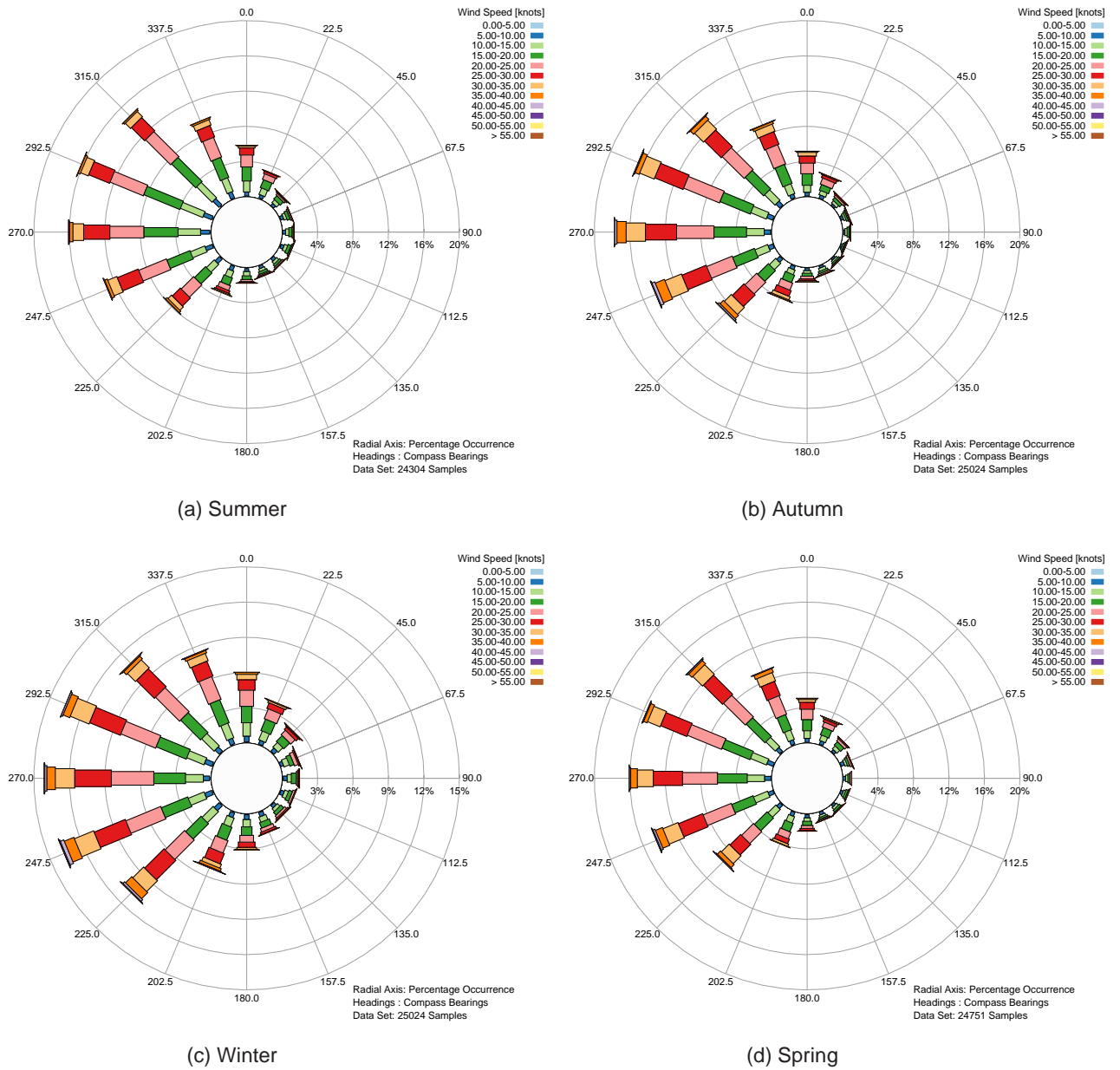


Figure 4.2: Campbell Islands Hindcast Wind Statistics by Season

5 Snares Islands

5.1 Wave Height and Direction Statistics

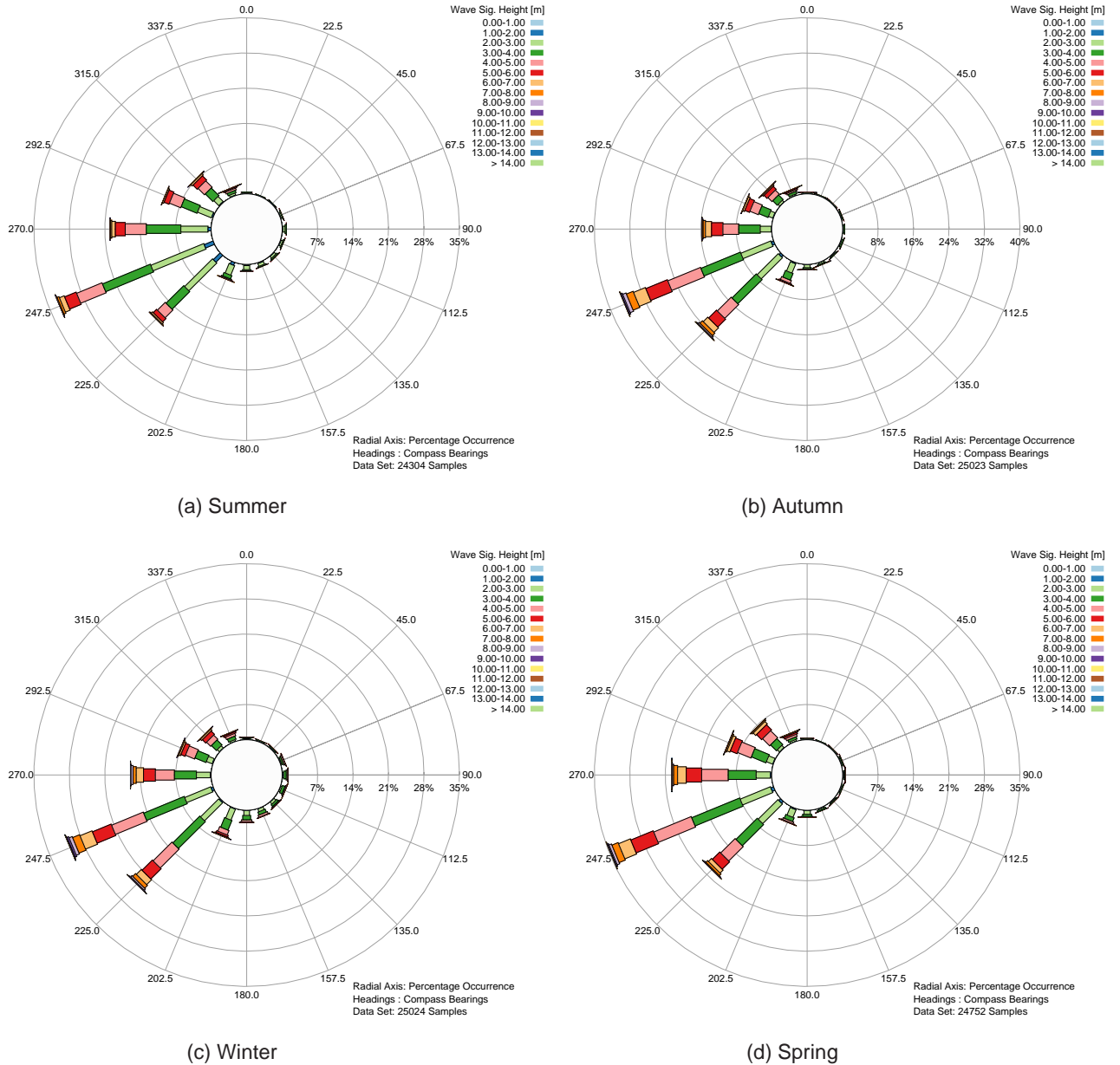


Figure 5.1: Snares Islands Hindcast Wave Statistics by Season

5.2 Wind Speed and Direction Statistics

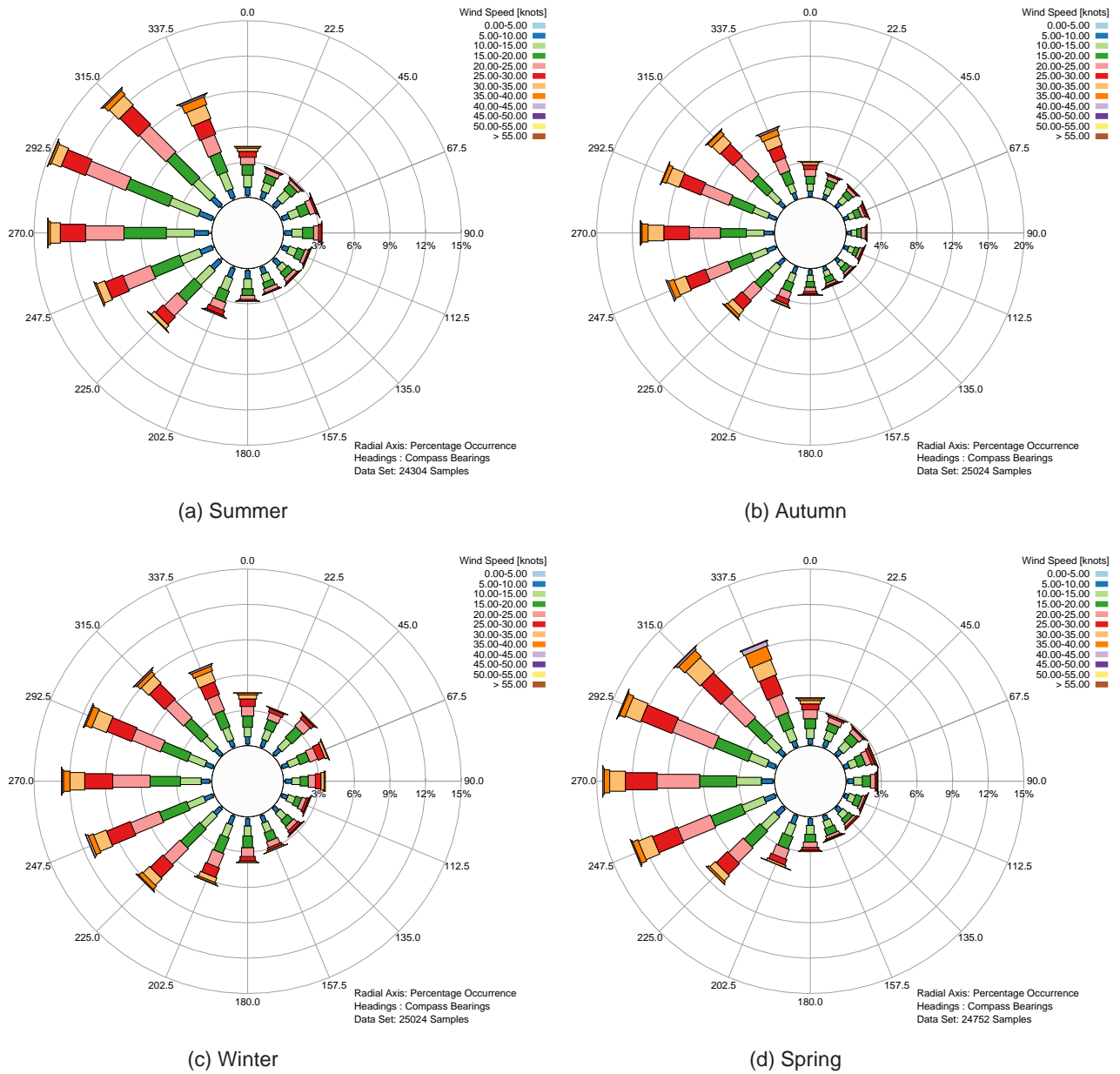


Figure 5.2: Snares Islands Hindcast Wind Statistics by Season