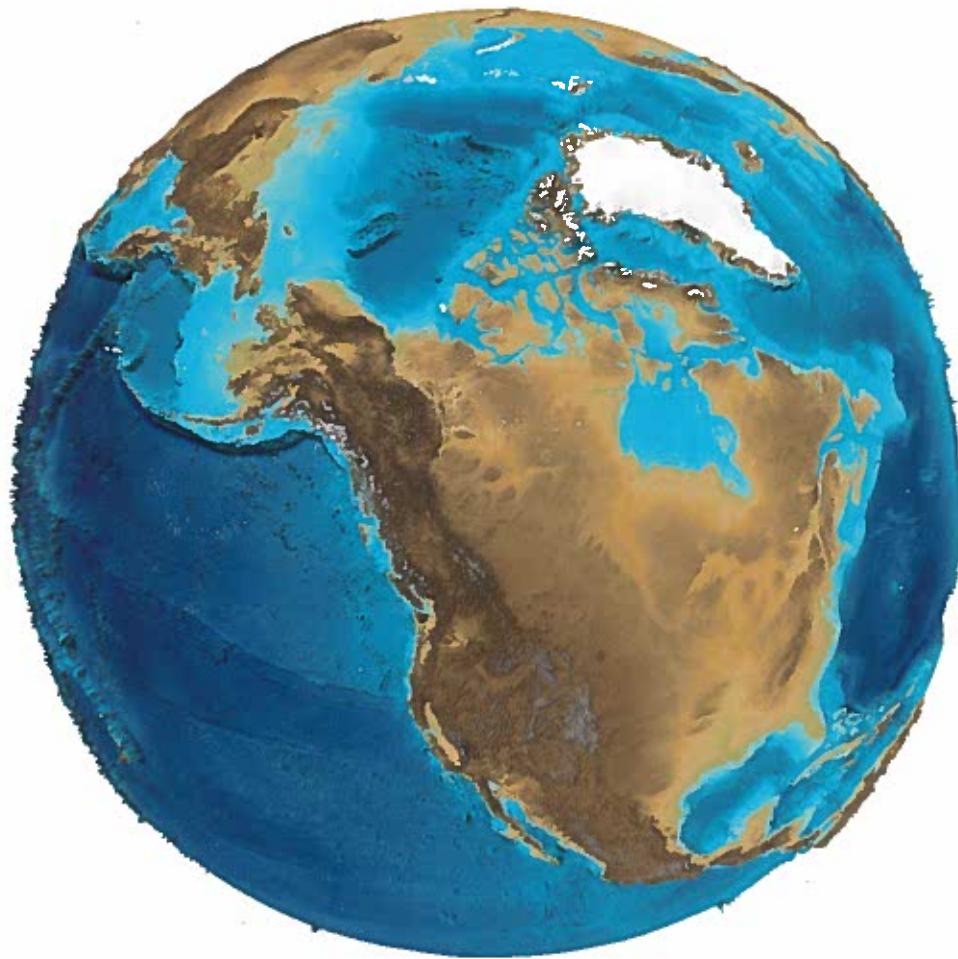


JAMES V. GARDNER

The Compilation and Analysis of Data Relevant to a U.S. Claim Under United Nations Law of the Sea Article 76: A Preliminary Report

Appendices



Center for Coastal and Ocean Mapping/Joint Hydrographic Center
University of New Hampshire

Durham, N.H.
May, 2002

Larry Mayer, Martin Jakobsson and Andrew Armstrong



Appendix A

UNITED NATIONS CONVENTION ON THE LAW OF THE SEA

AGREEMENT RELATING TO THE IMPLEMENTATION OF PART XI OF THE CONVENTION

CONTINENTAL SHELF

©
Article 76

Definition of the continental shelf

1. The continental shelf of a coastal State comprises the seabed and subsoil of the submarine areas that extend beyond its territorial sea throughout the natural prolongation of its land territory to the outer edge of the continental margin, or to a distance of 200 nautical miles from the baselines from which the breadth of the territorial sea is measured where the outer edge of the continental margin does not extend up to that distance.
2. The continental shelf of a coastal State shall not extend beyond the limits provided for in paragraphs 4 to 6.
3. The continental margin comprises the submerged prolongation of the land mass of the coastal State, and consists of the seabed and subsoil of the shelf, the slope and the rise. It does not include the deep ocean floor with its oceanic ridges or the subsoil thereof.
4. (a) For the purposes of this Convention, the coastal State shall establish the outer edge of the continental margin wherever the margin extends beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured, by either:
 - (i) a line delineated in accordance with paragraph 7 by reference to the outermost fixed points at each of which the thickness of sedimentary rocks is at least 1 per cent of the shortest distance from such point to the foot of the continental slope; or
 - (ii) a line delineated in accordance with paragraph 7 by reference to fixed points not more than 60 nautical miles from the foot of the continental slope.

(b) In the absence of evidence to the contrary, the foot of the continental slope shall be determined as the point of maximum change in the gradient at its base.

- 5. The fixed points comprising the line of the outer limits of the continental shelf on the seabed, drawn in accordance with paragraph 4 (a)(i) and (ii), either shall not exceed 350 nautical miles from the baselines from which the breadth of the

- territorial sea is measured or shall not exceed 100 nautical miles from the 2,500 metre isobath, which is a line connecting the depth of 2,500 metres.
6. Notwithstanding the provisions of paragraph 5, on submarine ridges, the outer limit of the continental shelf shall not exceed 350 nautical miles from the baselines from which the breadth of the territorial sea is measured. This paragraph does not apply to submarine elevations that are natural components of the continental margin, such as its plateaux, rises, caps, banks and spurs.
7. The coastal State shall delineate the outer limits of its continental shelf, where that shelf extends beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured, by straight lines not exceeding 60 nautical miles in length, connecting fixed points, defined by coordinates of latitude and longitude.
8. Information on the limits of the continental shelf beyond 200 nautical miles from the baselines from which the breadth of the territorial sea is measured shall be submitted by the coastal State to the Commission on the Limits of the Continental Shelf set up under Annex II on the basis of equitable geographical representation. The Commission shall make recommendations to coastal States on matters related to the establishment of the outer limits of their continental shelf. The limits of the shelf established by a coastal State on the basis of these recommendations shall be final and binding.
9. The coastal State shall deposit with the Secretary-General of the United Nations charts and relevant information, including geodetic data, permanently describing the outer limits of its continental shelf. The Secretary-General shall give due publicity thereto.
10. The provisions of this article are without prejudice to the question of delimitation of the continental shelf between States with opposite or adjacent coasts.

The Final Act of the Third United Nations Conference on the Law of the Sea

ANNEX II

STATEMENT OF UNDERSTANDING CONCERNING A SPECIFIC METHOD TO BE USED IN ESTABLISHING THE OUTER EDGE OF THE CONTINENTAL MARGIN

The Third United Nations Conference on the Law of the Sea,

Considering the special characteristics of a State's continental margin where:

(1) the average distance at which the 200 metre isobath occurs is not more than 20 nautical miles; (2) the greater proportion of the sedimentary rock of the continental margin lies beneath the rise; and

Taking into account the inequity that would result to that State from the application to its continental margin of article 76 of the Convention, in that, the mathematical average of the thickness of sedimentary rock along a line established at the maximum distance permissible in accordance with the provisions of paragraph 4(a)(i) and (ii) of that article as representing the entire outer edge of the continental margin would not be less than 3.5 kilometres; and that more than half of the margin would be excluded thereby;

Recognizes that such State may, notwithstanding the provisions of article 76, establish the outer edge of its continental margin by straight lines not exceeding 60 nautical miles in length connecting fixed points, defined by latitude and longitude, at each of which the thickness of sedimentary rock is not less than 1 kilometre,

Where a State establishes the outer edge of its continental margin by applying the method set forth in the preceding paragraph of this statement, this method

may also be utilized by a neighbouring State for delineating the outer edge of its continental margin on a common geological feature, where its outer edge would lie on such feature on a line established at the maximum distance permissible in accordance with article 76, paragraph 4(a)(i) and (ii), along which the mathematical average of the thickness of sedimentary rock is not less than 3.5 kilometres,

The Conference requests the Commission on the Limits of the Continental Shelf set up pursuant to Annex II of the Convention, to be governed by the terms of this Statement when making its recommendations on matters related to the establishment of the outer edge of the continental margins of these States in the southern part of the Bay of Bengal.

Appendix B

Organizations and Individuals collaborating in study

UNH CCOM/JHC	Martin Jakobsson Larry Mayer Andrew Armstrong
NGDC	Michael Loughridge George Sharman David Divins John Campagnoli Dan Metzger
Intergraph	Charles Woodbury
USGS	Debbie Hutchinson John Haines John Childs Erika Hammar-Klose
Five Seas	Norman Cherkis
GSC (Retired)	Ron Macnab
NIMA	Dan Donell

Appendix C

ANNEX II. COMMISSION ON THE LIMITS OF THE CONTINENTAL SHELF

@
Article 1

In accordance with the provisions of article 76, a Commission on the Limits of the Continental Shelf beyond 200 nautical miles shall be established in conformity with the following articles.

@
Article 2

1. The Commission shall consist of 21 members who shall be experts in the field of geology, geophysics or hydrography, elected by States Parties to this Convention from among their nationals, having due regard to the need to ensure equitable geographical representation, who shall serve in their personal capacities.
2. The initial election shall be held as soon as possible but in any case within 18 months after the date of entry into force of this Convention. At least three months before the date of each election, the Secretary-General of the United Nations shall address a letter to the States Parties, inviting the submission of nominations, after appropriate regional consultations, within three months. The Secretary-General shall prepare a list in alphabetical order of all persons thus nominated and shall submit it to all the States Parties.
3. Elections of the members of the Commission shall be held at a meeting of States Parties convened by the Secretary-General at United Nations Headquarters. At that meeting, for which two thirds of the States Parties shall constitute a quorum, the persons elected to the Commission shall be those nominees who obtain a two-thirds majority of the votes of the representatives of States Parties present and voting. Not less than three members shall be elected from each geographical region.
4. The members of the Commission shall be elected for a term of five years. They shall be eligible for re-election.
5. The State Party which submitted the nomination of a member of the Commission shall defray the expenses of that member while in performance of Commission duties. The coastal State concerned shall defray the expenses incurred in respect of the advice referred to in article 3, paragraph 1(b), of this Annex. The secretariat of the Commission shall be provided by the Secretary-General of the United Nations.

©
Article 3

1. The functions of the Commission shall be:

- (a) to consider the data and other material submitted by coastal States concerning the outer limits of the continental shelf in areas where those limits extend beyond 200 nautical miles, and to make recommendations in accordance with article 76 and the Statement of Understanding adopted on 29 August 1980 by the Third United Nations Conference on the Law of the Sea;
- (b) to provide scientific and technical advice, if requested by the coastal State concerned during the preparation of the data referred to in subparagraph (a).

2. The Commission may cooperate, to the extent considered necessary and useful, with the Intergovernmental Oceanographic Commission of UNESCO, the International Hydrographic Organization and other competent international organizations with a view to exchanging scientific and technical information which might be of assistance in discharging the Commission's responsibilities.

©
Article 4

Where a coastal State intends to establish, in accordance with article 76, the outer limits of its continental shelf beyond 200 nautical miles, it shall submit particulars of such limits to the Commission along with supporting scientific and technical data as soon as possible but in any case within 10 years of the entry into force of this Convention for that State. The coastal State shall at the same time give the names of any Commission members who have provided it with scientific and technical advice.

©
Article 5

Unless the Commission decides otherwise, the Commission shall function by way of sub-commissions composed of seven members, appointed in a balanced manner taking into account the specific elements of each submission by a coastal State. Nationals of the coastal State making the submission who are members of the Commission and any Commission member who has assisted a coastal State by providing scientific and technical advice with respect to the delineation shall not be a member of the sub-commission dealing with that submission but has the right to participate as a member in the proceedings of the Commission concerning the said submission. The coastal State which has made a submission to the Commission may send its representatives to participate in the relevant proceedings without the right to vote.

©
Article 6

- 1. The sub-commission shall submit its recommendations to the Commission.
- 2. Approval by the Commission of the recommendations of the sub-commission shall be by a majority of two thirds of Commission members present and voting.

3. The recommendations of the Commission shall be submitted in writing to the coastal State which made the submission and to the Secretary-General of the United Nations.

©
Article 7

Coastal States shall establish the outer limits of the continental shelf in conformity with the provisions of article 76, paragraph 8, and in accordance with the appropriate national procedures.

©
Article 8

In the case of disagreement by the coastal State with the recommendations of the Commission, the coastal State shall, within a reasonable time, make a revised or new submission to the Commission.

©
Article 9

The actions of the Commission shall not prejudice matters relating to delimitation of boundaries between States with opposite or adjacent coasts.

Implementation tasks and the time frame for their completion

Article 76 states that the tasks outlined above need to be completed by a coastal state within 10 years of the entry into force of UNCLOS for that particular state. In principle, the initial ratifiers of UNCLOS had until November 16, 2004 to carry out this work on their respective continental margins, if applicable, and to present their Submissions to the Commission on the Limits of the Continental Shelf (CLCS). However recognizing the significant practical difficulties that were faced by developing states in meeting such a deadline, the Tenth Meeting of States Parties agreed to defer the final date for presenting a Submission to May 13, 2009.

In this context, it should be noted that the above time limit does not apply to the USA and to other states that have not yet ratified UNCLOS. The deadlines for such states will be ten years from the dates of their individual UNCLOS ratifications.

A set of Guidelines has been prepared by the CLCS (United Nations, 1999) to assist coastal states in the execution of the tasks described above, in the preparation of a Submission, and in the organization of supporting material. In general, the implementation process consists of several successive steps, beginning with an initial desk study that: (a) assembles all available geoscientific information (bathymetry, morphology, and geology); (b) analyzes that information to develop provisional outer limits; and (c) determines whether a requirement exists for more or better geoscientific information.

Depending on the outcome of the desk study, it may prove necessary to conduct fieldwork or to engage in a more exhaustive search for existing information, with a view to improving the database in certain respects, e.g. determining a definitive territorial sea baseline, upgrading the bathymetric map in certain areas, or defining sediment thickness on the basis of seismic reflection and refraction. New information that is acquired through fieldwork or through an expanded archival search needs to be assimilated into existing databases. Previous interpretations then require revision and refinement in light of the new data, culminating in the construction of a definitive outer limit.

The penultimate operation involves the preparation of a comprehensive report that documents the procedures outlined above, the data sets that were used in the analysis, and the results of that analysis, expressed as a series of coordinates that define the outer limit of the juridical continental shelf. As the core of a coastal state's Submission to the CLCS, this document must present a clear and compelling substantiation of that state's case for an extended continental shelf.

The final step entails presentation of the coastal state's Submission to the CLCS for review and recommendation. Another CLCS document (United Nations, 1997b) describes at length the *modus operandi* that governs the process once this stage is reached. In essence, this involves the formation of a subcommission that will perform a technical evaluation of the Submission, consult with coastal state representatives, and formulate recommendations.

The terms of reference for the CLCS are defined in Annex II of UNCLOS. In brief, the Commission has a dual function: (a) to review Article 76 submissions by coastal states and to make recommendations; and (b) to provide scientific and technical advice to individual states upon request. Allowing for equitable geographic representation, membership in the Commission is drawn exclusively from states that have ratified the Convention, and consists of 21 elected experts in the field of geology, geophysics, or hydrography. Members are elected for five-year terms, the first term running from 1997 to 2002. The Commission's member nations are organized in accordance with the UN's customary regional groupings.

Appendix D

Statement on Proprietary Data from MMS

For Law of the Sea and EEZ exercises affecting National policy, Federal Government agencies may have access to proprietary seismic information currently in the MMS inventory. There are proprietary data forms that must be signed by the Secondary Office of Control. Seismic lines may be viewed at the appropriate MMS Regional office. On occasion, in specific instances, proprietary seismic information may be delivered to the office of another Federal agency. For example, during the negotiations with Mexico in the Gulf of Mexico Western Gap issue, MMS geoscientists brought seismic lines to the Department of State with appropriate proprietary data forms.

With regard to making a map from selected lines of proprietary seismic information for possible use in Law of the Sea issues, no designated line information may be used or displayed that would identify the seismic line itself, the permittee, or the current data holder. Traditionally, MMS has utilized the "three-source" rule, where a map is derived from proprietary information from no less than three separate sources and, in no way, could those sources be identified. The Office of the Solicitor has concurred in this policy. It would be preferred that such a map be drafted at an MMS Regional office.

APPENDIX E

SONAR SPECIFICATIONS

EM 120

Multibeam echo sounder



KONGSBERG
SIMRAD

9 TECHNICAL SPECIFICATIONS

Note !

Kongsberg Simrad is engaged in continuous developments of its products and reserves the right to alter specifications without prior notice.

9.1 Physical properties

List of units and main subunits

- Operator station
 - The Operator Station may contain a number of subunits and peripherals (for example storage units, printers and plotters). The configuration of these will be defined by the user.
- Transceiver Unit
- Preamplifier Unit
- TX Junction Box(es)
- Transmit Transducer Array
- Receive Transducer Array
- Junction Box
 - Normally, a single Junction Box is used for on/off and remote control. Additional junction boxes may need to be added if required to splice cables or add special functions.

Interfaces

- Serial lines with operator adjustable baud rate, parity, data length and stop bit length for:
 - Motion sensor (roll, pitch, heave and optionally heading) in format supported by sensors from Applied Analytics, Seatek and TSS
 - Gyrocompass in either NMEA 0183 HDT or SKR82/LR60 format
 - Positions in either Simrad 90, NMEA 0183 GGA or GGK format
 - External clock in NMEA 0183 ZDA format
 - Sound speed profile
 - Sound speed at transducer
 - Sea level height (tide)
 - Output of depth straight down in NMEA 0183 DPT format
- Interface for 1 PPS (pulse per second) clock synchronisation signal

Technical specifications

- SCSI interface for tape drive (DAT or Exabyte), additional disk drives and optional greyscale recorder for seabed image
- Parallel interface for Postscript colour graphics printer/plotter
- Ethernet interface for input of sound speed profile data and output of all data normally logged to disk and/or tape

Physical specifications

Transmit transducer	
Module length	179 / 132 mm
Width	760 mm (900 mm with frame)
Height	220 mm (280 mm with frame)
Module weight	58 kg
Frame length	4020 (2°) or 7770 (1°) mm
Receive transducer	
Module length	447 mm
Width	342 mm (400 mm with frame)
Height	120 mm (170 mm with frame)
Module weight	24 kg
Frame length	1808 (4°), 3600 (2°) or 7200 (1°) mm
Transceiver Unit	
Physical dimensions	Also see drawing 830-211291
Height	1760 mm
Width	600 mm
Depth	630 mm
Weight	197 kg
Power	100 to 240 Vac, < 1800 Vac, 47 to 63 Hz
Preamplifier Unit	
Physical dimensions	Also see drawing 834-213112
Height	920 mm
Width	600 mm
Depth	630 mm
Weight	Approx 96 kg
Power	100 to 240 Vac, < 300 Vac, 47 to 63 Hz

Kongsberg Simrad EM 120 Multibeam echo sounder

TX Junction Box	
Physical dimensions	Also see drawing 834-213111
Height	440 mm
Width	500 mm
Depth	303 mm
Weight	15.5 kg
Operator Station	
Dimensions and weight will depend upon choice of workstation model, thus the following figures serve as a guideline only.	
Chassis height	103 mm
Chassis width	418 mm
Chassis depth	443 mm
Chassis weight	10 kg
Monitor height	487 mm
Monitor width	475 mm
Monitor depth	506 mm
Monitor weight	31 kg
External storage unit height	68 mm
External storage unit width	190 mm
External storage unit depth	310 mm
External storage unit weight	3 kg

Power requirements

Operational voltage and frequency	
The single phase supply must be protected with 16A slow-blow fuses.	
Transceiver Unit	100 to 240 Vac, <1100 W, 47 to 63 Hz
Operator Station	100 to 240 Vac, < 300 W, 47 to 63 Hz
Preamplifier Unit	100 to 240 Vac, <300 W, 47 to 63 Hz
TX Junction Box	Not applicable
Acceptable transients	
Short time (max 2 sec)	± 25%, 42 - 69 Hz

Spikes (max 50µs)	< 1000 V
Power interrupts	
Menu settings, all parameters and the sound speed profile are stored on the Operator Station's harddisk during operation, so operation can continue after power interruption. However, the file system may be damaged, so the use of an uninterruptable power supply (UPS) is highly recommended.	

Restrictions for use - limitations

No specific restrictions apply.

Surface finish

All cabinets are painted. System units exposed to salt water must be treated accordingly.

9.2 Operating storage temperature

Preamplifier, TRU	0 - 45 °C
Operator station	0 - 40 °C
Storage	- 30 to + 70 °C

9.3 System performance data

Frequency	12 kHz
Maximum ping rate	5 Hz
Number of beams per ping	191
Beamwidth	1x1, 1x2, 2x2 or 2x4°
Beam spacing	Equidistant and equiangle
Coverage sector	Up to 150°
Transmit beam steering	Stabilized for roll, pitch and yaw
Receive beam steering	Stabilized for roll
Depth range from transducers	20 to 11000 m
Depth resolution	10, 20, 40 cm
Pulse length	2, 5 and 15 ms
Range sampling rate	2 kHz (37 cm)

Kongsberg Simrad EM 120 Multibeam echo sounder

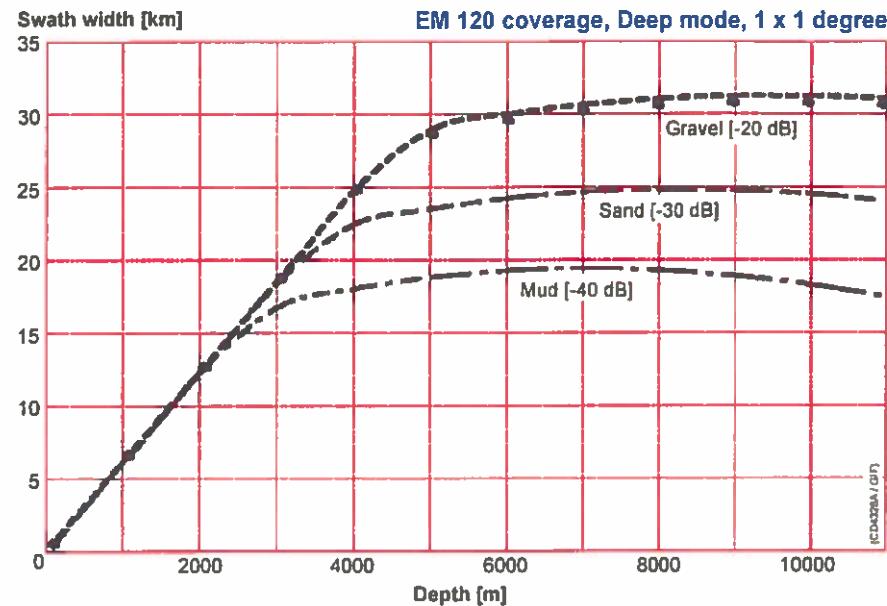


Figure 5 - EM 120 coverage capability (1 of 4)

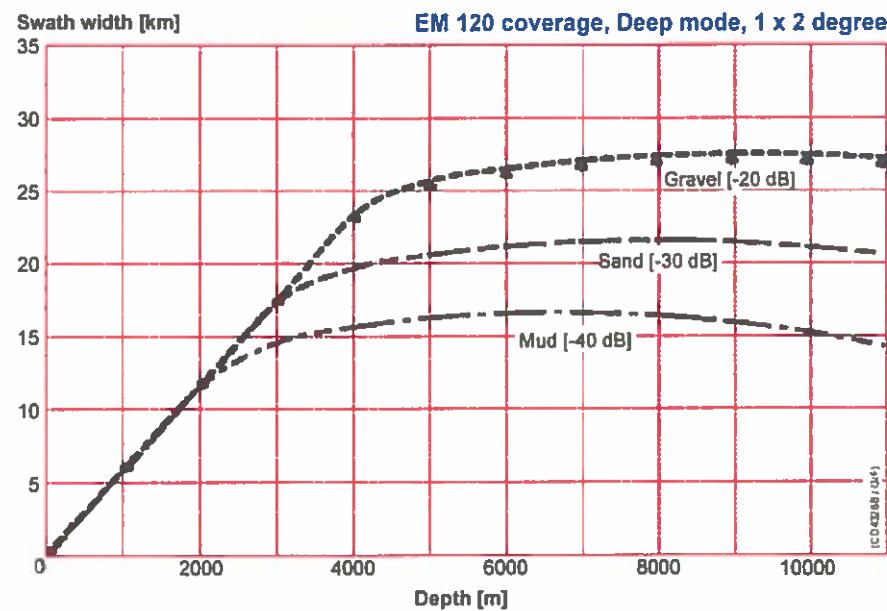


Figure 6 - EM 120 coverage capability (2 of 4)

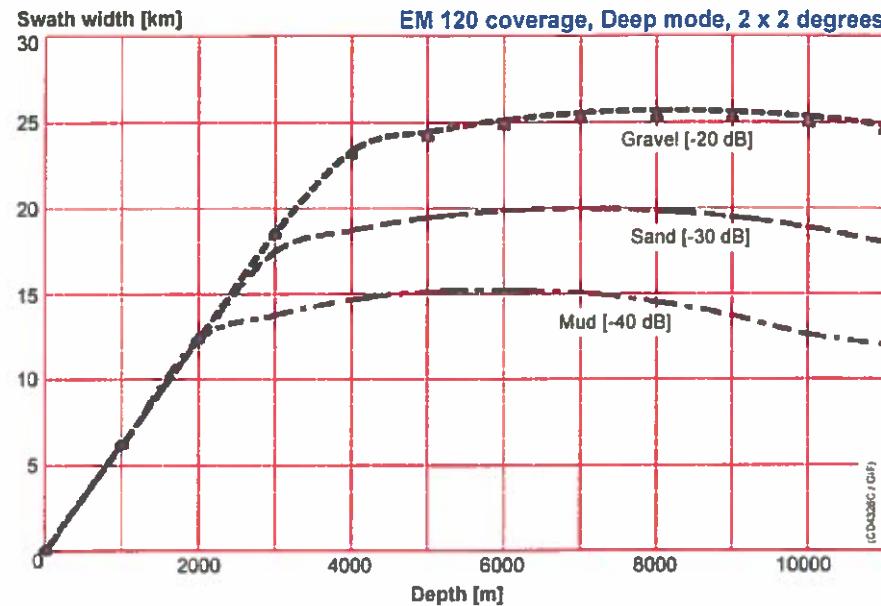


Figure 7 - EM 120 Coverage capability (3 of 4)

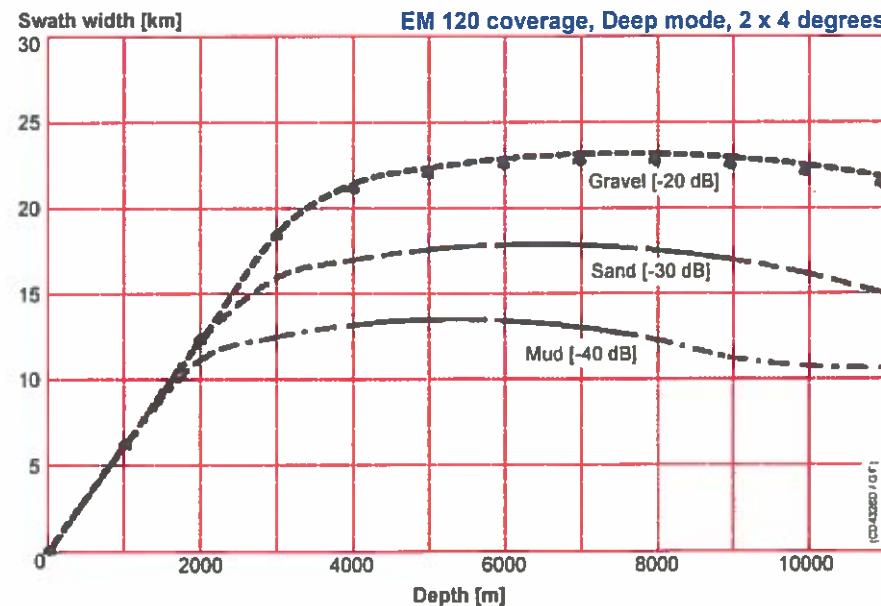


Figure 8 - EM 120 Coverage capability (4 of 4)



Technical Specifications



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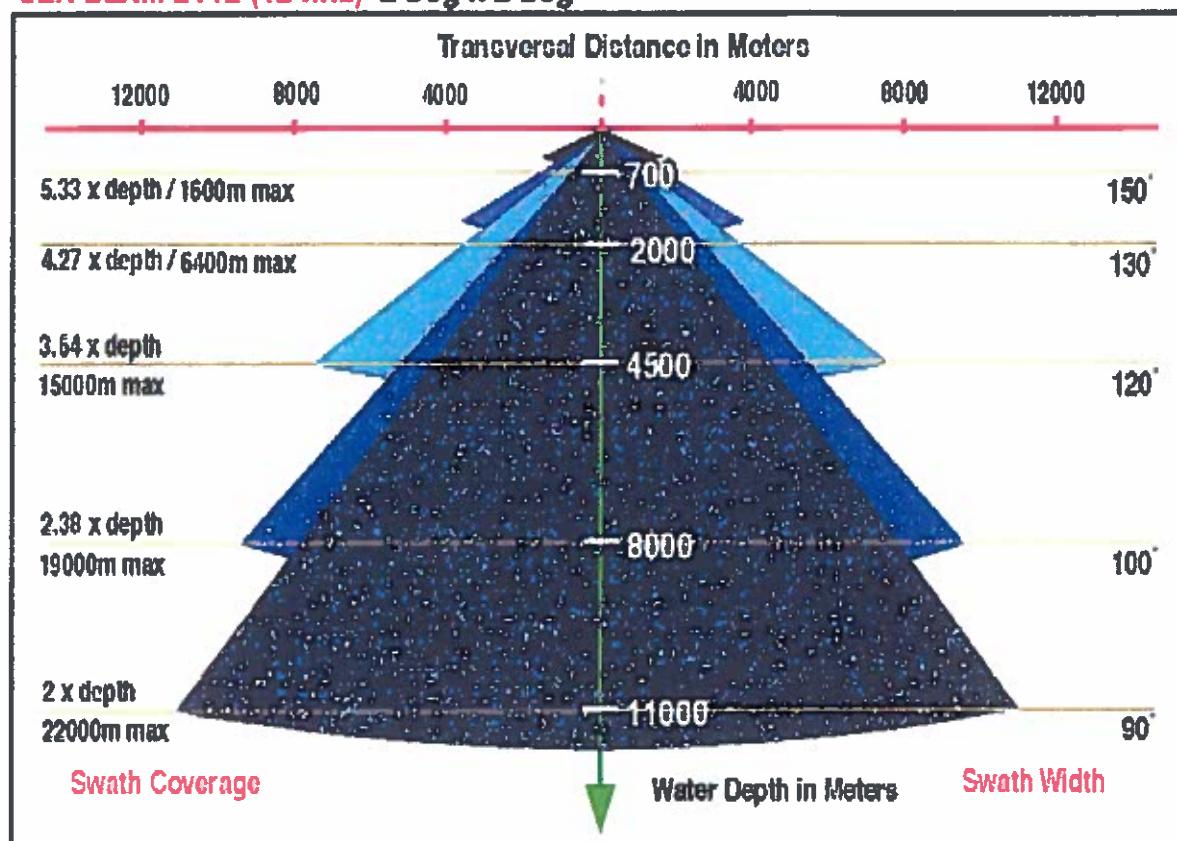
SEA BEAM 2112 (12 kHz)

Full-Ocean Depth Multibeam Bathymetric Survey System

Frequency	12 kHz Nominal
Swath Coverage vs Depth (2-Deg x 2-Deg)	150 Degree Swath --- 50m-700m 130-Degree Swath --- To 2,000m 120-Degree Swath --- To 4,500m 100-Degree Swath --- To 8,000m 90-Degree Swath --- To 11,000m
Swath Coverage vs Depth (1-Deg x 1-Deg)	150 Degree Swath --- 50m-1,000m 130-Degree Swath --- To 3,000m 120-Degree Swath --- To 6,000m 100-Degree Swath --- To 10,500m 98-Degree Swath --- To 11,000m
Projectors (2-Deg x 2-Deg)	Up to 14 molded modules, each containing ceramic resonators. Active array length approximately 4.3 meters.
Projectors (1-Deg x 1-Deg)	25 molded modules, each containing ceramic resonators. Active array length approximately 7.7 meters.
Hydrophones (2-Deg x 2-Deg)	10 molded modules, each containing ceramic line hydrophones. Active array length approximately 5.0 meters.
Hydrophones (1-Deg x 1-Deg)	16 molded modules, each containing ceramic line hydrophones. Active array length approximately 8.0 meters.
Number of Beams	Up to 149, depth dependant.
Source Level	Up to 234 db μ pa/1m (2-Deg x 2-Deg). Up to 238 db μ pa/1m (1-Deg x 1-Deg).
Pulse Width	3 msec. (shallow water) to 20 msec. (deep water), automatically selected; operator override can be used to favor bathymetry or sidescan.
Transmit Beam Width	2-degrees fore and aft at the minus 3 dB points (2-Deg x 2-Deg). 1-degree fore and aft at the minus 3 dB points (1-Deg x 1-Deg).
Horizontal Resolution	2-degrees athwartship (2-Deg x 2-Deg). 1-degree athwartship (1-Deg x 1-Deg).
Roll and Pitch	Accommodates \pm 10-degrees of roll and \pm 7.5-degrees of pitch.

Swath Width vs Depth

SEA BEAM 2112 (12 kHz) 2-Deg x 2-Deg



Performance based on typical backscatter level of -26 dB and total noise level equivalent to Sea State 4



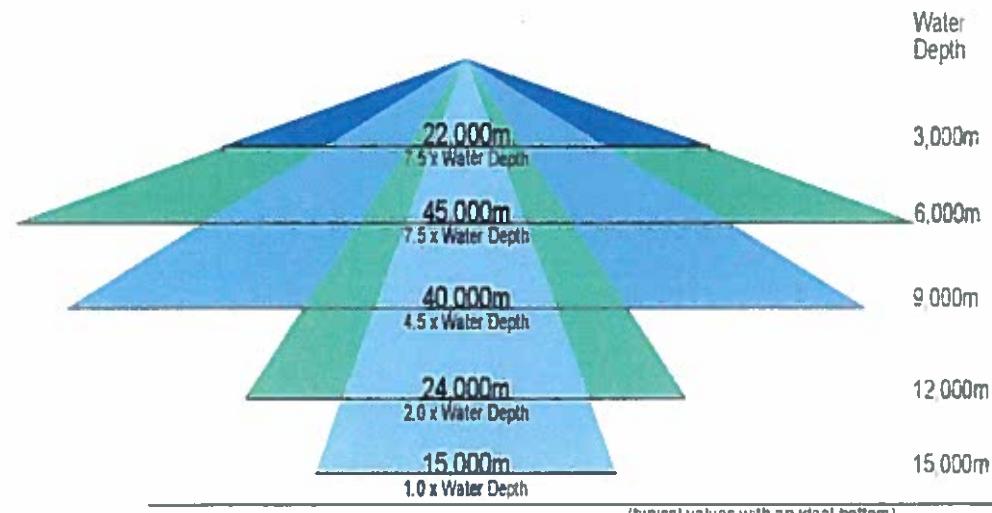
8150 Technical Specs

Swath coverage	7.5 X water depth
Beamwidth	1x1°, 1x2°, 2x2°, 4x4°
Beams / ping	234
Warranty	12 months from delivery
Maximum ping rate	15 pings/sec
Coverage sector	150°
Roll compensation	±10°
Pitch stabilization	±10°
Depth range	10 to 12,000m
Minimum pulse length	0.5ms (12 kHz), 0.3ms (24 kHz)
Maximum pulse length	20.4ms (12 kHz), 15.2ms (24 kHz)

RESON



SeaBat 8150



**12 kHz System
Swath Coverage**

RESON

Appendix F



MAPPING THE US ARCTIC OCEAN MARGIN

Preparation of a US Claim under UNCLOS Art. 76

Prepared for the *Ad Hoc* Working Group by

Dr. Bernard J. Coakley, Tulane University and
Dr. Garrett W. Brass, US Arctic Research Commission

Background

The US has not yet acceded to the UN Convention on the Law of the Sea (UNCLOS). Under this treaty, every coastal state may claim sovereignty over "submerged extensions of their continental margin" beyond the 200 nautical mile limit of their Exclusive Economic Zone (EEZ). Claims under this section of UNCLOS (Article 76) permit states to claim an extension for the exploitation of seabed resources (e.g., minerals, oil and gas). A nation's claim to a submerged extension of its continental margin can be based on a variety of definitions. Each nation is permitted to choose which definition(s) it will use to define the maximum claim.

There has been no urgency to address this issue within the US government, as ratification by the Senate has seemed a distant prospect. The Minerals Management Service (MMS) has developed estimates, based on existing data sets, of a US claim. The MMS worked mostly from the DBDB5 data base and the International Bathymetric Chart of the Arctic Ocean (IBCAO) to develop their estimates. To fully define the potential US claim in the Arctic, new data must be acquired. Without new data the US claim might be diminished from its full and proper extent and never be approved by the UN Technical Commission established to evaluate claims.

Once the Senate ratifies UNCLOS the US will become a "state-party" to the treaty with rights and responsibilities defined by the treaty. From now on, each new state-party to the treaty has ten years from accession to submit a claim for an extended continental margin. If the US accedes soon, it may also have the opportunity to place a representative on the Technical Commission which will

subsidiary documentation of the various assertions underlying a claim, are also desirable.

Cruise Plan

The two platforms we have to work with possess complementary capabilities. US Coast Guard icebreakers equipped with compressors and air guns, can collect multi-channel seismic (MCS) reflection and refraction data, which will penetrate the bulk of the sedimentary section in the Canada Basin. With continuous GPS navigation, these data will be well located, but because of the restrictions imposed by the ice pack, not extensive. We can hope to collect the necessary long MCS lines, which will complement the single deep MCS profile previously collected by Dr. Art Grantz of the USGS. A submarine is a far more mobile platform, which can be used in a survey mode to collect the continuous or near continuous data required to fully explore the possible extensions of the US continental margin in the Arctic.

While using the submarine and icebreaker in tandem might offer some interesting opportunities for collecting expanding spread profiles, using them in sequence offers the greatest flexibility. The icebreaker can work in the mid to late Summer, during the best ice conditions, collecting MCS and refraction data and installing 2-3 transponder ranges dispersed across the basin to support precise submarine navigation. This initial data acquisition and preparation of the survey area would define the best areas for submarine survey operations, which are independent of the seasons. The MCS data, constrained by the velocity profiles, will provide the local depth to basement, which can be interpolated between areas of good MCS coverage using gravity anomaly data.

Icebreaker Data Sets

- 1. Deep penetration MCS data to document along a few profiles (1-4 depending on ice conditions), extending out from the Alaskan margin, the thickness of sediments in the Canada Basin. The profiles collected by Art Grantz orthogonal to the Northwind Ridge and across the Canada Basin will provide additional constraint.**
- 2. Refraction data - from periodic sonobuoys of, if possible, from Refteks on the ice, set out and picked up by helicopter.**
- 3. Velocity profiles - since the thickness of sediments is required, good sound velocity control, garnered from sonobuoy data at large and medium offsets, is necessary.**

Icebreaker Activities in Support of Submarine Data Acquisition

Laying out small transponder arrays (offset between array elements limited to approximately 10 km) in two or three locations around the limits of the survey

area to act as "benchmarks" for the submarine's inertial navigation system (SINS). The arrays would support correction (primarily post-cruise or through acoustic modem?) of SINS positioning through acoustic ranging on a set of continuously GPS-positioned acoustic beacons. Probably it would be necessary to put out 4-5 beacons in each array, giving redundancy and the ability to take a least squares approach to positioning. One or two additional ranges could be set out from Point Barrow using fixed wing aircraft.

Submarine Data Sets

The submarine will be required to collect the data to fill in the gaps between the MCS lines collected during this program. The submarine (assume a Los Angeles Class submarine) will collect continuous underway data and supporting data working on the basic 60 nautical mile spacing specified by the Technical Commission. These profiles, extending from the shelf to the deep basin, at least 60 nautical miles beyond the foot of slope and 100 nautical miles beyond the 2500 meter isobath, will be the basic data set used to define a claim.

Longer lines, primarily to collect DTAGS (the US Navy's Deep Towed Acoustics/Geophysics System) data, which can provide a the limit (where imaged sediments are thicker than 1% of the distance to the foot of slope) and gravity data, which, supplemented by other data collected by NRL (and others) in the basin, will provide a means to estimate total sediment thickness away from the icebreaker collected MCS data if the Navy approves a tempalt to deploy DTAGS from the submarine and the system is made available.

The submarine will periodically visit the benchmark transponder nets to fix itself more precisely in absolute coordinates. If the nets are well positioned, this should be much less time consuming than surfacing for a GPS fix, which can take a day or more to find a feature, surface, dive and recover the track.

The basic data package is SCAMP (plus DTAGS if available) and the Warminster magnetic gradiometer (a US Navy magnetic field gradient instrument), if it can be found, fixed and installed. If not a standard gravimeter will be installed. The submarine will collect:

4. **Swath Bathymetry data - for determination of the position of the 2500 meter isobath and the base of slope.**
5. **Gravity Anomaly data - for determination of crust type (continental versus oceanic) and interpolation of sediment thickness data between MCS lines.**
6. **Chirp Sub-bottom Profiler data - observation of shallow stratigraphy.**
7. **Sidescan sonar data - determination of bottom type and texture.**

8. Magnetic data - position of the continent-ocean boundary.
9. (If approved) DTAGS Seismic Reflection data - to constrain sediment thickness and document the extent of gas hydrates in the Canada Basin and adjacent areas.

Ancillary Submarine Data Sets

Any submission will be evaluated by the Technical Commission for Article 76. For this reason it is absolutely necessary to be able to fully document the quality of both the bathymetry and the horizontal positioning data. In this regard previous SCAMP data are suspect, having been located with the output of an inertial navigation system. It will be necessary to document the precision and accuracy of the bathymetry and positional data collected for the submission. The commission is on record as being ready to give consideration to Arctic coastal states, but we should work to make sure that the data are the best that can be collected, constrained by multiple "proof points" underway.

10. Precision Transponder Navigation - precision determination of the sub's location by improvement of the SINS inertial fixes.
11. Expendable Conductivity Temperature Depth (XCTD) probe data - to document lateral and vertical variations in sound speed for swath data reduction,
12. Flat bottom tables - data collected over shallow and deep water, in conjunction with the XCTD acquisition so that the velocity characteristics of the various water masses can be accounted for in the reduction of the swath data.

Scientific Benefits

In addition to being an opportunity to support a national need, this is an outstanding opportunity to collect a comprehensive (or nearly so) data set for scientific analysis. The data needed to support a claim is precisely what is needed for the study of the Arctic Ocean basin. The resultant data set, particularly if we are able to utilize DTAGS, will also provide comprehensive documentation of the margins and perhaps the gas hydrates in the region. We propose to organize the data acquisition in such a way that the underlying science issues are addressed while we document the fullest possible claim for an extended EEZ under Article 76.

Budget (estimated)

Refreshing SCAMP tempalts for LA class.....	\$0.4 million
Improvements to SCAMP SSBS (fixed telemetry, all four rows)	0.7 million
Installation of SCAMP on a US Navy Submarine (LA class).....	2.0 million
Adaptation, tempalts and installation for DTAGS	1.0 million
Refurbishment and installation of towed magnetometer system.....	0.5 million
Ship costs for 80 operational days (port to port - 60 science days) on a Los Angeles Class submarine (\$25,000 per day).....	2.0 million
Development, acquisition, testing and installation of transponders.....	1.2 million
Mobilization and equipment expense for icebreaker cruise	0.2 million
Ship costs for 80 operational days (port to port - 60 science days) on USCG icebreaker (\$25,000 per day).....	2.0 million
Data processing, analysis and reporting cost	2.0 million
<hr/>	
Total.....	\$12.0 million

Conclusions

The technology and expertise to conduct a survey of the extent of the US continental margin in the Arctic exist and can be made available. A commitment, soon, to fund the data acquisition is essential if planning is to proceed. In addition, acknowledgements by the US Navy that they are prepared to supply a submarine platform and from the US Coast Guard that they are prepared to supply an icebreaker in the 2004 time frame are required soon. With these commitments the US will gather the data necessary for a claim to the maximum extent of submerged extensions to the US continental margin under the provisions of UNCLOS Art. 76.

Appendix G

Lookup table for attribution of navigational fix accuracy

Example taken from the attribution of trackline data downloaded using
GEODAS from NGDC's database.

Navigational NGDC Metadata	Assigned Navigational Class	Assigned Navigational Fix Accuracy
SHIPBOARD INTEGRATED NAV DOPPLER SONAR N	UNKNOWN	10000
RAYSTAR 920	UNKNOWN	10000
OCEONICS MN8GC	UNKNOWN	10000
NOT SPECIFIED.	UNKNOWN	10000
NOT SPECIFIED	UNKNOWN	10000
NOT KNOWN	UNKNOWN	10000
NOT AVAILABLE	UNKNOWN	10000
Non-differential GPS	GPS	100
NO INFN	UNKNOWN	10000
NAVOS 625 INTEGRATED NAVIGATION SYSTEM	UNKNOWN	10000
JMR4-JMR22 MAGNAVOX	UNKNOWN	10000
JMR 04-JMR22	UNKNOWN	10000
INTEGRATED NAVIGATION SYSTEM	UNKNOWN	10000
INTEGRATED NAV. COURSE RECORDER	UNKNOWN	10000
INTEGRATED NAV SYSTEM SATELLITE NAVIGATI	UNKNOWN	10000
D-M RAYDIST	UNKNOWN	10000
DEAD RECKONING/ ASTROLOGICAL	UNKNOWN	10000
DEAD RECKONING	UNKNOWN	10000
(SEE ADD.DOC. 18)	UNKNOWN	10000
WITH COURSE RECORDER	UNKNOWN	10000
NORTHSTAR 7000 SONOTECH	UNKNOWN	10000
INTEGRATED NAV SYSTEM	UNKNOWN	10000
VLF,SATELLITE,LORAN,CELESTIAL	TRANSIT	500
VLF,SATELLITE,LORAN CELESTIAL	TRANSIT	500
VLF,SATELLITE, LORAN, CELESTIAL	TRANSIT	500
USGS INTGRTD NAV SYSTEM(WEST GEOPH H.P.)	TRANSIT	500
TRISPOUNDER,SATELLITE-FIX,GPS	TRANSIT	500
TRISPOUNDER,SATELLITE,LORAN C	TRANSIT	500
TRISPOUNDER, SATELLITE	TRANSIT	500
TRANSIT SHIPBOARD INTEGRATED SYS	TRANSIT	500
TRANSIT SATELLITE, MINI-RANGER, LORAN	TRANSIT	500
TRANSIT SATELLITE, LORAN C	TRANSIT	500
TRANSIT SATELLITE, LORAN	TRANSIT	500
TRANSIT SATELLITE, GPS	TRANSIT	500
TRANSIT SATELLITE, COMPASS, SUN SIGHTS	TRANSIT	500
TRANSIT SATELLITE	TRANSIT	500
TRANSIT SAT./OMEGA/LORAN-A/CELESTIAL	TRANSIT	500
TRANSIT SAT, OMEGA	TRANSIT	500
TRANSIT SAT, DR, GPS A FEW HOURS/DAY	TRANSIT	500
transit sat	TRANSIT	500
TRANSIT PDP9	TRANSIT	500
TRANSIT PDP8	TRANSIT	500
TRANSIT + GPS DEGRADE	TRANSIT	500
TRANSIT	TRANSIT	500
TRANSAT(JRC NWZ-3500D) & GPS(6HR/DAY)	TRANSIT	500
tran sat	TRANSIT	500
TRACOR MK II TRANSIT SAT-NAV	TRANSIT	500
TRACOR MK I TRANSIT SAT-NAV	TRANSIT	500
tr sat	TRANSIT	500
SRN-9 SATNAV, LORAN A/C	TRANSIT	500
SRN-9 SATELLITE/DEAD RECKONING/LORAN-C	TRANSIT	500
SRN-9 SAT LORAN A/C	TRANSIT	500
SEXTANT AND SATELLITE	TRANSIT	500
SAT-NAV-MAGNAVOX 702 LORAN C-MAGNAVOX TD	TRANSIT	500
SATNAV/GPS,AUTO LOG GYRO+2D DOPPLER SPD	TRANSIT	500
SAT-NAV,SONAR DOPPLER RADAR LORAN C	TRANSIT	500
SATNAV,MANUAL ENTRY GYRO AND SPD CHANGES	TRANSIT	500
SATNAV,LORAN-C,SONAR DOPPLER	TRANSIT	500
SATNAV,LORAN-C,DOPPLAR SONAR	TRANSIT	500
SATNAV,LORAN-C	TRANSIT	500
SATNAV,LORAN-A,DOPPLER SONAR	TRANSIT	500
SATNAV,INTEGRATED NAVIGATION	TRANSIT	500
SATNAV,INTEGRATED NAV	TRANSIT	500
SATNAV,INTAEGRATED NAV,LORAN C	TRANSIT	500
SATNAV, GPS,AUTO LOG GYRO+2D DOPPLER SPD	TRANSIT	500

SATNAV,GPS,AUTO GYRO+2D DOPPLER SPD LOG	TRANSIT	500
SATNAV,AUTOLOG GYRO AND ENGINE RPM	TRANSIT	500
SATNAV,AUTOLOG GYRO + EMLOG	TRANSIT	500
SATNAV,AUTO LOG GYRO+2D DOPPLER SPD LOG	TRANSIT	500
SATNAV,AUTO 2D-DOPPLER,MANUAL GYRO ENTRY	TRANSIT	500
SATNAV, TRANSIT/GPS & DEAD RECKONING	TRANSIT	500
SATNAV, MINIRANGER	TRANSIT	500
SATNAV, LORAN-C, DOPPLER SONAR	TRANSIT	500
SATNAV, LORAN-C	TRANSIT	500
SATNAV, GPS,AUTO LOG GYRO+2D DOPPLER SPD	TRANSIT	500
SATNAV, AUTO LOG GYRO+2D DOPPLER SPD LOG	TRANSIT	500
SATNAV, AUTO LOG GYRO+2D DOPPLER SPD	TRANSIT	500
SATNAV, AUTO LEG GYRO+2D DOPPLER SPD LOG	TRANSIT	500
SATNAV,	TRANSIT	500
SAT-NAV SYSTEM LORAN C RHO-RHO	TRANSIT	500
SAT-NAV SYSTEM LORAN C DOPPLER SONAR SAT	TRANSIT	500
SATNAV RECEIVER (MAGNAVOX)	TRANSIT	500
SATNAV MAGNAVOX 1112/RADAR/SEXTANT	TRANSIT	500
SATNAV MAGNAVOX 1102A/RADAR/SEXTANT	TRANSIT	500
SATNAV MAGNAVOX 1102/RADAR/SEXTANT	TRANSIT	500
SAT-NAV LORAN C	TRANSIT	500
SAT-NAV DOPPLER SONAR RADAR DEL NORTE IN	TRANSIT	500
SATNAV & GPS	TRANSIT	500
SATNAV	TRANSIT	500
SAT-NAV	TRANSIT	500
SATELLITE, DR, LORAN	TRANSIT	500
SATELLITE,LORAN C D.R.	TRANSIT	500
SATELLITE/SEXTANT	TRANSIT	500
SATELLITE/LORAN-C	TRANSIT	500
SATELLITE/LORAN A/ CELESTIAL	TRANSIT	500
SATELLITE/ VISUAL BEARINGS	TRANSIT	500
SATELLITE/ SEXTANT	TRANSIT	500
SATELLITE/ OMEGA FIXES	TRANSIT	500
SATELLITE/ DEAD RECKONING	TRANSIT	500
SATELLITE,TRISPOUNDER	TRANSIT	500
SATELLITE,R-R DECCA LAMBDA, LORAC B	TRANSIT	500
SATELLITE,RADAR,DR,LORAN	TRANSIT	500
SATELLITE,OMEGA,SEXTANT,RADAR/G.CHALLENG	TRANSIT	500
SATELLITE,LORANC,OMEGA,TRANSPOUNDER,RTN	TRANSIT	500
SATELLITE,LORAN-C,OMEGA	TRANSIT	500
SATELLITE,LORAN-C	TRANSIT	500
SATELLITE,LORAN C,SAT OMEGA	TRANSIT	500
SATELLITE,LORAN C,A/SEXTANT	TRANSIT	500
SATELLITE,LORAN A	TRANSIT	500
SATELLITE,LORAN	TRANSIT	500
SATELLITE,DR,LORAN, VISUAL	TRANSIT	500
SATELLITE,DR,VISUAL	TRANSIT	500
SATELLITE,DR,RADAR	TRANSIT	500
SATELLITE,DR, CELESTIAL	TRANSIT	500
SATELLITE,DR, CELESTIAL	TRANSIT	500
SATELLITE,DR CELESTIAL	TRANSIT	500
SATELLITE,DEAD RECKONING,LORAN A+C,OMEGA	TRANSIT	500
SATELLITE,DEAD RECKONING, OMEGA, LORAN	TRANSIT	500
SATELLITE,DEAD RECKONING, OMEGA	TRANSIT	500
SATELLITE,ACNAV	TRANSIT	500
SATELLITE, TRISPOUNDER	TRANSIT	500
SATELLITE, SEXTANT	TRANSIT	500
SATELLITE, SAT OMEGA, A/SEXTANT	TRANSIT	500
SATELLITE, RANGE AND BEARING	TRANSIT	500
SATELLITE, RADAR, LORAN-C	TRANSIT	500
SATELLITE, OMEGA, SEXTANT	TRANSIT	500
SATELLITE, OMEGA, RADAR, REAL TIME NAV.	TRANSIT	500
SATELLITE, OMEGA	TRANSIT	500
SATELLITE, LORAN-C, SEXTANT	TRANSIT	500
SATELLITE, LORAN-C, SAT-OMEGA	TRANSIT	500
SATELLITE, LORAN-C, SAT OMEGA	TRANSIT	500
SATELLITE, LORANC, DOPPLER	TRANSIT	500
SATELLITE, LORAN-C, A/SEXTANT.	TRANSIT	500
SATELLITE, LORAN C, LORAN A, RADAR	TRANSIT	500
SATELLITE, LORAN C	TRANSIT	500

SATELLITE, LORAN	TRANSIT	500
SATELLITE, DR, GPS	TRANSIT	500
SATELLITE, DR	TRANSIT	500
SATELLITE, DECCA	TRANSIT	500
SATELLITE, DEAD RECKONING, RADAR	TRANSIT	500
SATELLITE, DEAD RECKONING, OMEGA	TRANSIT	500
SATELLITE, DEAD RECKONING, OMEGA	TRANSIT	500
SATELLITE, DEAD RECKONING, LORAN C	TRANSIT	500
SATELLITE, DEAD RECKONING, LORAN	TRANSIT	500
SATELLITE, DEAD RECKONING	TRANSIT	500
SATELLITE, CELESTIAL, DR	TRANSIT	500
SATELLITE, A-SEXTANT	TRANSIT	500
SATELLITE, AND SEXTANT	TRANSIT	500
SATELLITE, A/SEXTANT	TRANSIT	500
SATELLITE TRANSIT	TRANSIT	500
SATELLITE RECEIVER, DR	TRANSIT	500
SATELLITE RECEIVER, D.R.	TRANSIT	500
SATELLITE NAVIGATOR (REDIFON RSN-1)	TRANSIT	500
SATELLITE NAVIGATION MINIRANGER RADAR-BR	TRANSIT	500
SATELLITE NAVIGATION LORAN C RHO-RHO SHI	TRANSIT	500
SATELLITE NAVIGATION LORAN C NAVIGATION	TRANSIT	500
SATELLITE NAVIGATION DOPPLER SONAR LORAN	TRANSIT	500
SATELLITE NAVIGATION	TRANSIT	500
SATELLITE NAVIGATION	TRANSIT	500
SATELLITE NAV. DEL NORTE RANGE/RANGE	TRANSIT	500
SATELLITE NAV. AND LORAN-C	TRANSIT	500
SATELLITE LORAN C	TRANSIT	500
SATELLITE AND SEXTANT	TRANSIT	500
SATELLITE AND RADAR AND LORAN-C	TRANSIT	500
SATELLITE AND OMEGA	TRANSIT	500
SATELLITE AND LORAN-C-AND SEXTANT/RADAR	TRANSIT	500
SATELLITE AND LORAN C	TRANSIT	500
SATELLITE AND DEADRECKONING	TRANSIT	500
Satellite ?	TRANSIT	500
SATELLITE / LORAN A	TRANSIT	500
SATELLITE (AN/SR-9)/ LORAN A / LORAN C	TRANSIT	500
SATELLITE	TRANSIT	500
Satellite	TRANSIT	500
SAT/SEXTANT	TRANSIT	500
SAT/OMEGA/RADAR	TRANSIT	500
SAT/LORAN-C/OMEGA/DOPPLER SPEED	TRANSIT	500
SAT/LORAN/C/DECCA	TRANSIT	500
SAT/LORAN-C	TRANSIT	500
SAT/LORAN/SEXTANT	TRANSIT	500
SAT/LORAN/DECCA	TRANSIT	500
SAT/LORAN/CELES/DR	TRANSIT	500
SAT/LORAN C	TRANSIT	500
SAT/LORAN	TRANSIT	500
SAT/DECCA/LORAN	TRANSIT	500
SAT.D.R.,LORAN	TRANSIT	500
SAT.,LORAN,D.R.	TRANSIT	500
SAT.	TRANSIT	500
SAT TRANSIT	TRANSIT	500
SAT NAVIGATORS (REDIFON RSN-1/MAGNAVOX)	TRANSIT	500
SAT NAV,LORAN C,DOP.SONR	TRANSIT	500
SAT NAV (REDIFON RSN-1/MAGNAVOX 702)	TRANSIT	500
SAT NAV	TRANSIT	500
SAT MAGNAVOX - RADAR	TRANSIT	500
SAT MAGNAVOX - ARGO	TRANSIT	500
SAT MAGNAVOX	TRANSIT	500
SAT I.T.T. - PULSE 8	TRANSIT	500
SAT I.T.T. - OMEGA DIFF.	TRANSIT	500
SAT I.T.T. - PULSE 8	TRANSIT	500
SAT I.T.T.	TRANSIT	500
SAT AND LORAN	TRANSIT	500
SAT + GPS	TRANSIT	500
sat	TRANSIT	500
SAT	TRANSIT	500
SALELLITE RECEIVER,D.R.	TRANSIT	500
RHO-RHO LORAN C/SAT	TRANSIT	500

RANGE-RANGE LORAN, TRANSIT SATELLITE	TRANSIT	500
RANGE-RANGE LORAN, GPS, TRANSIT SATELLIT	TRANSIT	500
RADIO POS UNITS WITH SAT NAV	TRANSIT	500
RACAL MNS 2000G RECEIVER	TRANSIT	500
RACAL MNS 2000G	TRANSIT	500
NNSS/LORANC	TRANSIT	500
NNSS,SAT/LORAN-C	TRANSIT	500
NNSS,LORAN-C,P-P SYSTEM	TRANSIT	500
NNSS,LORAN-C 9970-X,Y,Z	TRANSIT	500
NNSS,LORAN-C 9970-X,Y	TRANSIT	500
NNSS SATELLITE	TRANSIT	500
NNSS LORAN-C 9970-X,Y	TRANSIT	500
NNSS (OPN-73-3) SATELLITE	TRANSIT	500
NNSS (OPN-73-3)	TRANSIT	500
NNSS (9302130151-GPS-9302170429)	TRANSIT	500
NNSS	TRANSIT	500
NAV-SAT LORAN A MINIRANGER RADAR D.R.	TRANSIT	500
NAVIGATION SYSTEM SAT NAVIGATION DOPPLER	TRANSIT	500
NAVIGATION SYSTEM LORAN C SAT/NAV SYSTEM	TRANSIT	500
NAV SATELLITE/DEL NORT RNG-RNG	TRANSIT	500
NAV SATELLITE / INTEGRATED NAV	TRANSIT	500
NAV SAT/DOPPLER SONAR/INTGR. NAV	TRANSIT	500
NAV SAT	TRANSIT	500
MX706 SATVAV, SPN 38 L/C	TRANSIT	500
MX706 SATNAV,SPN38 L/C,OMEGA	TRANSIT	500
MX706 SATNAV,LORAN A	TRANSIT	500
MX706 SATNAV,APN180 L/A SPN/4 OMEGA	TRANSIT	500
MX706 SATNAV, SPN38 S/C, APN180 L/A	TRANSIT	500
MX706 SATNAV, SPN38 L/C, APN180 L/A	TRANSIT	500
MX706 SATNAV, SPN38 L/C,	TRANSIT	500
MX706 SATNAV, SPN38 L/C	TRANSIT	500
MX706 SATNAV, SPN38 L/A, APN180 L/A	TRANSIT	500
MX706 SATNAV, SPN 38 L/C	TRANSIT	500
MX706 SATNAV, APN180 L/A	TRANSIT	500
MX706 SATNAV SPN38/LC	TRANSIT	500
MX706 SATNAV SPN38 L/C	TRANSIT	500
MX706 SATNAV	TRANSIT	500
MX-702 SATNAV,LORAN A/C	TRANSIT	500
MX-702 SATNAV, LORAN A/C	TRANSIT	500
MX-702 SATNAV	TRANSIT	500
MX5000 (GPS,SATNAV & LORAN-C)	TRANSIT	500
MX5000 (GPS, SATNAV & LORAN-C)	TRANSIT	500
MX1107RS TRANSIT SAT-NAV	TRANSIT	500
MX1107R, GPS TI4100	TRANSIT	500
MX1107R, GPS TI 4100	TRANSIT	500
MX1107 SATNAV & ML220 LORAN-C	TRANSIT	500
MX1107 SATNAV	TRANSIT	500
MX1107 RS GPS SATELLITE NAVIGATION.	TRANSIT	500
mx1107 gps, trimble gps	TRANSIT	500
MX1107 GPS	TRANSIT	500
MX 706 SATNAV,SPN 38 L/C	TRANSIT	500
MX 706 SATNAV, SPN 38 L/C,	TRANSIT	500
MX 706 SATNAV, SPN 38 L/C	TRANSIT	500
MX 706 SATNAV,	TRANSIT	500
MX 706 SATNAV	TRANSIT	500
MINIRANGER,SATNAV,LORAN C	TRANSIT	500
MINIRANGER,SATNAV	TRANSIT	500
MINIRANGER NAVIGATION SATELITE NAVIGATIO	TRANSIT	500
MINIRANGER NAVIGATION SAT NAV,LORAN C,DO	TRANSIT	500
MANOVox 706 SAT	TRANSIT	500
MAGNOVOX SATELLITE NAV. M706CH	TRANSIT	500
MAGNOVOX 706 SATELLITE RECEIVER	TRANSIT	500
MAGNIVOX DUAL CHANNEL SATELLITE	TRANSIT	500
MAGNAVOX TRASIT & GPS	TRANSIT	500
MAGNAVOX TRANSIT SAT-NAV	TRANSIT	500
MAGNAVOX TRANSIT (gps receiver dead)	TRANSIT	500
MAGNAVOX TRANSIT & GPS & LORAN C	TRANSIT	500
MAGNAVOX TRANSIT & GPS	TRANSIT	500
MAGNAVOX SATNAV,MANUAL & AUTO LOG	TRANSIT	500
MAGNAVOX SATELLITE RECEIVER	TRANSIT	500

MAGNAVOX SATELLITE NAVIGATOR	TRANSIT	500
MAGNAVOX SAT. FIXES	TRANSIT	500
MAGNAVOX SAT	TRANSIT	500
MAGNAVOX MX4400 & MX1107	TRANSIT	500
MAGNAVOX MX1112	TRANSIT	500
MAGNAVOX MX-1107RS, T-SET & MX-4200 GPS	TRANSIT	500
MAGNAVOX MX-1107RS TRANSIT, T-SET GPS	TRANSIT	500
MAGNAVOX MX1107R	TRANSIT	500
MAGNAVOX MX1107	TRANSIT	500
MAGNAVOX MX/702C/HP	TRANSIT	500
MAGNAVOX MX/702/HP	TRANSIT	500
MAGNAVOX MX 1107R	TRANSIT	500
MAGNAVOX MOD MX5102/NAVYDINE MOD ESZ4000	TRANSIT	500
MAGNAVOX MOD MX-5102	TRANSIT	500
MAGNAVOX MNS 2000G	TRANSIT	500
MAGNAVOX M1107	TRANSIT	500
MAGNAVOX DUAL CHANNEL SATELLITE	TRANSIT	500
MAGNAVOX 706SATNAV,SPN38 LORAN C REC.	TRANSIT	500
MAGNAVOX 706 SATNAV	TRANSIT	500
MAGNAVOX 706 SATELLITE/PROTOTYPE AN/SRN9	TRANSIT	500
MAGNAVOX 706 SAT	TRANSIT	500
MAGNAVOX 4400 & MX1100	TRANSIT	500
MAGNAVOX 2CH	TRANSIT	500
MAGNAVOX 1107RS SAT RCVR	TRANSIT	500
MAGNAVOX 1107, TRIMBLE 10X GPS	TRANSIT	500
MAGNAVOX 1107	TRANSIT	500
MAGNAVOX 1102A; RADAR	TRANSIT	500
MAGNAVOX 1102/1107	TRANSIT	500
MAGNAVOX	TRANSIT	500
LORAN-C, GPS, TRANSIT SATELLITE	TRANSIT	500
LORAN-A/NAVY SATELLITE/SUN LINES	TRANSIT	500
LORAN/SEXTANT/SAT	TRANSIT	500
LORAN/SAT/SEXTANT	TRANSIT	500
LORAN/SAT	TRANSIT	500
LORAN,SATNAV AUTO LOG GYRO+2D DOPPLER,SP,LG	TRANSIT	500
LORAN,SATELLITE,SAT OMEGA,RADAR	TRANSIT	500
LORAN, TRANSIT SATELLITE	TRANSIT	500
LORAN, SATELLITE, DEAD RECKONING	TRANSIT	500
LORAN C/ LORAN A/ CELESTIAL/ SATELLITE	TRANSIT	500
LORAN C/ LORAN A / CELESTIAL/ SATELLITE	TRANSIT	500
LORAN C/ LORAN A / CELESTIAL/ SATELLITE	TRANSIT	500
LORAN C,DR,SATELLITE	TRANSIT	500
LORAN C SATNAV	TRANSIT	500
LORAN C SATELLITE NAVIGATION	TRANSIT	500
LORAN C RHO RHO DOPPLER SONAR SATELLITE	TRANSIT	500
Loran C Navigation GPS Satellite Transit	TRANSIT	500
LORAN C GPS SATELLITE LORAN C RHORHO	TRANSIT	500
JRC-LORANC,FURUNO-LORANC/NNSS	TRANSIT	500
ITT Transit Satellite Receiver, Mod 5001	TRANSIT	500
INTEGRATED NAVIGATION GPS SATELLITE TRAN	TRANSIT	500
INDAS: Satnav (GPS+NNSS), Log+Gyro	TRANSIT	500
GPS< tr sat, and furuno	TRANSIT	500
GPS+TRANSIT	TRANSIT	500
GPS,TRANSIT SATELLITE	TRANSIT	500
GPS,TRANSIT SAT	TRANSIT	500
GPS,SATNAV,TRISPOUNDER	TRANSIT	500
GPS,SATNAV,RADAR,SEXTANT	TRANSIT	500
GPS,SATNAV,OMEGA	TRANSIT	500
GPS,SATNAV,AUTO LOG GYRO+2D DOPPLER SPD	TRANSIT	500
GPS,SATNAV OMEGA	TRANSIT	500
GPS,SATNAV	TRANSIT	500
GPS,SAT NAV,LORAN	TRANSIT	500
GPS,SAT NAV OMEGA	TRANSIT	500
GPS,SAT NAV	TRANSIT	500
GPS,LORAN-C,SATNAV	TRANSIT	500
GPS, TRASIT SAT	TRANSIT	500
GPS, TRANSIT SATELLITE	TRANSIT	500
GPS, TRANSIT SAT	TRANSIT	500
GPS, tr sat, furuno	TRANSIT	500
GPS, tr sat, and furuno	TRANSIT	500

GPS, tr sat	TRANSIT	500
GPS, SATNAV	TRANSIT	500
GPS, SATELLITE	TRANSIT	500
GPS, SAT, TRISPOUNDER	TRANSIT	500
GPS, SAT NAV	TRANSIT	500
GPS, OMEGA, TRANSIT SATELLITE	TRANSIT	500
GPS, MINIRANGER, TRANSIT SATELLITE	TRANSIT	500
GPS, LORAN-C, TRANSIT SATELLITE	TRANSIT	500
GPS(TRIMBLE 4000),SATNAV(MAGNAVOX1107)	TRANSIT	500
gps satellite loran c rho-rho transit sa	TRANSIT	500
GPS + TRANSIT	TRANSIT	500
GPS & transit satellites	TRANSIT	500
GPS & occasionally TRANSIT SATELLITES	TRANSIT	500
GPS & MAGNAVOX SATELLITE NAVIGATOR	TRANSIT	500
GPR, tr sat, and furuno	TRANSIT	500
FURUNO,TRANSIT SAT,GPS	TRANSIT	500
DR CELESTIAL,SATELLITE	TRANSIT	500
DOPPLER SONAR SATELLITE NAVIGATION LORAN	TRANSIT	500
DOP SON, LOR C RR,SATNAV	TRANSIT	500
DEL NORTE TRISPOUNDER,SATELLITE,SEXTANT	TRANSIT	500
DEAD RECKONING/ SATEELITE	TRANSIT	500
ARGO NAVCUBE/MAGNAVOX 1107RS SAT. RCVR.	TRANSIT	500
AN/SRN-9 SATELLITE/LORAN-A/LORAN-C	TRANSIT	500
706 SATELLITE RECIEVER	TRANSIT	500
TRANSIT SAT MICROLOGIC AND NORTHSTAR DO	TRANSIT	500
MAGNAVOX T-SET TRANSIT	TRANSIT	500
MAGNAVOX T-SET NORTHSTAR 7000 TRANSIT	TRANSIT	500
LORAN-C TRANSIT SAT	TRANSIT	500
GPS TRANSIT	TRANSIT	500
TRISPOUNDER	SURVEY	50
SHIPBOARD INTEGRATED NAV MINIRANGER	SURVEY	50
SERCEL "SYLEDIS" SEE USGS REPT OFR89-150	SURVEY	50
RAYDIST	SURVEY	50
MINIRANGER SHIPBOARD INT. NAV. SYS.	SURVEY	50
MINIRANGER	SURVEY	50
HIFIX/SAT	SURVEY	50
DOPPLER SONAR INTEGRATED NAV SYS MINIRGE	SURVEY	50
DEL NORTE RNG/RNG	SURVEY	50
DEL NORTE	SURVEY	50
Del Norte	SURVEY	50
DECCA HI-FIX AND SEA-FIX, MAGNAVOX-706SA	SURVEY	50
ARGO	SURVEY	50
STARFIX (REC S/N 041)	STARFIX	50
STARFIX (REC S/N 005)	STARFIX	50
STARFIX (JOHN E. CHANCE ASSOC.)	STARFIX	50
STARFIX (JOHN E. CHANCE & ASSOC.)	STARFIX	50
STARFIX	STARFIX	50
VISUAL OBSERVATION	PILOT	2000
RADAR RHO-RHO MODE SATELLITE NAVIGATION	PILOT	2000
RADAR	PILOT	2000
48-MILE RANGE RADAR/SEXTANT	PILOT	2000
15-MILES RADAR SYSTEM,SEXTANT	PILOT	2000
SATELLITE,OMEGA	OMEGA	7300
OMEGA, TRANSIT SATELLITE	OMEGA	7300
OMEGA, RADAR, VISUAL	OMEGA	7300
OMEGA, CELESTIAL	OMEGA	7300
OMEGA AND SEXTANT	OMEGA	7300
MAGNAVOX OMEGA COURSE RECORDER	OMEGA	7300
SRN RADIO NAV.SYSTEM (LORAN?), NEL-5	LORAN_GEN	1200
LORAN/SEXTANT	LORAN_GEN	1200
LORAN,DR,CELESTIAL,RADAR,VISUAL	LORAN_GEN	1200
LORAN,DR, CELESTAL,RADAR	LORAN_GEN	1200
LORAN, SATELLITE	LORAN_GEN	1200
LORAN, OMEGA, DR. STAR, RADAR	LORAN_GEN	1200
LORAN, DR, CELESTIAL,RADAR,VISUAL	LORAN_GEN	1200
LORAN, D.R.,CELESTIAL,RADAR	LORAN_GEN	1200
LORAN, D.R. RADAR, VISUAL	LORAN_GEN	1200
LORAN SEXTANT	LORAN_GEN	1200
Loran	LORAN_GEN	1200
KARLUK LORAN L SYSTEM INTEGRATED NAVIGAT	LORAN_GEN	1200

CELESTIAL AND LORAN	LORAN_GEN	1200
TRISPOUNDER,LORAN C,RADAR	LORAN_C	500
SHIPBOARD INTEGRATED NAV LORAN C MARCONI	LORAN_C	500
MAGNAVOX/LORAN-C/RADAR/SEXTANT	LORAN_C	500
LORAN-C/VISUAL AND RADAR BEARINGS	LORAN_C	500
LORAN-C/SEXTANT/RADAR	LORAN_C	500
LORAN-C,NNSS,GPS	LORAN_C	500
LORAN-C,NNSS	LORAN_C	500
LORAN-C NEAR COASTLINES	LORAN_C	500
LORAN-C HYPERBOLIC MODE SATELLITE NAVIGA	LORAN_C	500
LORANC GPS	LORAN_C	500
LORAN-C 1 MINUTE FIXES	LORAN_C	500
Loran-C	LORAN_C	500
LORAN-C	LORAN_C	500
LORAN-A/ LORAN-C	LORAN_C	500
LORAN-A,LORAN-C,NNSS	LORAN_C	500
LORAN-A 2S3.2S4.2S5.LORANC SS3-W,X,Y	LORAN_C	500
LORAN-A 2S0.2S2.LORAN-C 9970-X.Y.W,NNSS	LORAN_C	500
LORAN-A 2H7.2S2,LORAN-C 9970-X.W,NNSS	LORAN_C	500
LORAN-A 2H6.2H7.2S7,LORAN-C 9970-X.Y.Z	LORAN_C	500
LORAN-A 2H5.2S7,LORAN-C 9970-X.Y.Z,NNSS	LORAN_C	500
LORAN C-RHO RHO DOPPLER SONAR INTEGRATED	LORAN_C	500
LORAN C/SEXTANT	LORAN_C	500
LORAN C,SATELLITE,OMEGA	LORAN_C	500
LORAN C,RAD,SAT,DR	LORAN_C	500
LORAN C,DOPPLER SON,MARCO	LORAN_C	500
LORAN C, SATELLITE, DEAD RECKONING	LORAN_C	500
LORAN C, SATELLITE	LORAN_C	500
LORAN C, GPS, SATELLITE	LORAN_C	500
LORAN C, GPS, SATELLITE	LORAN_C	500
LORAN C RHO-RHO & HYPER INTEGRATED NAVIG	LORAN_C	500
LORAN C MINIRANGER INTEGRATED NAV SYSTEM	LORAN_C	500
LORAN C ACOUSTIC BTM TRANSPONDER GPS SAT	LORAN_C	500
LORAN C /SEXTANT	LORAN_C	500
LORAN C	LORAN_C	500
LORAC HYPERBOLIC NETWORK	LORAN_C	500
INTEGRATED NAVIGATION LORAN C RHO-RHO MI	LORAN_C	500
INTEGRATED NAVIGATION LORAN C RHO RHO MO	LORAN_C	500
INTEGRATED NAV/LORAN-C/DOPPLER SONAR	LORAN_C	500
INTEGRATED NAV/LORAN-C RHO RHO,ADD.DOC.	LORAN_C	500
INTEGRATED NAV/LORAN C/DOPPLER SONAR	LORAN_C	500
INTEGRATED AT,LORAN-C,DOPPLER SONAR	LORAN_C	500
GSTGEONAV/LORAN C/DOPPLER SONAR/INT.NAV	LORAN_C	500
GPS/NNSS/LORAN-C	LORAN_C	500
GPS/LORANC	LORAN_C	500
GPS/LORAN-C	LORAN_C	500
GPS,LORAN-C	LORAN_C	500
SEXTANT/LORAN-A/RADAR	LORAN_A	1200
LORAN-C/LORAN-A/ CELESTIAL/SATELLITE	LORAN_A	1200
LORAN-C/LORAN-A/ CELESTIAL/SATELLITE	LORAN_A	1200
LORAN-C/ LORAN-A/ CELESTIAL/ SATELLITE	LORAN_A	1200
LORAN-A/RADAR	LORAN_A	1200
LORAN-A,LORAN-C 9970-X,Y	LORAN_A	1200
LORAN-A,EVERY 15MINUTES	LORAN_A	1200
LORAN-A LORAN-C	LORAN_A	1200
LORAN-A 2S4.2S5,LORAN-C 9970-X.Y,NNSS	LORAN_A	1200
LORAN.A,2S3,2S4	LORAN_A	1200
LORAN C, LORAN A	LORAN_A	1200
LORAN C AND A	LORAN_A	1200
LORAN A.2S1,2S2,2H7 LORAN C.SS3-W.SS3-X	LORAN_A	1200
LORAN A,2S1.2S2.2S3.2H7	LORAN_A	1200
LORAN A, RADAR	LORAN_A	1200
LORAN A, LORAN C	LORAN_A	1200
LORAN A AND LORAN C	LORAN_A	1200
LORAN A /LORAN C	LORAN_A	1200
LORAN A / LORAN C	LORAN_A	1200
LORAN A	LORAN_A	1200
LORAN A.2S3.2S4	LORAN_A	1200
TRIMBLE TASMAN P(Y) GPS	GPS_CODE	20
TRIMBLE CENTURION P CODE & FUGRO MN8QC	GPS_CODE	20

	GPS_CODE	20
P-CODE GPS	GPS	100
TRIMBLE SPS GPS	GPS	100
TRIMBLE NAVTRAC GPS	GPS	100
TRIMBLE NAUTRAC GPS	GPS	100
Trimble GPS Receiver, Mod 4000	GPS	100
TRIMBLE GPS RECEIVER	GPS	100
TRIMBLE GPS ?	GPS	100
TRIMBLE GPS	GPS	100
TRIMBLE 4000 SE RECEIVER	GPS	100
TRIMBLE 4000 DL RECEIVER	GPS	100
TRIMBLE 4000 DL GPS RECEIVER	GPS	100
TRIMBLE 4000 DL	GPS	100
RACAL SKYFIX AND MULTIFIX DGPS	GPS	100
RACAL SKYFIX AND MULTIFIX DGPS	GPS	100
RACAL MK90 GPS RECEIVER	GPS	100
MN8QC GPS RECEIVER	GPS	100
MN8QC	GPS	100
MN8 GPS / CENTURION GPS	GPS	100
MAGNAVOX MX4400 GPS RECEIVER	GPS	100
MAGNAVOX GPS 200	GPS	100
MAGNAVOX 5000 GPS TRANSIT	GPS	100
MAGELLAN GPS NAV 1000	GPS	100
GPS-15 SEC FIXES, LORAN C	GPS	100
GPS,TRIMBLE MOD. 4000AX	GPS	100
GPS,TRIMBLE 4000AX	GPS	100
GPS,SATELLITE NAVIGATOR	GPS	100
GPS,MANUAL ENTRY GYRO SPEED	GPS	100
GPS,MAGNAVOX,MX200,WGS84	GPS	100
GPS,AUTO LOG GYRO+2D DOPPLER SPD	GPS	100
GPS, TRIMBLE MOD. 4000AX	GPS	100
GPS TRIMBLE MOD. 4000AX	GPS	100
GPS Satellite Loran C Rho-Rho	GPS	100
GPS MAGNABOX MX200	GPS	100
GPS AUTO LOG GYRO+2D DOPPLER SPD	GPS	100
GPS + LORAN C	GPS	100
GPS (UNDIFFERENTIATED C/A CODE)	GPS	100
GPS (selective availability)	GPS	100
GPS (RECEIVER TYPE UNKNOWN)	GPS	100
GPS (INS)	GPS	100
GPS	GPS	100
Furuno speed log, Magnavox GPS 4200D and	GPS	100
FURUNO GPS	GPS	100
DEL NORTE 1009 RECEIVER	GPS	100
DEL NORTE 1009 & QYF GPS	GPS	100
CENTURION GPS	GPS	100
ASHTECH GPS	GPS	100
ANRITSU RN403A GPS RECEIVER	GPS	100
Sonotrack bottom transpo Trimble GPS No	GPS	100
Northstar 7000 Sonotrack II GPS	GPS	100
MN8QC DGPS	DGPS	20
RACAL DECCA MK53G GPS RECEIVER	DECCA	500
LORAN/SEXTANT/DECCA	DECCA	500
LORAN/DECCA/SEXTANT	DECCA	500
HOKKAIDO DECCA CHAIN (9CM/MP)	DECCA	500
DECCA/SEXTANT	DECCA	500
DECCA/LORANC/SAT	DECCA	500
DECCA TYPE DSS	DECCA	500
DECCA 9C/MP,LORAN-A.2S3.2S4	DECCA	500
DECCA 7C/MP	DECCA	500
DECCA	DECCA	500
stars and dead reckoning	CELESTIAL	10000
stars	CELESTIAL	10000
SOLAR-STELLAR	CELESTIAL	10000
SOLAR/STELLAR (WITH SEXTANT)	CELESTIAL	10000
SEXTANT/RADAR	CELESTIAL	10000
SEXTANT	CELESTIAL	10000
RADAR,STELLAR	CELESTIAL	10000
RADAR,SEXTANT	CELESTIAL	10000
RADAR(48-MILE RANGE),SEXTANT	CELESTIAL	10000
ECHOLOT,SEXTANT,"RLC"	CELESTIAL	10000

CELESTIAL,MANUAL ENTRY GYRO SPEED CELESTIAL,MANUAL ENTRY GYRO & SPEED CELESTIAL,D.R.,SATELLITE CELESTIAL stars DEL NORTE 1009 P CODE DEL NORTE 1009 & QYF P CODE SAT/LRNC/GYCOMP/SPDLOG/DOPPSONAR/RHO-RHO	CELESTIAL CELESTIAL CELESTIAL CELESTIAL CELESTIAL GPS_CODE GPS_CODE TRANSIT	10000 10000 10000 10000 10000 20 20 500
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Appendix H

Stored Tables in CCOM/JHC Oracle 9i Database

This database is still under construction. The following Table information was acquired 05/28/2002.

Table Name: GEOMAR SONNE

Comments: Cruises where Hydrosweep data was collected along the US West coast with German Research Vessel Sonne.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	START_DATE_YYYYMMDD	NUMBER(10)	Y	
3	START_TIME_HHMMSS	NUMBER(8)	Y	
4	LINE	VARCHAR2(10)	Y	
5	PROJECT	VARCHAR2(20)	Y	
6	CRUISE	VARCHAR2(20)	Y	
7	SHIP	VARCHAR2(10)	Y	
8	INSTITUTE	VARCHAR2(22)	Y	
9	CHIEF_SCIENTIST	VARCHAR2(20)	Y	
10	START_YEAR	NUMBER(4)	Y	
11	END_YEAR	NUMBER(4)	Y	
12	BATHY_SYSTEM	VARCHAR2(30)	Y	
13	PRIMARY_NAV	VARCHAR2(20)	Y	
14	SECONDARY_NAV	VARCHAR2(20)	Y	
15	MAX_NAVFIX_ERROR	NUMBER(5)	Y	
16	HORIZONTAL_DATUM	VARCHAR2(10)	Y	
17	GEOMETRY	SDO_Geometry	Y	

Table Name: LAMONT_SEISMIC

Comments: Seismic tracklines collected by Lamont Doherty Earth Laboratory received through NGDC. Analog seismic records from these cruises have been scanned by NGDC.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SURVEY_ID	VARCHAR2(8)	Y	
3	SHIP_NAME	VARCHAR2(50)	Y	
4	INSTITUTION	VARCHAR2(50)	Y	
5	START_DATE	NUMBER(8)	Y	
6	START_TIME	NUMBER(8)	Y	
7	NEGATIVE_SCAN	NUMBER(6)	Y	
8	GEOMETRY	SDO_Geometry	Y	
9	DL_FLAG	VARCHAR2(10)	Y	

Table Name: LDEO_EWING_HYDSW_WGS84

Comments: Cruises where multibeam data was collected by Lamont Doherty Earth Laboratory with Research Vessel Maurice Ewing.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	CRUISE_ID	VARCHAR2(15)	Y	
3	SHIP	VARCHAR2(20)	Y	
4	INSTITUTE	VARCHAR2(50)	Y	
5	YEAR	NUMBER(4)	Y	
6	START_DATE	VARCHAR2(25)	Y	
7	BATHY_INSTRUMENT	VARCHAR2(20)	Y	
8	NAV_PRIMARY	VARCHAR2(20)	Y	
9	NAV_ACCURACY	NUMBER(6,1)	Y	
10	HORIZONTAL_DATUM	VARCHAR2(5)	Y	
11	GEOMETRY	SDO_Geometry	Y	

Table Name: MMS_ALASKA_NAD83

Comments: Navigation for seismic lines from MMS of the coast of Alaska.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	PERMIT_NO	VARCHAR2(6)	Y	
3	SEISMIC_LINE	VARCHAR2(25)	Y	
4	START_SHOTPOINT	NUMBER(10)	Y	
5	ARCHIVE	VARCHAR2(50)	Y	
6	DATA_INFO	VARCHAR2(50)	Y	
7	HORIZONTAL_DATUM	VARCHAR2(50)	Y	
8	GEOMETRY	SDO_Geometry	Y	

Table Name: MMS_ATLANTIC_NAD83

Comments: Navigation for seismic lines from MMS of the US Atlantic coast.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SEISMIC_LINE	VARCHAR2(25)	Y	
3	START_SHOTPOINT	NUMBER(10)	Y	
4	ARCHIVE	VARCHAR2(50)	Y	
5	DATA_INFO	VARCHAR2(50)	Y	
6	HORIZONTAL_DATUM	VARCHAR2(50)	Y	
7	GEOMETRY	SDO_Geometry	Y	

Table Name: MMS_ATLANTIC_WGS84

Comments: Navigation for seismic lines from MMS of the US Atlantic coast.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SEISMIC_LINE	VARCHAR2(25)	Y	
3	START_SHOTPOINT	NUMBER(10)	Y	
4	ARCHIVE	VARCHAR2(50)	Y	
5	DATA_INFO	VARCHAR2(50)	Y	
6	HORIZONTAL_DATUM	VARCHAR2(50)	Y	
7	GEOMETRY	SDO_Geometry	Y	

Table Name: MMS_GULF_NAD27

Comments: Navigation for seismic lines from MMS in the Gulf of Mexico.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SEISMIC_LINE	VARCHAR2(25)	Y	
3	START_SHOTPOINT	NUMBER(10)	Y	
4	ARCHIVE	VARCHAR2(50)	Y	
5	DATA_INFO	VARCHAR2(50)	Y	
6	HORIZONTAL_DATUM	VARCHAR2(50)	Y	
7	GEOMETRY	SDO_Geometry	Y	

Table Name: MMS_PACIFIC_NAD83

Comments: Navigation for seismic lines from MMS of the US Pacific coast.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SEISMIC_LINE	VARCHAR2(25)	Y	
3	ARCHIVE	VARCHAR2(50)	Y	
4	DATA_INFO	VARCHAR2(50)	Y	
5	HORIZONTAL_DATUM	VARCHAR2(50)	Y	
6	GEOMETRY	SDO_Geometry	Y	

Table Name: NGDC_GEODAS_BATHYTWT

Comments: Tracklines showing collected bathymetry where Two-Way-Travel time is stored. This data was downloaded from NGDC's MGG CD-ROMs using GEODAS.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SURVEY_ID	VARCHAR2(8)	Y	
3	NGDC_NUMBER	VARCHAR2(8)	Y	
4	SHIP_NAME	VARCHAR2(50)	Y	
5	INSTITUTION	VARCHAR2(50)	Y	

6	START_DATE	NUMBER(8)	Y
7	END_DATE	NUMBER(8)	Y
8	NAV_INSTRUMENT	VARCHAR2(50)	Y
9	DATUM_POS_METHOD	VARCHAR2(50)	Y
10	BATHY_INSTRUMENT	VARCHAR2(50)	Y
11	SEISMIC_INSTRUMENT	VARCHAR2(50)	Y
12	SEISMIC_INFO	VARCHAR2(75)	Y
13	NAV_CLASS	VARCHAR2(50)	Y
14	NAV_ACCURACY	NUMBER(8)	Y
15	GEOMETRY	SDO_GEOmetry	Y
16	DL_FLAG	VARCHAR2(10)	Y

Table Name: NGDC_GEODAS_GRAVFREE

Comments: Tracklines showing where Free Air Gravity data was collected. This data was downloaded from NGDC's MGG CD-ROMs using GEODAS.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SURVEY_ID	VARCHAR2(8)	Y	
3	NGDC_NUMBER	VARCHAR2(8)	Y	
4	SHIP_NAME	VARCHAR2(50)	Y	
5	INSTITUTION	VARCHAR2(50)	Y	
6	START_DATE	NUMBER(8)	Y	
7	END_DATE	NUMBER(8)	Y	
8	NAV_INSTRUMENT	VARCHAR2(50)	Y	
9	DATUM_POS_METHOD	VARCHAR2(50)	Y	
10	BATHY_INSTRUMENT	VARCHAR2(50)	Y	
11	SEISMIC_INSTRUMENT	VARCHAR2(50)	Y	
12	SEISMIC_INFO	VARCHAR2(75)	Y	
13	NAV_CLASS	VARCHAR2(50)	Y	
14	NAV_ACCURACY	NUMBER(8)	Y	
15	GEOMETRY	SDO_GEOmetry	Y	
16	DL_FLAG	VARCHAR2(10)	Y	

Table Name: NGDC_GEODAS_GRAVOBS

Comments: Tracklines showing where observed Gravity data was collected. This data was downloaded from NGDC's MGG CD-ROMs using GEODAS.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SURVEY_ID	VARCHAR2(8)	Y	
3	NGDC_NUMBER	VARCHAR2(8)	Y	
4	SHIP_NAME	VARCHAR2(50)	Y	
5	INSTITUTION	VARCHAR2(50)	Y	
6	START_DATE	NUMBER(8)	Y	
7	END_DATE	NUMBER(8)	Y	
8	NAV_INSTRUMENT	VARCHAR2(50)	Y	
9	DATUM_POS_METHOD	VARCHAR2(50)	Y	

10	BATHY_INSTRUMENT	VARCHAR2(50)	Y
11	SEISMIC_INSTRUMENT	VARCHAR2(50)	Y
12	SEISMIC_INFO	VARCHAR2(75)	Y
13	NAV_CLASS	VARCHAR2(50)	Y
14	NAV_ACCURACY	NUMBER(8)	Y
15	GEOMETRY	SDO_GEOmetry	Y
16	DL_FLAG	VARCHAR2(10)	Y

Table Name: NGDC_GEODAS_MAGRES

Comments: Tracklines showing where observed Magnetic Residual Field was collected. This data was downloaded from NGDC's MGG CD-ROMs using GEODAS.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SURVEY_ID	VARCHAR2(8)	Y	
3	NGDC_NUMBER	VARCHAR2(8)	Y	
4	SHIP_NAME	VARCHAR2(50)	Y	
5	INSTITUTION	VARCHAR2(50)	Y	
6	START_DATE	NUMBER(8)	Y	
7	END_DATE	NUMBER(8)	Y	
8	NAV_INSTRUMENT	VARCHAR2(50)	Y	
9	DATUM_POS_METHOD	VARCHAR2(50)	Y	
10	BATHY_INSTRUMENT	VARCHAR2(50)	Y	
11	SEISMIC_INSTRUMENT	VARCHAR2(50)	Y	
12	SEISMIC_INFO	VARCHAR2(75)	Y	
13	NAV_CLASS	VARCHAR2(50)	Y	
14	NAV_ACCURACY	NUMBER(8)	Y	
15	GEOMETRY	SDO_GEOmetry	Y	
16	DL_FLAG	VARCHAR2(10)	Y	

Table Name: NGDC_GEODAS_MAGTOT

Comments: Tracklines showing where observed Magnetic Total Field was collected. This data was downloaded from NGDC's MGG CD-ROMs using GEODAS.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SURVEY_ID	VARCHAR2(8)	Y	
3	NGDC_NUMBER	VARCHAR2(8)	Y	
4	SHIP_NAME	VARCHAR2(50)	Y	
5	INSTITUTION	VARCHAR2(50)	Y	
6	START_DATE	NUMBER(8)	Y	
7	END_DATE	NUMBER(8)	Y	
8	NAV_INSTRUMENT	VARCHAR2(50)	Y	
9	DATUM_POS_METHOD	VARCHAR2(50)	Y	
10	BATHY_INSTRUMENT	VARCHAR2(50)	Y	
11	SEISMIC_INSTRUMENT	VARCHAR2(50)	Y	
12	SEISMIC_INFO	VARCHAR2(75)	Y	
13	NAV_CLASS	VARCHAR2(50)	Y	
14	NAV_ACCURACY	NUMBER(8)	Y	
15	GEOMETRY	SDO_GEOmetry	Y	
16	DL_FLAG	VARCHAR2(10)	Y	

Table Name: NGDC_GEODAS_MULTIBEAM
Comments: Tracklines showing where multibeam was collected. This data was downloaded from NGDC's MGG CD-ROMs using GEODAS.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SURVEY_ID	VARCHAR2(8)	Y	
3	NGDC_NUMBER	VARCHAR2(8)	Y	
4	SHIP_NAME	VARCHAR2(50)	Y	
5	INSTITUTION	VARCHAR2(50)	Y	
6	START_DATE	NUMBER(8)	Y	
7	END_DATE	NUMBER(8)	Y	
8	NAV_INSTRUMENT	VARCHAR2(50)	Y	
9	DATUM_POS_METHOD	VARCHAR2(50)	Y	
10	BATHY_INSTRUMENT	VARCHAR2(50)	Y	
11	SEISMIC_INSTRUMENT	VARCHAR2(50)	Y	
12	SEISMIC_INFO	VARCHAR2(75)	Y	
13	NAV_CLASS	VARCHAR2(50)	Y	
14	NAV_ACCURACY	NUMBER(8)	Y	
15	GEOMETRY	SDO_GEOGRAPHY	Y	
16	DL_FLAG	VARCHAR2(2)	Y	

Table Name: NGDC_GEODAS_NAV

Comments: Tracklines showing all navigational data stored on NGDC's MGG CD-ROMs. This data was downloaded from NGDC's MGG CD-ROMs using GEODAS.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SURVEY_ID	VARCHAR2(8)	Y	
3	NGDC_NUMBER	VARCHAR2(8)	Y	
4	SHIP_NAME	VARCHAR2(50)	Y	
5	INSTITUTION	VARCHAR2(50)	Y	
6	START_DATE	NUMBER(8)	Y	
7	END_DATE	NUMBER(8)	Y	
8	NAV_INSTRUMENT	VARCHAR2(50)	Y	
9	DATUM_POS_METHOD	VARCHAR2(50)	Y	
10	BATHY_INSTRUMENT	VARCHAR2(50)	Y	
11	SEISMIC_INSTRUMENT	VARCHAR2(50)	Y	
12	SEISMIC_INFO	VARCHAR2(75)	Y	
13	NAV_CLASS	VARCHAR2(50)	Y	
14	NAV_ACCURACY	NUMBER(8)	Y	
15	GEOMETRY	SDO_GEOGRAPHY	Y	
16	DL_FLAG	VARCHAR2(10)	Y	

Table Name: NGDC_GEODAS_SEIS

Comments: Seismic tracklines stored on NGDC's MGG CD-ROMs. This data was downloaded

from NGDC's MGG CD-ROMs using GEODAS.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SURVEY_ID	VARCHAR2(8)	Y	
3	NGDC_NUMBER	VARCHAR2(8)	Y	
4	SHIP_NAME	VARCHAR2(50)	Y	
5	INSTITUTION	VARCHAR2(50)	Y	
6	START_DATE	NUMBER(8)	Y	
7	END_DATE	NUMBER(8)	Y	
8	NAV_INSTRUMENT	VARCHAR2(50)	Y	
9	DATUM_POS_METHOD	VARCHAR2(50)	Y	
10	BATHY_INSTRUMENT	VARCHAR2(50)	Y	
11	SEISMIC_INSTRUMENT	VARCHAR2(50)	Y	
12	SEISMIC_INFO	VARCHAR2(75)	Y	
13	NAV_CLASS	VARCHAR2(50)	Y	
14	NAV_ACCURACY	NUMBER(8)	Y	
15	GEOMETRY	SDO_Geometry	Y	
16	DL_FLAG	VARCHAR2(10)	Y	

Table Name: NIMA_TRACKS_WGS84

Comments: Ships tracklines received from NIMA's HYSAS database.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER	N	
2	DATA HOLDER	VARCHAR2(15)	Y	
3	NIMA_ID	VARCHAR2(15)	Y	
4	PLATFORM	VARCHAR2(30)	Y	
5	STARTTIME	VARCHAR2(15)	Y	
6	ENDTIME	VARCHAR2(15)	Y	
7	COUNTRY	VARCHAR2(25)	Y	
8	SCALE	VARCHAR2(20)	Y	
9	VERTICAL_DATUM	VARCHAR2(10)	Y	
10	HORIZONTAL_DATUM	VARCHAR2(10)	Y	
11	COMMENTS	VARCHAR2(150)	Y	
12	GEOMETRY	SDO_Geometry	Y	
13	DL_FLAG	NUMBER	Y	

Table Name: NOS_SUR_POLYGON_NAD1927

Comments: Survey polygons enclosing NOS hydrographic surveys

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SURVEY_ID	VARCHAR2(8)	Y	
3	NGDC_NUMBER	VARCHAR2(8)	Y	
4	SHIP_NAME	VARCHAR2(50)	Y	
5	INSTITUTION	VARCHAR2(75)	Y	

6	START_YEAR	NUMBER(8)	Y
7	END_YEAR	NUMBER(8)	Y
8	SURVEY_SCALE	VARCHAR2(15)	Y
9	POSITION_METHOD	VARCHAR2(100)	Y
10	GEOMETRY	SDO_Geometry	Y

Table Name: NOS_SUR_POLYGON_NAD1983

Comments: Survey polygons enclosing NOS hydrographic surveys

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SURVEY_ID	VARCHAR2(8)	Y	
3	NGDC_NUMBER	VARCHAR2(8)	Y	
4	SHIP_NAME	VARCHAR2(50)	Y	
5	INSTITUTION	VARCHAR2(75)	Y	
6	START_YEAR	NUMBER(8)	Y	
7	END_YEAR	NUMBER(8)	Y	
8	SURVEY_SCALE	VARCHAR2(15)	Y	
9	POSITION_METHOD	VARCHAR2(100)	Y	
10	GEOMETRY	SDO_Geometry	Y	

Table Name: USGS_ARCTIC_NAD27

Comments: Tracklines showing acquired bathymetry by USGS in the Arctic region

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SURVEY_ID	VARCHAR2(15)	Y	
3	SHIP	VARCHAR2(50)	Y	
4	INSTITUTE	VARCHAR2(50)	Y	
5	CHIEF_SCIENTIST	VARCHAR2(50)	Y	
6	STARTYEAR	NUMBER(4)	Y	
7	ENDYEAR	NUMBER(4)	Y	
8	NAV_INSTRUMENT	VARCHAR2(50)	Y	
9	NAV_CLASS	VARCHAR2(50)	Y	
10	FIX_ACCURACY	NUMBER(8)	Y	
11	BATHY_INSTRUMENT	VARCHAR2(50)	Y	
12	ORIG_HORIZ_DATUM	VARCHAR2(20)	Y	
13	GEOMETRY	SDO_Geometry	Y	

Table Name: USGS_ARCTIC_WGS84

Comments: Tracklines showing acquired bathymetry by USGS in the Arctic region

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SURVEY_ID	VARCHAR2(15)	Y	
3	SHIP	VARCHAR2(50)	Y	
4	INSTITUTE	VARCHAR2(50)	Y	
5	CHIEF_SCIENTIST	VARCHAR2(50)	Y	
6	STARTYEAR	NUMBER(4)	Y	

7	ENDYEAR	NUMBER(4)	Y
8	NAV_INSTRUMENT	VARCHAR2(50)	Y
9	NAV_CLASS	VARCHAR2(50)	Y
10	FIX_ACCURACY	NUMBER(8)	Y
11	BATHY_INSTRUMENT	VARCHAR2(50)	Y
12	ORIG_HORIZ_DATUM	VARCHAR2(20)	Y
13	GEOMETRY	SDO_Geometry	Y

Table Name: USGS_ATLANTIC_WGS84

Comments: Seismic tracklines acquired by USGS in the Atlantic region. This data is simply transferred from ArcView shape files using GeoMedia Pro.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	LENGTH	FLOAT(126)	Y	
2	ID	NUMBER	Y	
3	FILENAME	VARCHAR2(30)	Y	
4	LENGTH1	FLOAT(126)	Y	
5	ID1	NUMBER	Y	
6	SEISMIC_IN	VARCHAR2(62)	Y	
7	DATA_INFO	VARCHAR2(28)	Y	
8	BATHY_SYST	NUMBER	Y	
9	NAV_SYSTEM	VARCHAR2(13)	Y	
10	ACQUISITIO	VARCHAR2(31)	Y	
11	ARCHIVE	VARCHAR2(22)	Y	
12	HORIZONTAL	VARCHAR2(5)	Y	
13	YEAR	NUMBER	Y	
14	GAVPRIMARYKEY	NUMBER	Y	
15	GEOMETRY	SDO_Geometry	Y	
16	ID2	NUMBER	N	

Table Name: USGS_INFOBK_NAD27

Comments: Tracklines download from the USGS Infobank

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SURVEY_ID	VARCHAR2(15)	Y	
3	SHIP	VARCHAR2(50)	Y	
4	INSTITUTE	VARCHAR2(50)	Y	
5	START_DATE	VARCHAR2(12)	Y	
6	NAVSYSTEM	VARCHAR2(115)	Y	
7	BATHY_INSTRUMENT	VARCHAR2(115)	Y	
8	SEISMIC_INSTRUMENT	VARCHAR2(115)	Y	
9	SEIMSIIC_INFO	VARCHAR2(115)	Y	
10	NAVCLASS	VARCHAR2(50)	Y	
11	NAV_ACCU	NUMBER(8)	Y	
12	HORIZONTAL_DATUM	VARCHAR2(10)	Y	
13	VERTICAL_DATUM	VARCHAR2(10)	Y	
14	GEOMETRY	SDO_Geometry	Y	

Table Name: USGS_INFOBK_NAD83

Comments: Tracklines download from the USGS Infobank

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SURVEY_ID	VARCHAR2(15)	Y	
3	SHIP	VARCHAR2(50)	Y	
4	INSTITUTE	VARCHAR2(50)	Y	
5	START_DATE	VARCHAR2(12)	Y	
6	NAVSYSTEM	VARCHAR2(115)	Y	
7	BATHY_INSTRUMENT	VARCHAR2(115)	Y	
8	SEISMIC_INSTRUMENT	VARCHAR2(115)	Y	
9	SEIMSC_INFO	VARCHAR2(115)	Y	
10	NAVCLASS	VARCHAR2(50)	Y	
11	NAV_ACCU	NUMBER(8)	Y	
12	HORIZONTAL_DATUM	VARCHAR2(10)	Y	
13	VERTICAL_DATUM	VARCHAR2(10)	Y	
14	GEOMETRY	SDO_Geometry	Y	

Table Name: USGS_MGULF_NAD83

Comments: Seismic tracklines acquired by USGS in the Gulf of Mexico.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SEISMIC_LINE	VARCHAR2(12)	Y	
3	CRUISE_ID	VARCHAR2(15)	Y	
4	INPUT_FILE	VARCHAR2(15)	Y	
5	DATA_INFO	VARCHAR2(115)	Y	
6	SEISMIC_INFO	VARCHAR2(115)	Y	
7	ACQUISITION_INFO	VARCHAR2(115)	Y	
8	ARCHIVE	VARCHAR2(30)	Y	
9	HORIZONTAL_DATUM	VARCHAR2(10)	Y	
10	YEAR	NUMBER(4)	Y	
11	BATHY_INSTRUMENT	VARCHAR2(50)	Y	
12	NAVSYSTEM	VARCHAR2(50)	Y	
13	NAVCLASS	VARCHAR2(50)	Y	
14	NAV_ACCU	NUMBER(8)	Y	
15	GEOMETRY	SDO_Geometry	Y	

Table Name: USGS_PACIFIC_NAD27

Comments: Seismic tracklines acquired by USGS in the Pacific.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SEISMIC_LINE	VARCHAR2(12)	Y	
3	CRUISE_ID	VARCHAR2(15)	Y	
4	DATA_INFO	VARCHAR2(30)	Y	
5	SEISMIC_INFO	VARCHAR2(50)	Y	
6	ACQUISITION_INFO	VARCHAR2(115)	Y	
7	ARCHIVE	VARCHAR2(30)	Y	

8	HORIZONTAL_DATUM	VARCHAR2(10)	Y
9	YEAR	NUMBER(4)	Y
10	GEOMETRY	SDO_GEOmetry	Y
11	DL_FLAG	VARCHAR2(2)	Y

Table Name: USGS_PACIFIC_NAD83

Comments: Seismic tracklines acquired by USGS in the Pacific.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SEISMIC_LINE	VARCHAR2(12)	Y	
3	CRUISE_ID	VARCHAR2(15)	Y	
4	DATA_INFO	VARCHAR2(30)	Y	
5	SEISMIC_INFO	VARCHAR2(50)	Y	
6	ACQUISITION_INFO	VARCHAR2(115)	Y	
7	ARCHIVE	VARCHAR2(30)	Y	
8	HORIZONTAL_DATUM	VARCHAR2(10)	Y	
9	YEAR	NUMBER(4)	Y	
10	GEOMETRY	SDO_GEOmetry	Y	

Table Name: USGS_REFRP_EAST_WGS84

Comments: Seismic refraction points along the US Atlantic Coast.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	ID	NUMBER	Y	
2	X	FLOAT(126)	Y	
3	Y	FLOAT(126)	Y	
4	FILENAME	VARCHAR2(30)	Y	
5	REFERENCE	VARCHAR2(44)	Y	
6	SEISMIC_IN	VARCHAR2(7)	Y	
7	DATA_INFO	VARCHAR2(25)	Y	
8	BATHY_SYST	VARCHAR2(7)	Y	
9	NAV_SYSTEM	VARCHAR2(12)	Y	
10	ACQUISITIO	VARCHAR2(7)	Y	
11	ARCHIVE	VARCHAR2(25)	Y	
12	HORIZONTAL	VARCHAR2(7)	Y	
13	YEAR	VARCHAR2(7)	Y	
14	GAVPRIMARYKEY	NUMBER	Y	
15	GEOMETRY	SDO_GEOmetry	Y	
16	ID1	NUMBER	N	

Table Name: USGS_REFR_EAST_WGS84

Comments: Seismic refraction lines along the US Atlantic Coast.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	LENGTH	FLOAT(126)	Y	
2	ID	NUMBER	Y	
3	FILENAME	VARCHAR2(30)	Y	
4	REFERENCE	VARCHAR2(55)	Y	
5	SEISMIC_IN	VARCHAR2(7)	Y	
6	DATA_INFO	VARCHAR2(25)	Y	
7	BATHY_SYST	VARCHAR2(7)	Y	
8	NAV_SYSTEM	VARCHAR2(12)		
9	ACQUISITIO	VARCHAR2(21)	Y	
10	ARCHIVE	VARCHAR2(25)	Y	
11	HORIZONTAL	VARCHAR2(7)	Y	
12	YEAR	VARCHAR2(5)	Y	
13	GAVPRIMARYKEY	NUMBER	Y	
14	GEOMETRY	SDO_GEOmetry	Y	
15	ID1	NUMBER	N	

Table Name: US_SEDIMENT_THICKNESS

Comments: Source data for NGDC's sediment compilation

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	DATA_SOURCE	VARCHAR2(18)	Y	
3	SEDIMENT_THICKNESS	NUMBER(8,3)	Y	
4	GEOMETRY	SDO_GEOmetry	Y	
5	DL_FLAG	VARCHAR2(10)	Y	

Table Name: CHS_SOUNDINGS_NAD27

Comments: Soundings from the Canadian Hydrographic Service received via IBCAO

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	PROJECT_YEAR_NO	NUMBER(8)	Y	
3	STATION	NUMBER(8)	Y	
4	NAV_ACCU	NUMBER(5)	Y	
5	COORD_SOURCE_CODE	VARCHAR2(3)	Y	
6	DEPTH_ACCU_PERCENT	NUMBER(5,2)	Y	
7	DEPTH_ACCU_METER	NUMBER(6,2)	Y	
8	DEPTH_SOURCE_CODE	VARCHAR2(3)	Y	
9	DD_MM_YYYY	VARCHAR2(12)	Y	
10	HHMM	VARCHAR2(5)	Y	
11	HORIZONTAL_DATUM	VARCHAR2(15)	Y	
12	DEPTH	NUMBER(8,3)	Y	
13	GEOMETRY	SDO_GEOmetry	Y	

Table Name: CHS_TRACK_SOUND_NAD27

Comments: Soundings along ship tracks from the Canadian Hydrographic Service received via IBCAO

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	PROJECT_YEAR_NO	NUMBER(8)	Y	
3	STATION	NUMBER(8)	Y	
4	NAV_ACCU	NUMBER(5)	Y	
5	COORD_SOURCE_CODE	VARCHAR2(3)	Y	
6	DEPTH_ACCU_PERCENT	NUMBER(5,2)	Y	
7	DEPTH_ACCU_METER	NUMBER(6,2)	Y	
8	DEPTH_SOURCE_CODE	VARCHAR2(3)	Y	
9	DD_MM_YYYY	VARCHAR2(12)	Y	
10	HHMM	VARCHAR2(5)	Y	
11	HORIZONTAL_DATUM	VARCHAR2(15)	Y	
12	DEPTH	NUMBER(8,3)	Y	
13	GEOMETRY	SDO_Geometry	Y	

Table Name: CHS_XYZ_NAD27_1

Comments: Soundings from the Canadian Hydrographic Service received via IBCAO

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	DATA_FILE	VARCHAR2(25)	Y	
3	INSTITUTE	VARCHAR2(35)	Y	
4	DATA_INFO	VARCHAR2(35)	Y	
5	YEAR	NUMBER(4)	Y	
6	DEPTH	NUMBER(8,3)	Y	
7	HORIZONTAL_DATUM	VARCHAR2(15)	Y	
8	GEOMETRY	SDO_Geometry	Y	

Table Name: CHS_XYZ_NAD27_2

Comments: Soundings from the Canadian Hydrographic Service received via IBCAO

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	DATA_FILE	VARCHAR2(25)	Y	
3	INSTITUTE	VARCHAR2(35)	Y	
4	DATA_INFO	VARCHAR2(35)	Y	
5	YEAR	NUMBER(4)	Y	
6	DEPTH	NUMBER(8,3)	Y	
7	HORIZONTAL_DATUM	VARCHAR2(15)	Y	
8	GEOMETRY	SDO_Geometry	Y	

Table Name: GEODAS_0_90E_53_90N

Comments: Sounding data downloaded form with GEODAS from NGDC CD-ROM between 0-90deg East and 53-90 deg North.

Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SURVEY_ID	VARCHAR2(9)	Y	
3	NAV_INSTRUMENT	VARCHAR2(50)	Y	
4	DATUM_POS_METHOD	VARCHAR2(50)	Y	
5	BATHY_INSTRUMENT	VARCHAR2(50)	Y	
6	NAV_CLASS	VARCHAR2(50)	Y	
7	NAVFIX_ACCURACY	NUMBER(8)	Y	
8	TIMEZONE_CORR	NUMBER(3)	Y	
9	YEAR	NUMBER(4)	Y	
10	MONTH	NUMBER(2)	Y	
11	DAY	NUMBER(2)	Y	
12	HOUR	NUMBER(2)	Y	
13	MINUTESX1000	NUMBER(5)	Y	
14	NGDC_POS_CODE	NUMBER(1)	Y	
15	DEPTH_TWT_MIC_SEC	NUMBER(6)	Y	
16	DEPTH_Corrected	NUMBER(6)	Y	
17	DEPTH_CORRECTION	VARCHAR2(25)	Y	
18	BATHY_TYPE	VARCHAR2(15)	Y	
19	NAV_PROBLEMS	VARCHAR2(30)	Y	
20	GEOMETRY	SDO_Geometry	Y	

Table Name: GEODAS_180_90W_53_90N

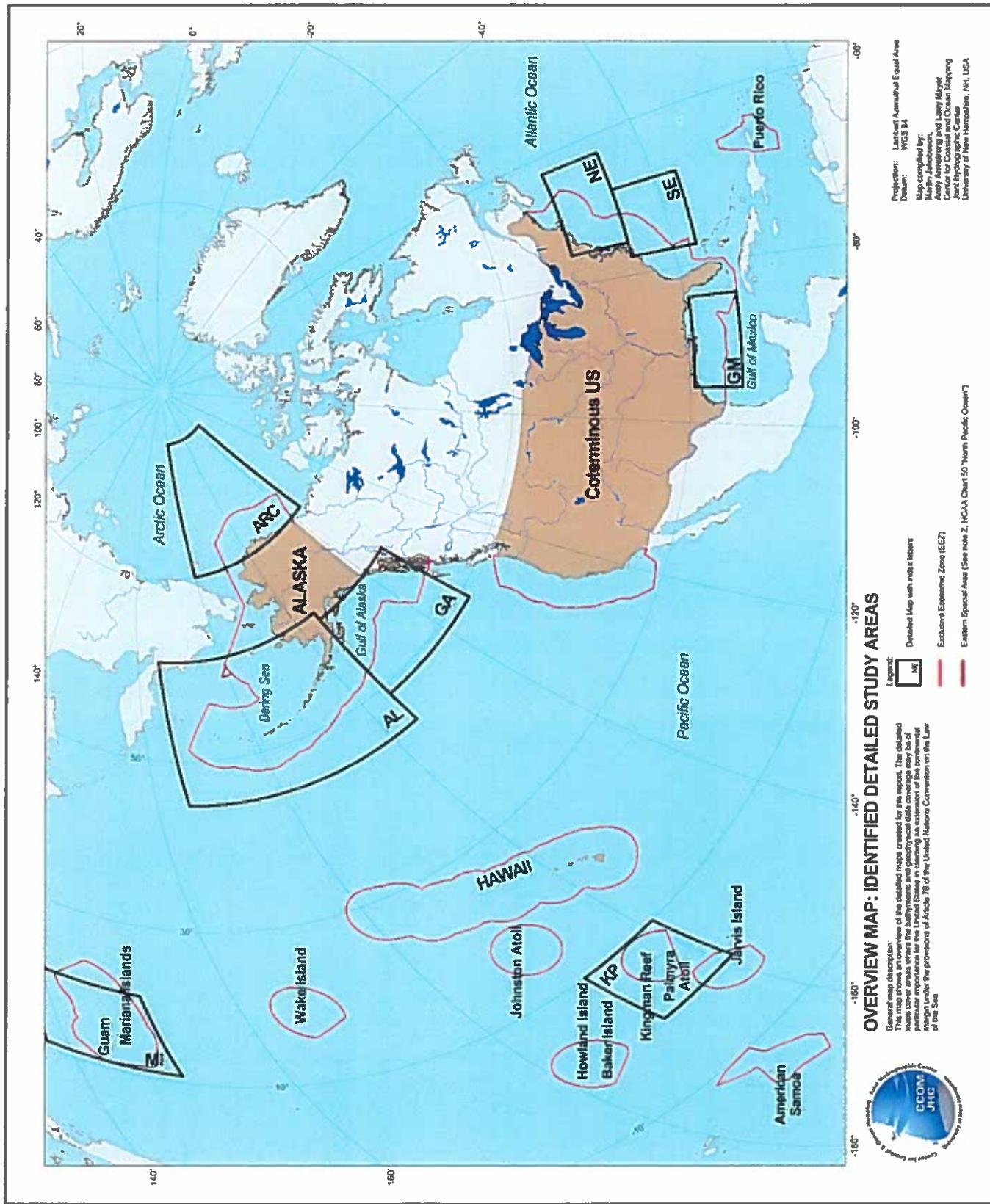
Comments: Sounding data downloaded from GEODAS from NGDC CD-ROM between 180-90 deg West and 53-90 deg North.

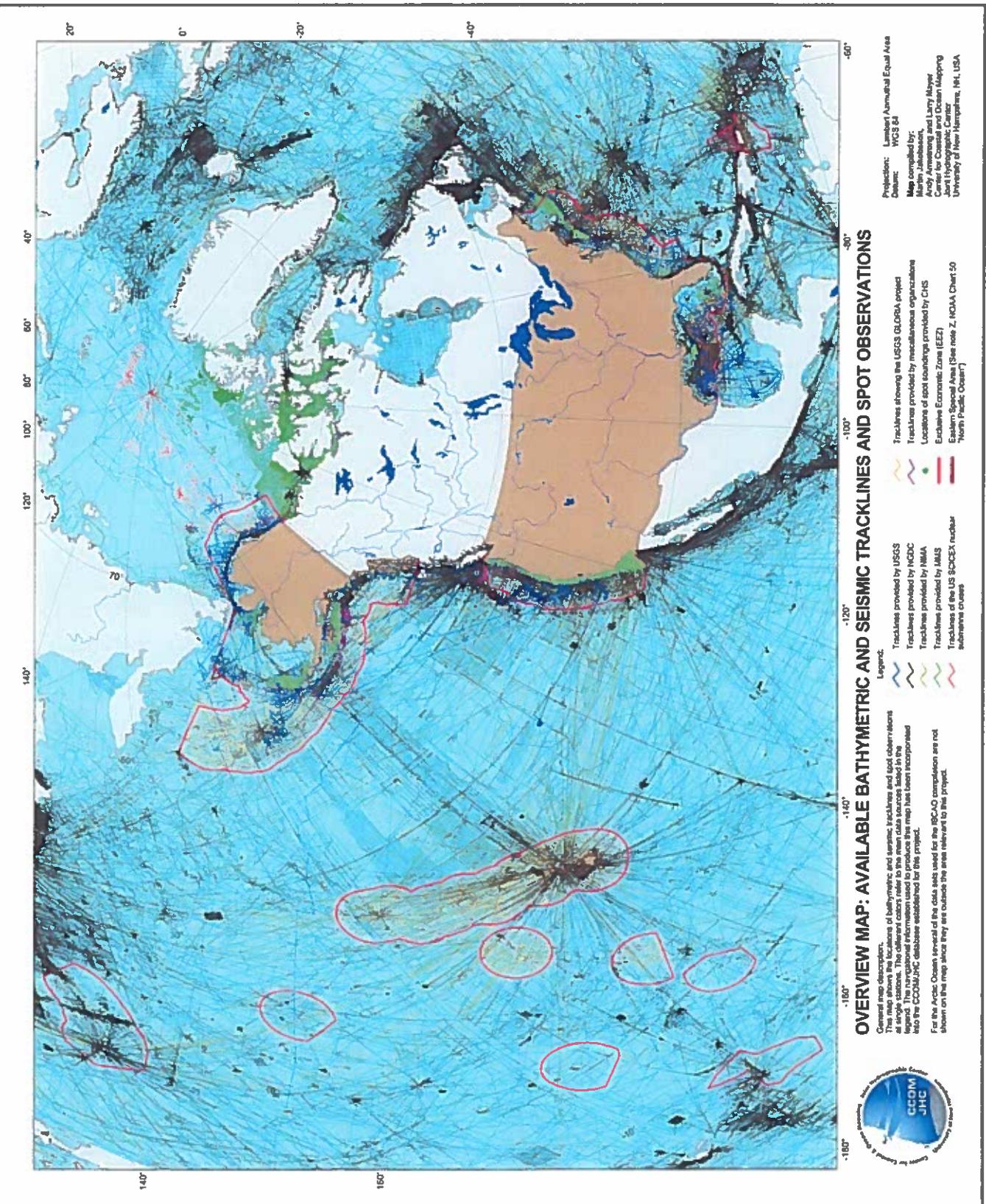
Columns:

#	Name	Data Type	Nulls?	Default Value
1	PID	NUMBER(10)	N	
2	SURVEY_ID	VARCHAR2(9)	Y	
3	NAV_INSTRUMENT	VARCHAR2(50)	Y	
4	DATUM_POS_METHOD	VARCHAR2(50)	Y	
5	BATHY_INSTRUMENT	VARCHAR2(50)	Y	
6	NAV_CLASS	VARCHAR2(50)	Y	
7	NAVFIX_ACCURACY	NUMBER(8)	Y	
8	TIMEZONE_CORR	NUMBER(3)	Y	
9	YEAR	NUMBER(4)	Y	
10	MONTH	NUMBER(2)	Y	
11	DAY	NUMBER(2)	Y	
12	HOUR	NUMBER(2)	Y	
13	MINUTESX1000	NUMBER(5)	Y	
14	NGDC_POS_CODE	NUMBER(1)	Y	
15	DEPTH_TWT_MIC_SEC	NUMBER(6)	Y	
16	DEPTH_Corrected	NUMBER(6)	Y	
17	DEPTH_CORRECTION	VARCHAR2(25)	Y	
18	BATHY_TYPE	VARCHAR2(15)	Y	
19	NAV_PROBLEMS	VARCHAR2(30)	Y	
20	GEOMETRY	SDO_Geometry	Y	

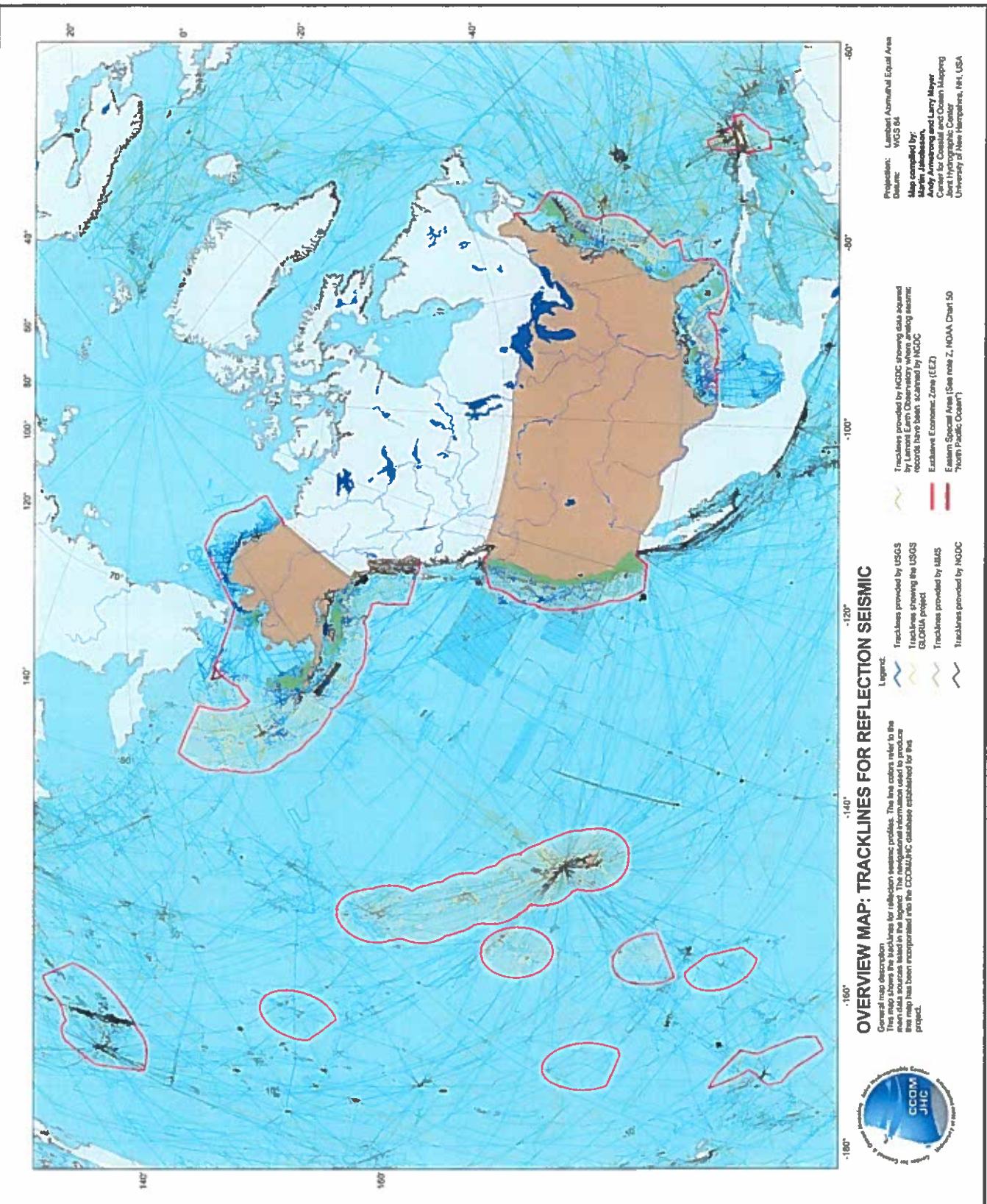
APPENDIX I
MAPS

Map. Detailed-maps



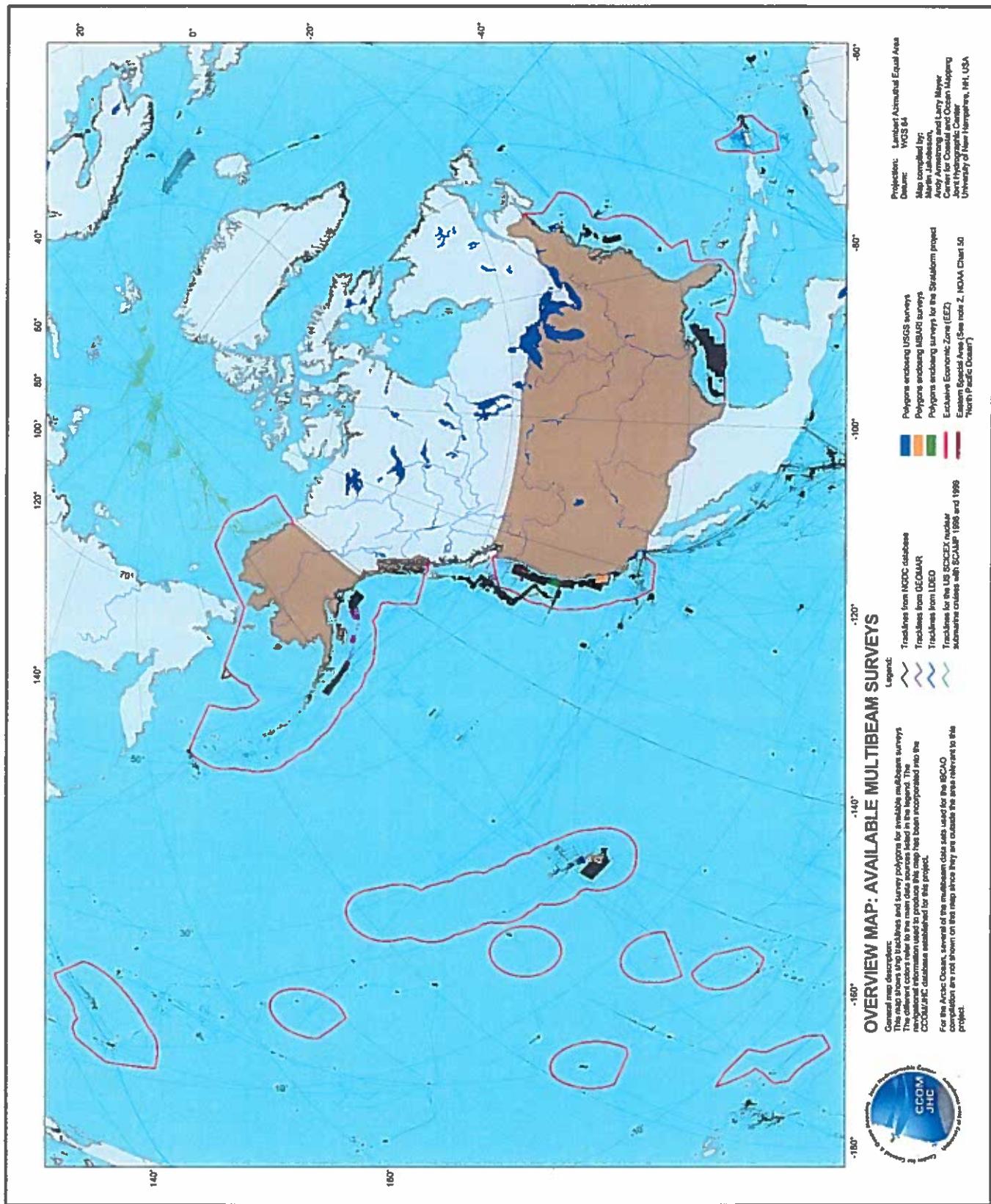


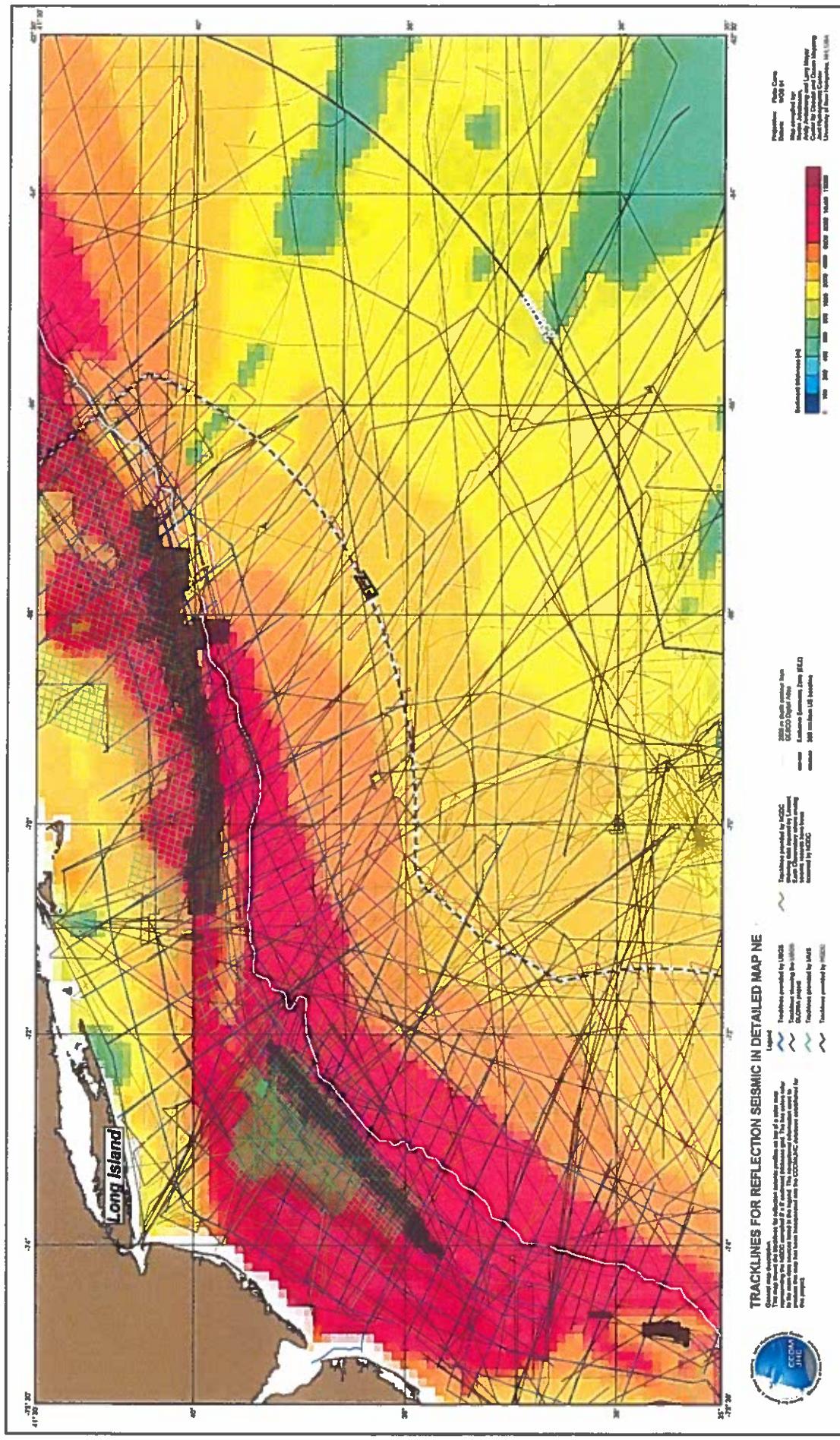
Map. Tracklines.



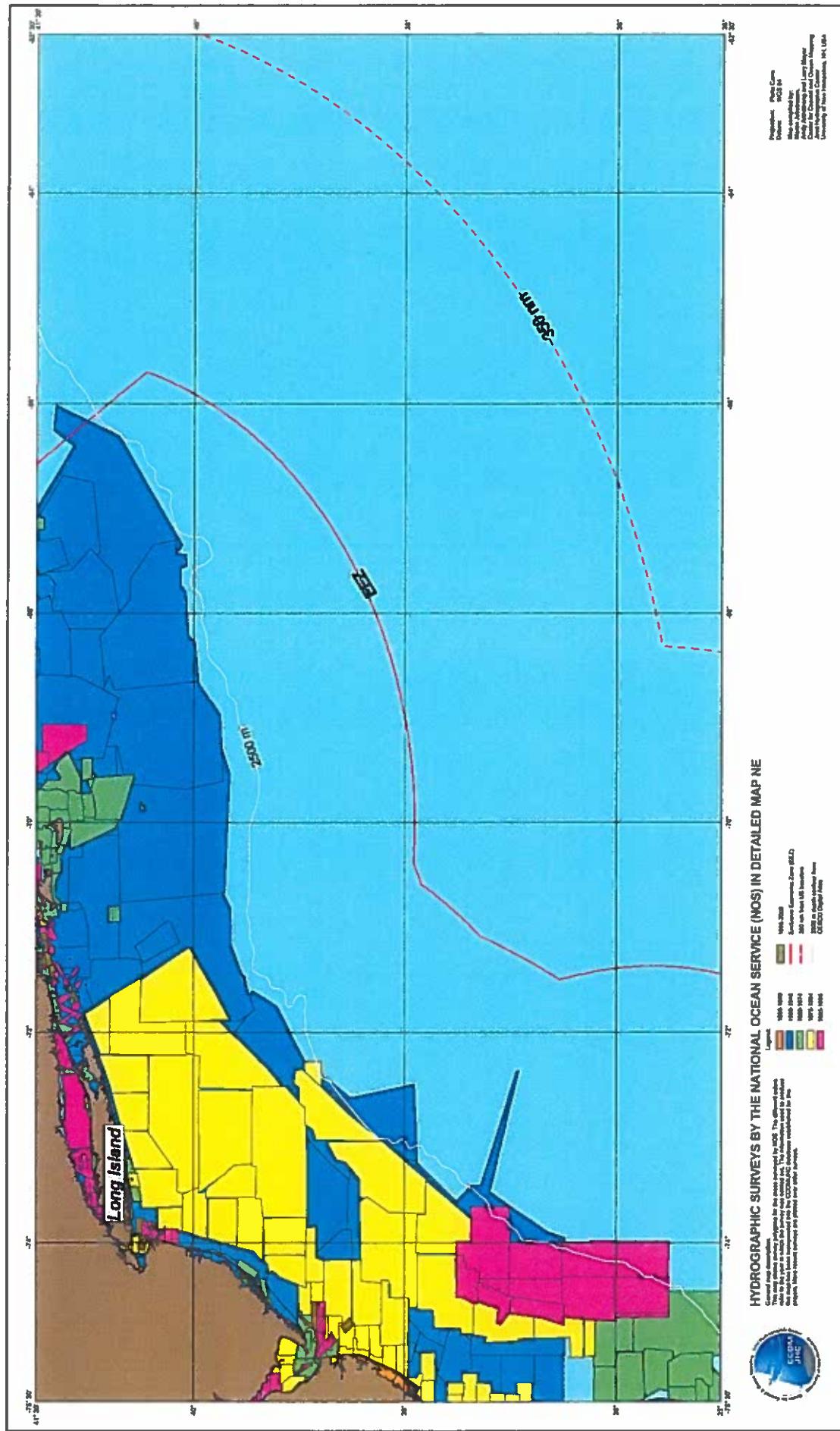
Map. Seismic-tracklines.

Map. Multibeam-surveys.

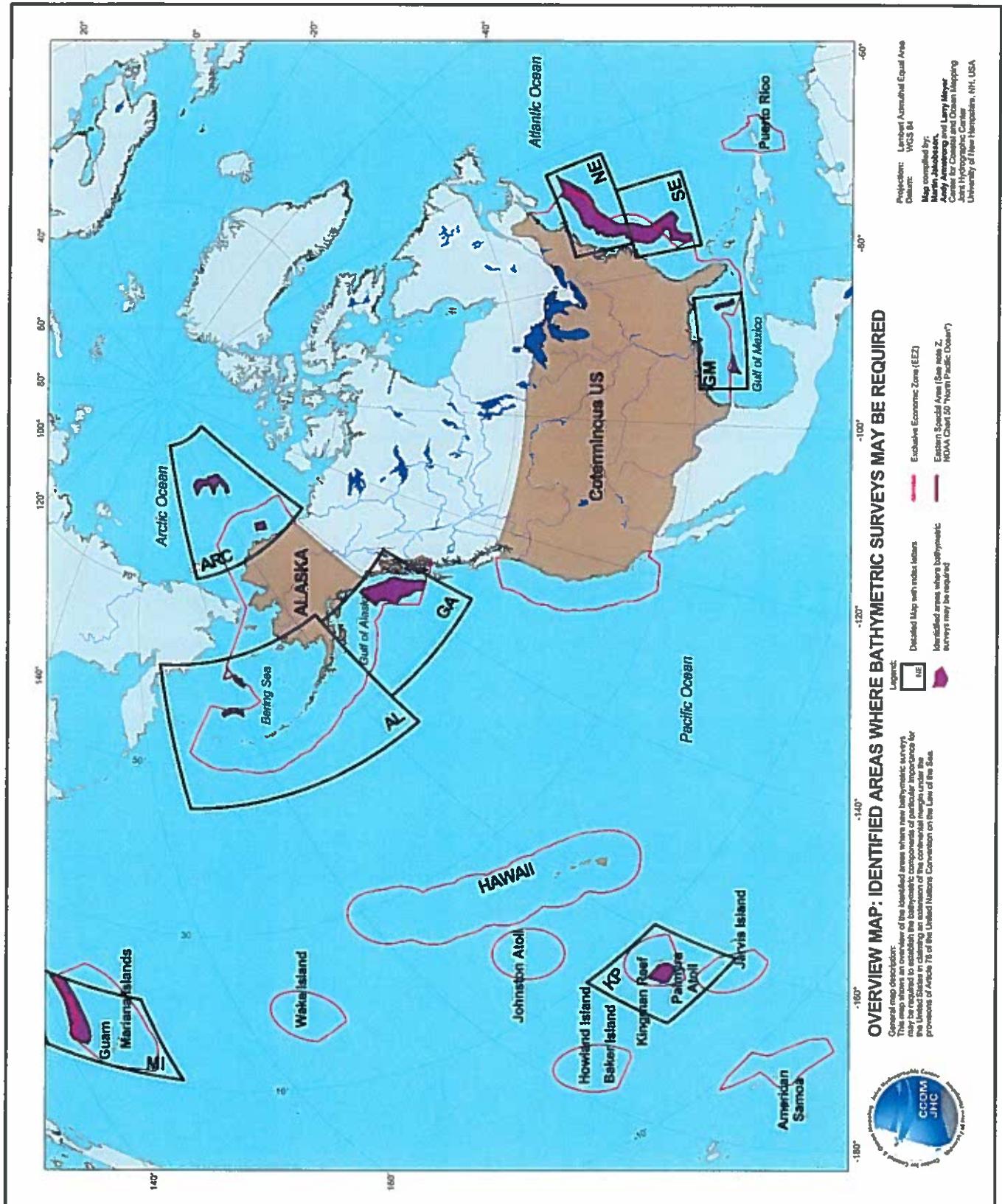




Map. Seismic-tracklines-sediment-NE.

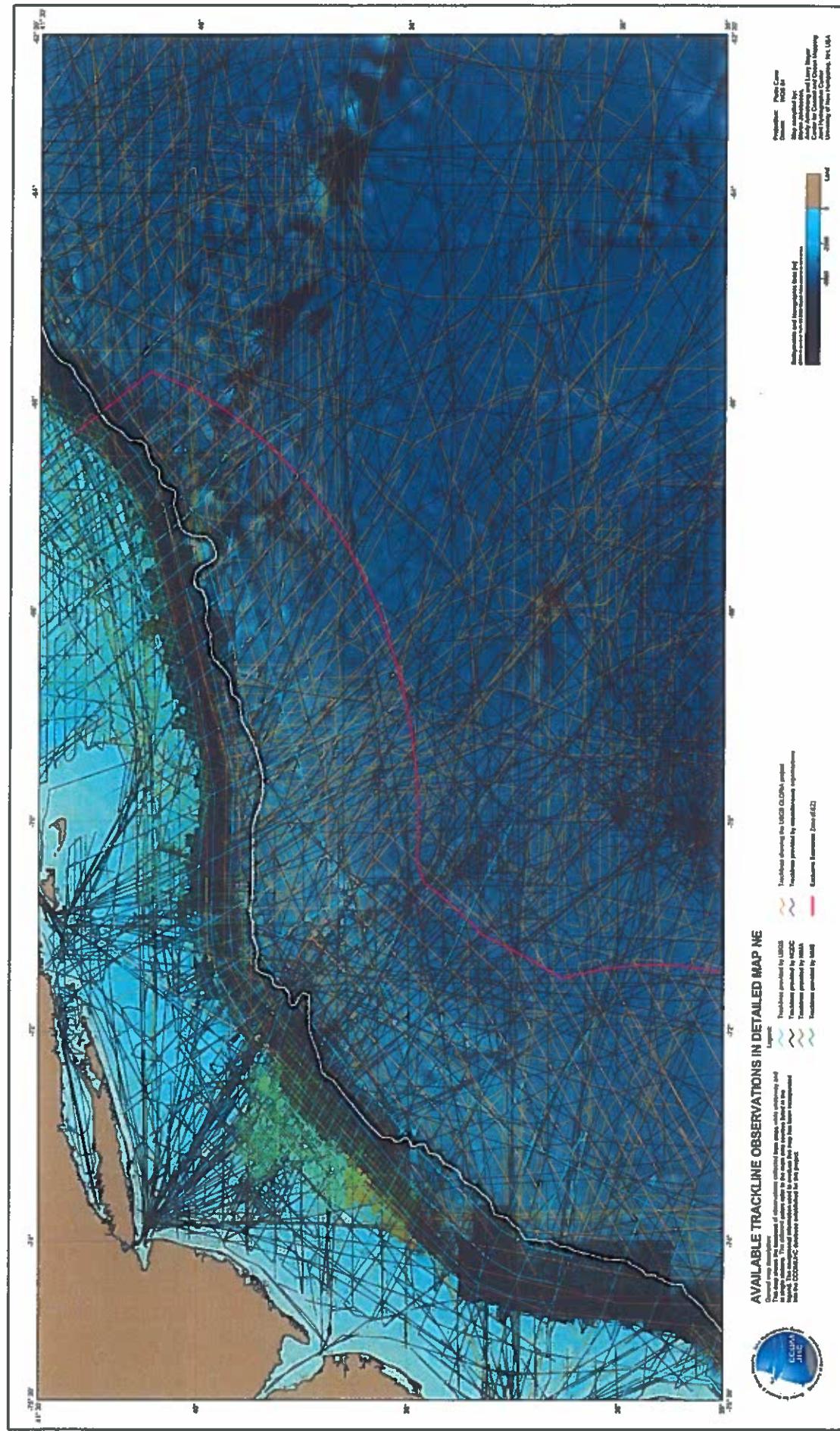


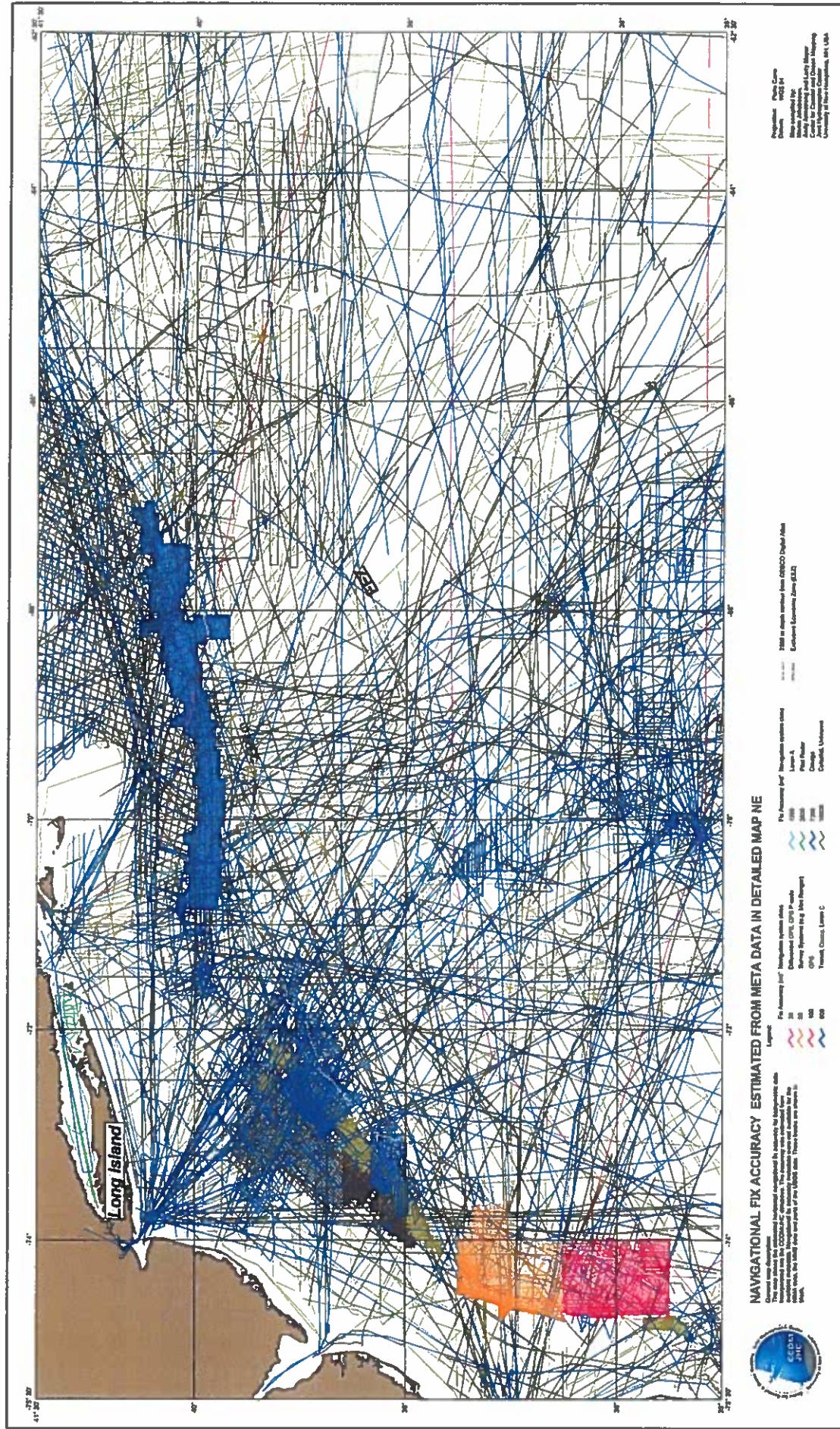
Map. NOS-surveys-NE.



Map. More-bathymetry-required.

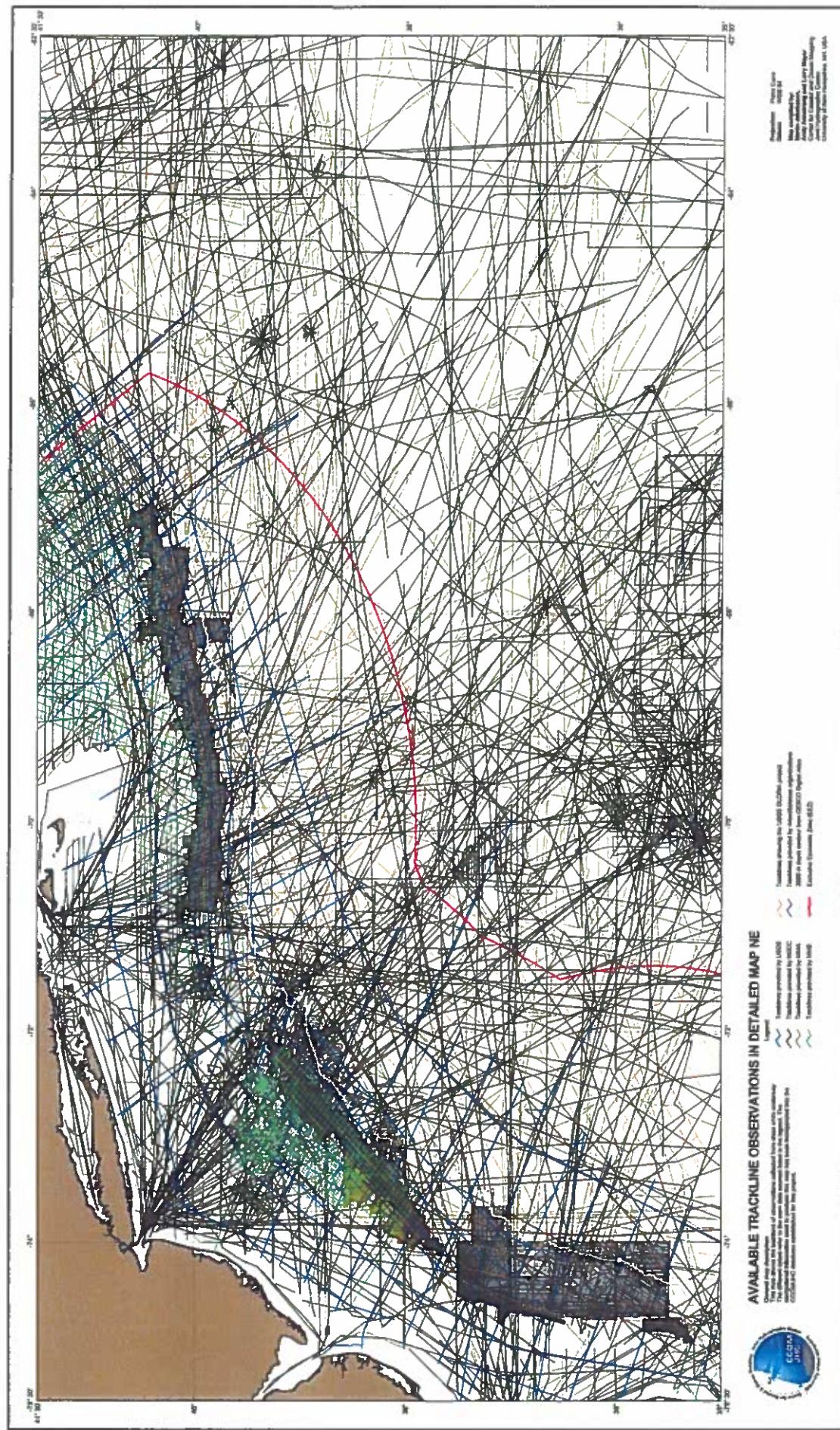
Map. Tracklines-ETOPO2-NE.

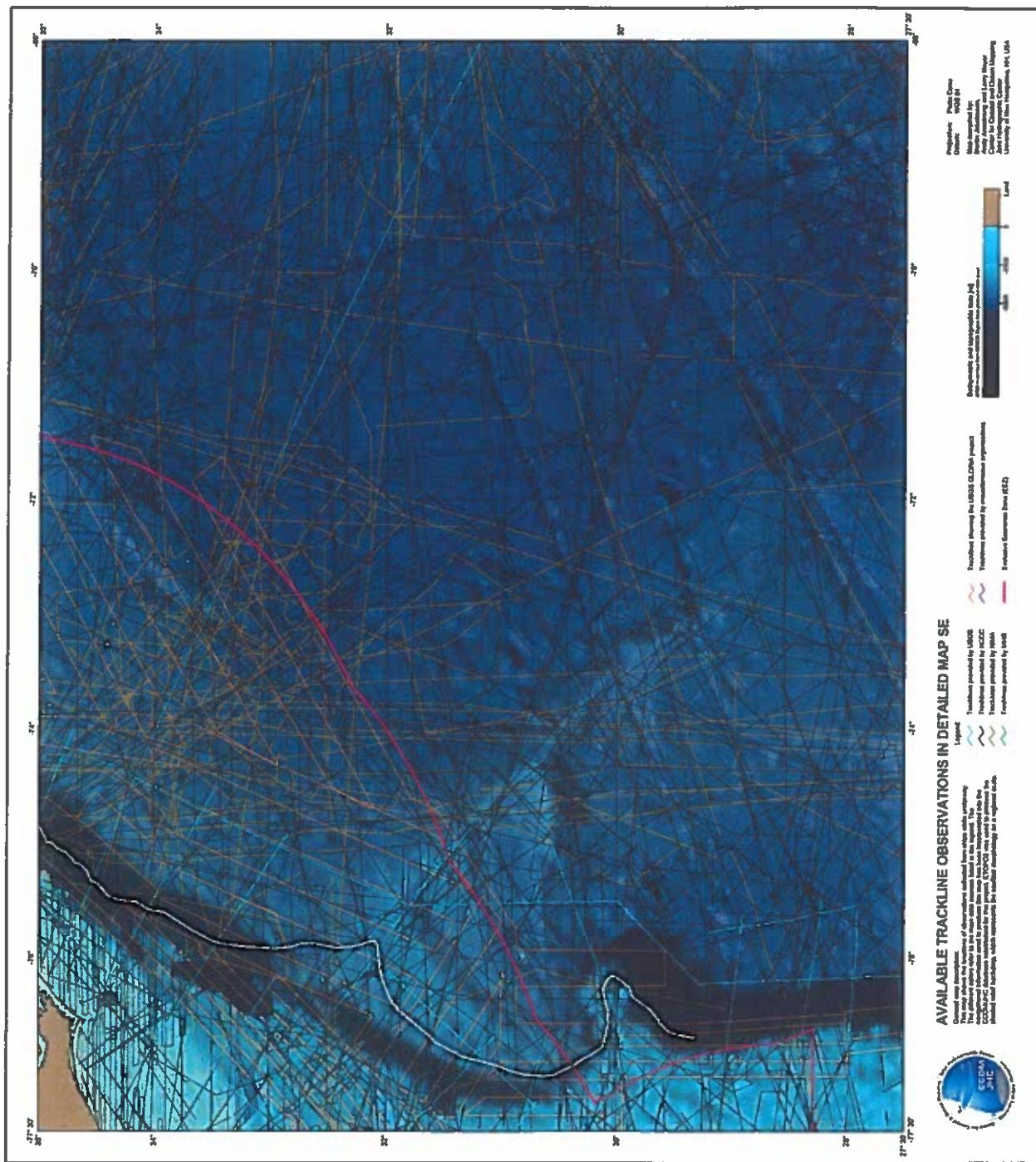




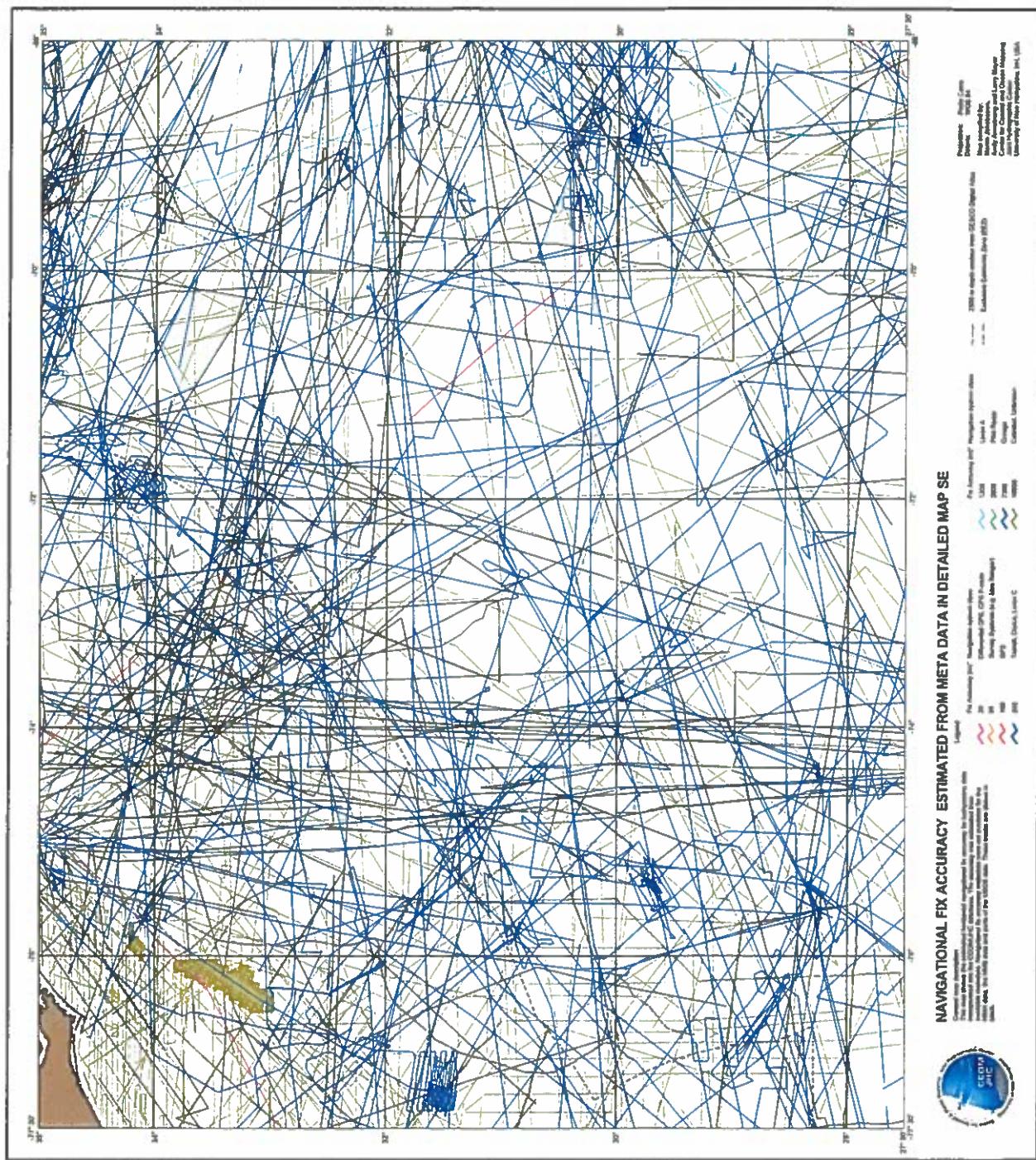
Map. Navigational-fix-accuracy-NE.

Map. Tracklines-NE.

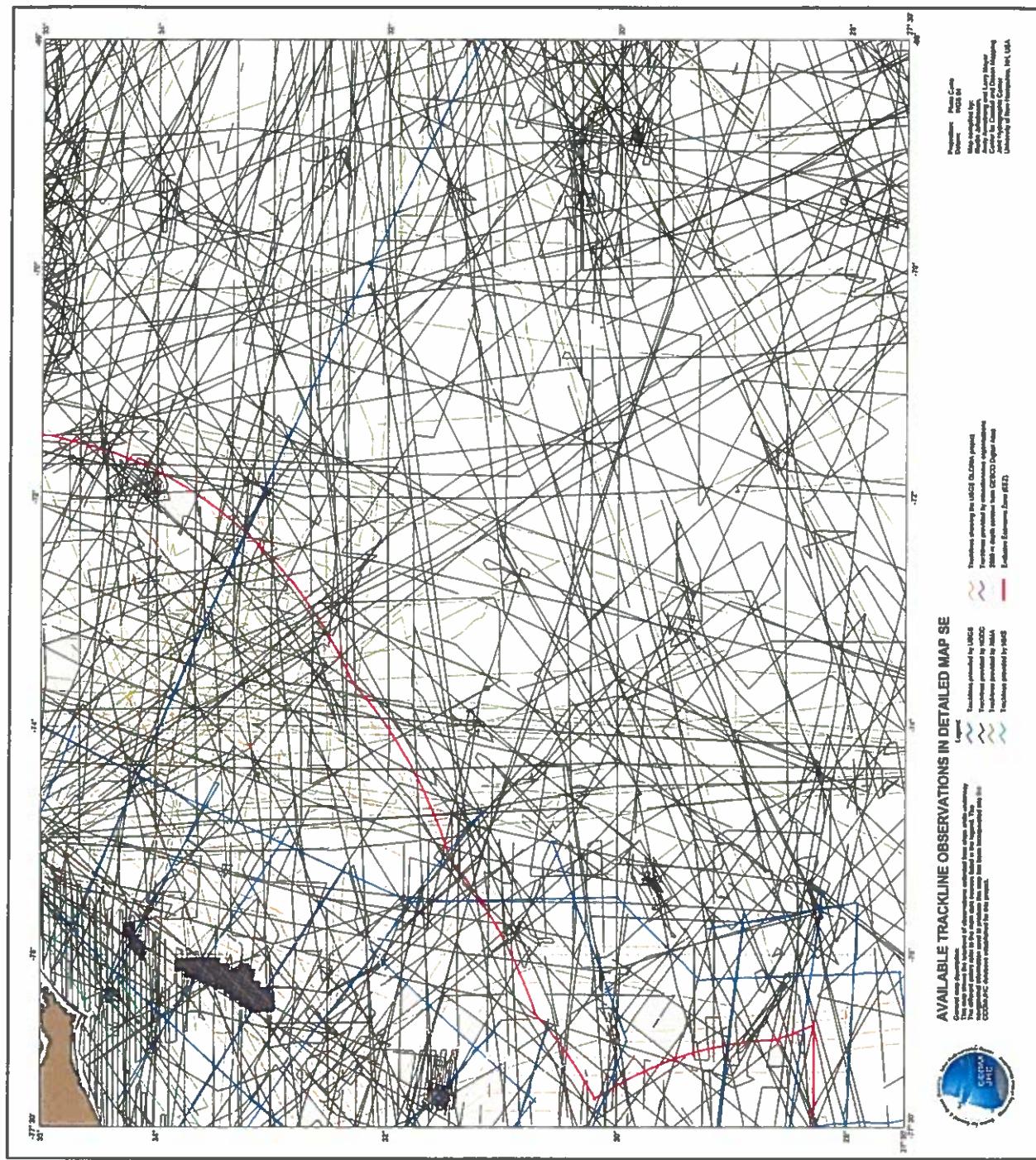




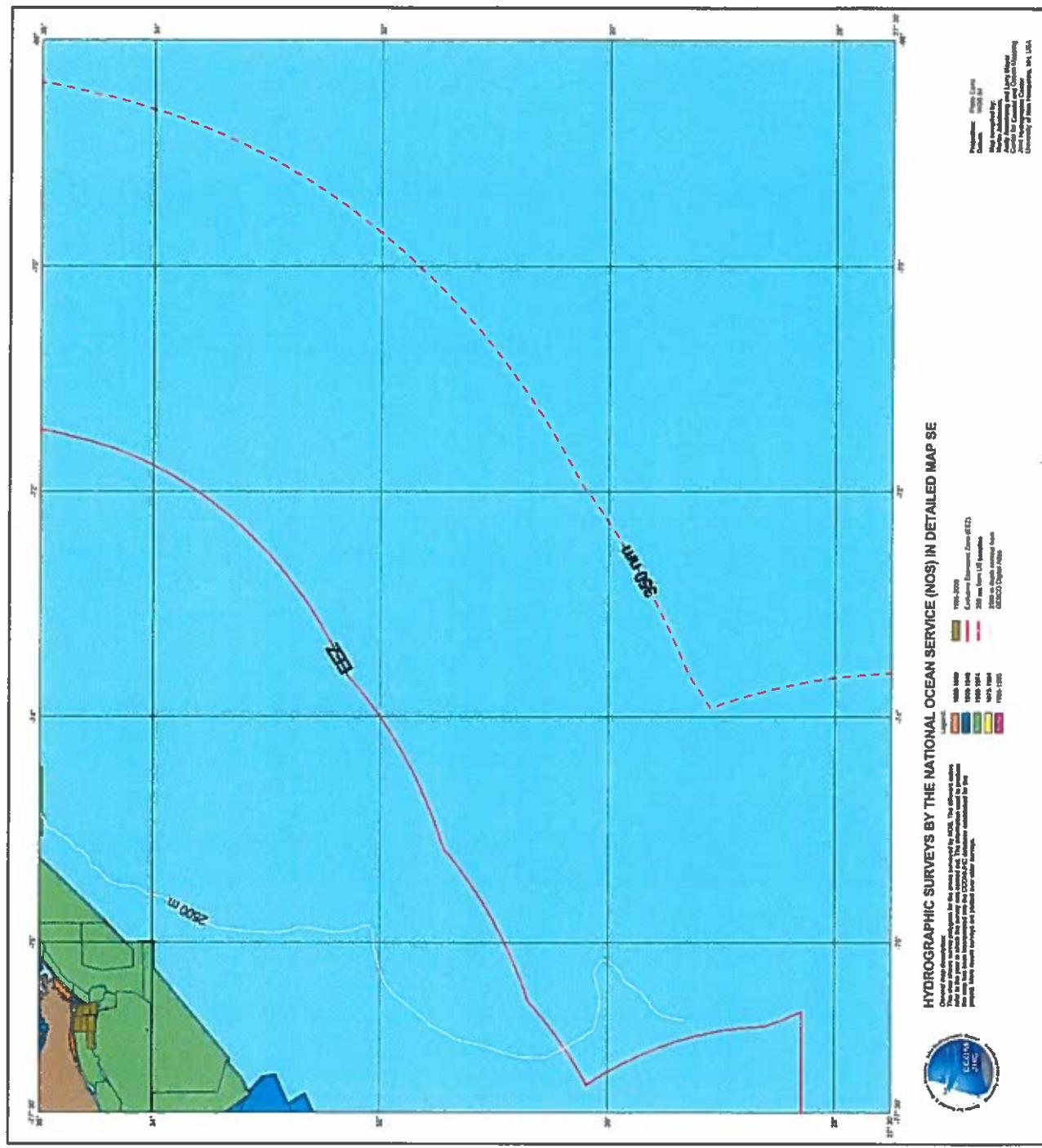
Map. Tracklines-ETOPO2-SE.



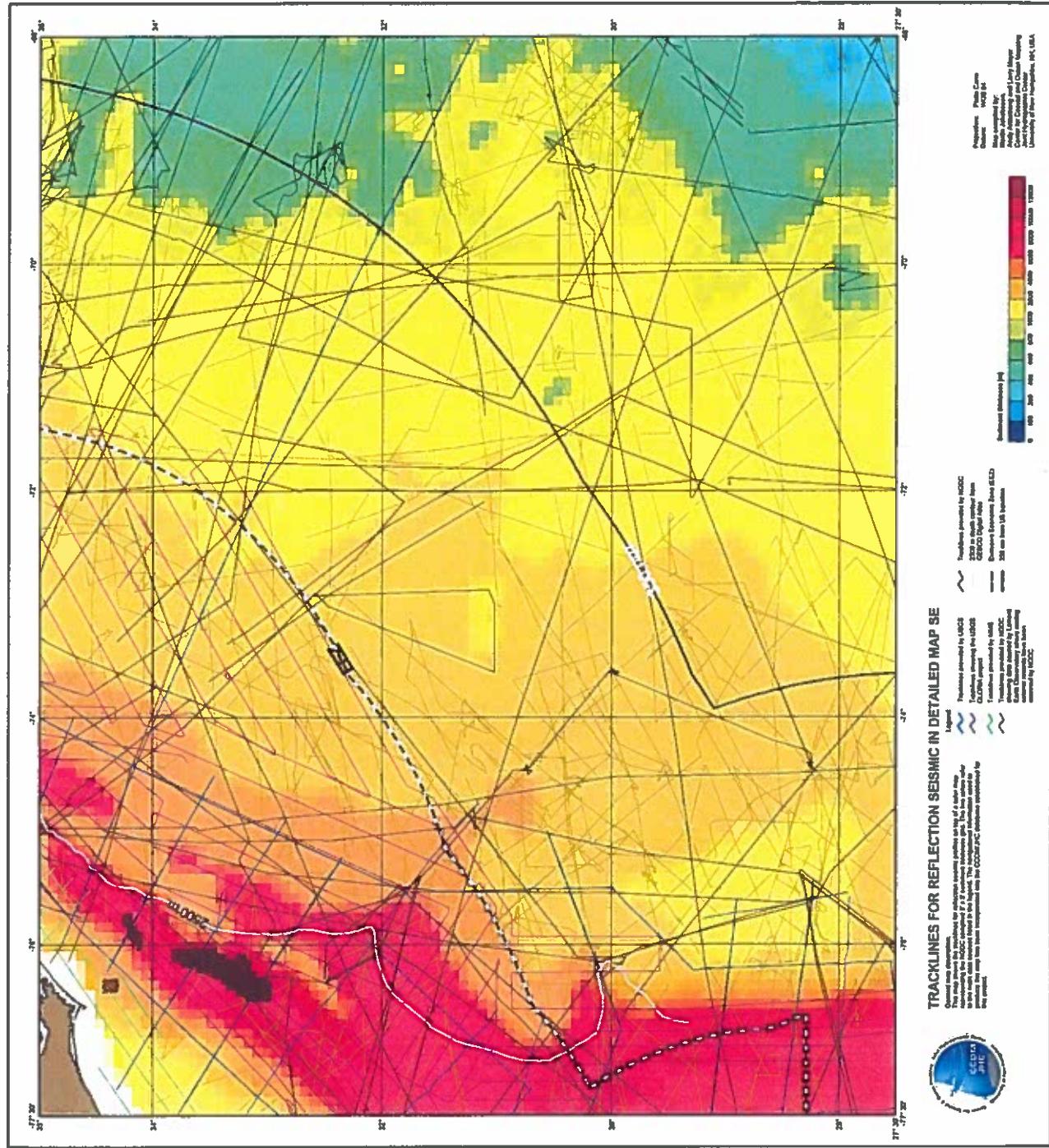
Map. *Navigational-fix-accuracy-SE.*



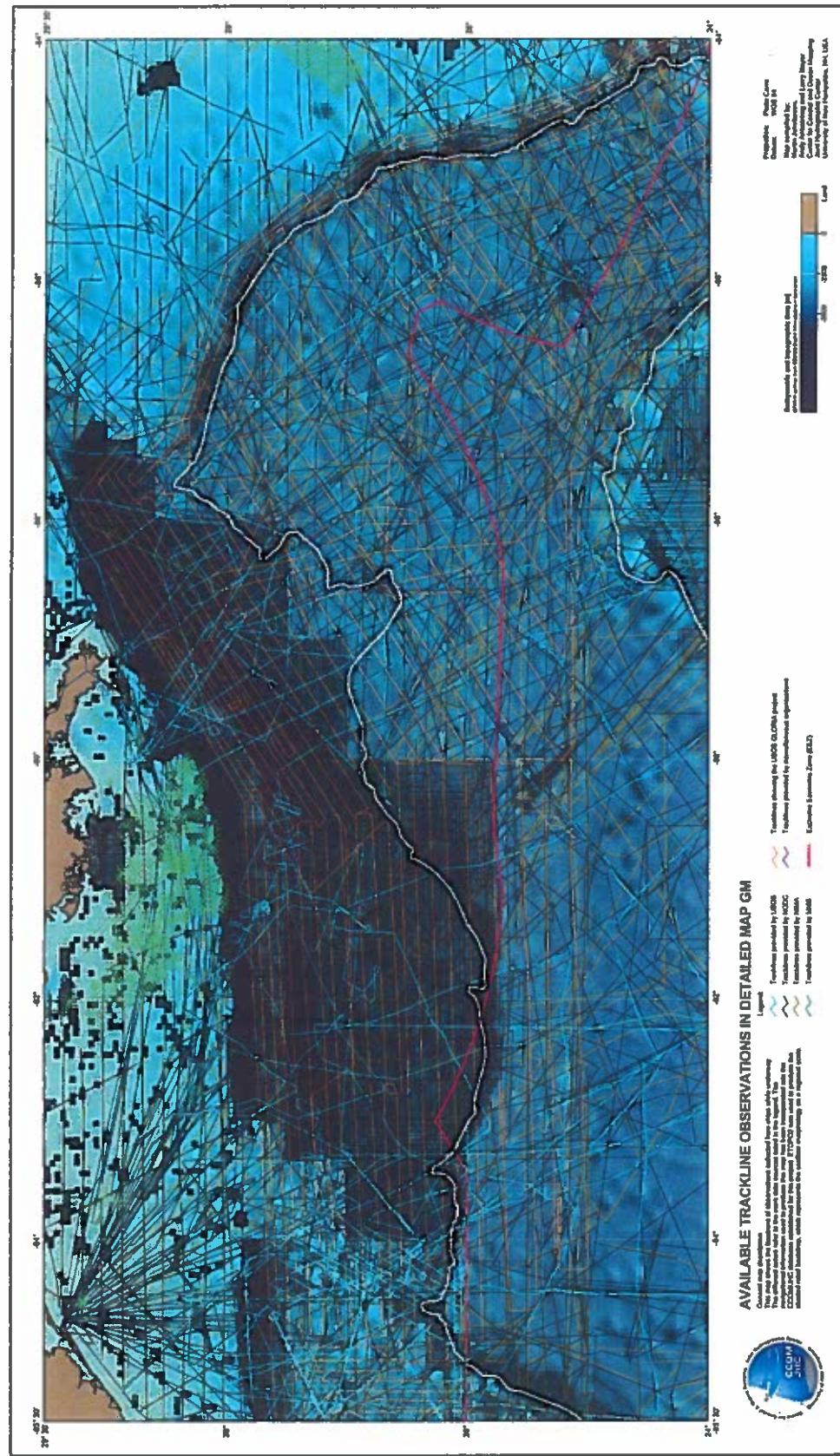
Map. Tracklines-SE.



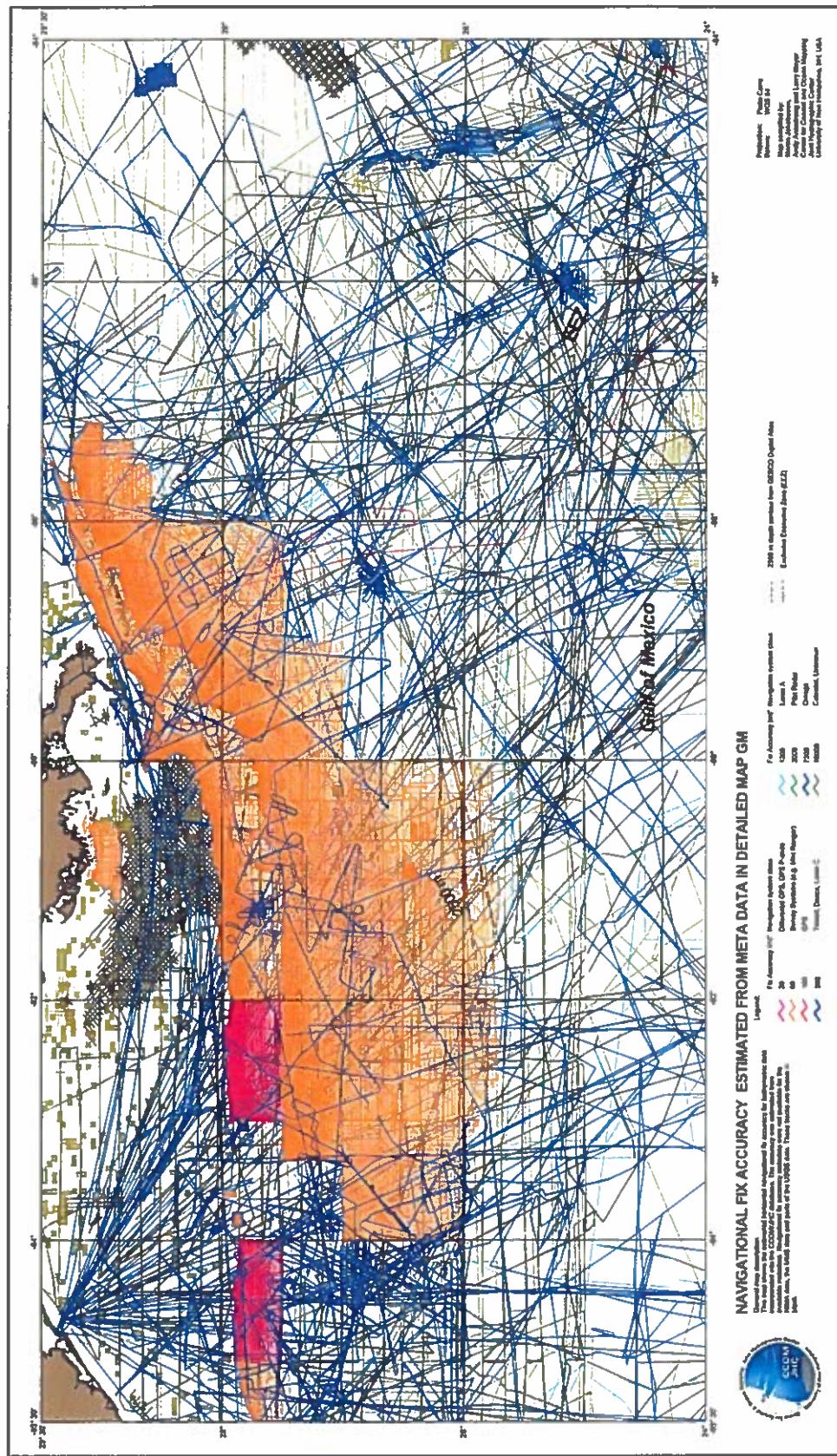
Map. NOS-surveys-SE.



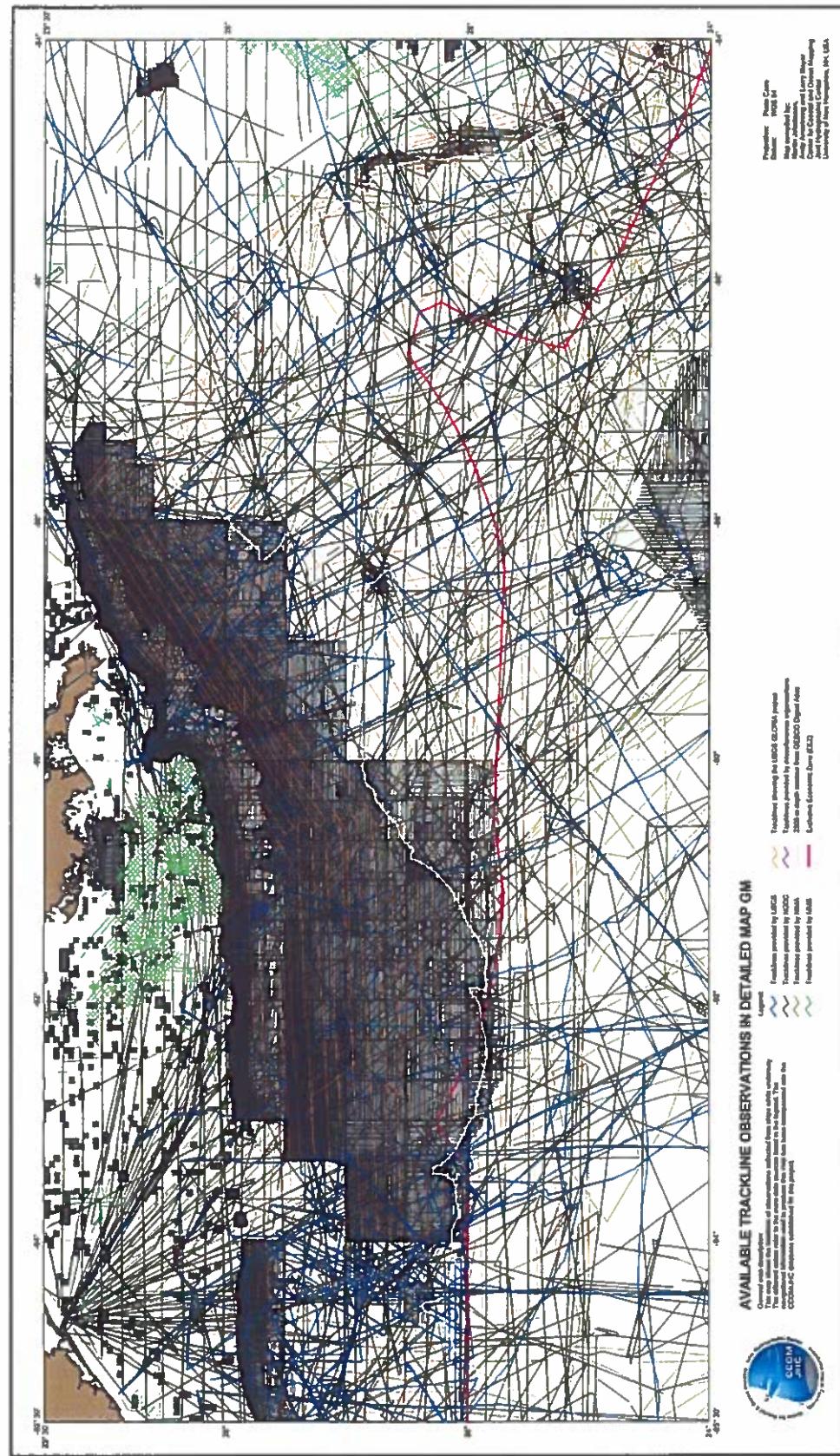
Map. Seismic-tracklines-sediment-SE.



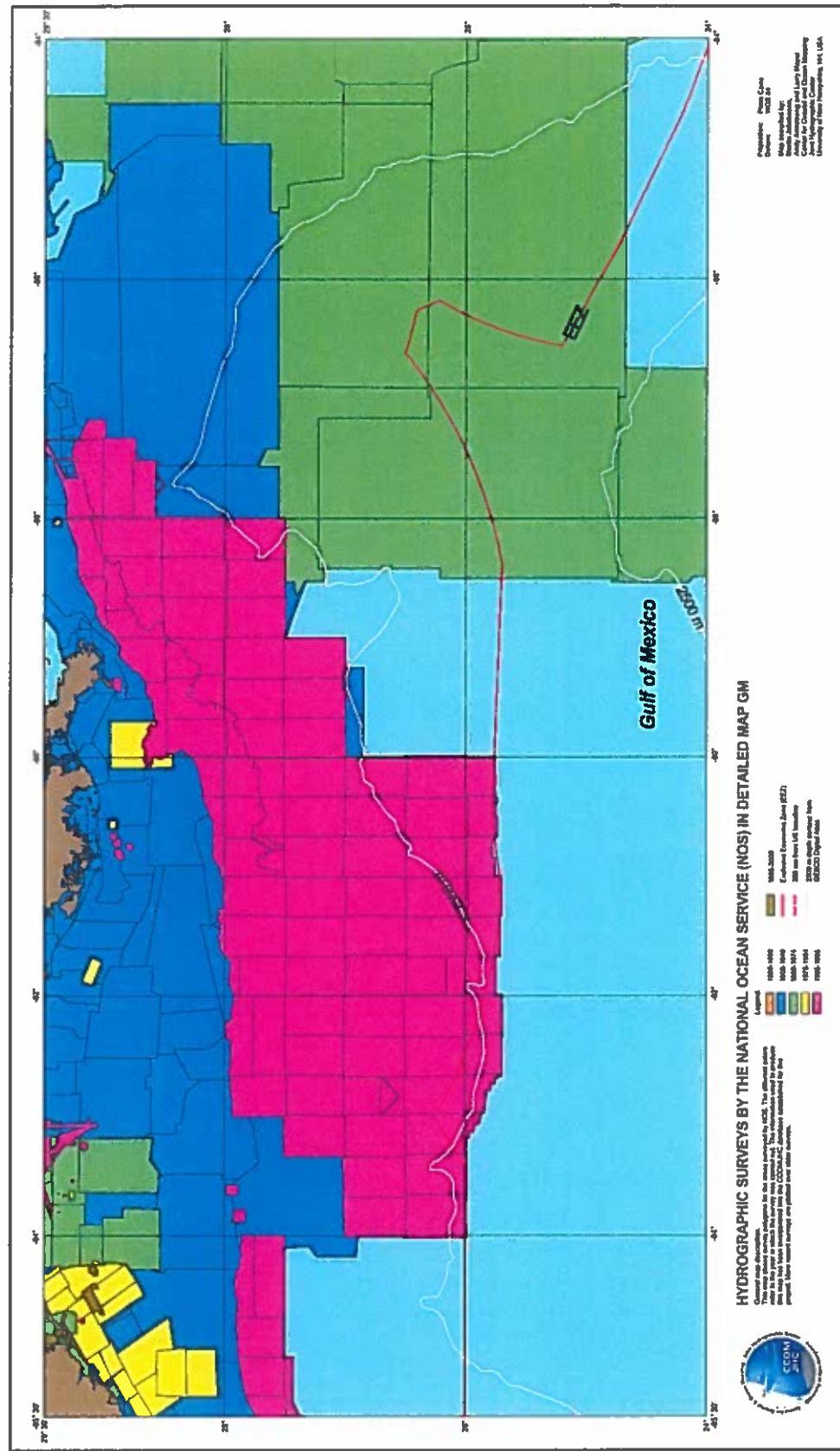
Map. Tracklines-ETOPO2-GM.



Map. Navigational-fix-accuracy-GM.

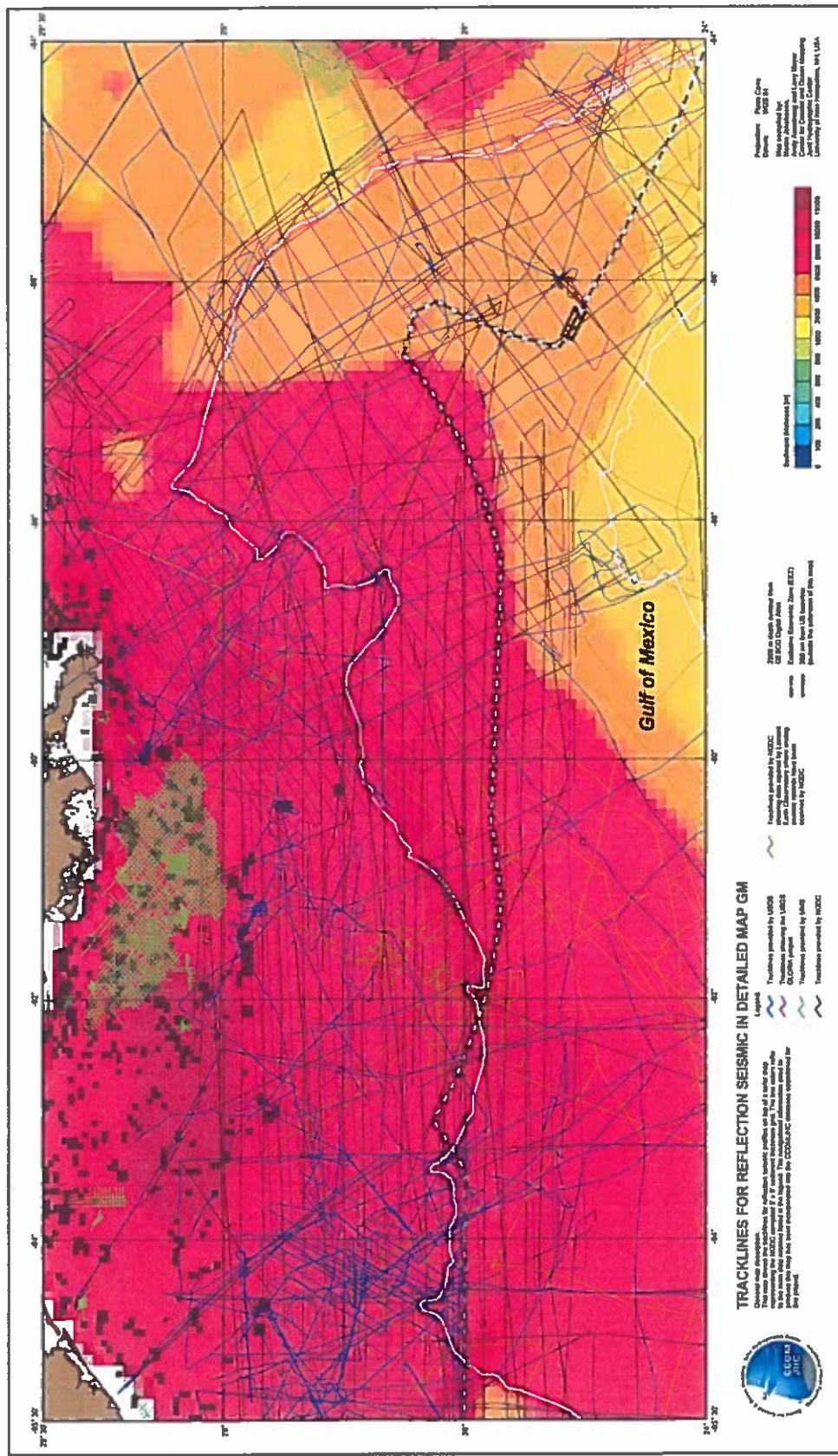


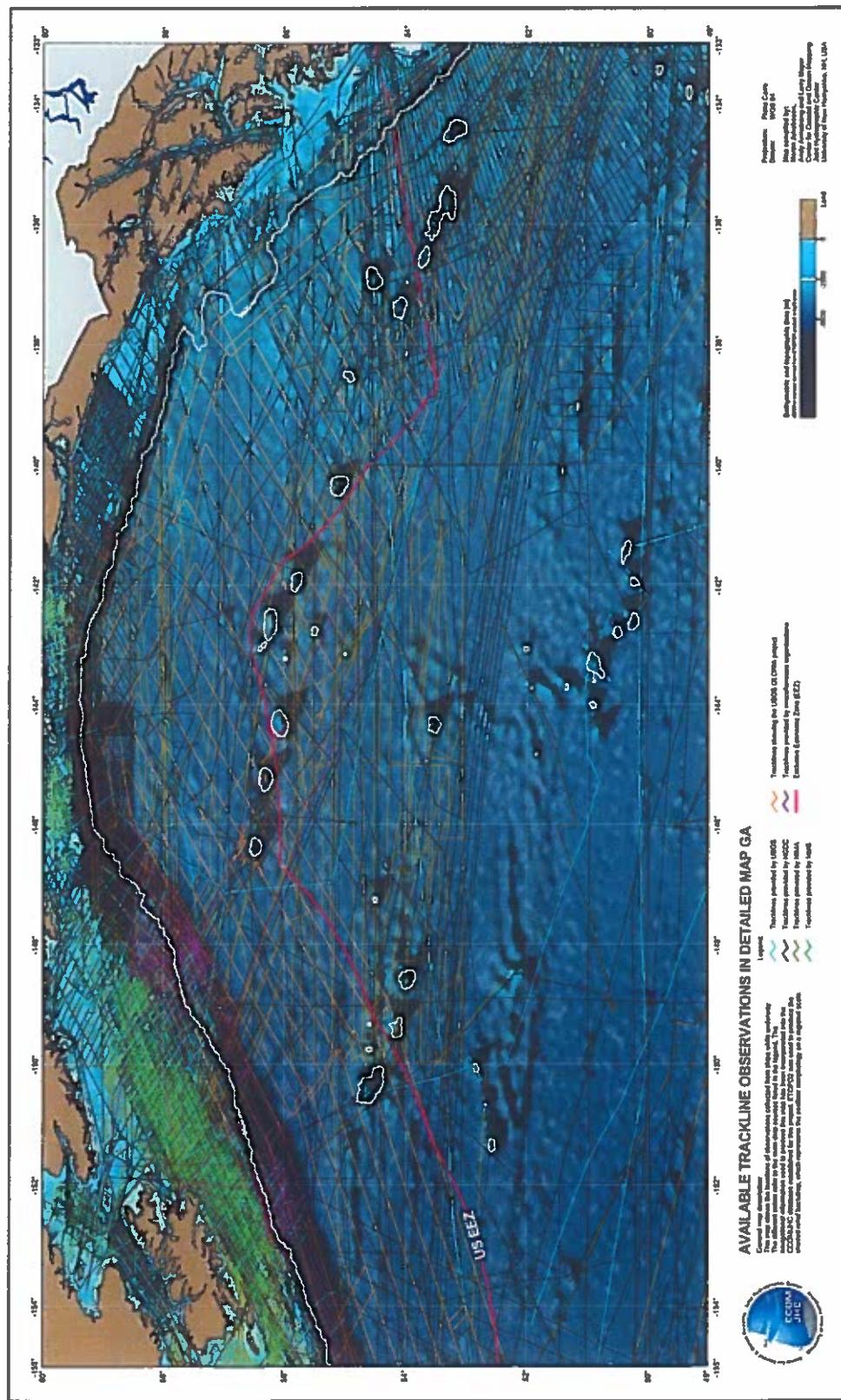
Map. Tracklines-GM.



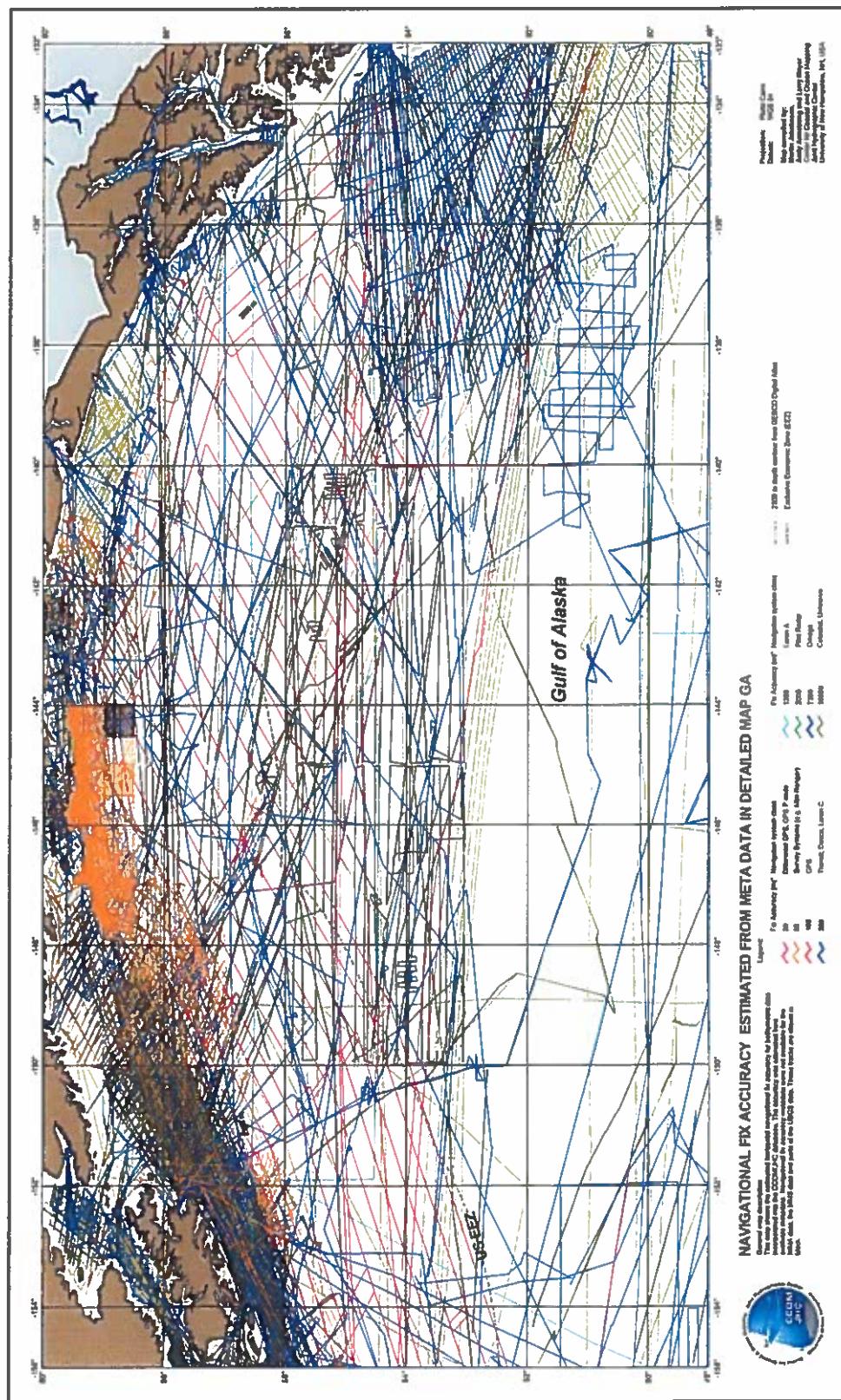
Map. NOS-surveys-GM.

Map. Seismic-tracklines-sediment-GM.



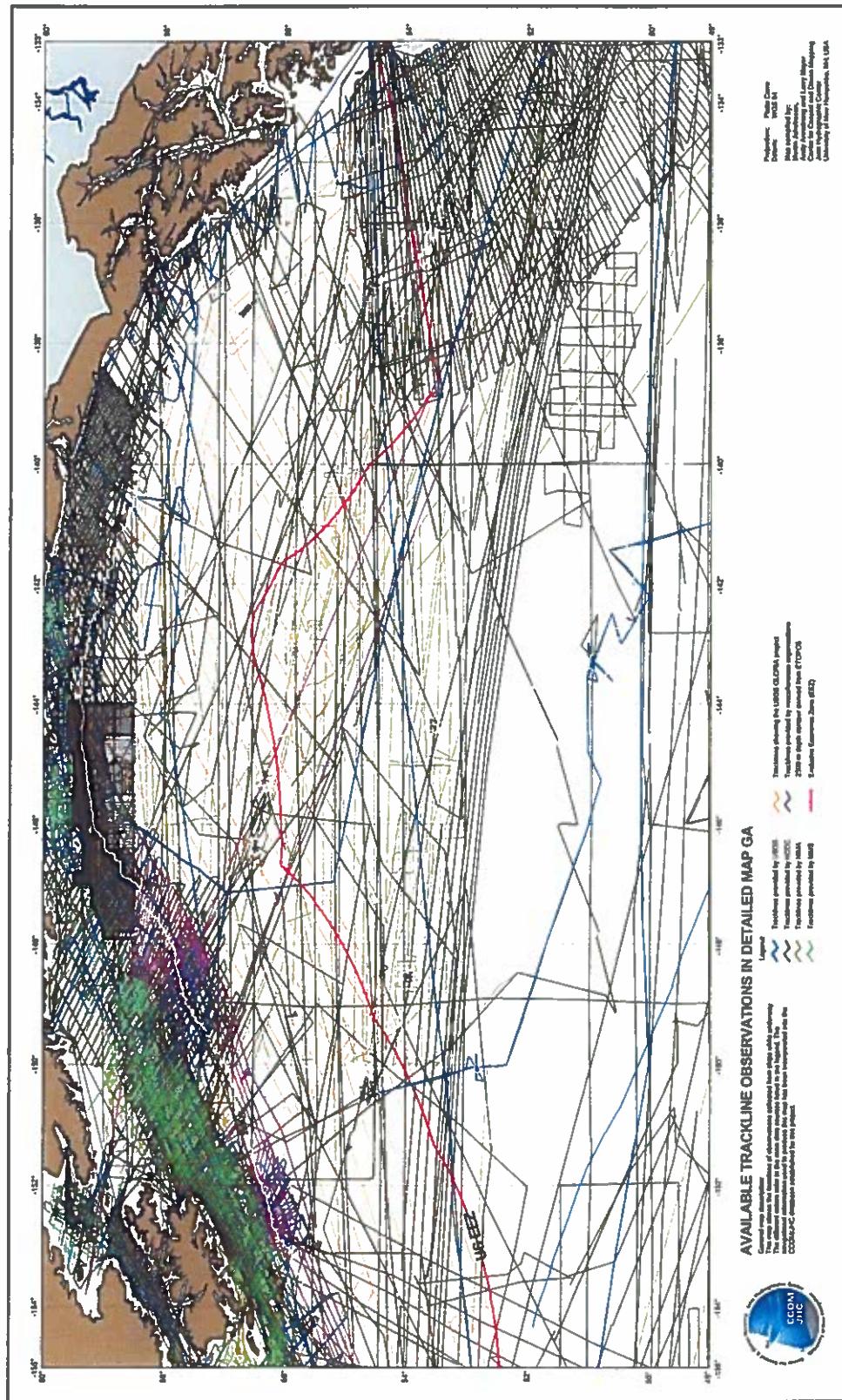


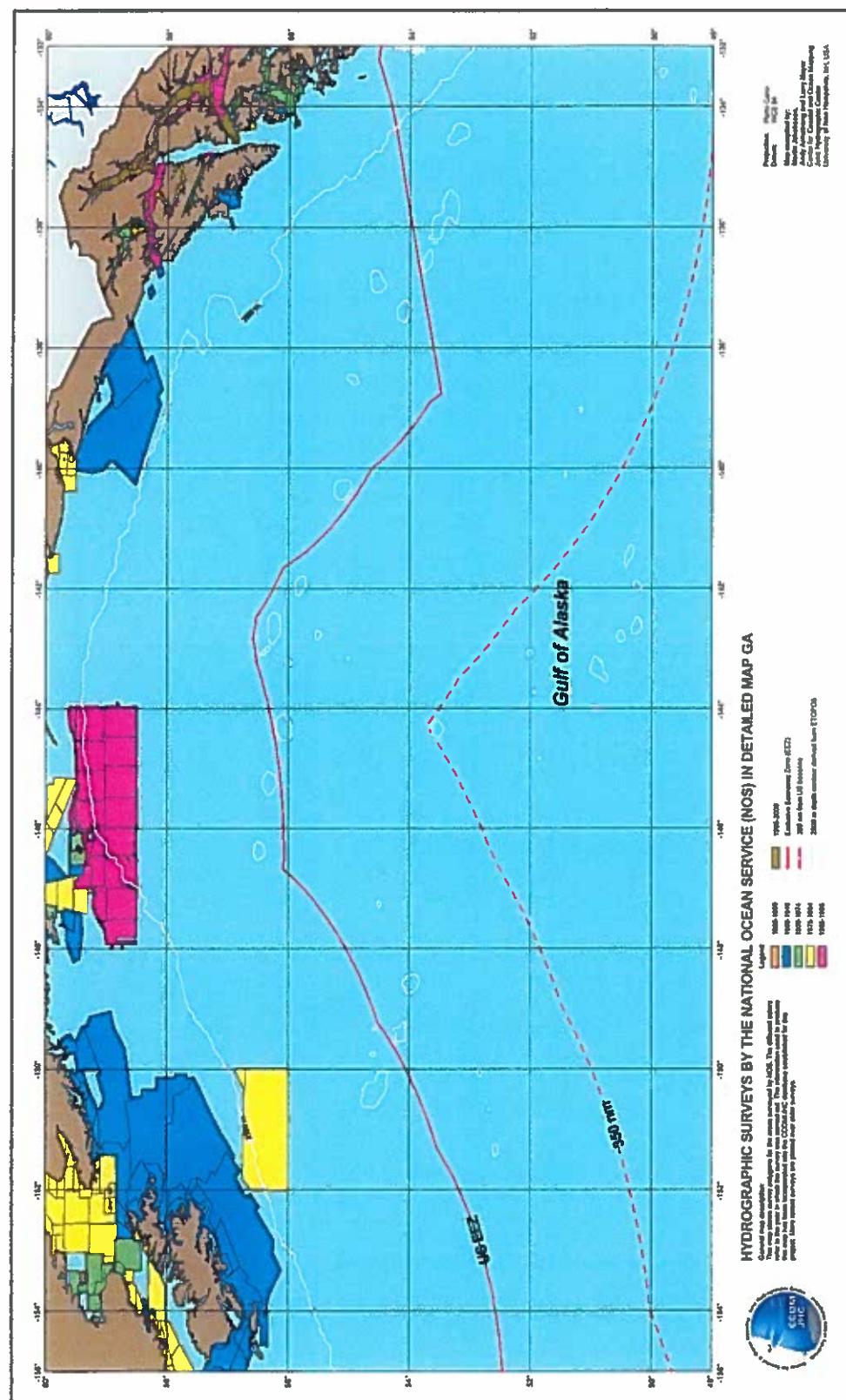
Map. Tracklines-ETOPO2-GA.



Map. Navigational-fix-accuracy-GA.

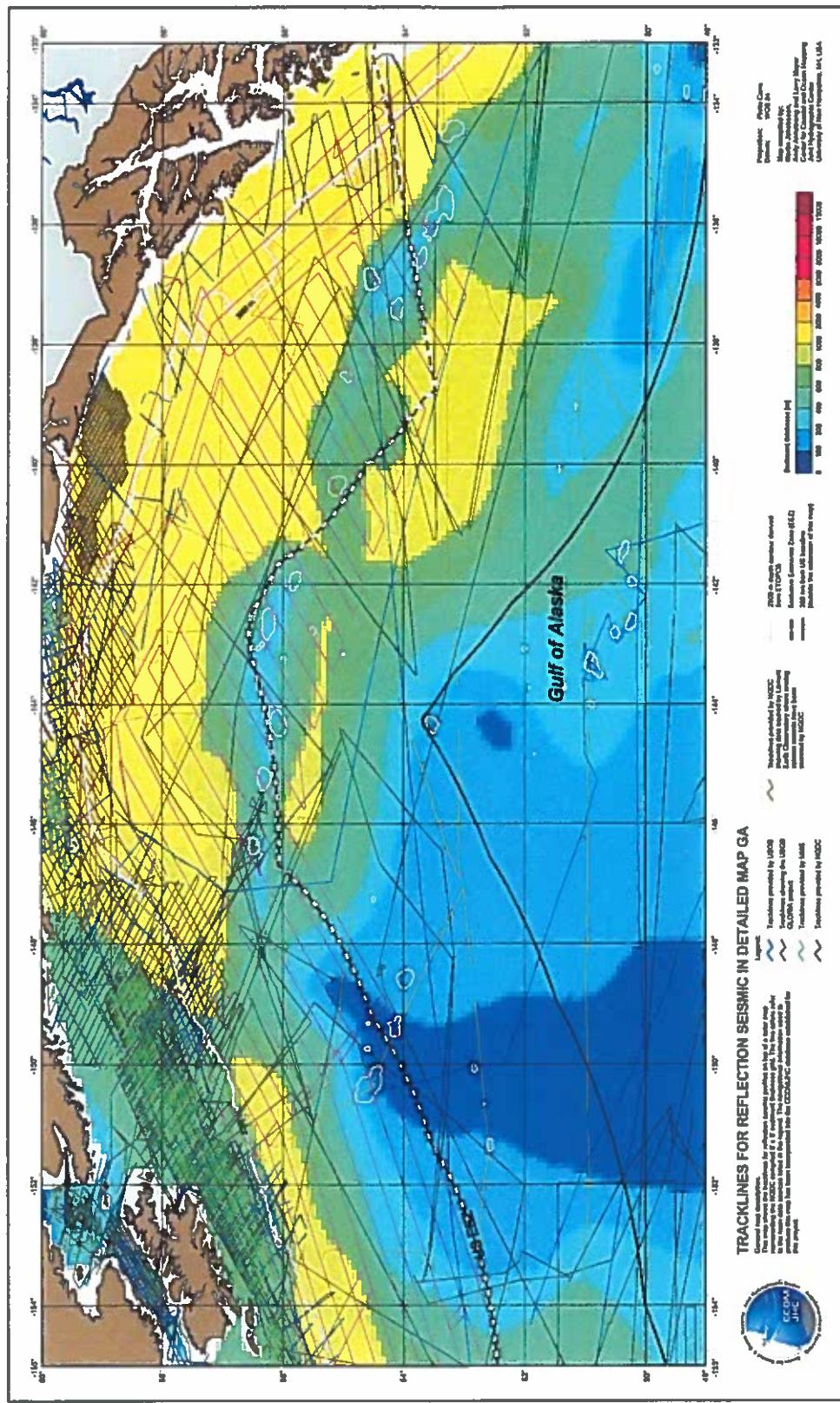
Map. Tracklines-GA.

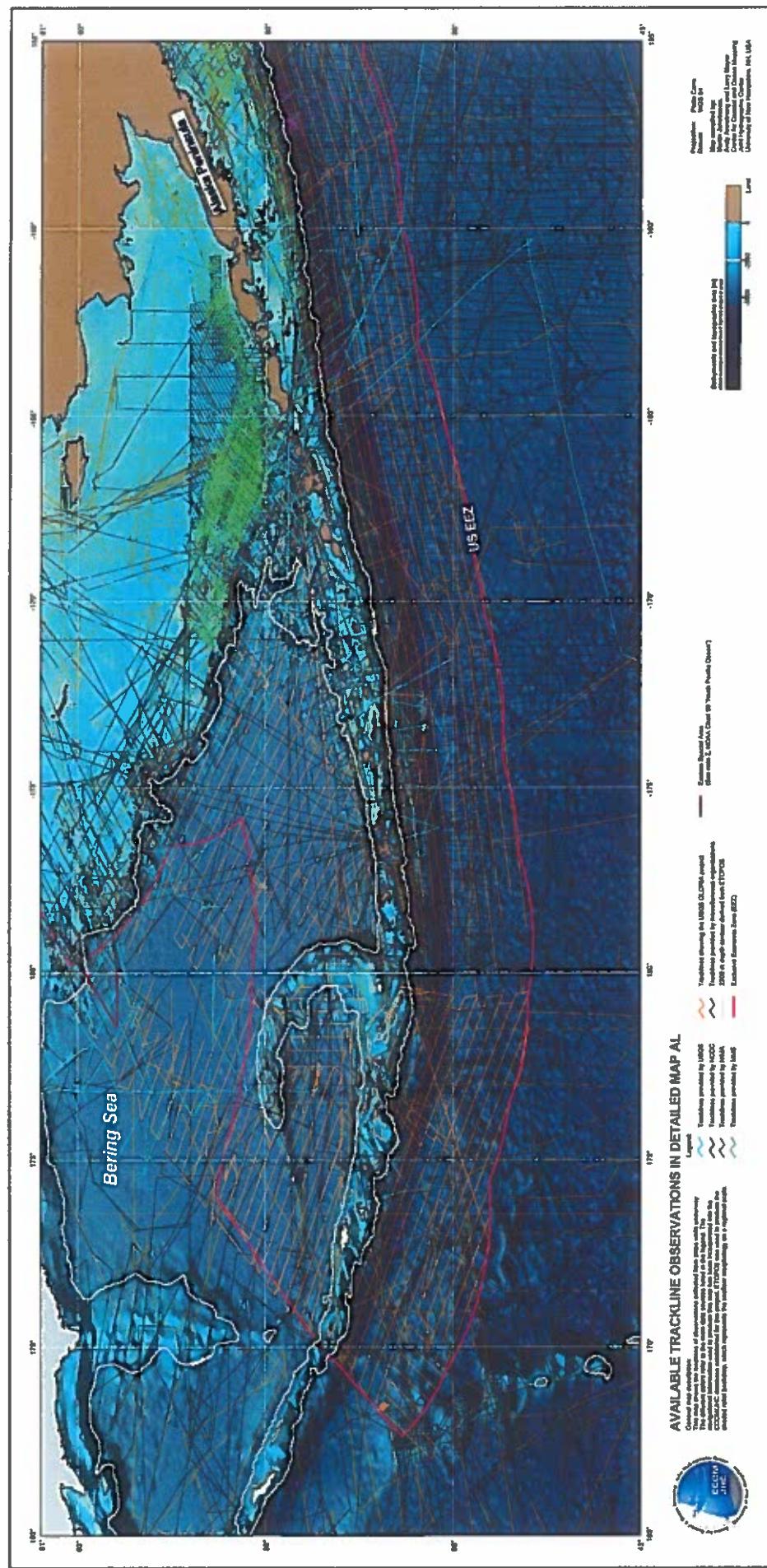




Map: NOS-surveys-GA.

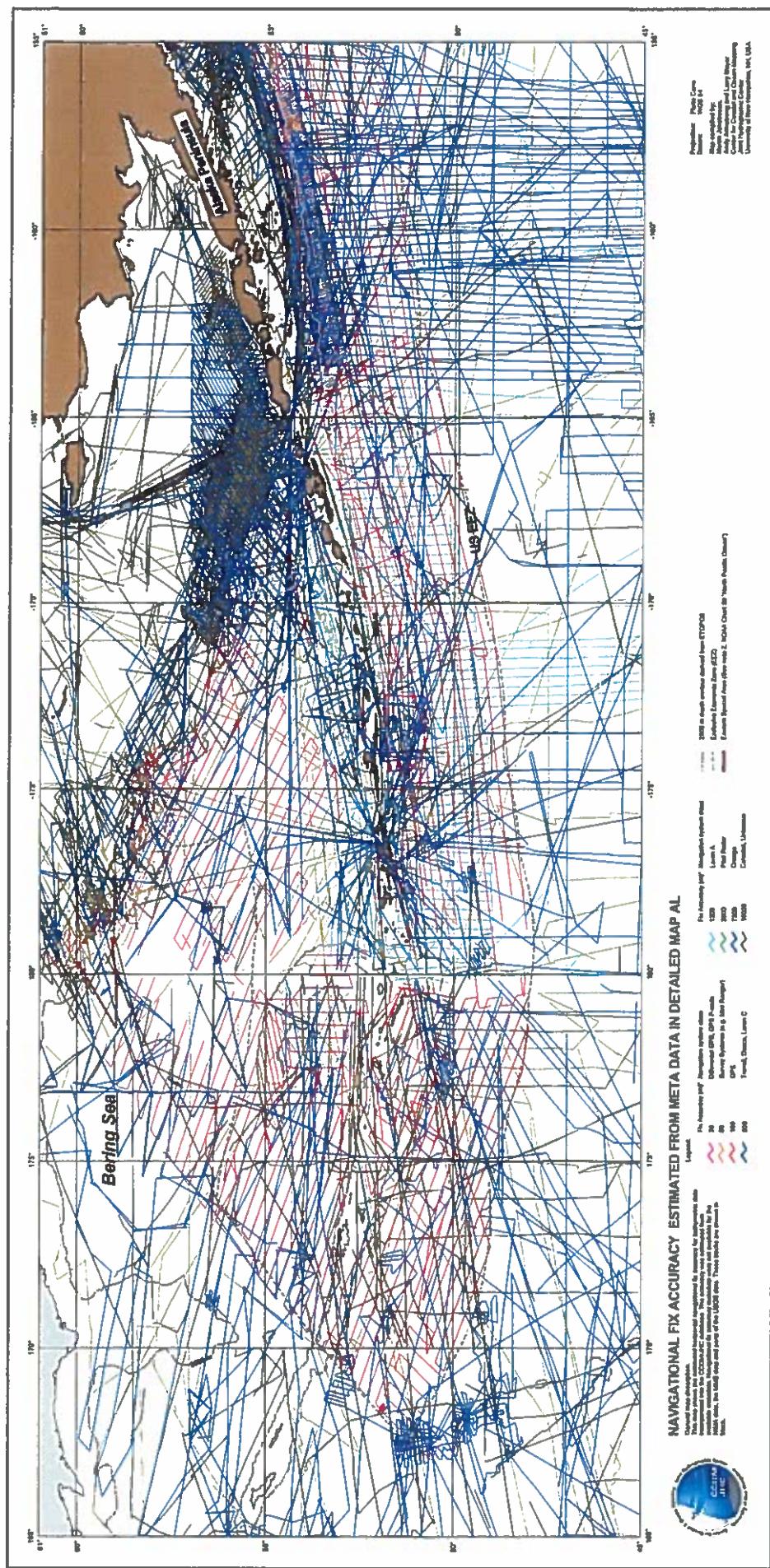
Map. Seismic-tracklines-sediment-GA.

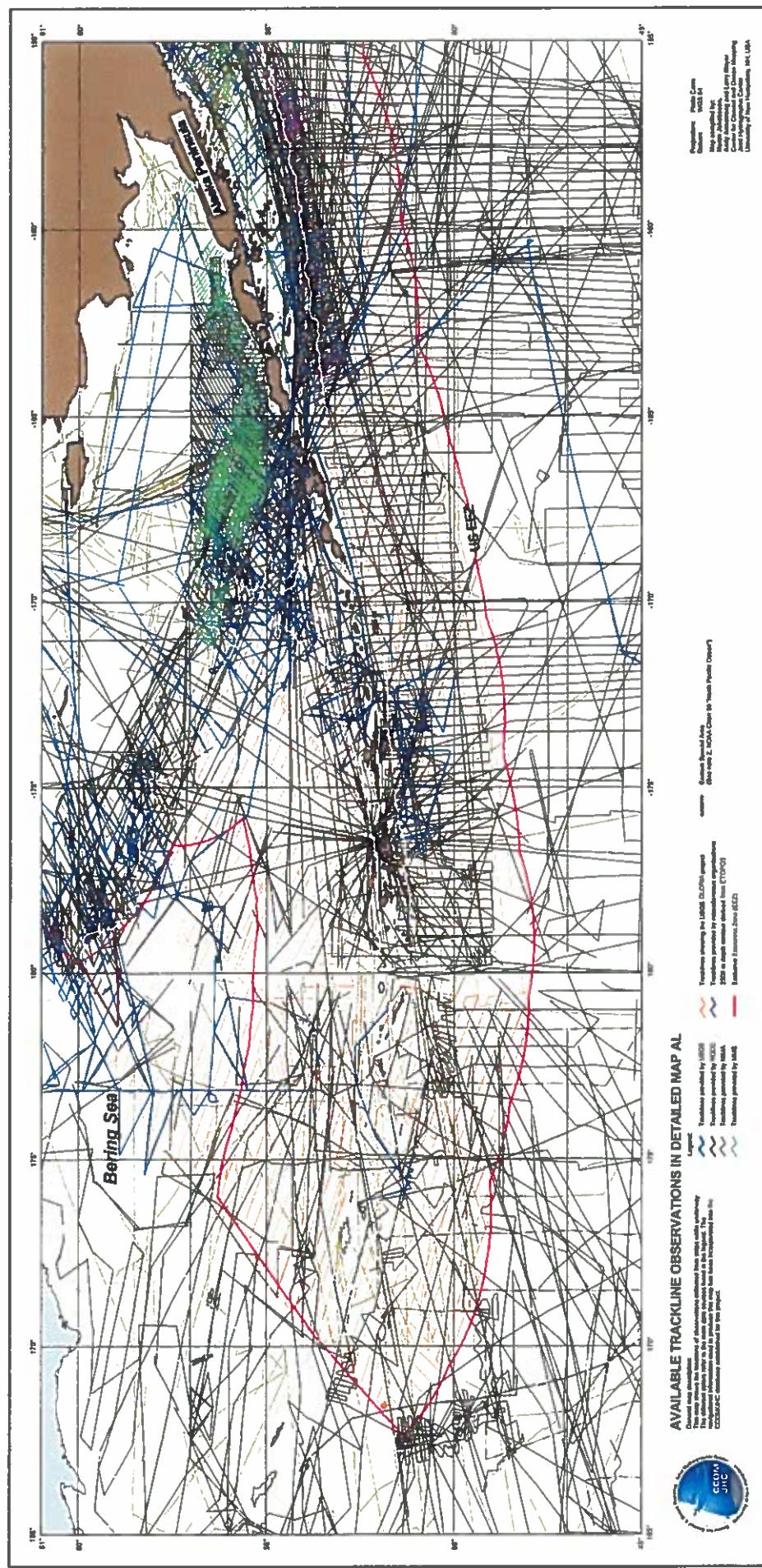




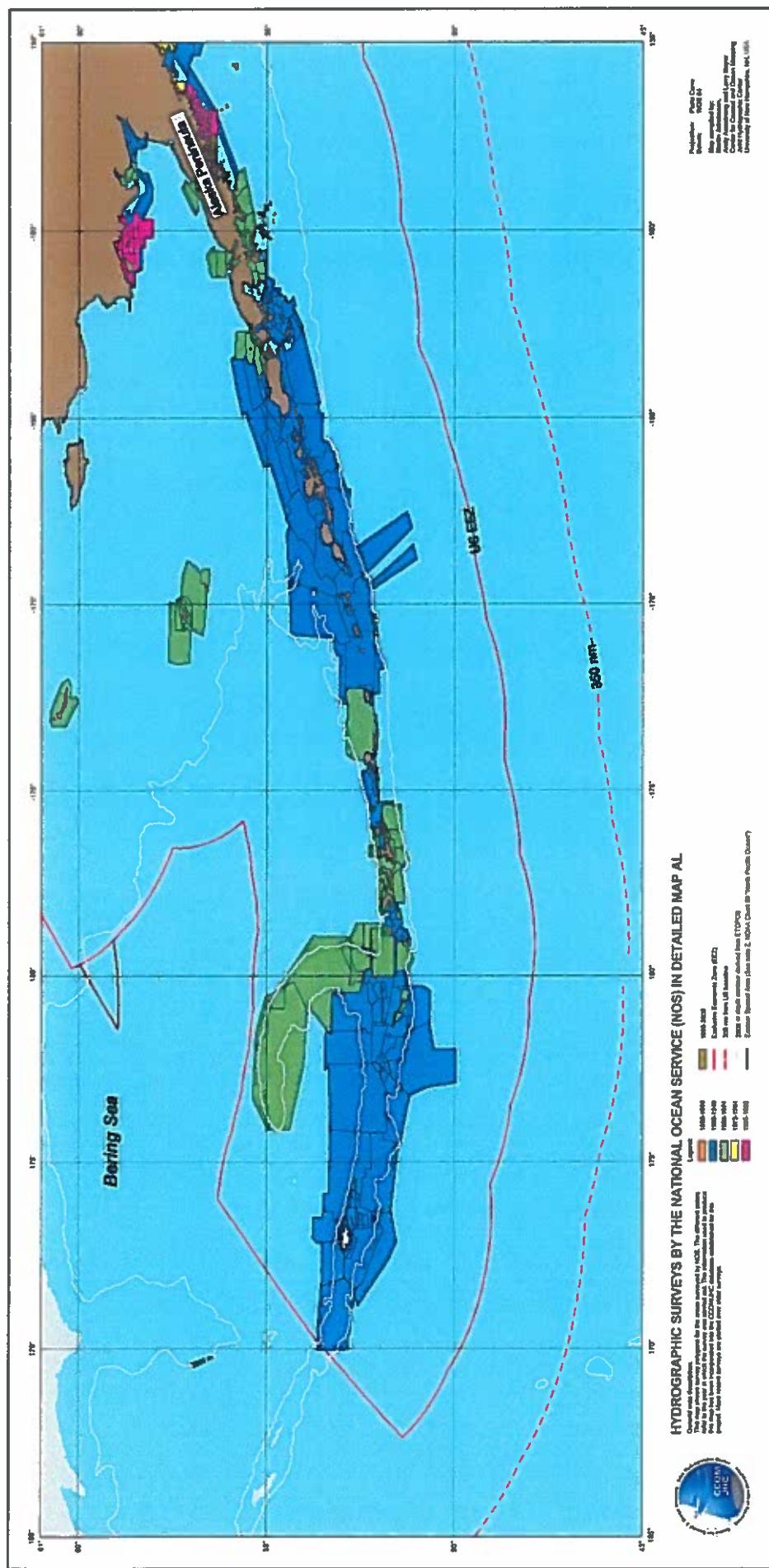
Map. Tracklines-ETOPO2-AL.

Map. Navigational fix-accuracy-AL.

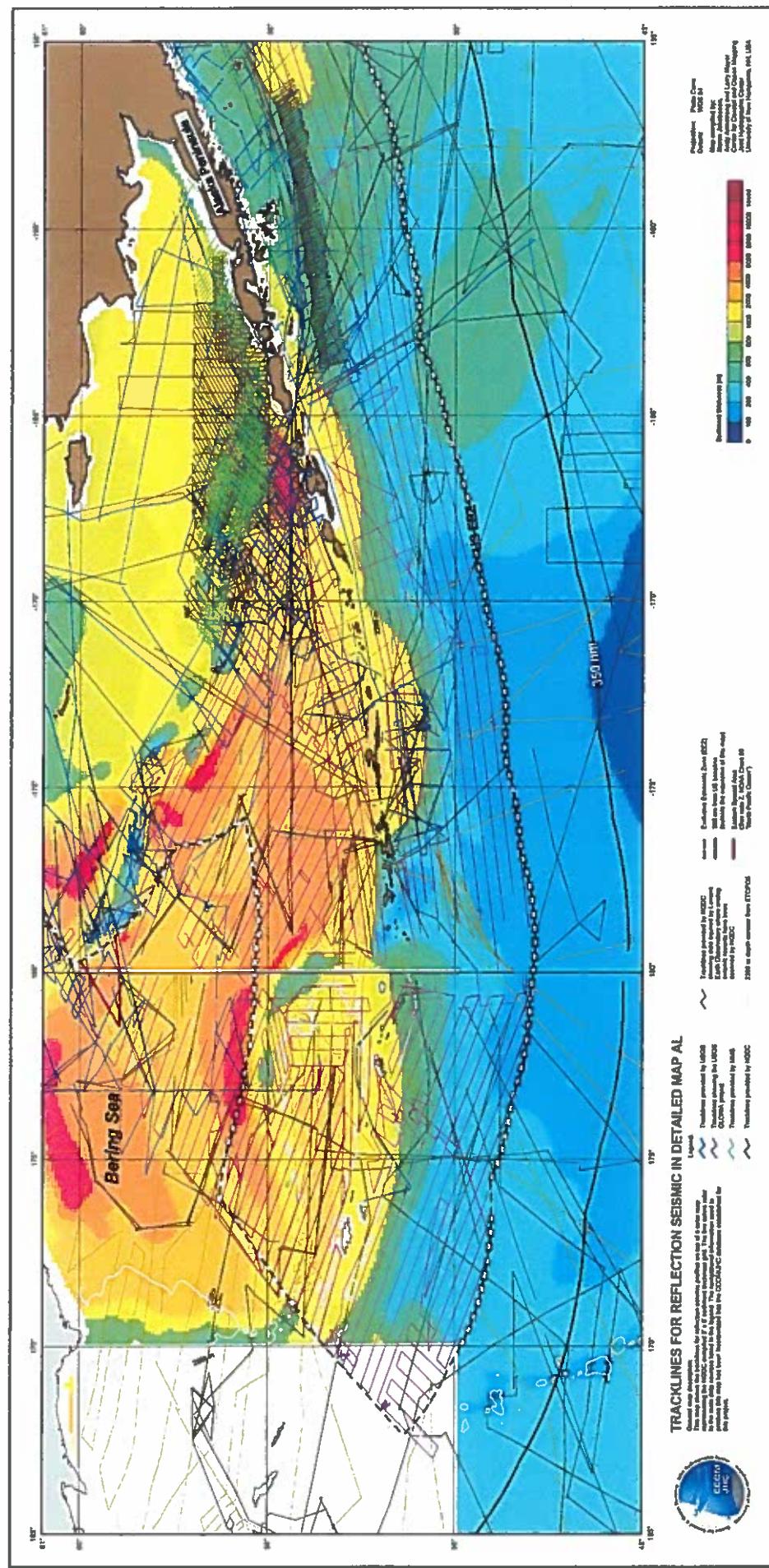




Map. Tracklines-AL.

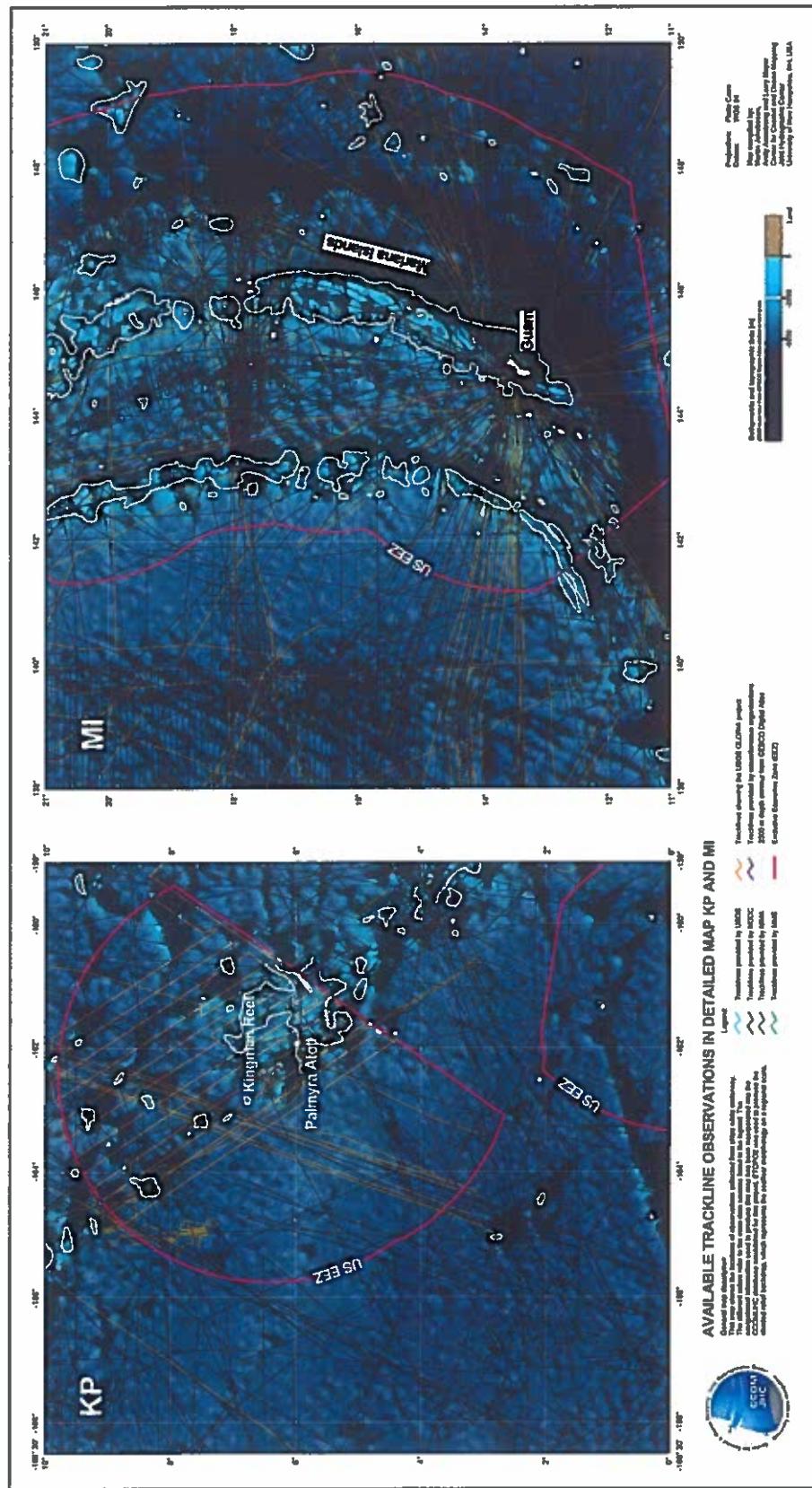


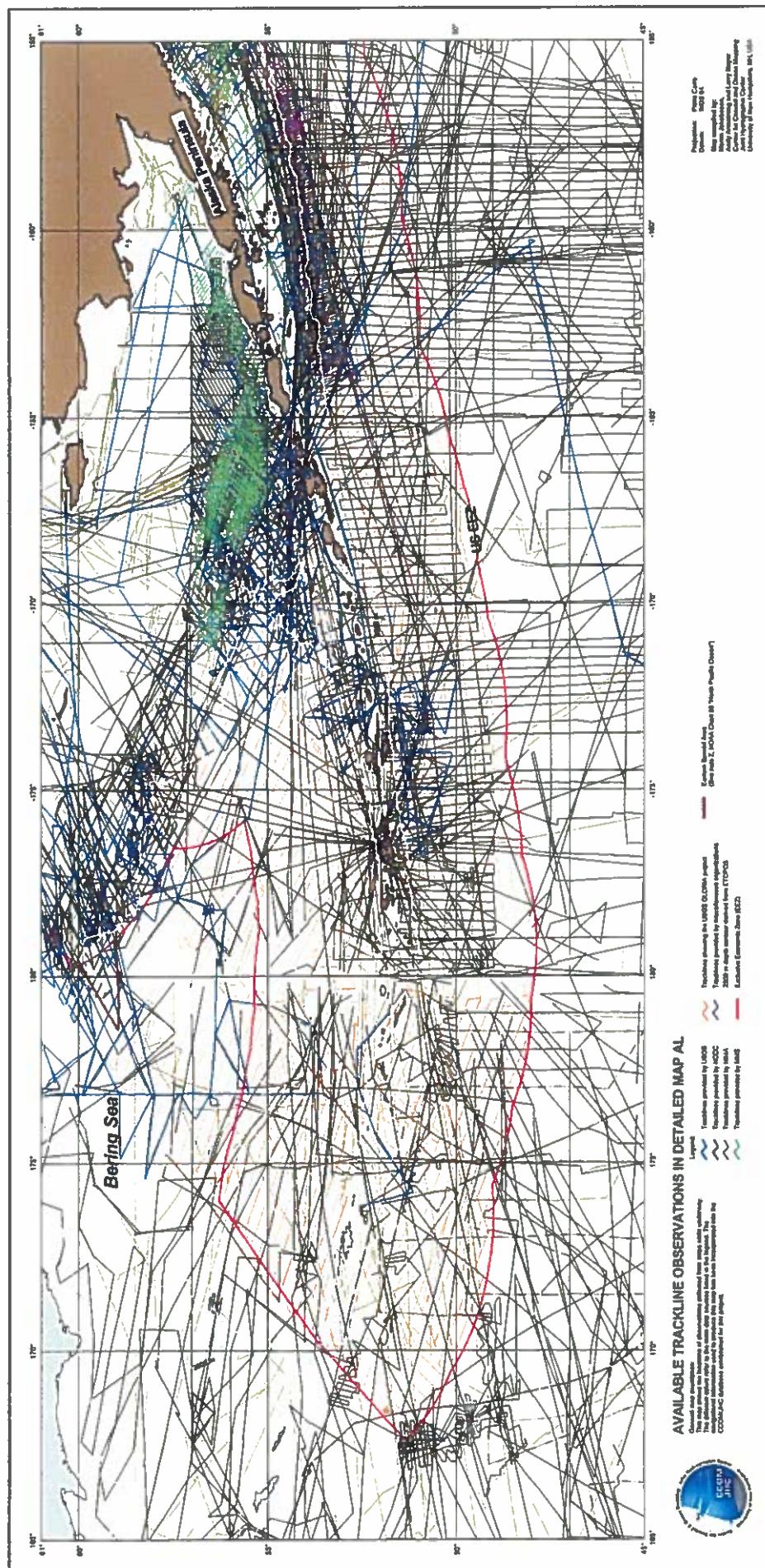
Map. NOS-surveys-AL.



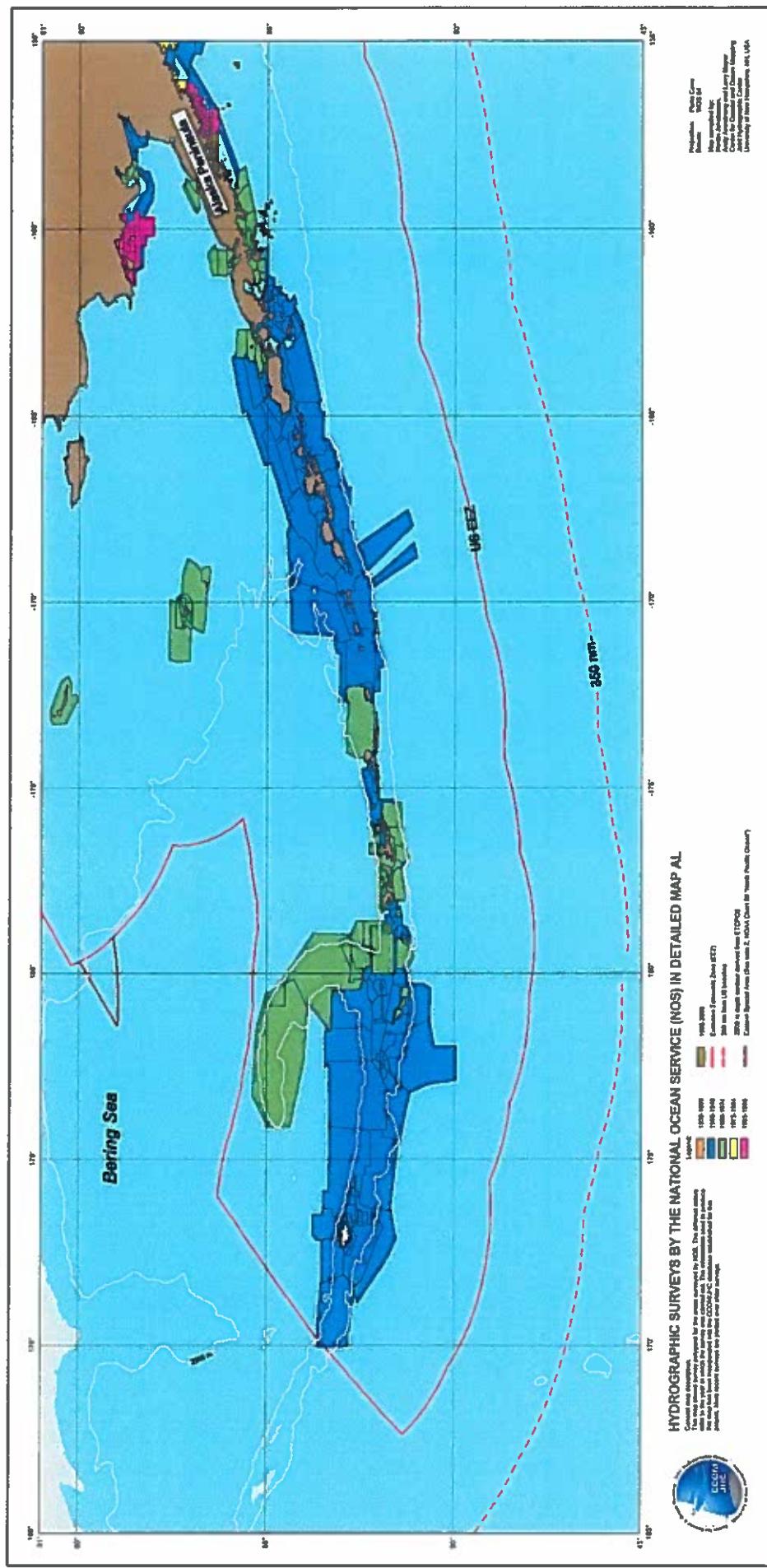
Map. Seismic-tracklines-sediment-AL.

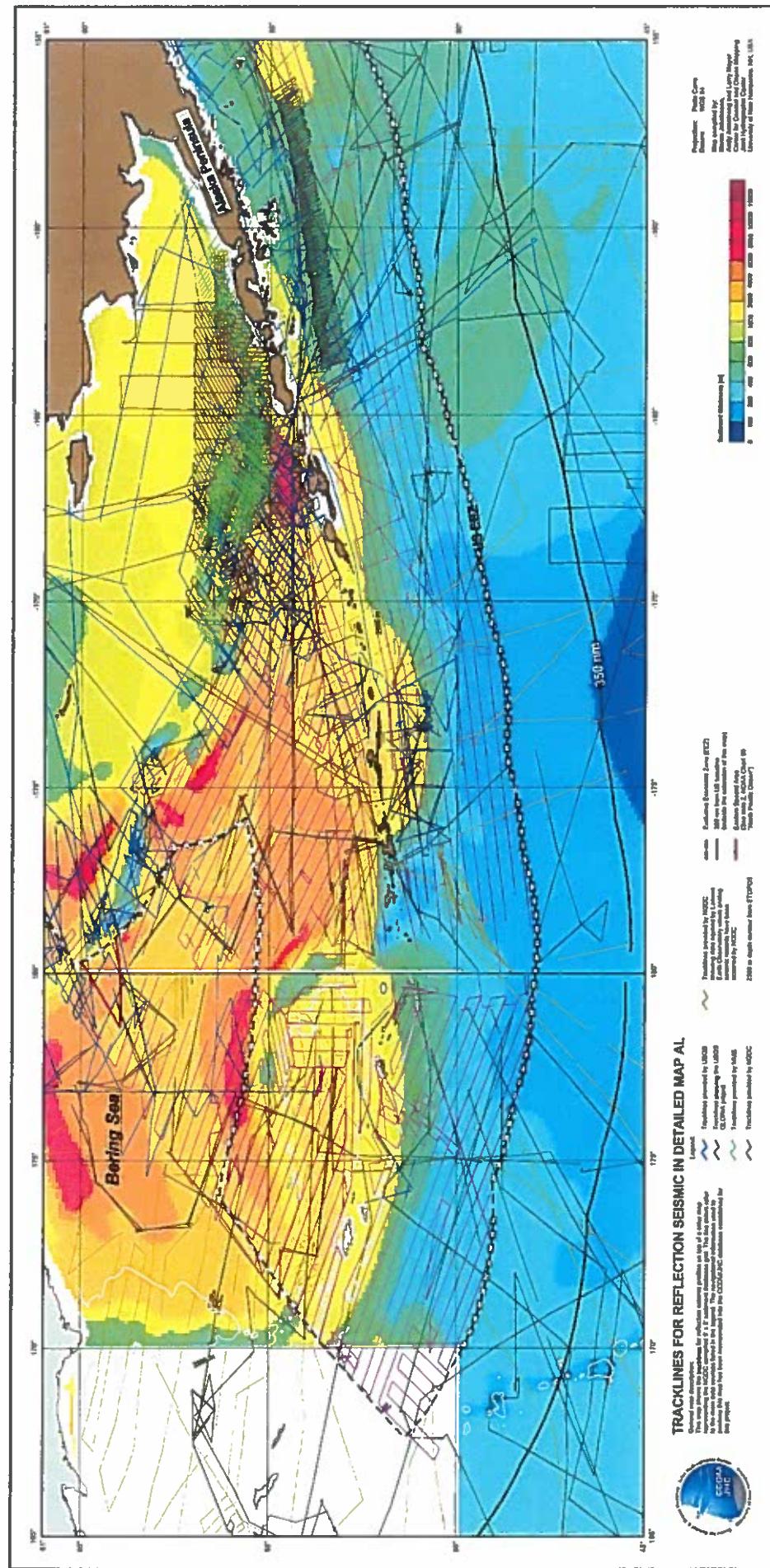
Map. Tracklines-ETOPO2-KP-MI.



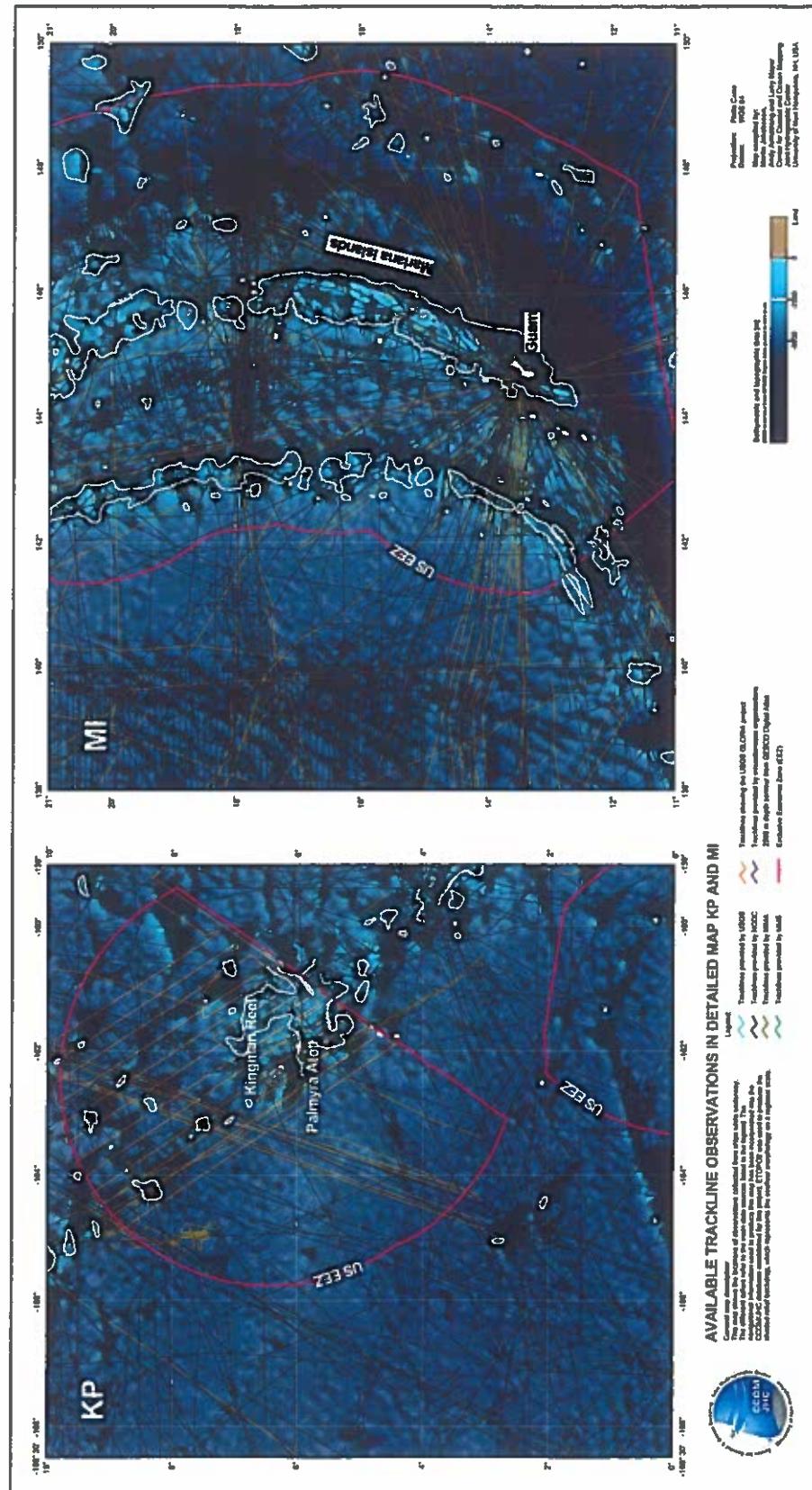


Map. Tracklines-AL.

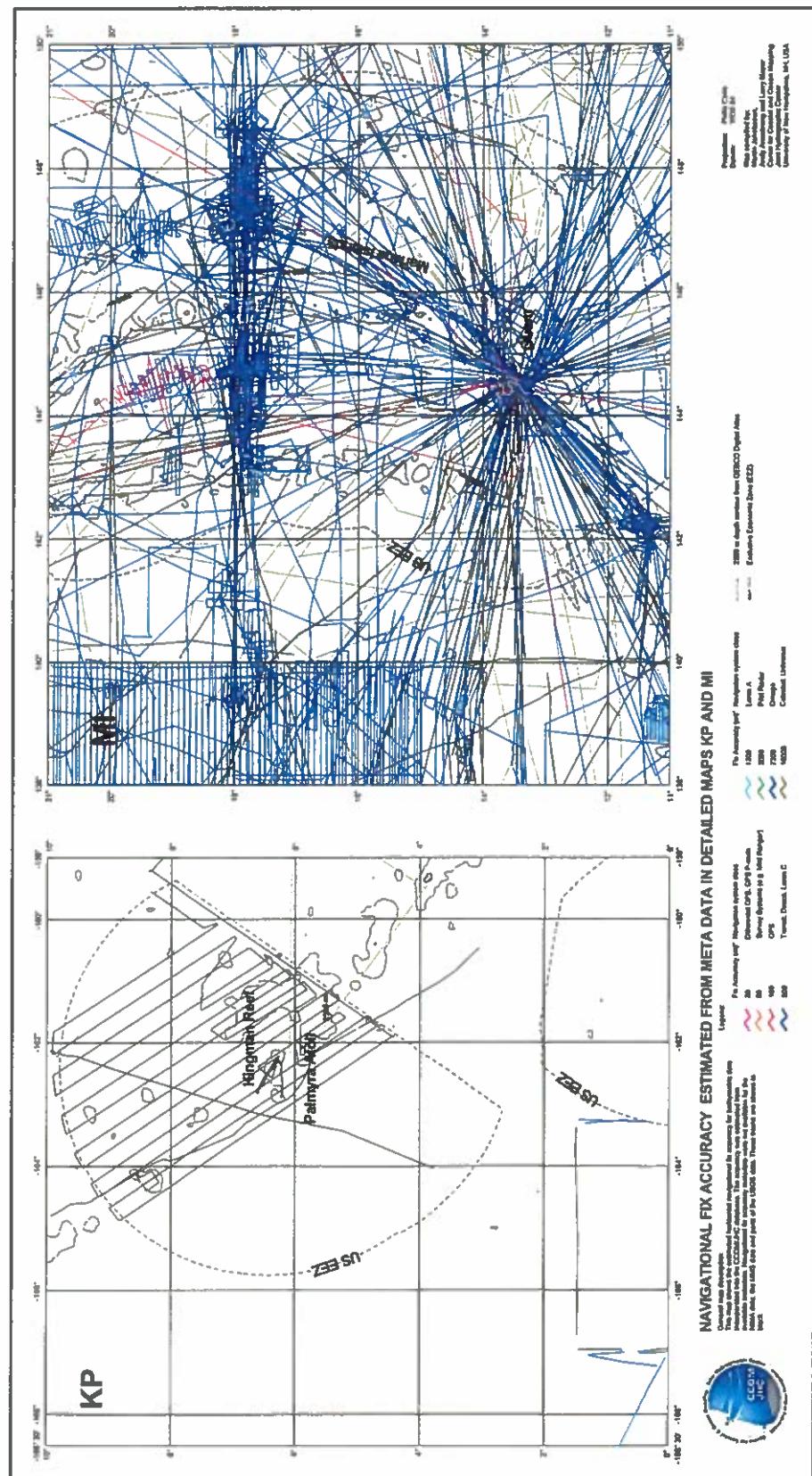




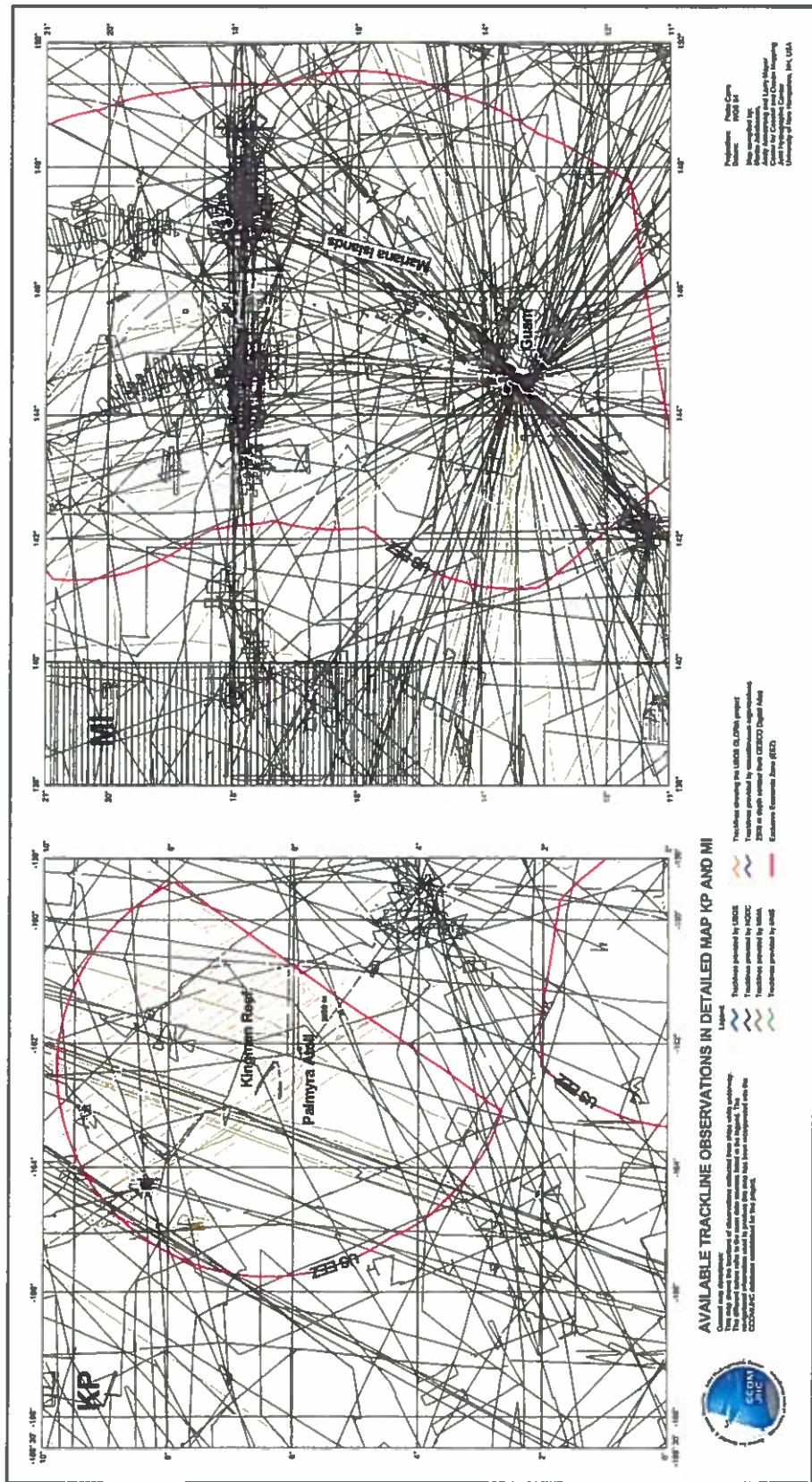
Map. Seismic-tracklines-sediment-AL.



Map. Tracklines-ETOP02-KP-MI

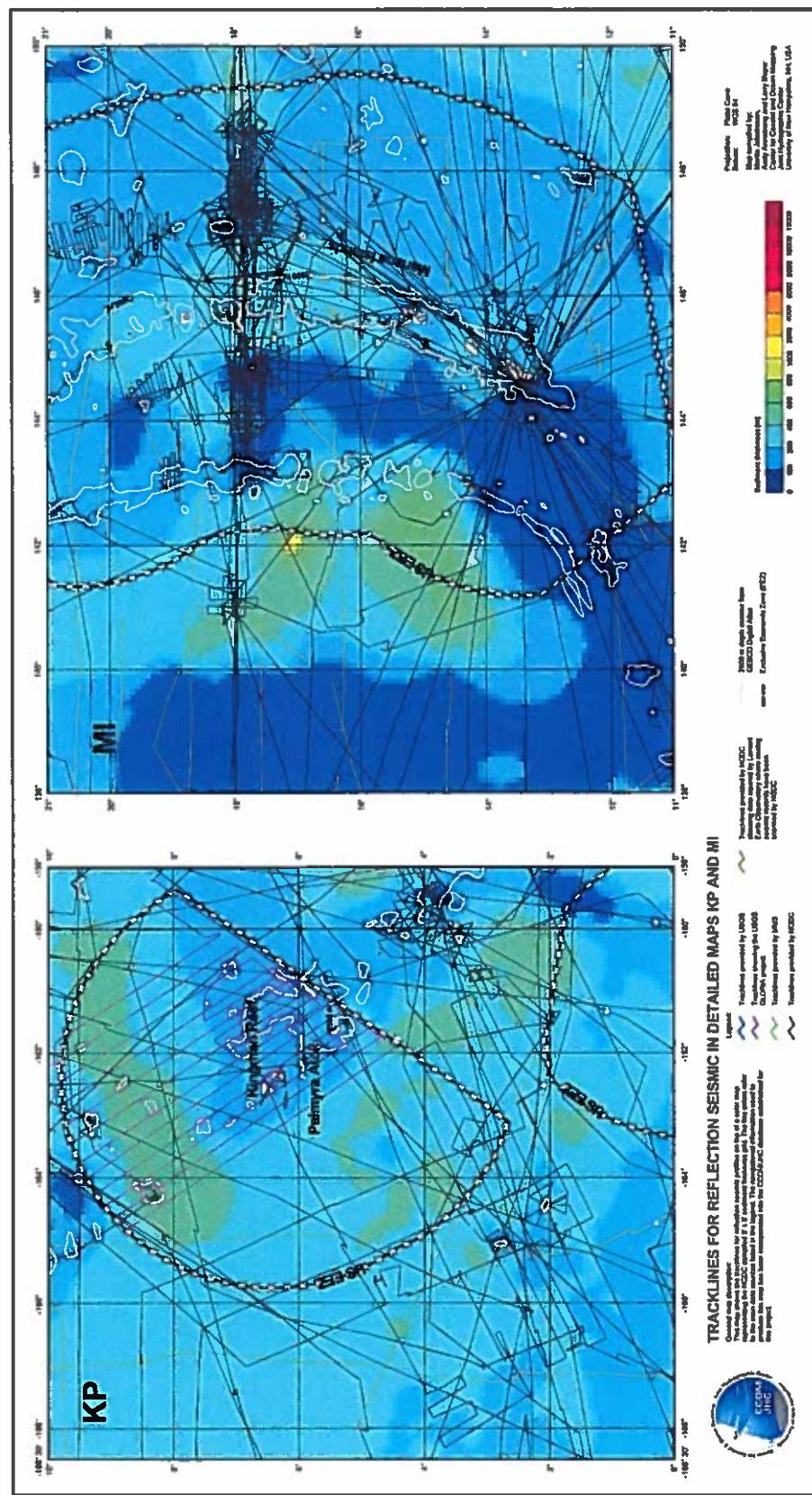


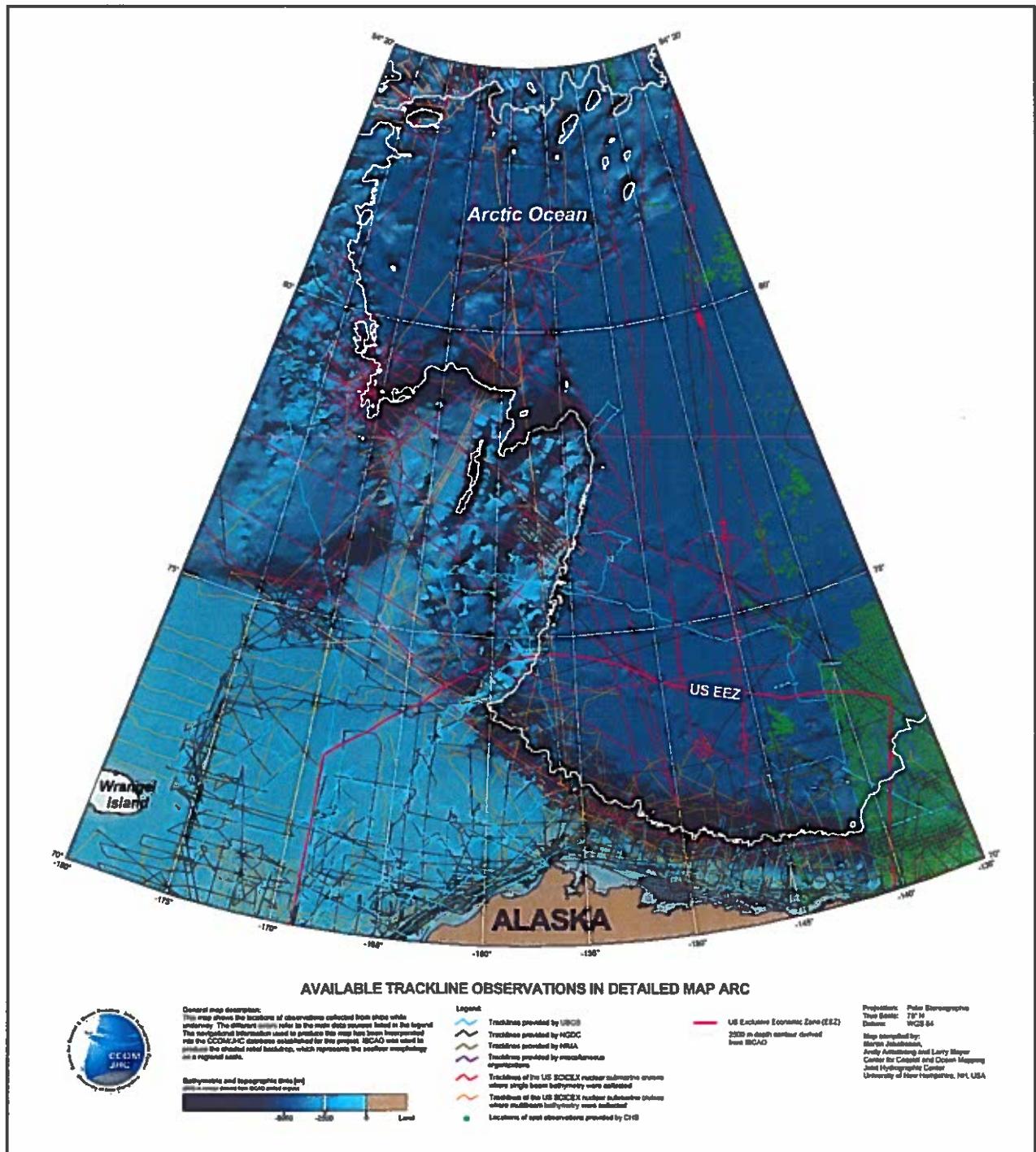
Map. *Navigation-fix-accuracy-KP-MI*



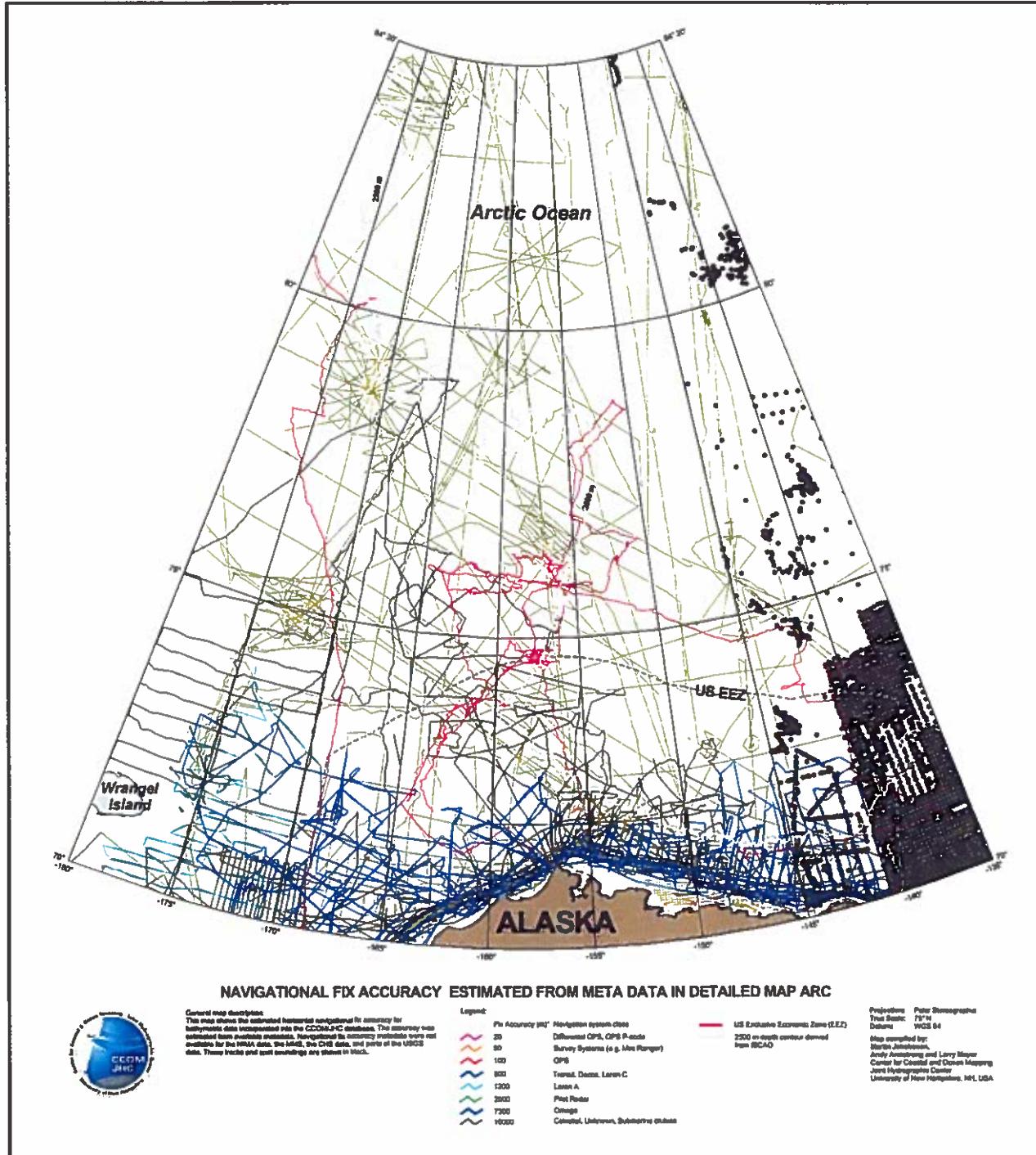
Map. Tracklines-KP-MI.

Map. Seismic-tracklines-sediment-KP-MI.

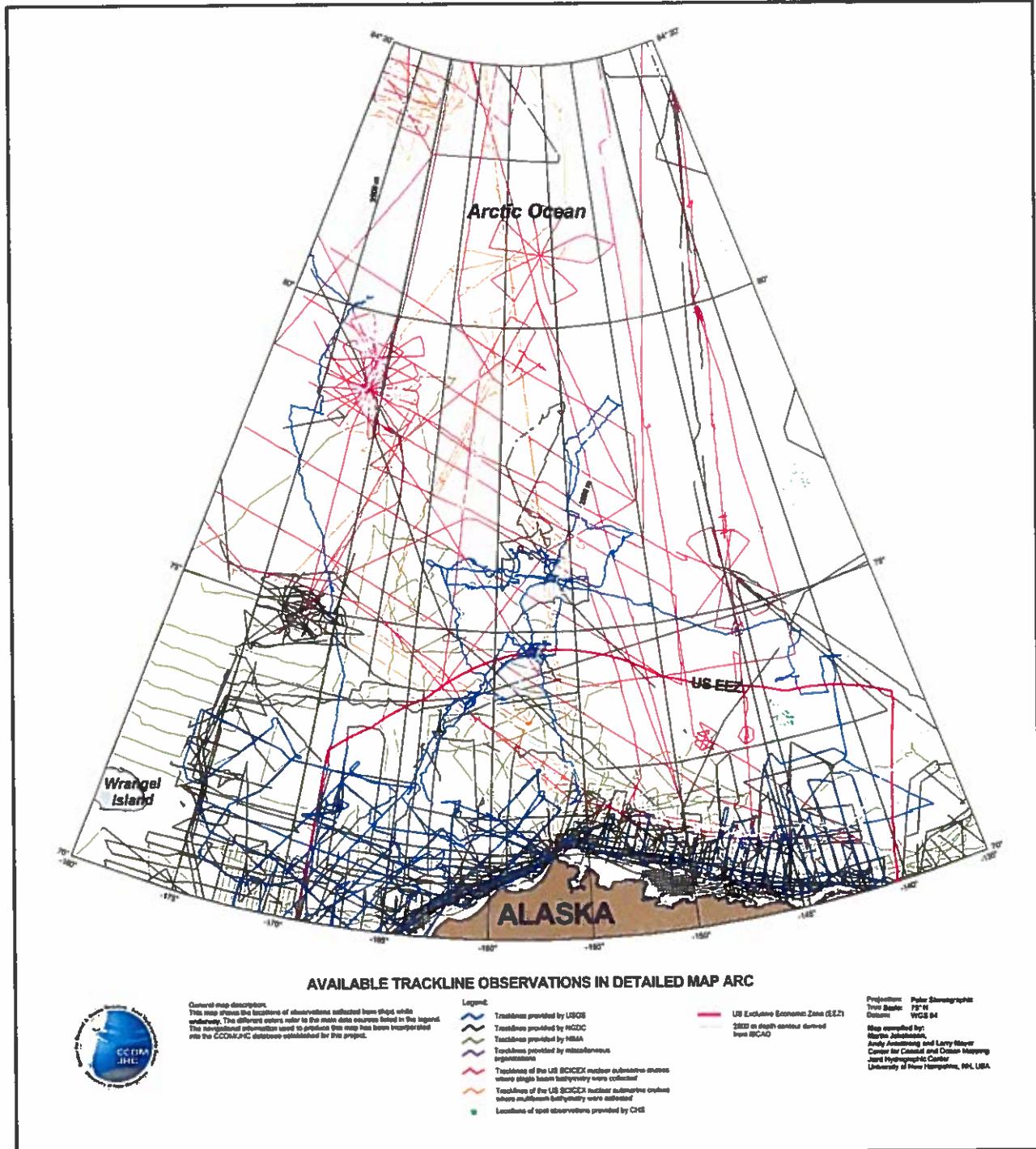




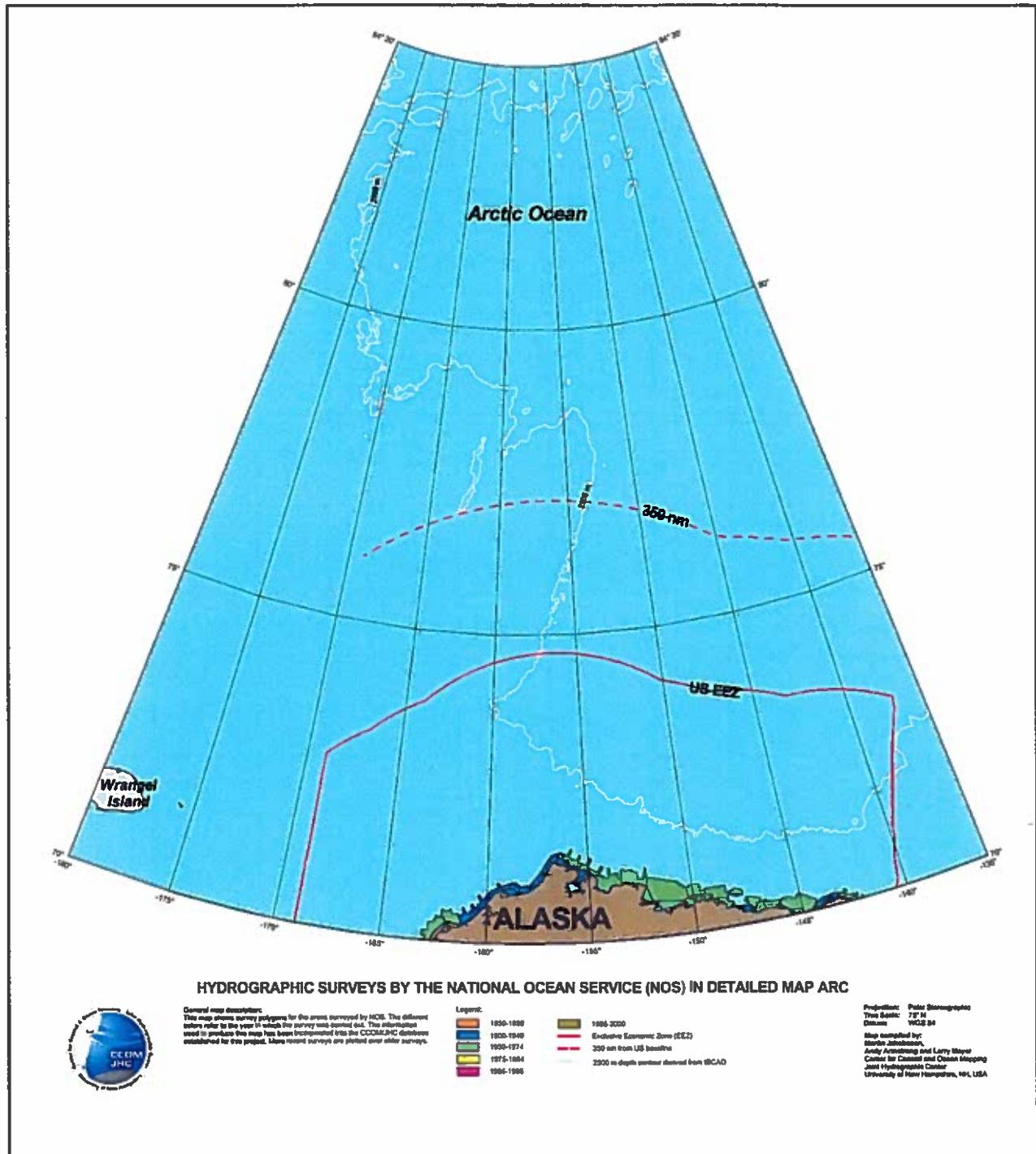
Map. Tracklines-IBCAO-ARC.



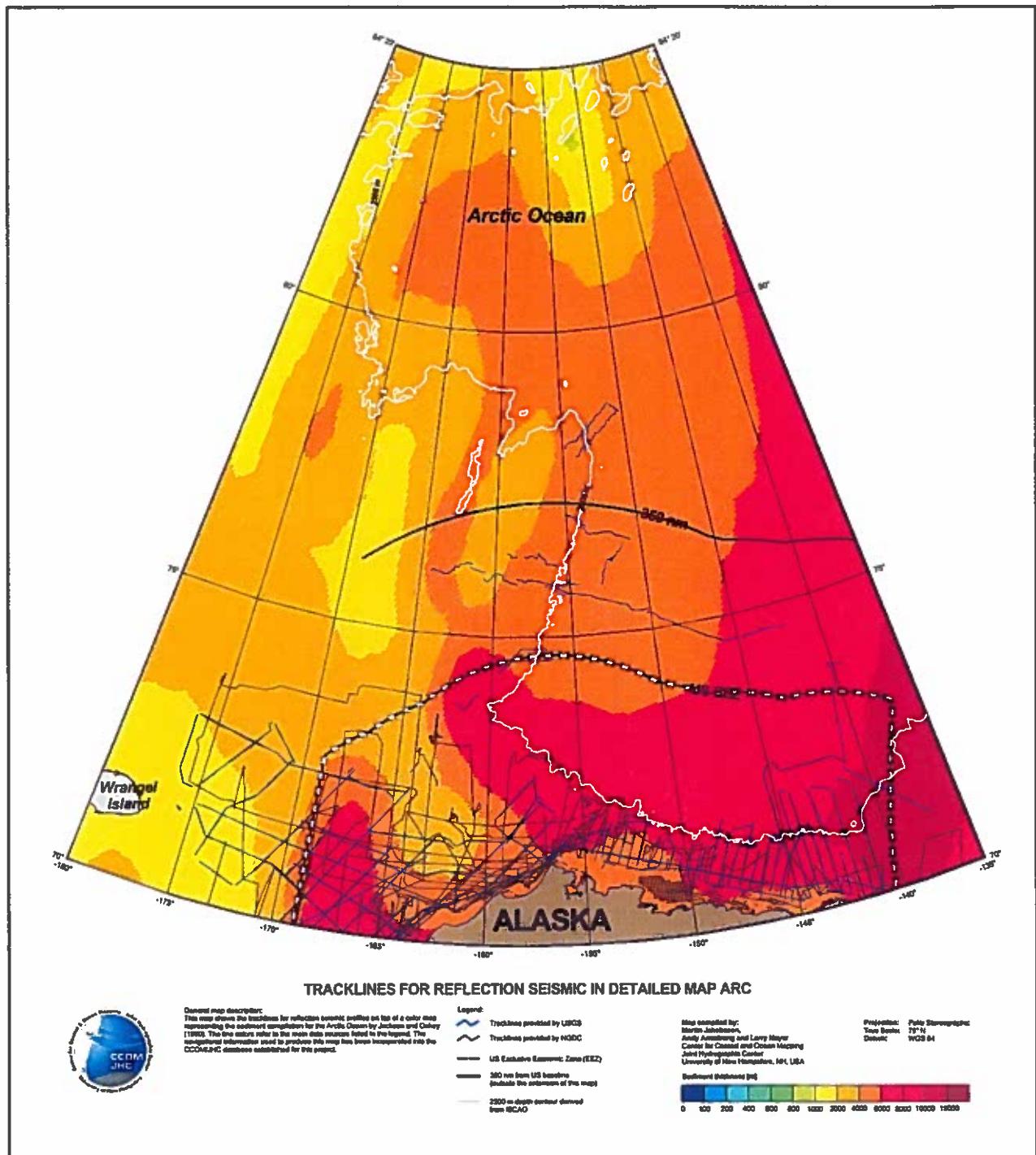
Map. Navigational-fix-accuracy-ARC.



Map. Tracklines-ARC.



Map. NOS-surveys-ARC.



Map. Seismic-tracklines-sediment-ARC.