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Hydrography in the Pacific

NZ Aid Presentation to South West Pacific Hydrographic Committee

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Problem statement (1)

- Good maritime charts are an essential building block for maritime safety and economic development
- Many of the existing nautical charts rely on very old data, some going back over 100 years or more
- Even charts from WW2 may be inaccurate as reef systems change over time and GPS coordinates need to be more exact

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Problem statement (2) – What poor charts can mean

- Risk to life and the environment from shipping accidents
- Risks around legal liability e.g. for the costs of accidents / oil spills
- Insurance companies may not insure or raise premiums for vessels
- Barrier to economic development – lack of up to date Electronic Navigation Charts risks withdrawal of cruise ship visits (due to SOLAS Carriage Requirements for electronic charting systems on cruise ships from 2014) and impede the expansion of cruise ship tourism

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Proposal for a Regional Hydrography Programme (***Concept only – NOT YET APPROVED***) (1)

Overall outcome sought

•A safer maritime environment for the transport of people and goods and economic development through trade and tourism

Outputs

•Identify priority maritime areas where there is Significant, Heightened and Moderate risk (Hydrographic Risk Assessments)

•Assist PICS to reduce maritime transport safety risk through active mitigation measures

•Improve quality of navigation charts in priority areas through working with partners and identifying funding for hydrographic surveys

•Produce Electronic Navigation Charts to enable cruise shipping and other international commercial vessels to comply with SOLAS requirements

•Build capacity in PICs so they can take greater responsibility for their navigation charts

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Proposal for a Regional Hydrography Programme (***Concept only – NOT YET APPROVED***) (2)

1. Complete Hydrographic Risk Assessments for all South West Pacific PICs over next 2 - 3 years
2. Mitigation of risk areas
3. Data discovery of existing survey data
4. Cost benefit analysis to assess economic case for hydrographic survey & charting
5. Implement Vanuatu hydrographic survey as proof of concept demonstration
6. Seek funding of Technical Adviser to assist PICs with non survey mitigations in risk areas

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Proposal for a Regional Hydrography Programme (***Concept only – NOT YET APPROVED***) (3)

7. 10 year programme of survey work across the Pacific targeting risk areas identified in PIC Hydrographic Risk Assessments

8. NZ is seeking funding package from development partners and other potential funding contributors (e.g. private sector, PIC governments, Primary Charting Authorities)

9. Seek agreements with Primary Charting Authorities and PICs to make use of survey data to convert to Electronic Navigation Charts. PCAs to make commitment to upgrade the charts for the areas where new or improved survey data is provided to them

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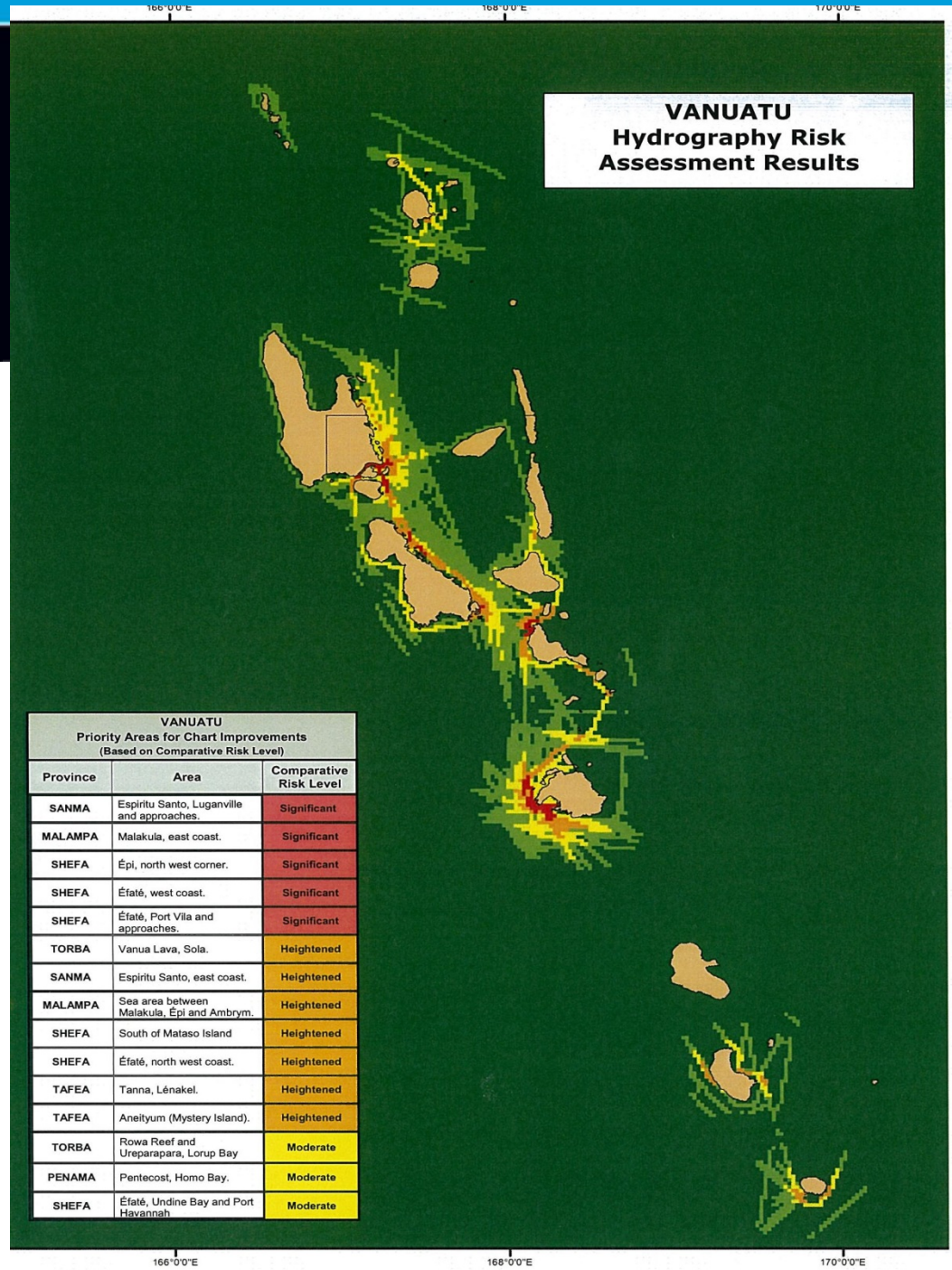
Risk Assessment methodology permits identification of Significant, Heightened and Moderate priority areas for chart improvements and mitigation



VANUATU
Priority Areas for Chart Improvements
(Based on Comparative Risk Level)

Province	Area	Comparative Risk Level
SANMA	Espiritu Santo, Luganville and approaches.	Significant
MALAMPA	Malakula, east coast.	Significant
SHEFA	Épi, north west corner.	Significant
SHEFA	Éfaté, west coast.	Significant
SHEFA	Éfaté, Port Vila and approaches.	Significant
TORBA	Vanua Lava, Sola.	Heightened
SANMA	Espiritu Santo, east coast.	Heightened
MALAMPA	Sea area between Malakula, Épi and Ambrym.	Heightened
SHEFA	South of Mataso Island	Heightened
SHEFA	Éfaté, north west coast.	Heightened
TAFEA	Tanna, Lénakel.	Heightened
TAFEA	Aneityum (Mystery Island).	Heightened
TORBA	Rowa Reef and Ureparapara, Lorup Bay	Moderate
PENAMA	Pentecost, Homo Bay.	Moderate
SHEFA	Éfaté, Undine Bay and Port Havannah	Moderate

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Mitigation

Risk assessments help PICs and development partners identify priority areas for potential mitigations, such as

- Chart improvement surveys
- Navigational aids
- Shipping lanes / traffic separation
- Drafting depth of ships
- Minimum distances from shore
- Notice to mariners of hazard areas

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Aids to Navigation

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Hydrographic Survey Phases of Work (1)

Phase 1 - Set-to Works (20% of costs)

- Mobilisation: Vessel, equipment and personnel mobilised to location
- Customs clearance, permits, consents
- Assistance from Government departments and organisations (Dept. of Surveys, Port Companies)
- Equipment installed, calibrated and full integrated system checks completed, including horizontal positioning checks and multi-beam patch test and confidence check
- Mobilisation Report detailing calibrations of all survey sensors as required by the survey specifications

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Hydrographic Survey Phases of Work (2)

Phase 2 - Fieldwork (50% of costs)

- Cost of chartering and operating vessel(s); personnel; hired equipment (positioning system, tide gauges, multi-beam echo sounder, ancillary equipment)
- Complexity of survey area (seabed topography, environmental conditions, cultural requirements)
- Surveyor in Charge to ensure data collected to required standards and specifications
- Weather standby contingency

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Hydrographic Survey Phases of Work (3)

Phase 3 - Processing and Rendering on Survey Data (30% of costs)

- Data processed to required standards and specifications
- Review of data by Client and any revisions

Phase 4 - Revise and/or Publish new chart

- Data sent to Primary Charting Authority (PCA)
- PCA prioritises charting
- Paper and/or ENC New Edition and/or New Chart published

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Hydrographic Survey Phases of Work (4)

Survey estimates based on

- Multi-beam survey
- full seafloor search (i.e. IHO Order 1a)
- features >2m^3
- water depths up to 40m
- suitably qualified and experienced Surveyor In Charge is responsible for, and involved in, all aspects of the work including planning, conduct, rendering and approval

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Hydrographic Survey Cost Estimates

- Cost of a hydrographic survey will vary depending on the survey standard, technology, extent and seabed topography

- Land Information NZ (LINZ) and SPC has provided estimates based on
  - multi-beam survey typical of an annual national survey
  - coastal shipping lanes and approaches to port/harbour
  - commercial rates for hireage of the professional staff, vessels and equipment required

- SPC has estimated a multi-beam survey in Luganville harbour in Vanuatu with two weeks of on-site survey could cost about $400,000

- Full country survey programme is between NZ$1.8m and $5.5m

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How to reduce the costs of survey and upgrading charts (1)

- Source existing data based on previous survey work
- Use of domestic or visiting navy vessels (e.g. NZ Navy) with survey capability
- In-kind contribution of vessel and crew by PIC - e.g. offshore patrol vessel
- Utilise SPC's resources
  - single and multi-beam echo sounder equipment
  - workshop with skilled maintenance technicians
  - full time CAT B hydrographer

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How to reduce the costs of survey and upgrading charts (2)

- Use survey equipment fit for purpose:
  - port berths and shallow areas in channels surveys can use basic equipment – e.g. single beam echo sounder for depth side scan, sonar for object detection

- Negotiate a contribution towards survey costs from commercial service providers (e.g. cruise ship company, ferry company, freight shipper)