



Seabed Minerals Authority Runanga Takere Moana

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INDEX OF DATA PACKAGE 2015 TENDER

A comprehensive Data Package has been compiled by the Authority to assist Applicants in developing their proposals for the Cook Islands Seabed Minerals Tender 2015. This information includes legacy, and recent reports, cruises, associated acquired data and recent compilations of this work. All available spatial referenced data including chemical analyses, contents of grab samples, photographs, maps, survey lines and limited biological data has been compiled into a GIS data base and this will be available within the Data Package. In addition, relevant Cook Islands legislation that a successful tender will need to comply with to do business in Cook Islands will be posted on the Authority's website: www.seabedmineralsauthority.gov.ck

To apply for the Data Package please complete and return the application form for the data package available on the Authority's website.

The following table provides information on the contents of the Data Package.

Folder	Brief Description
<u>Folder: Data Package 2015\CKI Reports\Acreage Valuation</u> <ul style="list-style-type: none">• Map Montage for Reports 140315• Valuation of Blocks as at 140219• Valuing Acreage Cook Islands EEZ	Internal Authority report and background information on a valuation of the Cook Islands [CKI] seabed mineral resources on a 1 degree latitude/longitude grid based on available information and an understanding of the geological model as at February 2014
<u>Folder: Data Package 2015\CKI Reports\CKI Other</u> <ul style="list-style-type: none">• 2010_Halbach_MnNodules&Seamounts_UMI• DSM Information Brochure 3_Cook Islands• EconomicAndDevelopmentPotentialofManganeseNodules 1995• Kingan_1998_MnNodulesOfTheCookIslands• Lynch_2011_RegulatoryFrameworkforDMinCI• SOPAC_EW Study 1993• Deep Sea Minerals in the Pacific Islands Regional Brochure 11 Cook Isls (2014)	Various legacy and recent compilation and analysis reports relevant to the CKI seabed mineral resources
<u>Folder: Data Package 2015\CKI Reports\Cronan\Cronan Report to SBMA</u> <ul style="list-style-type: none">• Cronan Report to SBMA Part I Report• Cronan Report to SBMA Part II Appendix 8	

Folder	Brief Description
<ul style="list-style-type: none"> • Cronan Report to SBMA Part II Appendices 1-7 	
<p><u>Folder:Data Package 2015\CKI Reports.zip\CKI Reports\Cronan\Cronan Report to SBMA</u></p> <ul style="list-style-type: none"> • Cronan Report to SBMA Part I Report • Cronan Report to SBMA Part II Appendix 8 • Cronan Report to SBMA Part II Appendices 1-7 	<p>The Authority commissioned D.S. Cronan to collate all available published and unpublished research on seabed minerals research relevant to the CKI polymetallic mineral resources and assist with the development of a geological model, and a resource estimate.^{1 2} The report enabled the considerable legacy spatial data to be retrieved.</p>
<p><u>Folder: Data Package 2015\CKI Reports\Cronan\Cronan various reports</u></p> <ul style="list-style-type: none"> • 17031400 Nodules and Crust in and Adjacent to the EEZ of the Cook Islands (the Aitutaki-JarvisTransect)_1991 • CR019 CCOP/SOPAC Cruise Report 119_1987 • Element supply to surface manganese nodules along the Aitutaki-Jarvis Transect, South Pacific_1994 • Some controls on the geochemical variability of manganese nodules with particular reference to the tropical South Pacific • Manganese Nodules in SW Paciic_Gladsby_1986 • TR0088 Manganese Nodules and CobaltRich Crusts in the EEZ's of the Cook Islands, Kiribati and Tuvalu_PartI_1989 • TR0099 Manganese Nodules and CobaltRich Crusts in the EEZ's of the Cook Islands, Kiribati and Tuvalu_PartII_1989 • TR01000 Manganese Nodules and CobaltRich Crusts in the EEZ's of the Cook Islands, Kiribati and Tuvalu_PartIII_1989 • TR0102 Manganese Nodules and CobaltRich Crusts in the EEZ's of the Cook Islands, Kiribati and Tuvalu_PartIV_1990 • Nodules & Crusts in & Adjacent to the EEZ of CKI Part 1_1991 	<p>Legacy research reports authored/co-authored by D.S. Cronan relevant to CKI polymetallic mineral resources.</p>
<p><u>Folder: Data Package 2015\CKI Reports\KENEX\2014 Prospectivity Study</u></p> <ul style="list-style-type: none"> • Mineral Prospectivity model for the Cook Islands EEZ manganese nodule deposits • Cook Islands Economic Exclusive Zone Prospectivity Study • Grid interpolation procedures • CI_FolderStructure • Datasources • CI_GIS [Folder] 	<p>In late 2013 the Authority commissioned Kenex Ltd to digitise all available spatial data that the Authority retrieved following the Cronan report and develop a GIS data base. Once completed prospectivity modelling study was undertaken resulting in a much improved understanding of the key deposition controls and</p>

¹ Cronan D.S. (2013); The Distribution, Abundance, Composition and Resource Potential of The Manganese Nodules in the Cook Islands Exclusive Economic Zone.

² Report part funded by the SPC-EU EDF10 Deep Sea Minerals (DSM) Project.

Folder	Brief Description
	understanding of the spatial distribution of the resource parameters. The GIS data base and report from this work is included in folder CI_GIS. ³
<p><u>Folder: Data Package 2015\CKI Reports\KENEX\2014 Probabilistic Study Kenex</u></p> <ul style="list-style-type: none"> • Block Model • Data • DepositScaleGrade7 • DepositScaleGrade10 • DepositScaleGrade20 • Grids • Various ArcGISMap Documents(12) • CI_posterfinal • ProbabilisticValuationofCookislandsEEZSeabedMineralsAcreage • Stats Analysis 	In late 2014 the Authority commissioned Kenex Ltd to undertake a probabilistic valuation of the CKI polymetallic nodule resource using the spatial data base to constrain resource estimates and enable a ranking of “highest value” areas as part of a screening for suitable areas for allocation. Report and data of the findings and the supporting information generated. ⁴
<p><u>Folder: Data Package 2015\Japan-SOPAC SW Pacific Cruises\Associated CKI legacy cruise Reports</u></p> <ul style="list-style-type: none"> • CR0023 Marine Geology, Geophysics and Manganese Nodule Deposits in the Penrhyn Basin. <i>Geological Survey of Japan Cruise Report 23</i> • CR0122 CCOP/SOPAC Moana Wave Cruise 3 (MW87-02) To the territorial waters of western Samoa, The Cook Islands and Kiribati_1987 • Cruise Report No.22 Marine Geology, Geophysics and Manganese Nodule Deposits in the Southern Part of the Central Pacific Basin, August – October 1982 (Hakurei-Maruk Cruise GH82-4 • TR0325 Japan/SOPAC DeepSea Mineral Resources Programme a synthesis of the first stage_2001 • Preliminary Report on the Results of the Japan/Sopac Deepsea Mineral Resources Surve in The Cook Islands Waters SOPAC Prelim Report 129 (2001) • TR_359_Summary Report on Cooperative DSMR Study Programme fof R/V Hakurei-Maruk No.2 Cruises, for Polymetallic Manganese Nodules, The EEZ Of The Cook Islands 2003 	Interim reports from SOPAC/Japan cruises and Japan Geological Survey Cruise Reports
<p><u>Folder: Data Package 2015\Japan-SOPAC SW Pacific Cruises\CKI Research Cruises</u></p> <ul style="list-style-type: none"> • Ocean Resources Investigation_VOL1_SeaAreaOfCookIs_Feb10_1986 • Ocean Resources Investigation_VOL2_SeaAreaOfCookIs_Feb10_1987 • Ocean Resources Investigation_VOL1-2_SeaAreaOfCookIs_Feb8_1991 	SOPAC/Japan detailed cruise reports. Contain details of cruises, raw data, photographs and interpretations.

³ Report funded by CITAF

⁴ Report funded by CITAF

Folder	Brief Description
<ul style="list-style-type: none"> REPORT ON THE COOPERATIVE STUDY PROJECT_VOL1_SeaAreaofTheCookIslands_Feb9_2001 	
<p><u>Folder: Data Package 2015\Other key reports\Bechtel</u></p> <ul style="list-style-type: none"> Deep Sea Nodule Appendix A Deep Sea Nodule Mining pre-feasibility Study Deep-Sea Nodule Mining part 1 Deep-Sea Nodule Mining part 2 Deep-Sea Nodule Mining part 3 Deep-Sea Nodule Mining part 4 Deep-Sea Nodule Mining part 5 Deep-Sea Nodule Mining part 6 Deep-Sea Nodule Mining part 7 Deep-Sea Nodule Mining part 8 Deep-Sea Nodule Mining part 9 Deep-Sea Nodule Mining part 10 Deep-Sea Nodule Mining part 11 Deep-Sea Nodule Mining part 12 Deep-Sea Nodule Mining part 13 Deep-Sea Nodule Mining part 14 Deep-Sea Nodule Mining part 15 Deep-Sea Nodule Mining Prefeasibility Study July 1996 	<p>1996 Pre-feasibility report prepared for the CKI Government by Bechtel Corporation⁵ on the mining of nodules using technology and prices of the day.</p>
<p><u>Folder: Data Package 2015\Other key reports\Hein Reports</u></p> <ul style="list-style-type: none"> Critical Metals in Mn Nodules in the Cook Islands EEZ_Hein et al 2015 An est of the Mn Nodule Metals Res_ Star Conf 2013 	<p>Results of detailed re analyses of polymetallic nodules (from 1985-2000 SOPAC/Japan surveys) for mineralogical and chemical composition, which include many critical metals not previously analysed. Results published in "Ore Geology"</p>
<p><u>Folder: Data Package 2015\Other key reports\Norwegian Reviews</u></p> <ul style="list-style-type: none"> NDSMG Marine Mineral Resources_Business Opportunities for Norwegian Industry_2001 UMI 2003_ Frerick Soreide 	<p>Results of a 2001 Norwegian consortium (Norwegian Deep Seabed Mining Group) technical and economic feasibility study of recovering CKI polymetallic nodules.</p>

Geospatial Inventory

The ArcReader and ArcGIS files for viewing the projects.

- CI_map.mxd (ArcGIS)
- CI_map.pmf (ArcReader)
- CI_model.mxd (ArcGIS)
- CI_model.pmf (ArcReader)

⁵ Funded by US Trade and Development Agency

Spatial data table listing all the maps tested in the model

- CIEEZ_SDT.xlsx

Data files which are used by mxd(ArcGIS) and pmf (ArcReader files), these files can also be opened in Quantum GIS.

Shapefiles:

- Basins
- CobaltCrust
- CookIsland1Deg
- CookIsland20minGrid
- CookIslandEEZGrid
- ECSA_BoundaryPoly
- EEZ_BoundaryLine
- EEZ_BoundaryPoly
- FeMnCrust
- Geology
- Highlightarea
- Megafauna_TuiCruise
- mfes1985
- mfes1986
- MicroprobeAnalysis_TuiCruise
- mn_2000-re_ab-grade_point
- mn_2000-re_co-grade_point
- mn_2000-re_cu-grade_point
- mn_2000-re_fe-grade_point
- mn_2000-re_mi-grade_point
- mn_2000-re_mn-grade_point
- mn1986_photos
- mn2000_photos
- MnCrust_TuiCruise
- MnNod_1985_Analysis
- MnNod_Cronan
- MnNod_GH83_3
- MnNod_GH83_3_Analysis
- MnNod_GH83_3_Grainsize
- MnNod_JICA
- MnNod_JICA_Analysis
- MnNod_JICA_Avg_ST
- MnNod_JICA_DetailChemComp
- MnNod_JICA_DetailDesc
- MnNod_JICA_DetailNodComp
- MnNod_JICA_DetailPrincipalElem
- MnNod_JICA_Grainsize
- MnNod_JICA_MajorMinorElem
- MnNod_Sonne
- MnNod_Sonne_Analysis
- MnNod_ThomasWash1987
- MnNod_TuiCruise_Analysis

- MnNodDescr_TuiCruise
- MnRocks_TuiCruise
- MnSediment_TuiCruise
- MnStationSum_TuiCruise
- nbs1985
- nbs1986
- shadedline

Rasters

- Bathymetry
- Sedthickness
- Studyarea

Reclassified grids of the final maps used within the model.

- bathy_rc
- ccd_rc
- co_abpc_rc
- cu_abpc_rc
- fe_abpc_rc
- geo_rc
- mn_abpc_rc
- mnfe_rc
- ni_abpc_rc
- seamount_rc
- sedthick_rc
- slope_rc

The training points and the outputs generated by the model (raster maps and targets shapefile).

- FinalTargets
- mn_conf
- mn_mdvar
- mn_pprb
- mn_pprb_rc
- mn_std
- mn_tstd
- mn_uc
- pmap_rc2
- TrainingPoints

The spatial tables of the final maps used within the model.

- bathy_rc_CT
- ccd_rc_CT
- co_abpc_rc_CT
- fe_abpc_rc_CT
- geo_RC_CT
- mn_abpc_rc_CT

- mnfe_rc_CT
- ni_abpc_rc_CT
- seamount_buff_CT
- seamount_rc_CT
- sedthick_CT
- slope_rc

Requested maps, both in pdf and jpg.

- AreabelowCCD.jpg
- AreabelowCCD.pdf
- Bathymetry.jpg
- Bathymetry.pdf
- MnDist.jpg
- MnDist.pdf
- PostProb.jpg
- PostProb.pdf
- PostProb&Blocks.jpg
- PostProb&Blocks.pdf
- PropectivityVsDollarArea.jpg
- PropectivityVsDollarArea.pdf
- ProspectiveAreas.jpg
- ProspectiveAreas.pdf
- Targets.jpg
- Targets.pdf
- Targets&Blocks.jpg
- Targets&Blocks.pdf

Requested maps, both in pdf and jpg.

- CoCuNi\$.jpg
- CocuNi\$.pdf
- CoCuNiTotppm.jpg
- CoCuNiTotppm.pdf
- CoDist.jpg
- CoDist.pdf
- CuDist.jpg
- CuDist.pdf
- DollarArea.jpg
- DollarArea.pdf
- MnAbund.jpg
- MnAbund.pdf
- NiDist.jpg
- NiDist.pdf
- SampleDist1.jpg
- SampleDist1.pdf
- SampleDist2.jpg
- SampleDist2.pdf

Photos which are linked to some of the sample locations, which can be viewed and queried in the pmf file in ArcReader.

- Sample points photos (*.jpg)

Project documentation, procedures and report.

- CookIslandsModel_CW_EP_CP.pptx
- datasources.docx
- FINALDRAFT_Polymetallic Nodule Deposit Model.pdf
- Grid interpolation procedures.

