Fisheries New Zealand
Tini a Tangaroa

Fisheries New Zealand Maori Crest.png

Ministry for Primary Industries
Manatū Ahu Matua

Selection of protected areas: SPRFMO's approach

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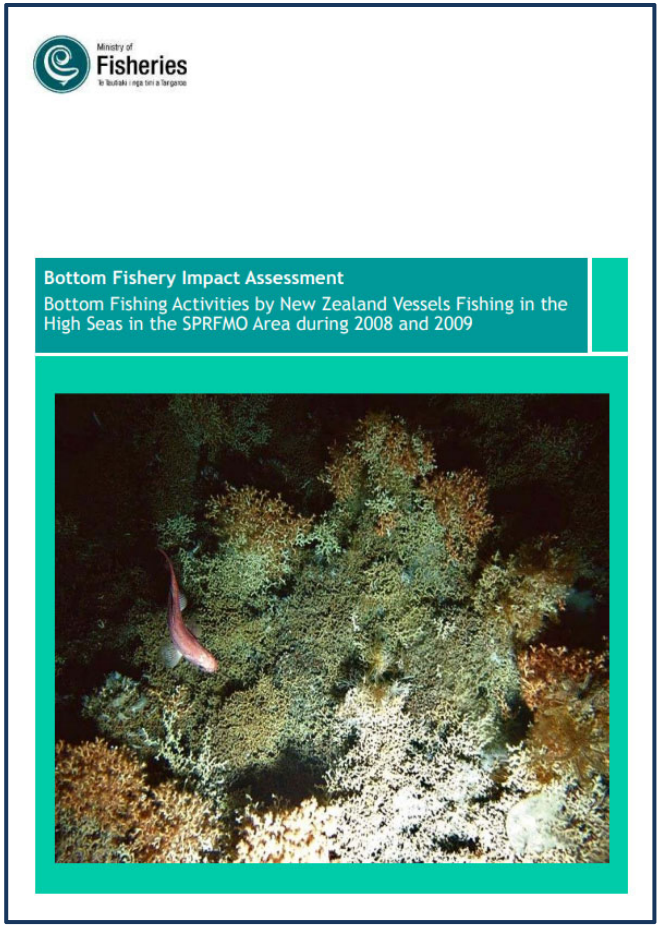
SIOFA-PAEWG, 18-19 March 2019

www.mpi.govt.nz

Management measures for bottom fisheries

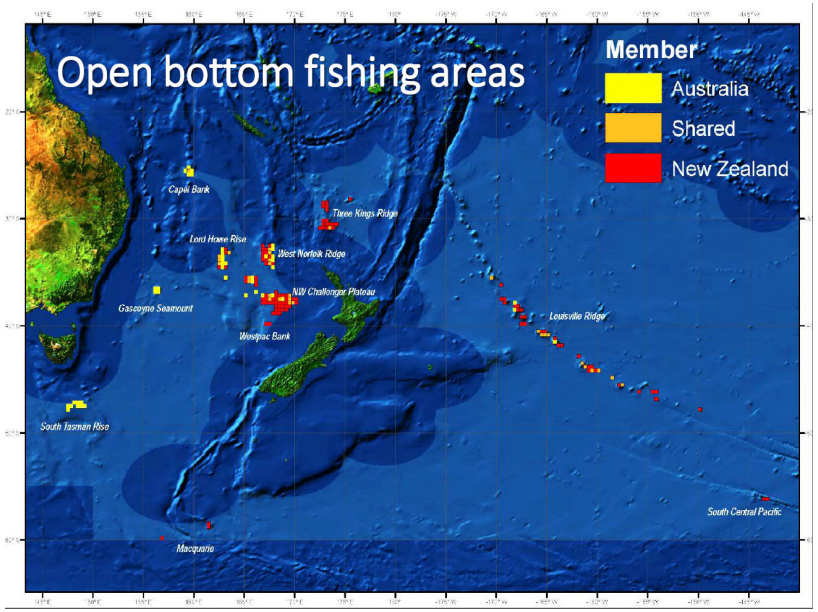
- Starting with Interim Measures in 2007:
- Reference period 2002–2006
- Members not to exceed average catch in reference years
- Members not to fish outside their footprint in reference years
- Members to implement measures to avoid significant adverse impacts (SAIs) on vulnerable marine ecosystems (VMEs)
- Fishing allowed only after footprint advised and Bottom Fishery Impact Assessment provided
- So far, only Australia and New Zealand have completed these steps



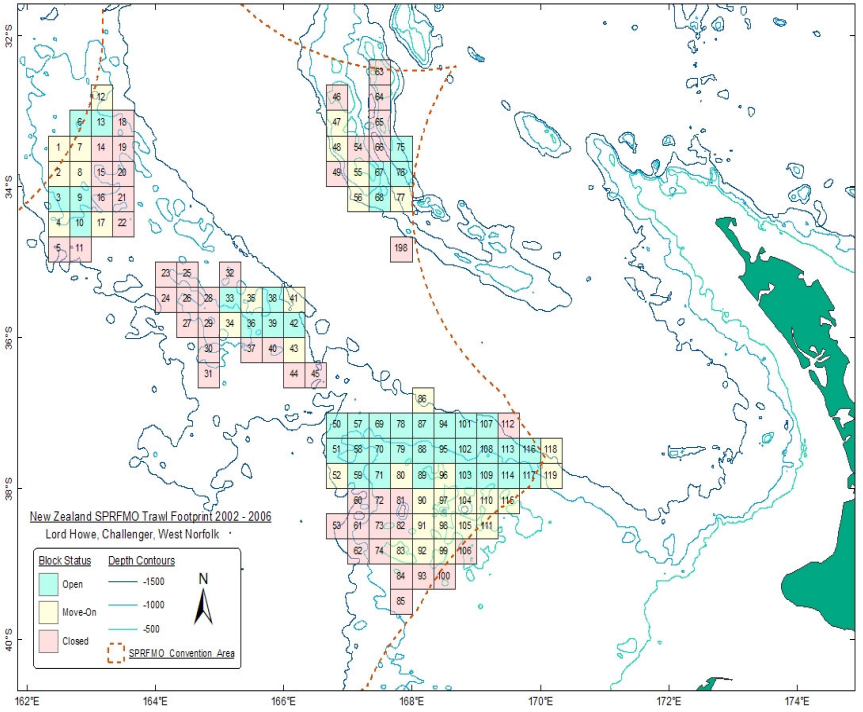
https://www.sprfmo.int/assets/Meetings/Meetings-before-2013/Scientific-Working-Group/SWG-06-2008/a-Miscellaneous-Documents/New-Zealand-Bottom-Fishery-Impact-Assessment-v1.3-2009-05-13.pdf

Complexity of the interim management measures: the need for a new approach

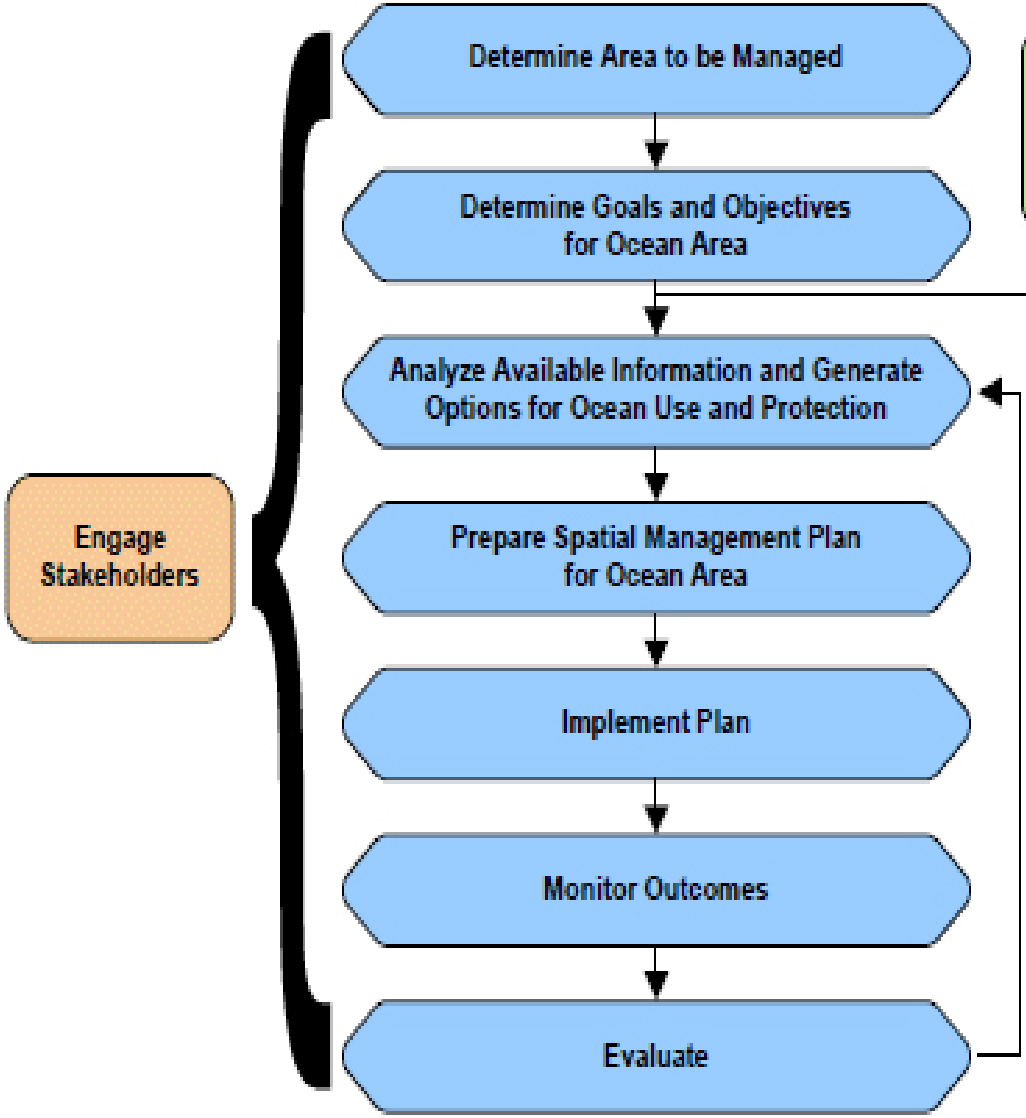
- **Australian and New Zealand interim measures had different:**
  - **Catch limitation approaches**
  - **Spatial footprints**
  - **VME trigger levels**
  - **Move-on arrangements**



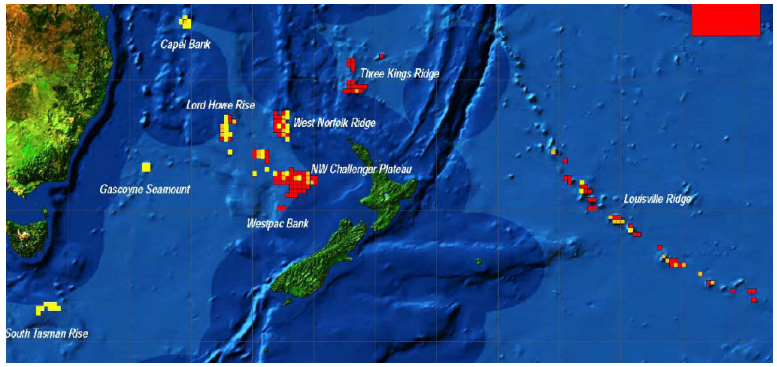
New Zealand's stratified spatial measures



Generic spatial management planning process



Area to be managed



Who needs to be involved?

Important to determine stakeholders so we can identify all relevant objectives:

- **Fishing industry, participating or intending companies, both Australian and New Zealand, representative bodies, etc;**
- **Environmental organisations, national and international, DSCC, ECO, Pew, etc;**
- **Management agencies and those who will have to implement measures (MPI, AFMA, SPRFMO);**
- **Various other interested parties (MFAT, DOC, ABARES, NOAA, GOBI/CBD, SPC, …)**

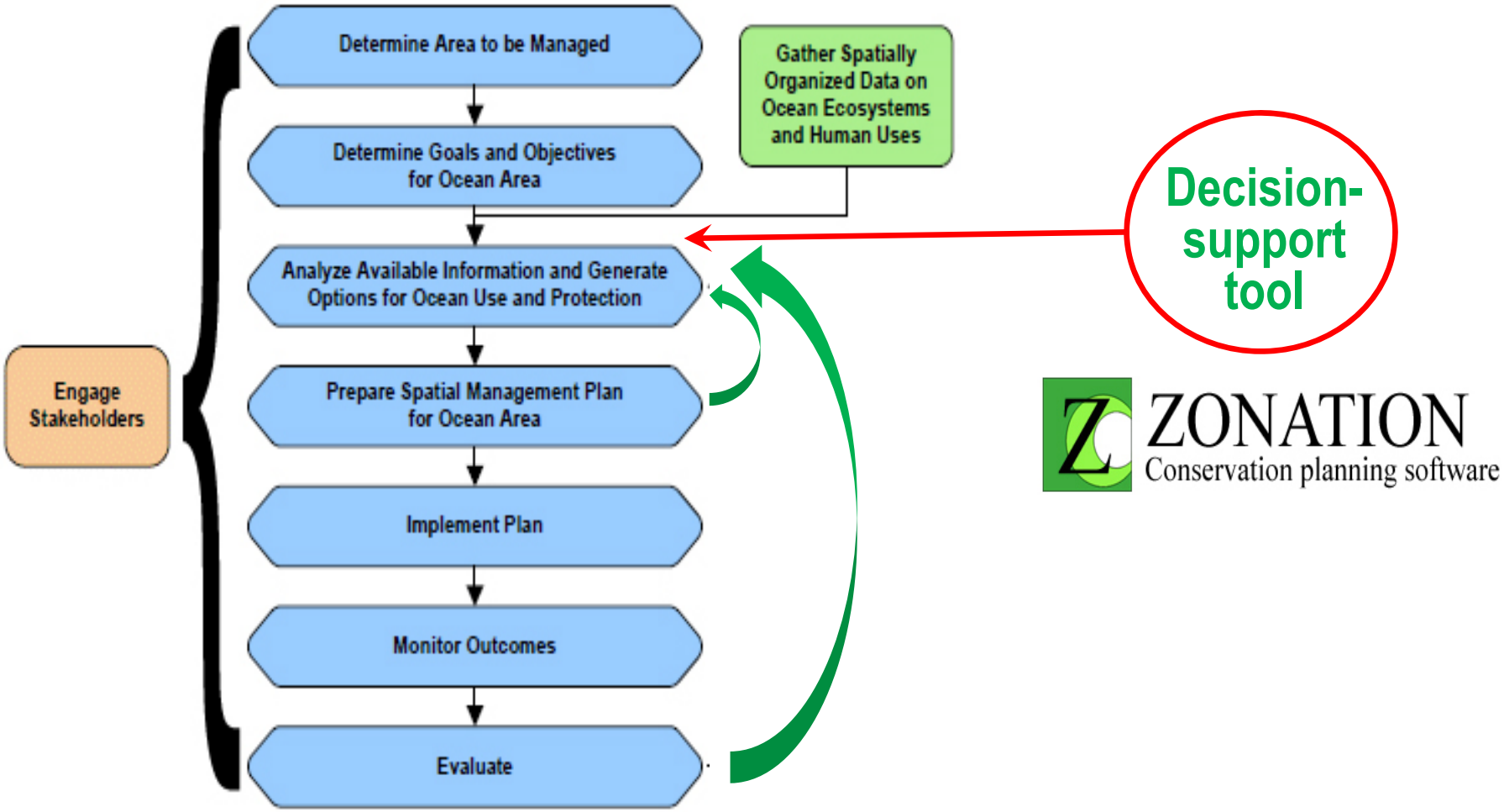
Objectives for spatial management planning

Important because they drive the decision-support tools and metrics to be calculated: need to be clear what stakeholders wish to achieve:

Abbreviated objectives for SPRFMO work:

- **Access to as much economically productive fishing ground as possible;**
- **Provide a management approach that industry can confidently promote as sustainable;**
- **UNGA resolutions and Conventions implemented, including closing areas to trawling where VMEs likely to occur (unless managed to avoid SAIs);**
- **Impacts on VMEs to be minimised;**
- **Management measures that are easily-understood, practical, enforceable, and without un-necessary complexity and cost;**
- **Noting constraints of the legal and policy framework.**

How do spatial decision-support tools fit in?



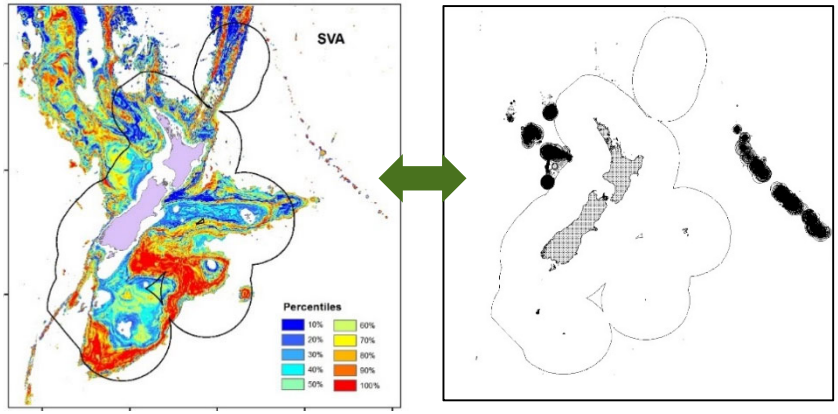
Spatial Management Planning process

Decision support tool: key concepts

Tool for bringing all information together in objective analyses of how choices influence outcomes

VME value:

- Habitat suitability models for 10 VME indicator taxa (weighting corals)
- Model uncertainty
- Naturalness (based on fishing effort)



Value to fishing:

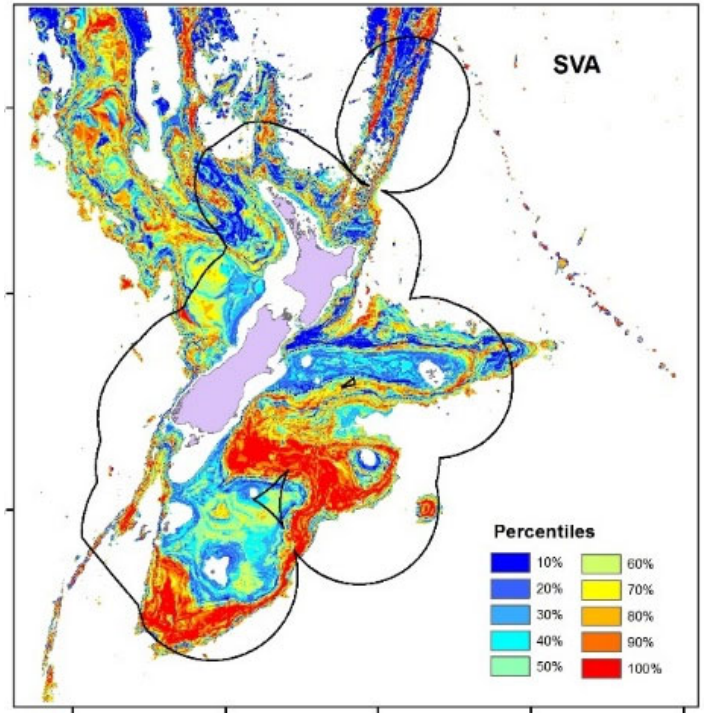
- Catch data for two fishing methods, four time periods
- Can consider different industry value metrics
- Practicalities

- But (NB!) application is not straightforward or "robotic"
- Outputs explicitly portray trade-offs inherent in any candidate spatial regime for stakeholders' stated objectives
- Recall that stated objectives reflect very different viewpoints!

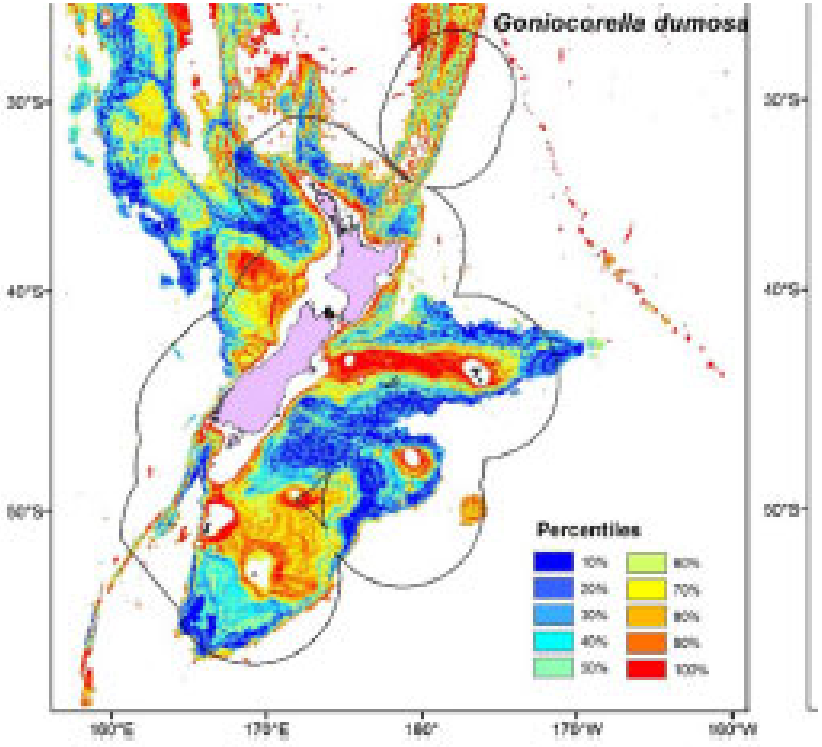
Which biodiversity features to include?

- Choice and weighting of biodiversity datasets to represent multiple objectives of the stakeholder process
- Vulnerable Marine Ecosystems using predictive habitat suitability layers

Solenosmilia variabilis

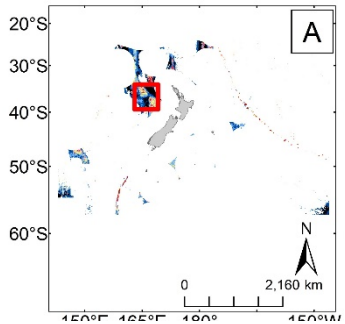


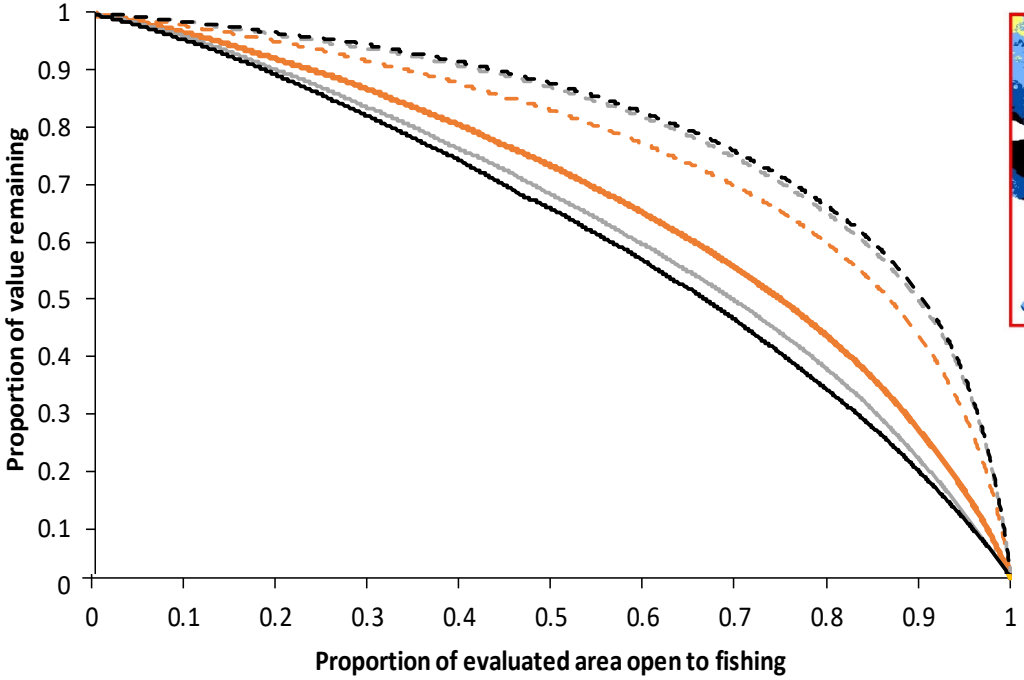
Goniocorella dumoas

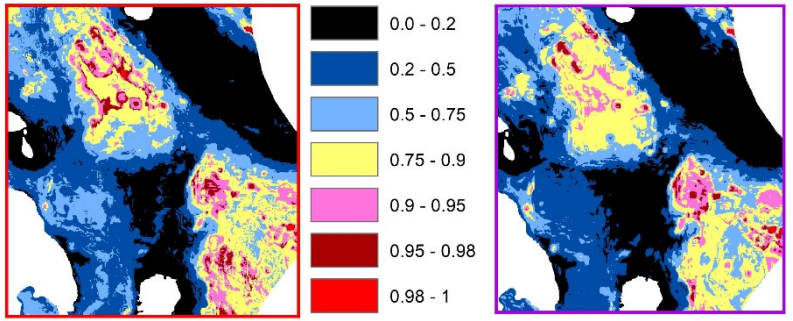


Impact of playing with weights

- Curves for stony corals (dashed) and other VME taxa (line)
- Equal weighting (orange)
- Stony corals 3 x's other VME taxa (grey)
- Stony corals 5 x's other VME taxa (black)



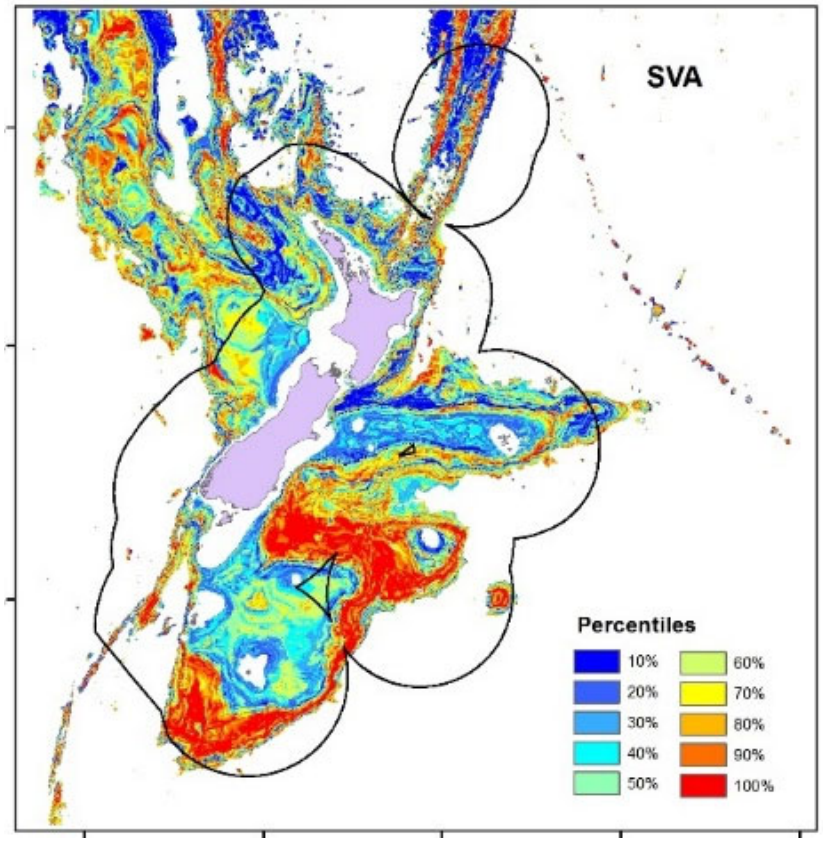




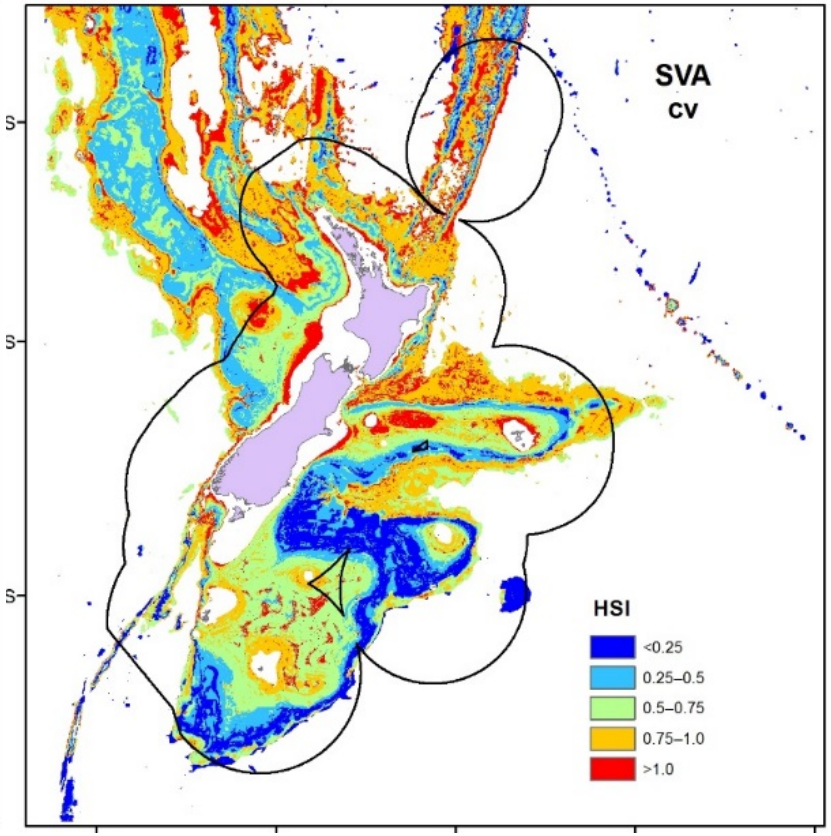
Only relatively small, localized differences in the distribution of prioritization values

Can also include uncertainty in habitat suitability model predictions

Solenosmilia variabilis



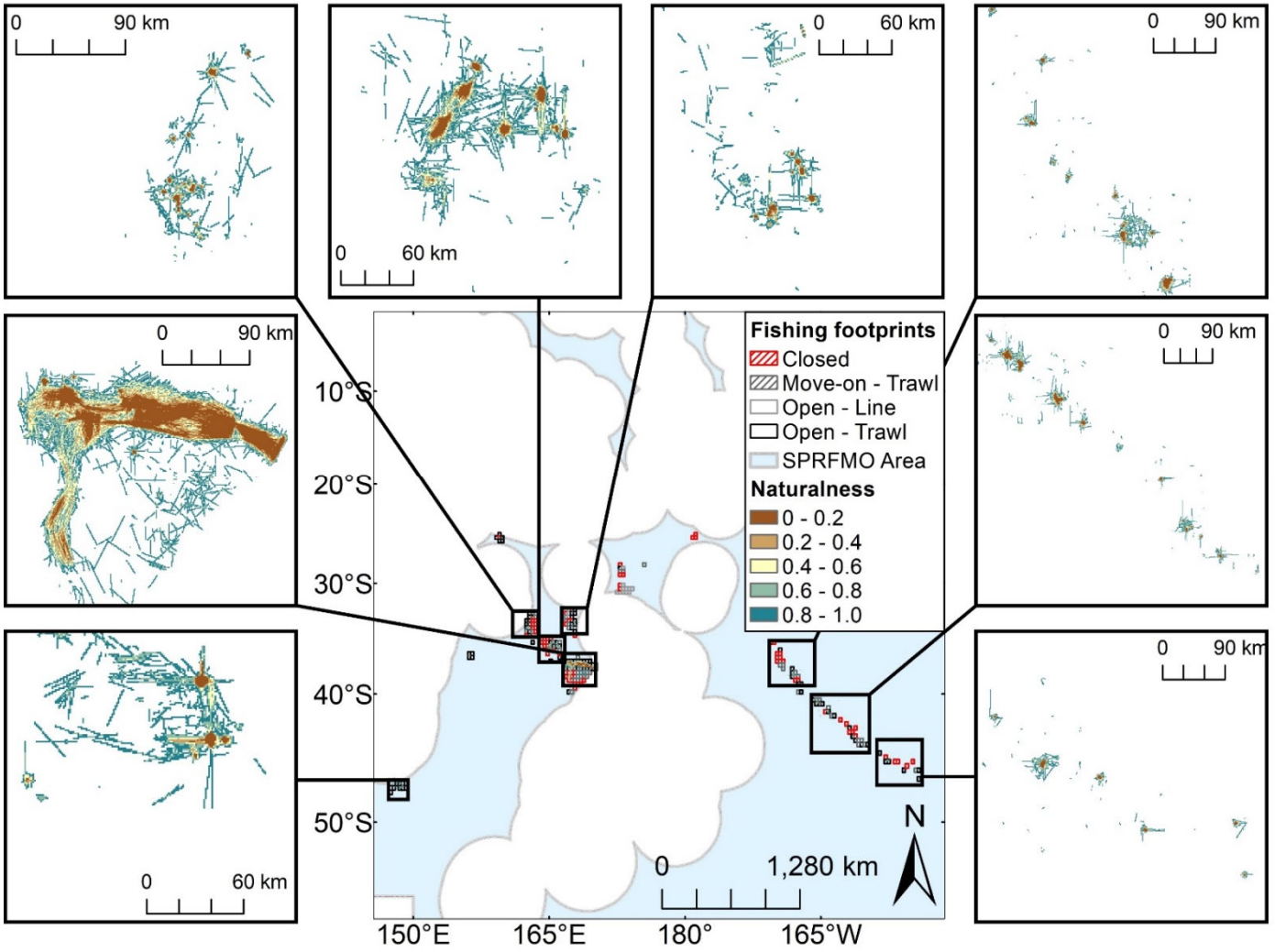
Habitat Suitability Layer



Uncertainty Layer

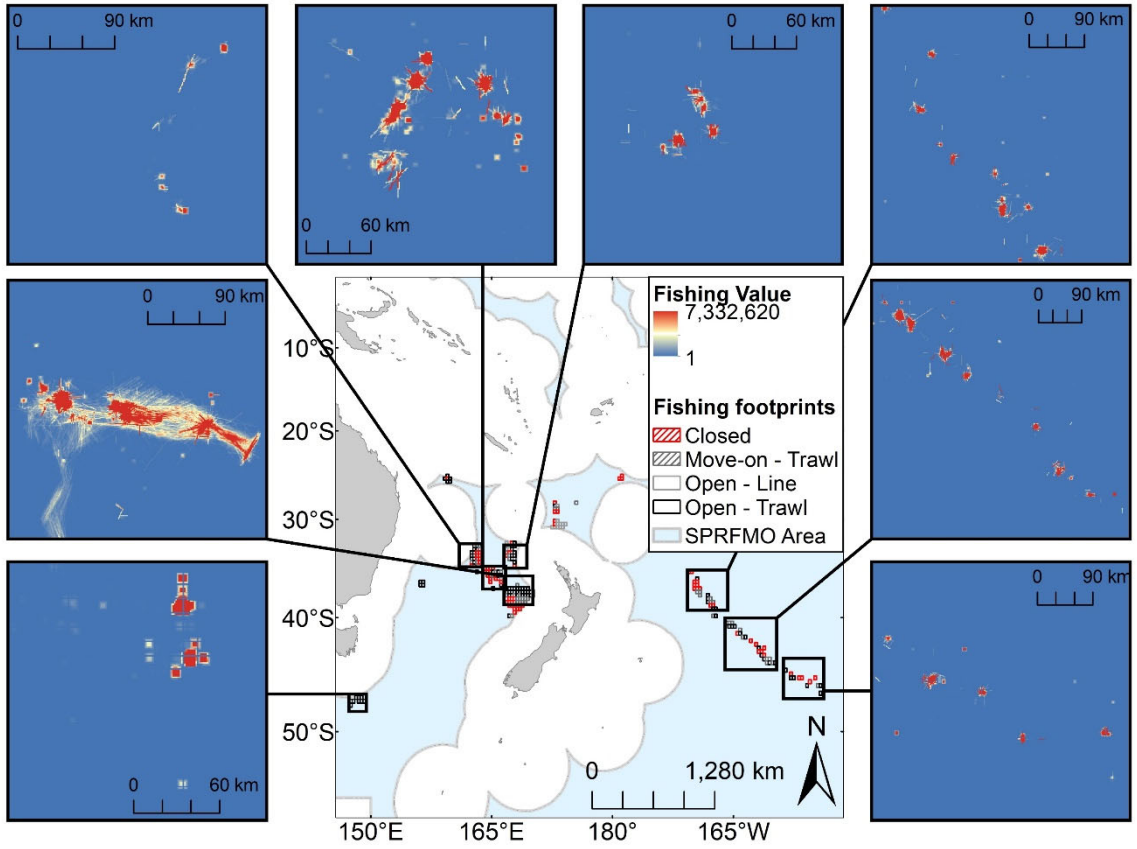
Layer for estimated naturalness was included

- 0 = all local conservation value has been lost
- 1 = habitat remains locally in “pristine state”



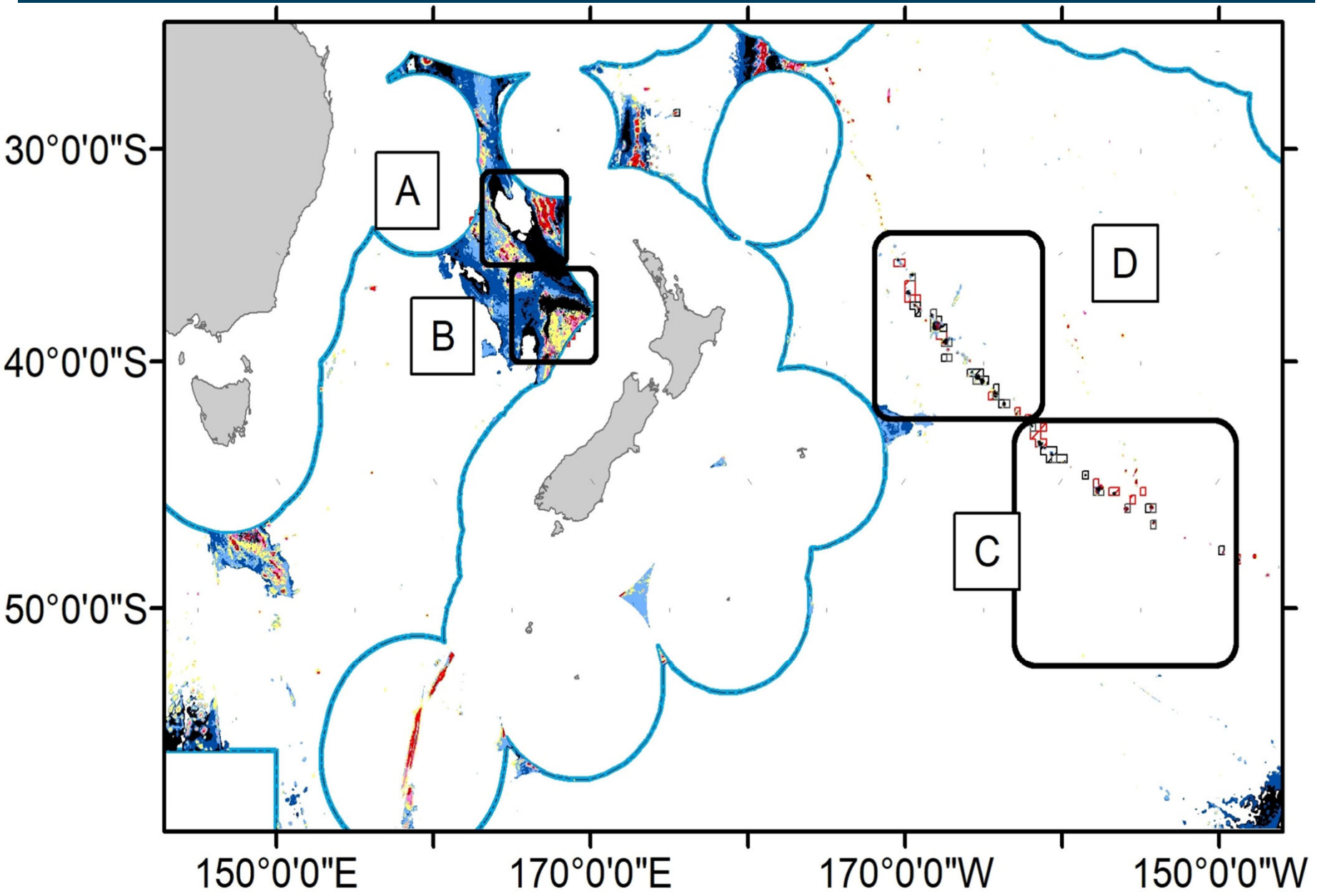
Industry supplied a layer to indicate value to fishery

- Accumulated value to the fishery as a cost layer (Cordue, unpublished) (multiple iterations)
- layers included a 'buffer zone' to allow for logistics of deploying gear
- NB: Naturalness ≠ cost layer



Tag team…

How do we get from this map to open/closed areas?

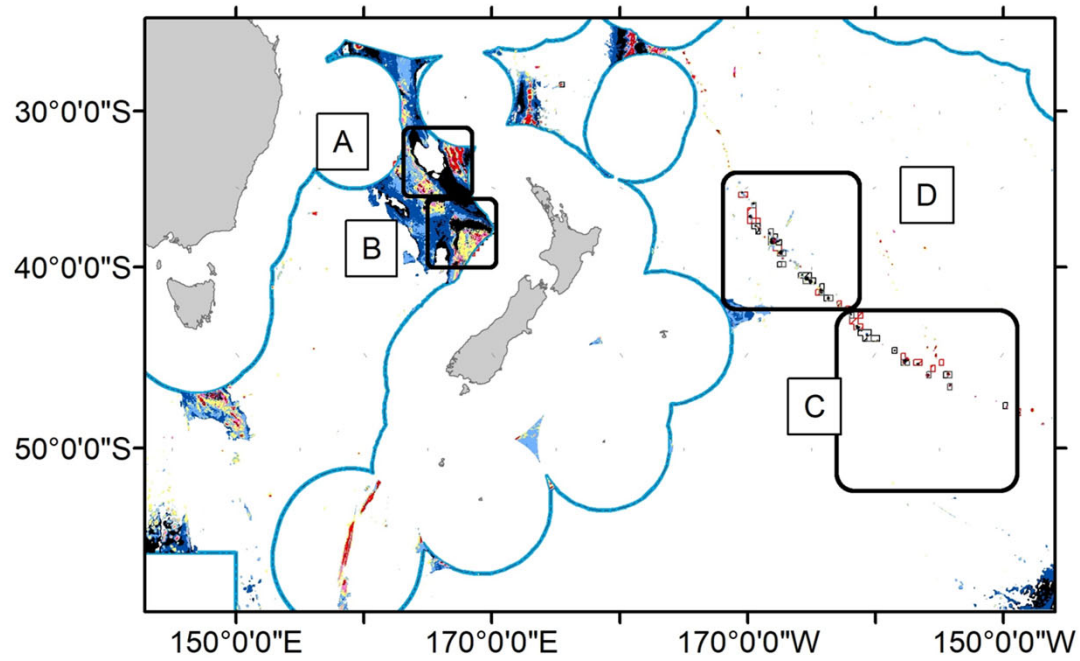


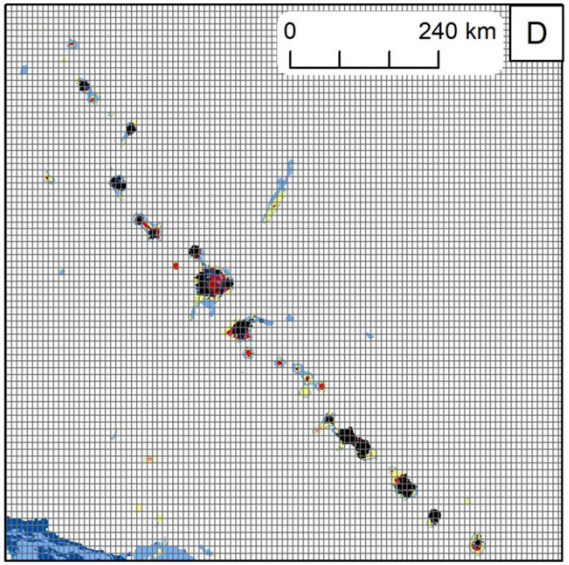
Stakeholder / technical engagement meetings

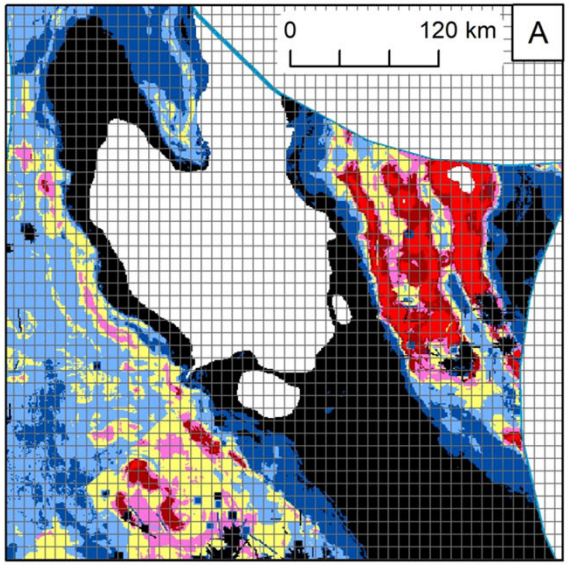
	VME project	SPACWG	Specific engagement	SPRFMO meetings
Pre-2014	SAG x 2	–	–	SWG/SC x 12
2014 Qtr 1				
2014 Qtr 2	SAG3			
2014 Qtr 3		SPACWG x 4		
2014 Qtr 4				SC-02
2015 Qtr 1	SAG4			Comm-03
2015 Qtr 2				
2015 Qtr 3		SPACWG x 3		
2015 Qtr 4				SC-03
2016 Qtr 1	SAG5			Comm-04
2016 Qtr 2				
2016 Qtr 3		SPACWG x 2		
2016 Qtr 4				SC-04
2017 Qtr 1	SAG6	SPACWG x 1		Comm-05
2017 Qtr 2		SPACWG x 1	SCW-03	
2017 Qtr 3		SPACWG x 2	Workshop x 4	
2017 Qtr 4			Consultation x 2	SC-05
2018 Qtr 1				Comm-06
2018 Qtr 2		SPACWG x 2		
2018 Qtr 3		SPACWG x 3	Workshop x 2	
2018 Qtr 4			Consultation x 2	SC-06
2019 Qtr 1				Comm-07

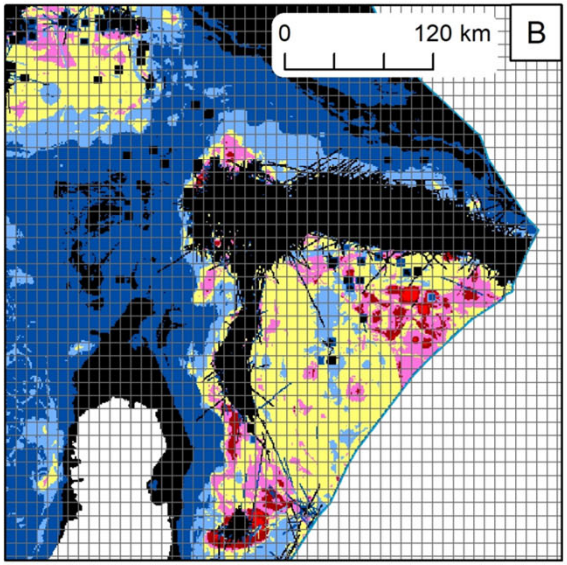
Designing spatial management areas: Officials' first stab at a spatial management proposal, 9 November 2017

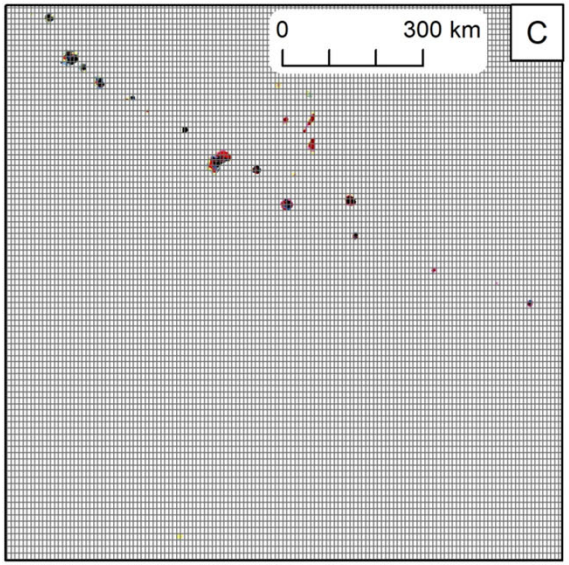
- Officials took *Zonation* output and stakeholder feedback from all those workshops and meetings;
- Developed candidate spatial management areas for final discussions with stakeholders:
  - Automated GIS search for 6-minute cells of lowest VME value to open for fishing;
  - Automated GIS search for 6-minute cells of highest fishing value to open for fishing;
  - Merge these two GIS searches;
  - Officials "nuance" boundaries targeting:
  - VME protection; fishing grounds; simple boundaries;
- Candidate areas taken to more workshops...



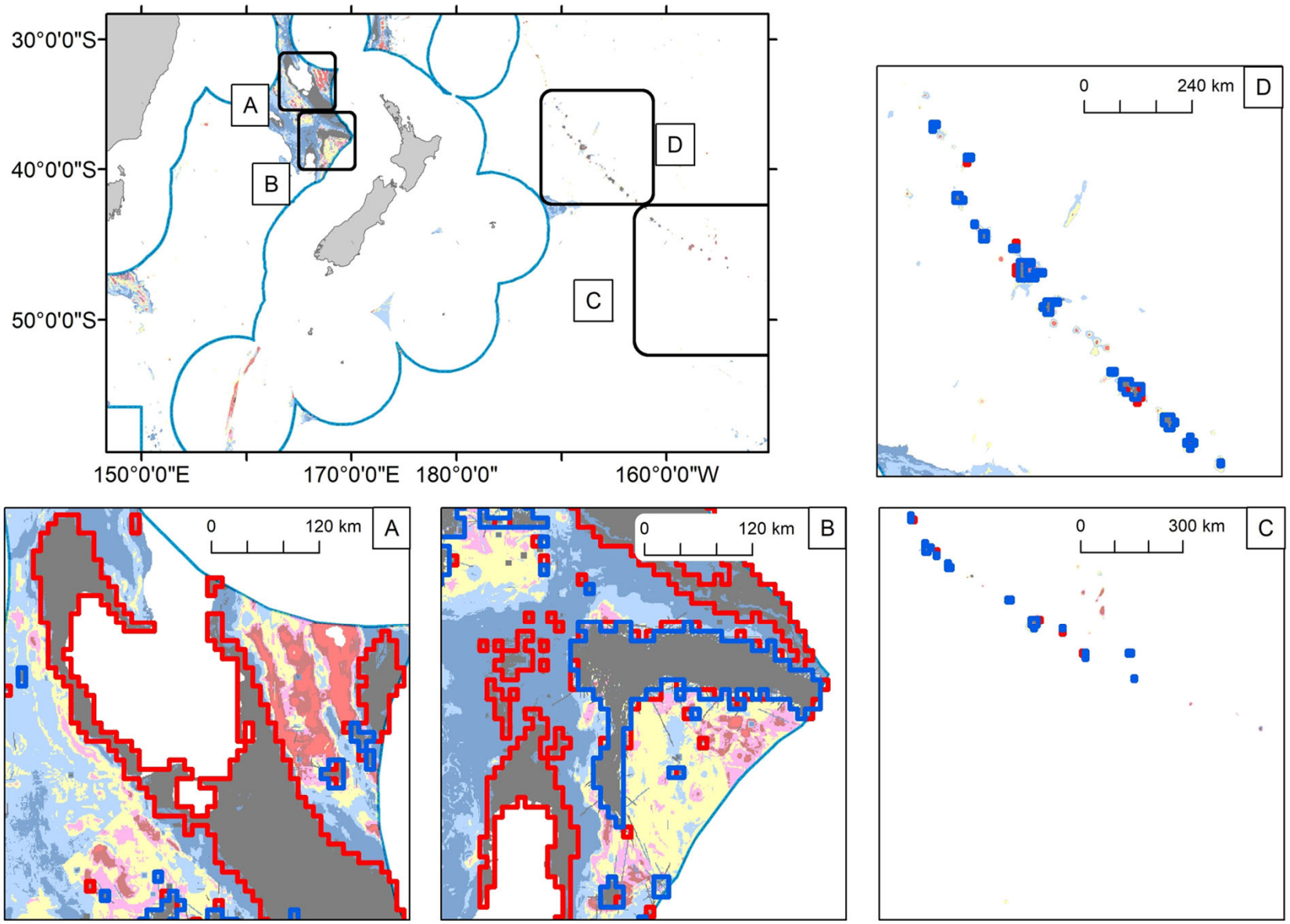






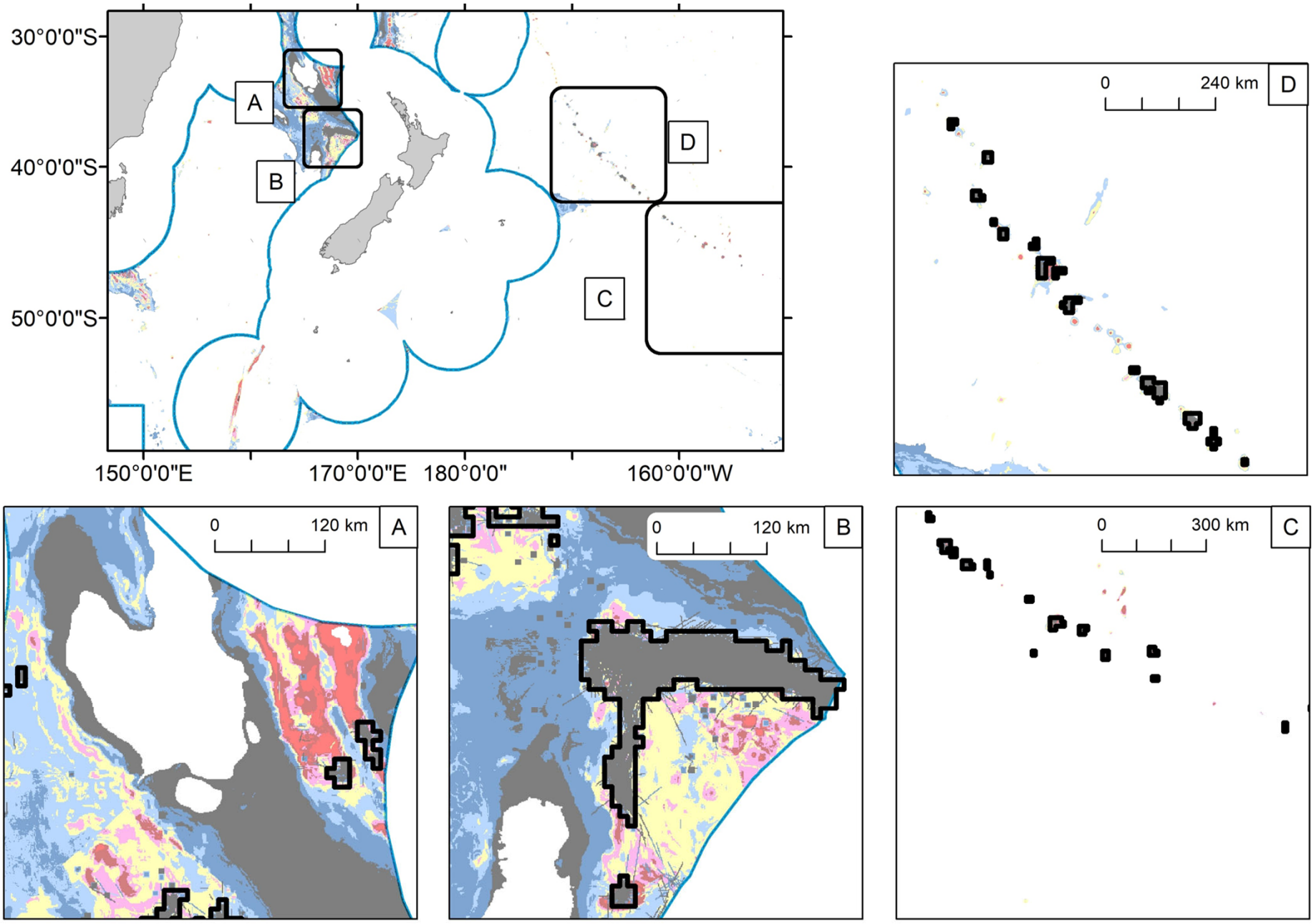


Create 6 m.o.a. grid

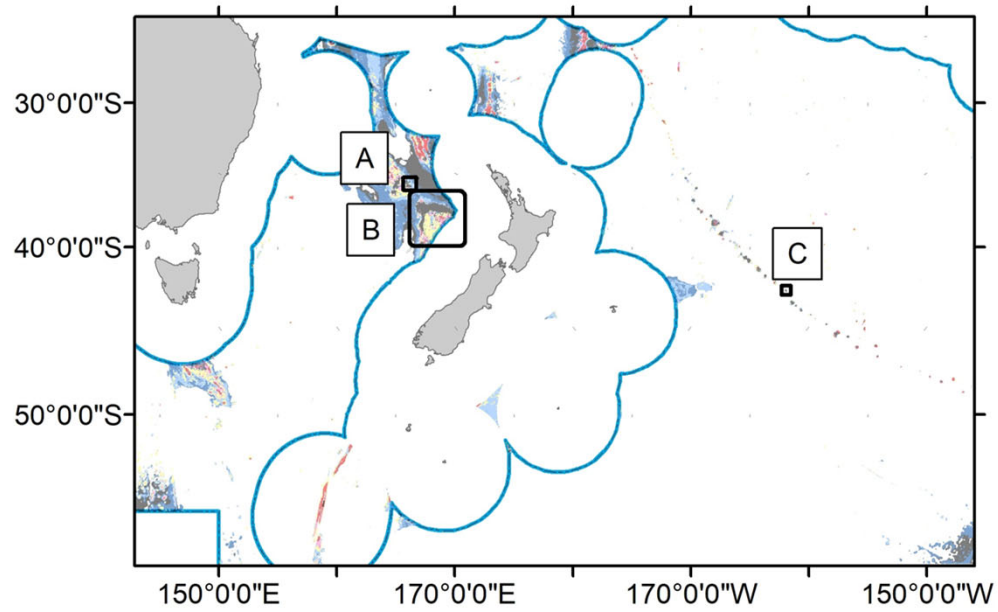


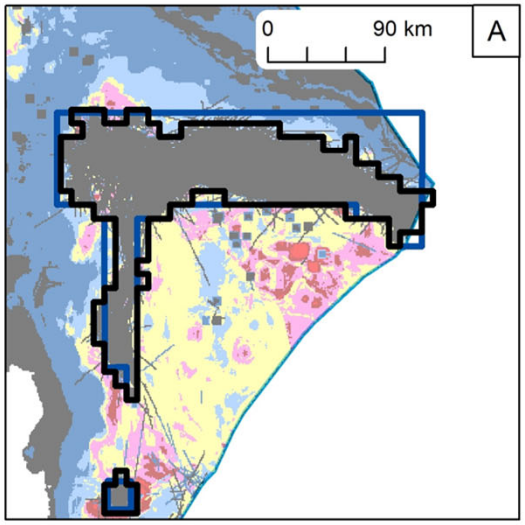
GIS searches for "good" cells to include

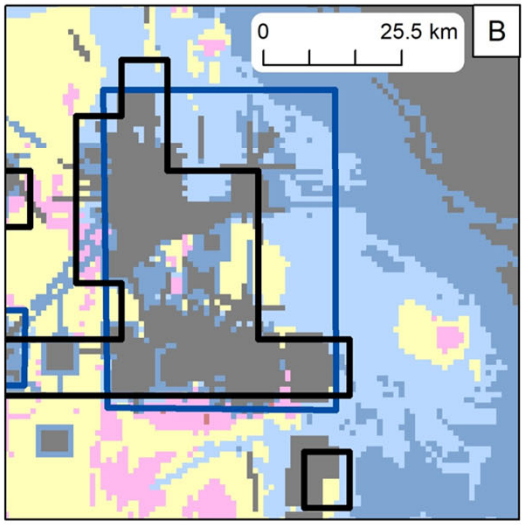
Blue = high interest to industry, red = low biodiversity-VME loss

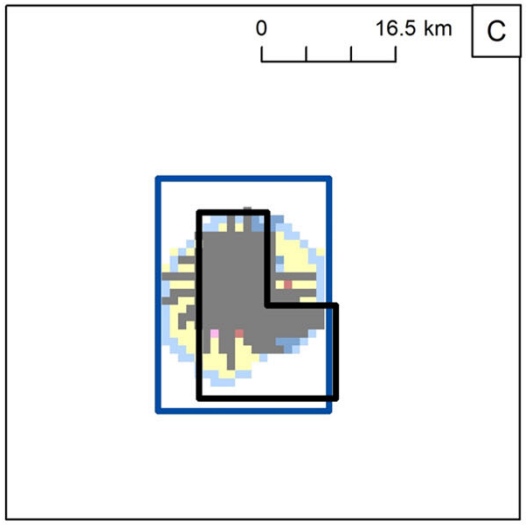


Intersection of GIS searches >>>> computer's first cut









"Nuancing" of boundaries (by officials…)

Final development of candidate spatial management areas: near-final consultation

- "Final" stakeholder workshop to view/discuss:
  - Morning: development and discussion of proto-candidate spatial management areas;
  - Afternoon: draft measure including all aspects of management of bottom fishing;
  - On reflection, ~~probably~~ way too rushed!
- Shapefiles distributed to stakeholders for any further thoughts;
- Officials make final adjustments in response to feedback on 29-Nov-2017;
- Spatial management areas included in bottom fishing measure submitted to SPRFMO…

Gains to be made using decision-support tools: moving from interim 20 m.o.a. blocks to "designed" spatial management areas (29 November 2017 iteration)

Location	Percent of fishing industry value layer unavailable ("cost")		Overall percent of VME habitat protected	
	Existing	Proposed	Existing	Proposed
Overall	8.7	7.9	65.4	84.1
Tasman Sea	10.9	2.9	61.0	86.5
Louisville	6.3	12.7	56.2	74.4
Other areas	95.8	100.0	86.2	100.0

Development of candidate spatial management areas: “final” outcome in 2019

- Draft bottom fishing measure submitted to SPRFMO late 2017 as a joint Australia – New Zealand proposal;
- Australia – New Zealand negotiations continued on details;
- Agreement on some aspects not possible in available time (catch allocation);
- Draft measure converted to an information paper for SPRFMO Commission to show progress;
- New measures not adopted in February 2018 ☹
- Following several more workshops and consultations, slightly modified measures adopted in January 2019 ☺

Take-home lessons from SPRFMO experience

- Science not easy – tricky and expensive, sparse data, modelling still developing;
- Spatial decision-support tools (e.g., *Zonation*) useful for explicitly weighing up different / opposing objectives;
- NOT robotic, lots of calls to be made and lots of levers and dials to play with;
- It takes a long time to get the confidence and buy-in of stakeholders in the software and process;
- Need multiple discussions, workshops, consultation as well as technical forums
- Complete agreement is unlikely but trade-offs are made explicit

Designing spatial management areas (where fishing is allowed): Officials' first stab at it, 9 November 2017

Key data layers on-screen in GIS:

- Zonation prioritisation map (colours black through yellow to red)
- Fishing tows and value (not shown)

Automated GIS outputs:

- All 6-moa blocks where >30% of 1km cells had a low VME priority value (solid pale blue)
- All 6-moa blocks where >50% of 1km cells had a fishery value higher than 1% of its maximum (hatched)

Product (pale blue backgrounded):

- Orthogonal boundaries "nuanced" to:
  - Maximise VME protection;
  - Maximise access to catch and ability to tow (including shooting);
  - Simplify overall boundaries.

Challenger Plateau
(Tasman Sea)