紋別市 市制施行７０周記念

第３８回北方圏国際シンポジウム
オホーツク海と流氷

The 38th International Symposium on the Okhotsk Sea & Polar Oceans

Photo by Kento Imaizumi

と　き　２０２４年2月１８日（日）～２１日（水）

ところ　紋別市文化会館　紋別市立博物館　紋別市民会館

18-21 February 2024

Mombetsu Arts & Culture Center, Mombetsu Municipal Museum
Mombetsu Machinaka Art Museum, Mombetsu Citizens' Public Hall
Okhotsk Sea Ice Museum of Hokkaido
Arctic Research Center, Hokkaido University

北方圏国際シンポジウム

開催趣旨

世界の海の 10%を覆う流氷は、地球の熱的バランスの大きな要素として大気・海洋大循環の駆動力を生み出しています。オホーツク海は、世界で最も低緯度の凍る海であり、流氷の南限です。毎冬、オホーツク海の 60～70%は流氷野となり、私たちの生活にも功罪両面の働きをしています。さらに最近の地球温暖化の影響により北極海の海氷面積は急激に減少し、環境問題としては由々しき事態です。一方で太平洋と欧州を結ぶ「北極海航路」が重要になりましたが、その国際情勢は微妙な状況にあります。

このように流氷は地球環境のみならず、水産業、農業、工業などの生産活動にも深く関わっています。シンポジウムでは、最新の海氷研究から地球温暖化、環境問題、海洋生物、北極海航路、極地、オホーツク地域の諸問題まで様々な話題を取り上げています。

北方圏国際シンポジウム「オホーツク海と流氷」は、1986 年に第 1 回が開催されて以来、毎年紋別市で開かれていましたが、2021 年は新型コロナウィルス感染症拡大防止のため学術分科会は中止となりました。2022 年は学術分科会をオンラインで開催し、2023 年はオンラインと対面式のハイブリッドで開催しました。今年、2024 年は第 38 回北方圏国際シンポジウムとして学術分科会を 4 年ぶりに対面式を基本として開催することになりました。さらに「市民公開講座」、「子どもシンポジウム」、記念レセプションも再開しますので、市民の皆様のご来場をお待ちしております。是非、多くの皆様がシンポジウムに参加して、実り多い交流を深めることを期待します。

- **主　　催**　紋別市
- **共　　催**　北海道大学北極域研究センター
- **主　　管**　北方圏国際シンポジウム実行委員会
- **後　　援**　国立極地研究所，(国研)海洋研究開発機構，北海道大学低温科学研究所，北見工業大学
  東海大学札幌キャンパス，東京農業大学オホーツクキャンパス，東京海洋大学
  北海道大学大学院水産科学研究院，北海道大学北方生物圏フィールド科学センター
  東京大学大気海洋研究所，(国研)水産研究・教育機構水産資源研究所
  (国研)宇宙航空研究開発機構，北極環境研究コンソーシアム
  (一財)リモート・センシング技術センター，(公社)日本雪氷学会，日本海洋学会
  (公社)日本気象学会，(公社)日本水産学会北海道支部，国土交通省，文部科学省，水産庁
  北海道，北見市，網走市，オホーツク町村会，(公社)北海道国際交流・協力総合センター
  (公財)北海道環境財団，(独法)国際交流基金，(公財)オホーツク生活文化振興財団
  (公財)札幌国際プラザ，北海道新聞社，(株)北海民友新聞社

- **協　　賛**　**協　賛　道外・道内関係企業** 五洋建設㈱，北日本港湾コンサルタント㈱，
  ㈱石本建築事務所，㈱ズコーシャ，日東建設㈱，電通設備㈱，大槻理化学㈱，
  日本データ―サービス㈱，日本工営㈱，住友金属鉱山㈱，㈱藤共工業（順不同）

  市内関係団体　紋別市議会，紋別医師会，北見歯科医師会紋別歯科医師団，
  紋別商工会議所，紋別漁業協同組合，紋別漁業協同組合定置部会・毛ガニ部会，
  オホーツクはまなす農業協同組合，オホーツク中央森林組合，紋別港ロータリークラブ，
  紋別ロータリークラブ，紋別オホーツクライオンズクラブ，北海道税理士会北見支部，
  流氷倶楽部，北海道大学同窓会紋別支部（順不同）

  市内関係企業　㈱マルカイチ水産，丸銀漁業㈱，㈲丸富渡辺水産，㈱吉岡水産，
  ㈱ヤマイチ水産，北方建設産業㈱，鈴木建設㈱，㈱西村組紋別支店，渋田海運㈱，
  旭ダンケ㈱紋別工場，佐藤木材工業㈱，㈱渡辺組紋別支店，川村建設㈱，
  ㈱中央製作所，関電気㈱，山本電工㈱，紋別バイオマス発電㈱，佐藤電気㈱，
  ㈱成田設備工業，北見信用金庫紋別支店，㈱北洋銀行紋別支店，北海道労働金庫紋別
  出張所，遠軽信用金庫紋別支店，イオン北海道㈱イオン紋別店，シティもんべつ店，
  日東水産㈱紋別営業所，みゆき観光開発㈱，㈱紋別セントラルホテル，紋別プリンスホテル㈱，オホーツク・ガリンコタワー㈱，㈲ゆやフラワー，㈱しめまる，よつ葉乳業㈱，
  オホーツクソーテック㈱，㈱民友商事，㈱北海民友新聞社，㈱ソーゴー，横田印刷㈱，
  白野商店㈱，伊藤建材店㈱，カラーセンター，北東開発工業㈱，㈱リテック，手塚興産㈱，
  ㈱紋別観光振興公社，北紋バス㈱,紋別市役所役長会・部長会・課長会　　（順不同）

日程および内容

2月18日（日） **紋別市市民会館 大ホール**

14:30～16:20 **開会式**

■ **主 催 者 挨 拶** 紋別市長 宮川 良一

■ **実行委員長挨拶** 北方圏国際シンポジウム実行委員会委員長 高橋 修平

■ **来 賓 祝 辞** 北海道オホーツク総合振興局長 中島 和彦

■ **海外講師紹介**

《オーストラリア》
Dr. Jimin Hwang ニューファンドランドメモリアル大学，ラブラドール大学

《ベルギー》
Dr. Gaston R. Demarée ベルギー王立気象研究所

《カナダ》
Dr. Neil Bose ニューファンドランドメモリアル大学，ラブラドール大学
Dr. Mathieu Plante カナダ環境・気候変動省

《ノルウェー》
Prof. Arild Moe フリチョフ・ナンセン研究所
Prof. Kjell Stokvik ノード大学

《イギリス》
Dr. Emilian Parau イーストアングリア大学

■ 留学生紹介 北見工業大学

■ アトラクション
紋別大谷認定こども園〔歌とお遊戯〕

■ 特別講演
ガチャピンの南極レポート ガチャピン (第64次南極観測隊参加)

18:00～19:30 **記念レセプション** **【3 階小ホール】**

2月19日（月） **紋別市文化会館 1 階ホール**

9:00～9:10 **学術分科会開会式**

開会のことば 高橋 修平 (北方圏国際シンポジウム実行委員会)

9:10～10:30 **基調講演 A**

9:10 **A-1** Climate-driven shifts of marine biodiversity in the Arctic waters
Irene D. Alabia, Jorge Garcia Molinos, 平田 貴文 (北海道大学北極域研究センター),
Franz J. Mueter (University of Alaska Fairbanks, USA) and
Carmen L. David (Wageningen University and Research, Netherlands)

9:50 **A-2** Development of Russia's Northern Sea Route in the context of climate change and international tensions
Arild Moe (Fridtjof Nansen Institute, Norway)

2月19日（月） **紋別市文化会館 1階ホール**

10:40～11:40 学術分科会 B：気象・気候

13:30～17:20 ワークショップ C：北極海の環境変動を考慮した持続可能な航路利用の探究

紋別市文化会館 3階特別会議室

10:00～12:00 市民公開講座：災害・油汚染対策と環境保護フォーラム

13:30～16:30 市民公開講座：オホーツク～ふるさとの海

紋別市文化会館 3階サークル室

10:40～12:30 ワークショップ D：北極海海運の可能性と展望、現在と未来（HAI-FES プロジェクト主催）

13:30～17:00 学術分科会 E：雪氷と暮らし

紋別市立博物館

13:30～15:20 学術分科会 F：海氷観測・計測

15:30～17:30 学術分科会 G：海洋

2月20日（火） **紋別市文化会館 1階ホール**

16:00～18:00 市民公開講座: オホーツク地域の冬災害を考える

紋別市文化会館 3階特別会議室

9:00～12:35 ワークショップ H：氷縁から定着氷における海氷と波浪

13:30～17:50 ワークショップ I：南極・北極気候システム研究の進展

紋別市文化会館 3階サークル室

13:30～14:30 学術分科会 J：工学

紋別市文化会館 3階ロビー

12:30～13:00 P：ポスターセッション

紋別市立博物館

9:00～11:50 学術分科会 K：極域の海洋生物・水産

13:30～15:40 ワークショップ L：冷水域におけるプランクトンの出現とその生態

15:50～17:50 ワークショップ M：オホーツク沿岸におけるサケマス資源の持続的管理に向けた最近の研究

基調講演 M-1 衛星を利用した持続可能なサケ資源生産支援システムの開発
齊藤 誠一 (北海道大学北極域研究センター/ Digital 北海道研究会/グリーン＆ライフ・イノベーション)

ホテルオホーツクパレス

19:00～20:30 交歓の夕べ

2月21日（水） **紋別市文化会館 1階ホール**

11:00～11:30 青田昌秋賞表彰式

14:00～16:00 市民公開講座：森から海の連環を考えるシンポジウム

紋別市文化会館 3階特別会議室

9:00～16:40 ワークショップ N：海氷変動と物質循環・生態系へのインパクト

16:40～17:00 学術分科会閉会式
講評
閉会のことば　高橋 修平（北方圏国際シンポジウム実行委員会）

紋別市立博物館

13:30～17:10 市民公開講座：オホーツク･テロワールシンポジウム 2024 in 紋別

紋別市民会館 大ホール

13:10～14:30 子ども流氷シンポジウム
Ⅰ．オホーツク海の流氷と地球環境
高橋修平 (オホーツク流氷科学センター)
Ⅱ．雪と氷の地 ―北方圏･ユーラシア内陸の冬の暮らし―
ロマーエヴァ マリーナ (北海道大学)

2月19日（月）～21日（水） **紋別文化会館 3階ロビー**

デモンストレーション：
北極域実践コミュニティの活動紹介 -みんなで北極域の未来を考えよう

出展：北海道大学 北極域研究センター

北極域実践コミュニティでは、北極域における複雑な環境・社会経済の変化と、それが日本を含む地球全体に及ぼす影響について、様々な分野の研究者、企業、NPO、学生などの会員が定期的に集い、異なる見解を共有し、意見交換を行っています。本展示では、北極域実践コミュニティが企画実施しているワークショップや交流会の様子を紹介することで本コミュニティの活動への理解を広げるとともに、訪問者が北極の自然環境、政治経済、文化社会と我々の日々の生活との繋がりについて考える機会を提供します。

2月10日（土）～29日（木） **オホーツク流氷科学センター**

協賛行事　流氷織物展　流氷をテーマにした織物の展示

日 程 表

2月	会 場		午 前	午 後
18 日（日）	市民会館	大ホール		14:30-16:20　開会式 特別講演 ガチャピンの南極レポート
19 日（月）	文化会館	1 階 ホール	9:00- 9:10　学術分科会開会式 9:10-10:30　基調講演 A 10:40-11:40 学術分科会 B 気象・気候	13:30-17:20 ワークショップ C 北極海の環境変動を考慮した持続可能な航路利用の探究
		3 階 会議室	10:00-12:00 市民公開講座 災害・油汚染対策と環境保護フォーラム	13:30-16:30 市民公開講座 オホーツク～ふるさとの海
		3 階 サークル室	10:40-12:30 ワークショップ D 北極海海運の可能性と展望、現在と未来 (HAI-FES プロジェクト主催)	13:30-17:00 学術分科会 E 雪氷と暮らし
	博物館	郷土 学習室		13:30-15:20 学術分科会 F 海氷観測・計測 15:30-17:30 学術分科会 G 海洋
20 日（火）	文化会館	1 階 ホール		16:00-18:00 市民公開講座 オホーツク地域の冬災害を考える
		3 階 会議室	9:00-12:35 ワークショップ H 氷縁から定着氷における海氷と波浪	13:30-17:50 ワークショップ I 南極・北極気候システム研究の進展
		3 階 サークル室		13:30-14:30 学術分科会 J 工学
		3 階ロビー		12:30-13:00 P ポスターセッション
	博物館	郷土 学習室	9:00-11:50 学術分科会 K 極域の海洋生物・水産	13:30-15:40 ワークショップ L 冷水域におけるプランクトンの出現とその生態 15:50-17:50 ワークショップ M オホーツク沿岸におけるサケマス資源の持続的管理に向けた最近の研究
21 日（水）	文化会館	1 階 ホール	11:00-11:30 青田昌秋賞表彰式	14:00-16:00 市民公開講座 森から海の連環を考えるシンポジウム
		3 階 会議室	9:00-10:05 ワークショップ N 海氷変動と物質循環・生態系へのインパクト	13:00-16:40 ワークショップ N 海氷変動と物質循環・生態系へのインパクト 16:40-17:00 学術分科会閉会
	博物館	郷土 学習室		13:30-17:10 市民公開講座 オホーツク・テロワールシンポジウム 2024 in 紋別
	市民会館	大ホール		13:10-14:30 子ども流氷シンポジウム

❏市民公開講座は，無料です．

❏２月１９日（月）～２月２１日（水），紋別文化会館１階ロビーで「技術展示-観測機器の紹介」と３階ロビーでは「デモンストレーション-北極域実践コミュニティの活動紹介，北海道大学 北極域研究センター」を行っています．

❏21 日（水）青田昌秋賞表彰式終了後、文化会館から，空港までバスがでます

技 術 展 示

場　所：紋別市文化会館　　１階ロビー
日　時：２月１９日（月曜日）～２月２１日（水曜日）９：３０～１６：３０（２１日は１２：００迄）

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2024 年 2 月 19 日（月）　文化会館 1 階ホール

9:00	**【学術分科会開会式】** 司会：片倉靖次（紋別市） **開会のことば：** 高橋修平（北方圏国際シンポジウム実行委員会）
	【A：基調講演】 座長：高橋修平（流氷科学センター）
9:10	**A-1** Climate-driven shifts of marine biodiversity in the Arctic waters ○Irene D. Alabia, Jorge Garcia Molinos，平田貴文（北大北極セ), Franz J. Mueter (Univ. Alaska Fairbanks, USA) and Carmen L. David (Wageningen Univ. Res., Netherlands)
9:50	**A-2** Development of Russia's Northern Sea Route in the context of climate change and international tension ○Arild Moe (Fridtjof Nansen Inst., Norway)
10:30	休憩
	【B：気象・気候】 座長：佐藤和敏（極地研/総研大）
10:40	**B-1** Intra-seasonal and interannual variations in snowfall and rainfall during winter in Rikubetsu, inland Hokkaido, Japan ○平沢尚彦（極地研/総研大)，小西啓之（大阪教育大）
11:00	**B-2** Development of a monitoring system for forecasting the occurrence of superior mirage ○舘山一孝（北見工大)，佐藤トモ子（北見工大院)，長谷川稔（北見工大)，今泉賢斗（北見工大院）
11:20	**B-3** ENSO: Research history of "equilibrium of imbalances" Solving the "temperature-pressure" relationship on the Earth's surface ○中陣隆夫（東海大）
11:40	昼食
	【C：ワークショップ、北極海の環境変動を考慮した持続可能な航路利用の探究】
13:30	**趣旨説明：**金野祥久（工学院大）　座長：金野祥久（工学院大）
13:35	**C-1** Maritime route choice in computational general equilibrium model -Application in the case of Artic shipping- ○Trang Tran，柴崎隆一（東大院工）
13:50	**C-2** Model-based evaluation of future utilization of Northern Sea Route for technology roadmappin ○☆**A** 森上和成，和田良太（東大院新領域)，柴崎隆一（東大工)，大塚夏彦（北大北極セ）
14:05	**C-3** Impact analysis of Arctic shipping routes by the multi-commodity global logistics intermodal network simulation model ○☆**A** 河内昂輝，柴崎隆一，小菅直樹（東大工)，Chathumi Ayanthi Kavirathna (Univ. Kelania, Sri Lanka)
14:20	**C-4** Investigation of beset incidents in the Northern Sea Route by risk index and sea ice convergence ○大塚夏彦，宇都正太郎（北大北極セ）
14:35	**C-5** Mid-term Arctic sea ice forecast in 2023 ○大山元夢，山口一（極地研)，木村詞明（東大大気海洋研）
14:50	休憩
	座長：大塚夏彦（北大北極セ）
15:05	**C-6** Preliminary assessment of Arctic oil spill response viability using high-resolution metocean data ○松沢孝俊（海技研)，金野祥久（工学院大)，大山元夢（極地研）
15:20	**C-7** Experimental study on the flexural strength of saline ice ○澤村淳司（阪大)，尾関俊浩（札教大)，木岡信治（寒地土木研）
15:35	**C-8** A method for detecting deformed ice using image recognition techniques for Sentinel-1 SAR images ○小野健太郎（工学院大院工)，金野祥久（工学院大）
15:50	**C-9** Exploration of methods for utilizing sea ice motion information to estimate sea ice conditions in coastal areas ○☆**A** 金子明人，金野祥久（工学院大）
16:05	休憩
	座長：松沢孝俊（海技研）
16:20	**C-10** Evaluation of fluid forces on an ice piece downstream of packed ice floes: Numerical analysis with OpenFOAM and comparison to basin experiments ○根本駿，金野祥久（工学院大）北澤大輔，Jinxin Zhou (東大生産技研)
16:35	**C-11** Flow analysis with solid collision around ships and ice pieces using the incompressible smoothed particle hydrodynamics ○輿石開生，金野祥久（工学院大）
16:50	**C-12** Estimation of water spray particle size distribution at the ship bow for ship hull icing assessment ○水津健太郎（工学院大院工)，金野祥久（工学院大）
17:05	**C-13** Laboratory experiments on spray icing with urea-doped water using flat and cylindrical specimens ○尾関俊浩（札教大)，松沢孝俊（海技研)，野村慎吾（札教大)，安達聖（防災研セ)，徳留大樹，金野祥久（工学院大）

○☆**A** 青田賞エントリー

	【D：ワークショップ、北極海海運の可能性と展望、現在と未来（HAI-FES プロジェクト主催）】 座長：兒玉裕二（北大北極セ）
10:40	**D-1** Current status of the Northern Sea Route by satellite AIS observation ○Kjell Stokvik (Nord Univ., Norway)
10:55	**D-2** Possible environmental risk due to the navigation along the Northern Sea Route ○大塚夏彦（北大北極セ）
11:10	**D-3** Feasibility and perspective of the Arctic shipping, today and future -Navigability perspective- ○宇都正太郎（北大北極セ）
11:25	**D-4** Feasibility of the Arctic shipping from the economic and maritime logistics perspective ○柴崎隆一（東大院工）
11:40	**D-5** Arctic geopolitics and its developments: The impacts of the Ukrainian War ○大西富士夫（北大北極セ）
11:55	**D-6** How Japan's scientific community has been tackling with the rapid change of the Arctic? -Perspective from the ArCS II project- ○榎本浩之（極地研）
12:10	討論
12:30	昼食
	【E：雪氷と暮らし】　座長：堀尾佳以（宇都宮大）
13:30	**E-1** Frederick William Beechey's Narrative of the Voyage of the *Blossom* to the Pacific and the Arctic ○Gaston R. Demarée (ベルギー王立気象研究所，ベルギー)，田上善夫（富山大）
13:50	**E-2** Improving winter life in Hokkaido: Proposals by Nitobe College Graduate Program students and collaboration with the regional and municipal governments ○ロマーエヴァ マリーナ, Artem Suslov (北大)，中島竜雄（北海道), Juha Saunavaara (北大北極セ)，三浦篤志（北大理）
14:10	**E-3** Impact of climate change on environment and society in northwest Greenland: Incorporate indigenous perspectives to better understand the changing climate ○☆**A** 小川萌日香（北大院環境)，日下稜（北大低温研)，櫻木雄太（北大院環境)，杉山慎（北大低温研)，三谷曜子（京大野生動物研セ）
14:30	**E-4** Arctic convoys and Polar Seas in Soviet and British military naval fiction ○☆**A** Artem Suslov (北大)
14:50	**E-5** Snow Power generation in cold region -The potential of Stirling Engines for cold climate disasters- ○☆**A** 狩野陸人，外山皓輝, Muhammad Najib Bin Roslan (宇都宮大工)
15:10	休憩
	座長：ロマーエヴァ マリーナ（北大）
15:20	**E-6** The efficiency of exothermic reaction of aluminium and quicklime (calcium oxide) -Monozukuri PBL for cold region disaster preparedness- ○☆**A** 櫛引洸介，朝倉直音, Dalilati Afiqah Binti Che Azhar (宇都宮大工)
15:40	**E-7** The intersection of aesthetic practice and scientific practice: Possibilities explored through the artwork 'Drifting Scenery' with the theme of drift ice ○☆**A** Hyunjung Park (北大)
16:00	**E-8** Characteristics and effects of wet snow in severe winter season in Hokkaido, Japan ○☆**A** 石井日菜（北見工大院)，白川龍生（北見工大）
16:20	**E-9** Mechanism of utilizing snow and ice of Torne River in ICEHOTEL creation in the Arctic ○福山貴史（北大観光高等研セ）
16:40	**E-10** Learning the Arctic through the board game: An educational tool for experiencing the changing Arctic ○木村元（JAMSTEC）
17:00	北極ボードゲーム

○☆**A** 青田賞エントリー

2024 年 2 月 19 日（月）　博物館

	【F：海氷観測・計測】 座長：舘山一孝（北見工大）
13:30	**F-1** New method for estimating sea ice age ○木村詞明，羽角博康（東大大気海洋研）
13:50	**F-2** Sea ice conditions in the Sea of Okhotsk in the 2022/2023 winter season ○堀直登，金子秀毅，浜田啓次，赤坂有史（気象庁）
14:10	**F-3** On the applicability of the LiDAR video fusion sensor to sea ice observation ○宇都正太郎，泉山耕（北大北極セ），岡田浩希，髙山喜央，柏瀬薦，案浦雅徳（京セラ）
14:30	休憩
14:40	**F-4** The possibilities of UAVs with multispectral camera and autonomous driving Rover ○松村寛一郎（東農大生物産業），Vitaly Kuzin (Nizhny Novgorod State Tech. Univ. n.a. R. E. Alekseev, Russia)
15:00	**F-5** On methods for solving inverse problems in spectroellipsometry and spectrophotometry ○Ferdenant Mkrtchyan (Kotelnikov Inst. Radioengineering Electronics, Russia)
15:20	休憩
	【G：海洋】 座長：宇都正太郎（北大北極セ）
15:30	**G-1** On the distribution of pollutants in the Arctic Basin ○Ferdenant Mkrtchyan (Kotelnikov Inst. Radioengineering Electronics, Russia)
15:50	**G-2** Features of hydrological conditions of the Sea of Okhotsk in the spring and fall periods of 2023 ○Egor Yurevich Malygin (Russian Federal Res. Inst. Fish, Oceanography, Russia)
16:10	**G-3** Microplastics baseline study in the Sea of Okhotsk ○Alexandra Ershova, Valeriia Proschakova and Ekaterina Golubeva (Russian State Hydrometeorological Univ., Russia)
16:30	**G-4** Tidal oscillation expands the wintertime mixed layer region over the Bering Sea ○Hung-Wei Shu (JAMSTEC)，三寺史夫，中村知裕（北大低温研），建部洋晶，長船哲史 (JAMSTEC)，木田新一郎（九大応力研），東屋知範（水産機構資源研），纐纈慎也（JAMSTEC）
16:50	**G-5** Features of tidal exchange in the Kuril Straits based on modeling data ○Vsevolod Ilyich Ilin and Victor Semyonovich Arkhipkin (Moscow State Univ., Russia)
17:10	**G-6** Features of ice conditions in the Bering Sea as extension of the NSR in 2004 -2022 ○Evgeniya Pavlova (Arctic Antarctic Res. Ins., Russia), Tatiana Alekseeva (Arctic Antarctic Res. Inst., Russia/Space Res. Inst., Russia) and Alexander Yulin (Arctic Antarctic Res. Inst., Russia)

2024 年 2 月 20 日（火）　文化会館３階特別会議室

	【H：ワークショップ、氷縁から定着氷における海氷と波浪】
9:00	**趣旨説明**：早稲田卓爾(東大院新領域)　座長：小平翼（東大院新領域）
9:05	**H-1** Direct observation of submesoscale and mesoscale eddies by ocean surface drifters near the sea ice edge in the Canada Basin, Arctic Ocean ○小平翼（東大院新領域），早稲田卓爾（東大院新領域/JAMSTEC），勝野智嵩（東大院新領域），君塚政文（産業技術高専），藤原泰（神戸大院海事），野瀬毅彦（東大院新領域），川口悠介（東大大気海洋研），藤原周（JAMSTEC）
9:25	**H-2** Observation and model estimation of ocean wind wave development under the off-ice wind conditions in the Arctic Ocean ○☆**A** 勝野智嵩，野瀬毅彦，小平翼（東大院新領域），早稲田卓爾（東大院新領域/JAMSTEC）
9:45	**H-3** Spatial patterns and origins of sediment-laden ice in the Arctic: A remote sensing approach ○藤原周（JAMSTEC），木村詞明（東大大気海洋研），和賀久朋（極地研/アラスカ大），木村仁（JAMSTEC）
10:05	**H-4** Sea-ice deformation in submesoscale and below in melting season ○木村仁（JAMSTEC），浮田甚郎（東大），藤原周，菊地隆（JAMSTEC）
10:25	**H-5** Sea-ice deformations derived from Sentinel-1 & RADARSAT Satellite Mission SAR imagery ○Mathieu Plante, Jean-François Lemieux (Environnement et Changement Climatique Canada, Canada), L. Bruno Tremblay, Amélie Bouchat, Damien Ringeisen, (McGill Univ., Canada), Philippe Blain (Environnement et Changement Climatique Canada, Canada), Stephen Howell, Mike Brady, Alexander Komarov (Environment and Climate Change Canada, Canada), Béatrice Duval, Lekima Yakuden and Frédérique Labelle (McGill Univ., Canada)
10:45	休憩

下線は，オンライン発表　　○☆**A** 青田賞エントリー

	【H：ワークショップ、氷縁から定着氷における海氷と波浪】　座長：早稲田卓爾（東大院新領域）
10:55	**H-6** Deformation of fast-ice prior to the 2023 ice breakup event in the Lützow-Holm Bay ○早稲田卓爾（東大院新領域），舘山一孝（北見工大），内山亮介，野瀬毅彦，小平翼，勝野智嵩（東大院新領域），田村岳史（極地研），豊田威信（北大低温研），J. Rebault (Met. Norway, Norway) M. Hoppmann (Alfred-Wegener-Inst., Norway)，清水大輔（極地研）
11:15	**H-7** Fluctuations in distribution, type and thickness of sea ice off the Lützow-Holm Bay, East Antarctica ○舘山一孝（北見工大）早稲田卓爾，内山亮介（東大院新領域），吉田悠嗣（北見工大院）
11:35	**H-8** Attenuation of nonlinear water waves in the marginal ice zone Alberto Alberello, ○Emilian Parau, Ben Humphries (Univ. East Anglia, UK) and Amin Chabchoub (Kyoto Univ./Univ. Sydney, Australia)
11:55	**H-9** Unstable wave dynamics in sea ice Alberto Alberello, Emilian Parau (Univ. East Anglia, UK) and ○Amin Chabchoub (Kyoto Univ./Univ. Sydney, Australia)
12:15	**H-10** Research on spectral downshifting of waves propagating under sea ice ○☆**A** 佐藤公哉（東大院新領域），早稲田卓爾（東大院新領域/JAMSTEC），小平翼（東大院新領域），藤原泰（神戸大院海事），野瀬毅彦，勝野智嵩（東大院新領域）
12:35	昼食　［ポスターセッション コアタイム：12:30-13:00，文化会館 3階ロビー］
	【I：ワークショップ、南極・北極気候システム研究の進展】
13:30	**趣旨説明，** 猪上淳（極地研/総研大）
	「南極気候システム」　座長：猪上淳（極地研/総研大）
13:35	**I-1** Precipitation observation by X-band Doppler Radar at Syowa station, Antarctica ○岩本勉之 (紋別市), 小西啓之（大阪教育大), 平沢尚彦 (極地研/総研大), 藤吉康志（北大名誉教授）
13:50	**I-2** Supercooled liquid water clouds in the mid-troposphere over the Southern Ocean ○猪上淳，佐藤和敏（極地研/総研大），清水慎吾（防災科研）
14:05	**I-3** Ice cloud formation related to oceanic supply of ice-nucleating particles: A case study in the Southern Ocean near an atmospheric river in late summer ○佐藤和敏，猪上淳（極地研/総研大）
14:20	**I-4** The climatological characteristics of atmospheric rivers observed in the 64th Japanese Antarctic Research Expedition ○☆**A** 高橋和（総研大），佐藤和敏，平沢尚彦，猪上淳（極地研/総研大）
14:35	**I-5** Analysis of short-term sea ice fluctuations occurring at Lützow-Holm Bay in JARE 64 ○吉田悠嗣（北見工大院），舘山一孝（北見工大）
14:50	休憩
	「北極気候システム 1」　座長：島田浩二（海洋大）
15:05	**I-6** Introduction of R/V MIRAI polar research cruises and the evolution of its support information ○末吉惣一郎（日本海洋事業）
15:20	**I-7** Impact of wildfire over western Canada on Arctic ice cloud formation: A case study in the Arctic Ocean near an atmospheric river in early autumn ○佐藤和敏，猪上淳（極地研/総研大）
15:35	**I-8** Forecasts of an Arctic cyclone in September 2018 by multi-resolution coupled atmosphere–ocean predictions ○山上晃央（埼玉県環境科学国際センター/気象研），豊田隆寛，浦川昇吾，中野英之，新藤永樹，吉村裕正，川上雄真，坂本圭（気象研），中野渡拓也（水産機構資源研），周宏偉（JAMSTEC），山中吾郎（気象研）
15:50	**I-9** Regime shift and variations of sea ice outflow velocities through the Fram Strait ○島田浩二，澤田若奈，原田倫，早川晃平（海洋大），吉澤枝里（JAXA）
16:05	**I-10** Impact of freshwater outflow from the Ob-Yenisei River on sea ice area in the Barents-Kara Sea ○☆**A** 矢野拓未，島田浩二（海洋大）
16:20	休憩

○☆**A** 青田賞エントリー

2024 年 2 月 20 日（火）　文化会館３階特別会議室

	【I：ワークショップ、南極・北極気候システム研究の進展】 「北極気候システム 2」　座長：Eun Yae Son (東大大気海洋研)
16:35	**I-11** Enhanced turbulent mixing associated with lee wave generation over rough topography in the Chukchi Borderland, Arctic Ocean ○☆**A** Eun Yae Son, 川口悠介 (東大大気海洋研)
16:50	**I-12** A parameterization of the ice-ocean drag coefficient depending on the roughness of sea ice floes ○☆**A** 原田倫, 島田浩二 (海洋大)
17:05	**I-13** Sensitivity experiments of sea ice thickness category parameterization in an OGCM ○豊田隆寛, 浦川昇吾, 坂本圭, 川上雄真, 青木邦弘, 中野英之 (気象研)
17:20	**I-14** Modeling on future changes in the Arctic Ocean interior associated with the sea-ice reduction in a low-resolution ice-ocean coupled model ○小野純, 小室芳樹 (JAMSTEC), 川崎高雄 (東大大気海洋研)
17:35	討論

2024 年 2 月 20 日（火）　文化会館３階ロビー

12:30 ｜ 13:00	**【P：ポスターセッション】** **P-1** The cumulative amount of drift ice in Okhotsk Mombetsu and the secular change in ice formation in the port ○村井克詞 (もんべつ海の学校) **P-2** Estimating sea ice thickness of drift ice and fast ice in coastal areas by means of UAV-SfM photogrammetry ○大内優希 (北見工大院), 舘山一孝, 渡邊達也 (北見工大) **P-3** Relationship between wind direction and differences in snow accumulation in heavy snowfall areas and non-heavy snowfall areas ○山本諒, 立花義裕 (三重大) **【Extra】** Intra-seasonal and interannual variations of sea ice along the Okhotsk coast of Hokkaido from the viewpoint of atmospheric circulation 朝妻勇貴, 倉持将也 (筑波大院生命環境), 植田宏昭 (筑波大生命環境)

2024 年 2 月 20 日（火）　文化会館３階サークル室

	【J：工学】　座長：安齋圭祐（ジャパン マリンユナイテッド）
13:30	**J-1** Simulation of ice sheet transport during tsunami event inside river channels using a particle method ○☆**A** 阿部孝章, 大串弘哉 (寒地土木研)
13:50	**J-2** Numerical estimation of ship resistance in drift ice fields using Bullet physics engine ○安齋圭祐, 水野滋也, 山内豊 (ジャパン マリンユナイテッド)
14:10	**J-3** How does a year-round gyre and the related middle layer upwelling form in the northwest Gulf of Alaska? ○Nan Yuan, 三寺史夫 (北大低温研)
14:30	休憩

2024 年 2 月 20 日（火）　博物館

	【K：極域の海洋生物・水産】　座長：平井惇也（東大大気海洋研）
9:00	**K-1** Ten-year changes in the distribution of eelgrass beds in Lake Notoro using a quantitative echo sounder ○☆**A** 伊藤慶造 (北大院環境), 園木詩織 (道釧路水試), 南憲吏, 朱妍卉 (北大北方セ), 千葉晋, 松本裕幸 (東農大生物産業), 宮下和士 (北大北方セ)
9:20	**K-2** Local heatwaves affect behavior and physiology of *Pandalus latirostris* in subarctic seagrass beds -Local heatwaves affect *Pandalus latirostris*- ○☆**A** 松本裕幸, 落合瞬, 東典子, 千葉晋 (東農大生物産業)
9:40	**K-3** Seasonal changes in fish communities in the Okhotsk Sea coast of Hokkaido inferred from environmental DNA analysis ○☆**A** 米子拓真, 川上達也 (北大院水産), 吉田瞳 (オホーツク・ガリンコタワー), 片倉靖次 (紋別市), 山崎友資 (蘭越町), 桑原尚司 (流氷科学センター), 中川至純 (東農大生物産業), 笠井亮秀 (北大院水産)
10:00	**K-4** The artificial reef effect on fish at the Okhotsk Tower ○中根幸則 (電中研), 片倉靖次, 岩本勉之 (紋別市), 占部雄太 (オホーツク・ガリンコタワー), 阿部聖哉 (電中研)
10:20	休憩

下線はオンライン発表　　○☆**A** 青田賞エントリー

	【K：極域の海洋生物・水産】　座長：Irene Alabia（北大北極セ）
10:30	**K-5** Comparative analysis of age determination methods for giant grenadier (*coryphaenoides pectoralis*) based on different age-recording structures of scales and otoliths ○Andrey I. Alferov, Oleg Z. Badaev and Alina.O. Erulina (Russian Federal Res. Ins. Fish. Oceanography, Russia)
10:50	**K-6** Spatial distribution of seals during summer in Inglefield Bredning, northwestern Greenland ○☆**A** 櫻木雄太，小川萌日香（北大院環境），大槻真友子，Jean-Baptiste Thiebot (北大院水産)，Yefan Wang，杉山慎（北大低温研），三谷曜子（京大野生動物研セ）
11:10	**K-7** Marine mammal conservation and management in the North Pacific: The case of the northern fur seal, with a focus on Japan and Russia ○ロマーエヴァ マリーナ（北大），三谷曜子（京大野生動物研セ），Juha Saunavaara (北大北極セ)，中島竜雄（北海道）
11:30	**K-8** Stable isotope ratios in minke whale baleen in the Sea of Okhotsk ○三谷曜子，李何萍（京大野生動物研セ），小川萌日香，古巻史穂，櫻木雄太（北大院環境），坂東武治，田村力（日鯨研）
11:50	昼食　［ポスターセッション コアタイム：12:30-13:00，文化会館 3階ロビー］
	【L：ワークショップ、冷水域におけるプランクトンの出現とその生態】　座長：長井敏（水産機構資源研）
13:30	**L-1** Exploring small eukaryotes by eDNA analysis in marine sediments in the Arctic region ○長井敏（水産機構資源研），小林稔，新井正矩，山本正伸（北大院環境）
13:50	**L-2** Differences in phytoplankton assemblages and their controlling factors in the southern Sea of Okhotsk between winter and spring ○Yanxu Sun (北大院環境)，西岡純，豊田威信（北大低温研），鈴木光次（北大院地球環境）
14:10	**L-3** Differentially expressed genes associated with food availability in *Neocalanus plumchrus* (Calanoida: Copepoda) ○☆**A** 大西拓也，谷内由貴子，葛西広海（水産機構資源研）
14:30	休憩
14:40	**L-4** The occurrence of *Gyrodinium* species (Dinophyceae) in the Indian sector of the Southern Ocean ○☆**A** 松田亮（創価大），高橋啓伍（創価大/極地研），佐野雅美（極地研），真壁竜介（極地研/総研大/海洋大），高尾信太郎（環境研），茂木正人（極地研/海洋大），黒沢則夫（創価大）
15:00	**L-5** Metabarcoding analysis of zooplankton communities during a period of sea ice in the Okhotsk Sea ○平井惇也（東大大気海洋研），片倉靖次（紋別市），葛西広海（水産機構資源研），玉蟲奈佳子（東大大気海洋研），長井敏（水産機構資源研）
15:20	**L-6** Biological response of scallop larvae to different *p*CO2 concentrations in seawater ○木元克典，脇田昌英（JAMSTEC），清水啓介（早稲田大），遊佐貴志（青森県産業技術センター）藤井賢彦（東大大気海洋研），高畠信一（道稚内水試）
15:40	休憩
	【M：ワークショップ、オホーツク沿岸におけるサケマス資源の持続的管理に向けた最近の研究】 ［基調講演］　座長：實吉隼人（道さけます内水試）
15:50	**M-1** Research and development of supporting system for sustainable use of salmon resource under changing climate using multiple satellite datasets ○齊藤誠一（北大北極セ/Digital 北海道研究会/グリーン＆ライフ・イノベーション）
16:20	**M-2** Recent status of chum salmon and pink salmon stocks in the Okhotsk area ○實吉隼人，越野陽介，倉谷京介（道さけます内水試）
16:40	休憩
16:50	**M-3** Characteristics of juvenile chum salmon off the coast of Hokkaido in the southern Sea of Okhotsk ○春日井潔，越野陽介，下田和孝（道さけます内水試），石田良太郎（道釧路水試）
17:10	**M-4** Effects of dam and fishway constructions on stream-dwelling salmonids: A lesson from a tributary of the Tokoro River basin, Hokkaido, Japan ○☆**A** 福井翔，小幡祐資，井場海晴，白石健太（東農大生物産業）
17:30	**M-5** Spawning escapement of wild salmon in the Okhotsk coastal area ○☆**A** 越野陽介（道さけます内水試），森高志（斜里町），宮腰靖之（北見管内さけ・ます増殖事業協会）

下線はオンライン発表　　○☆**A** 青田賞エントリ

	【N：ワークショップ、海氷変動と物質循環・生態系へのインパクト】
9:00	**趣旨説明**：西岡純（北大低温研）　座長：西岡純（北大低温研）
9:05	**N-1** Warm conveyor belt and warm currents causing the retreat of sea ice along the coast of the Sea of Okhotsk ○☆**A** 釜江陽一，横田百音（筑波大）
9:25	**N-2** Atmospheric phenomena reducing sea ice extent in the southern Sea of Okhotsk in March 1998 ○☆**A** 横田百音，釜江陽一（筑波大）
9:45	**N-3** Sea ice melting associated with vertical mixing driven by extratropical cyclones in the Sea of Okhotsk ○☆**A** 澤悠夏，唐木達郎，植田宏昭（筑波大），佐伯立，三寺史夫（北大低温研），黒田寛（水産機構資源研）
10:05	休憩
11:00	**【青田昌秋賞表彰式】**　※表彰式会場は,1 階ホール
12:00	昼食
	座長：西岡純（北大低温研）
13:00	**N-4** Numerical modeling study on sea ice iron flux in the Sea of Okhotsk ○中野渡拓也 (水産機構資源研)，渡邉英嗣 (JAMSTEC)，中村知裕，西岡純，三寺史夫（北大低温研）
13:20	**N-5** Outline of field observations during winter in seasonal sea ice area in Siorapaluk, Greenland ○的場澄人，飯塚芳徳，宮﨑雄三（北大低温研），原圭一郎（福岡大理），倉元隆之（東海大），黒﨑豊，松本真依（北大低温研/北大院環境），山崎哲秀（アバンナット），青木輝夫（極地研）
13:40	**N-6** Characteristics of water masses and nutrient properties in the southern Sea of Okhotsk ○西岡純，豊田威信（北大低温研），山下洋平，鈴木光次（北大院地球環境），村山愛子，小野数也，中村知裕，大島慶一郎，三寺史夫（北大低温研）
14:00	休憩
	座長：的場澄人（北大低温研）
14:10	**N-7** Ocean monitoring and ship observations around Shiretoko: 2 ○中村知裕（北大低温研），野別貴博（知床財団），嶋田宏，美坂正（道釧路水試），西岡純（北大低温研），三谷曜子（京大野生動物研セ），山村織生（北大院水産），三寺史夫（北大低温研）
14:30	**N-8** Long-term variations of water masses in the southern part of the Okhotsk Sea using public and unpublished data ○伊藤薫，中村知裕（北大低温研），美坂正（道釧路水試）
14:50	**N-9** Difference of pre-conditioning between heavy-ice-year and light-ice year in the Okhotsk Sea ○佐伯立，三寺史夫（北大低温研），中野渡拓也，黒田寛（水産機構資源研），井上知栄，植田宏昭（筑波大生命環境），岩本勉之（紋別市）
15:10	**N-10** Prediction of sea ice variations off Hokkaido in the southern Sea of Okhotsk ○三寺史夫，佐伯立（北大低温研），井上知栄，植田宏昭（筑波大），中野渡拓也，黒田寛（水産機構資源研）
15:30	休憩
	座長：中村知裕（北大低温研）
15:40	**N-11** Iron supply processes in the southern Sea of Okhotsk ○今井望百花（北大院環境），村山愛子，小野数也（北大低温研），山下洋平，鈴木光次（北大院地球環境），中村知裕，大島慶一郎，三寺史夫，西岡純（北大低温研）
16:00	**N-12** Assessment of primary production processes in the southern Sea of Okhotsk: A combined analysis using modelling, satellite remote sensing, and in-situ observation data ○田之上夕姫（北大院環境），Pat Wongpan, Peter Strutton (タスマニア大学，オーストラリア)，深井悠里（北大院環境/JAMSTEC），豊田威信，西岡純（北大低温研），鈴木光次（北大院地球環境）
16:20	**N-13** Continuous measurement of atmospheric organic aerosols and relevant parameters at the Mombetsu Okhotsk Tower ○宮﨑雄三，立花英里（北大低温研），吉田瞳（オホーツク・ガリンコタワー），的場澄人（北大低温研），青木一真（富山大），岩本勉之，片倉靖次（紋別市）
16:40 ｜ 17:00	**【学術分科会閉会式】**　司会：片倉靖次（紋別市） 講　評 閉会のことば：高橋修平（北方圏国際シンポジウム実行委員会）

○☆**A** 青田賞エントリー

2024年2月19日（月）～21日（水）

文化会館３階ロビー

9:00 ｜ 17:00	**【デモンストレーション：北極域実践コミュニティの活動紹介】** みんなで北極域の未来を考えよう 出展：北海道大学北極域研究センター

市民公開講座

2024年2月19日（月）

文化会館３階特別会議室

10:00	**【市民公開講座：災害・油汚染対策と環境保護フォーラム】** 司会：齊藤郷（OEPN） 命と暮らし、自然を守るために 必要なことは 挨拶：伊藤正人（OEPN） I. 自衛隊の活動について 谷口慎（第25普通科連隊/遠軽駐屯地） II. 蜃気楼の神秘 石原宙（流氷科学センター） III. 今、海に起きていること 佐々木邦昭（元海上保安庁/元海上災害防止センター/油濁コンサルタント） 講評：石井友也（OEPN）
12:00	昼食
	【市民公開講座：オホーツク～ふるさとの海】 司会：叶順之（紋別市）
13:30	挨拶：髙橋博明（紋別市）
13:35	Ⅰ．紋別漁業協同組合青年部の活動について 尾﨑勇太（紋別漁業協同組合青年部）
14:05	Ⅱ．道産ブリの利用について 濱川祐実（道総研網走水試）
14:50	休憩
15:00	Ⅲ．北海道のコンブ漁業の現状と道産の未利用海藻を利用した陸上養殖の可能性 前田高志（道総研稚内水試）
15:45	Ⅳ．オホーツクのサケ・マスの来遊 實吉隼人（道総研さけます・内水面水産試験場道東センター）
16:30	閉会の挨拶，叶順之（紋別市）

2024年2月20日（火）

文化会館１階ホール

	【市民公開講座：オホーツク地域の冬災害を考える】 司会：二ノ宮秀彦（網走開発建設部）
16:00	挨拶：髙橋修平（シンポジウム実行委員長/流氷科学センター）
16:05	Ⅰ．オホーツク地域の暴風雪の特徴～防災気象情報の有効活用に向けて～ 松下雄哉（気象庁 網走地方気象台）
16:25	Ⅱ．講演：北海道開発局の自然災害対応について 大場久義（北海道開発局 網走開発建設部）
16:40	休憩
16:50	パネルディスカッション コーディネータ：根本昌宏（日本赤十字北海道看護大学） 「防災教育や災害ボランティアなど、自助・共助の取り組みを知る」 〔パネリスト〕 伊藤公浩（気象庁 網走地方気象台），久保大輔（紋別市立渚滑中学校） 岩谷智浩（紋別市社会福祉協議会），濵田亮（北海道オホーツク総合振興局），石川眞（紋別市） 講評：根本昌宏（日本赤十字北海道看護大学）
17:55	挨拶：福原英之（北海道開発局 網走開発建設部）

2024 年 2 月 21 日（水）　文化会館１階ホール

11:00	**【青田昌秋賞表彰式】**
12:00	昼食
14:00 14:05	**【市民公開講座：森から海の連環を考えるシンポジウム】** 挨拶：中村雅俊 (網走西部流域森林・林業活性化協議会/紋別市) Ⅰ．北の森づくり専門学院卒業生の想い～新規就業者が北海道の林業界へ望む事～ 小笠原昭二 (オホーツク総合振興局東部森林室)
14:35	休憩
14:45	Ⅱ.豊かな森を育む中欧諸国のフォレスターとは ～林業が憧れの職業になるための７つのアイデア～ 中村幹広 (岐阜県可茂農林事務所)

2024 年 2 月 21 日（水）　博物館

13:30 13:40 14:20	**【市民公開講座：オホーツク・テロワール 2024 in 紋別】**　進行：長南進一（オホーツク・テロワール） 「オホーツク文化が残したメッセージ～オホーツク文化の原点とオホーツク・ツーリズムの未来と可能性を探る」 挨拶：大黒宏 (オホーツク・テロワール) 第1部　基調講演 オホーツク文化が残したもの 田才雅彦 (文化財サポート) 第2部　オホーツクの地で、土地にあるものを生かして循環する暮らし―体験発表 Ⅰ．伊吾田順平 (西興部村 NPO法人西興部村狩猟区管理協会) Ⅱ．田口真子 (雄武町 カフェうしり) Ⅲ．遠藤貴裕 (紋別市 うしお工房)
15:10	休憩
15:20 ｜ 17:10	第3部　フリーデスカッション　オホーツク文化から見えてくるオホーツク・ツーリズムの未来と可能性について -日本の新たなレガシー形成事業- オホーツク遺跡街道構想 話題提供：佐藤雅彦 (アウトドア・考古学写真家) 氏江敏文 (名寄市学芸員)

2024 年 2 月 21 日（水）　紋別市民会館大ホール

13:10 ｜ 14:30	**【子ども流氷シンポジウム】** Ⅰ．オホーツク海の流氷と地球環境 高橋修平 (オホーツク流氷科学センター) Ⅱ．雪と氷の地 ―北方圏・ユーラシア内陸の冬の暮らし― ロマーエヴァ マリーナ (北海道大学) 流氷クイズ大会

2 月 10 日（土）～29 日（木）　オホーツク流氷科学センター

	協賛行事　流氷織物展　流氷をテーマにした織物の展示

The 38th International Symposium on the Okhotsk Sea & Polar Oceans

English

Photo by Kazutaka Tateyama

18-21 February 2024

Mombetsu Arts & Culture Center, Mombetsu Municipal Museum
Mombetsu Machinaka Art Museum, Mombetsu Citizens' Public Hall
Okhotsk Sea Ice Museum of Hokkaido
Arctic Research Center, Hokkaido University

PURPOSE OF SYMPOSIUM

Sea ice covers 10% of the earth's oceans, which produces dynamic cycles in the atmosphere and in the oceans as a major factor in the global heat balance.

The Sea of Okhotsk is the lowest latitude freezing sea in the earth, and the coast of Hokkaido is the southern limit of sea ice in the Northern Hemisphere. Every winter, 60-70% of the Sea of Okhotsk is covered with sea ice, which has both merits and demerits in human lives.

Furthermore, the sea ice extent in the Arctic Ocean has decreased rapidly due to the recent global warming, which is a serious environmental problem. On the other hand, the "Arctic Sea Routes" between the Pacific Ocean and Europe has become important, and the international situation has become a sensitive issue.

For these reasons, sea ice deeply relates to the global environment and also to human activities such as fisheries, agriculture, and industry. So, our Symposium cover various topics of the latest sea ice researches, global warming, environment change, biology and fisheries, and many subjects in the Okhotsk region.

The International Symposium on Okhotsk Sea & Polar Oceans has been held every year in Mombetsu since 1986 until 2020, but was canceled in 2021due to the new coronavirus. However, the academic sessions were held online in 2022, and by a hybrid of online and face-to-face in 2023. This year, in 2024, the Symposium, is held entirely face-to-face for the first time in four years. In addition, Public Programs, Symposium for Children, and parties are also restarted. We hope that all participants will have fruitful discussions and warm up exchanges. Please enjoy the Symposium!

Organized by

City of Mombetsu
Symposium Committee

Organized and Sponsored by

Okhotsk Sea and Polar Oceans Research Association (OSPORA)
Arctic Research Center, Hokkaido University (ARC)
National Institute of Polar Research (NIPR)
Japan Agency for Marine-Earth Science and Technology (JAMSTEC)
Institute of Low Temperature Science, Hokkaido University (ILTS)
Kitami Institute of Technology (KIT)
Tokai University, Sapporo Campus
Tokyo University of Agriculture, Faculty of Bioindustry
Tokyo University of Marine Science and Technology
Graduate School of Fisheries Sciences, Hokkaido University
Field Science Center for Northern Biosphere, Hokkaido University
Atmosphere and Ocean Research Institute, The University of Tokyo (AORI)
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- Satoru Taguchi, National Institute of Polar Research, Japan
- Shuhei Takahashi, Prof. Emer., Kitami Institute of Technology, Japan
- Kazutaka Tateyama, Kitami Institute of Technology, Japan
- Hajime Yamaguchi, National Institute of Polar Research, Japan

(Alphabetical order)

Sunday 18 February **Mombetsu Citizens' Public Hall**

13:30-14:30 ◇**Registration** 【2F Lobby】

14:30-16:20 ◇**Opening Ceremony** 【Main Hall】

■ **Welcome Address**

Yoshikazu Miyakawa	Mayor, City of Mombetsu
Shuhei Takahashi	Chair, The Symposium Committee
Kazuhiko Nakashima	Director, Okhotsk General Subprefectural Bureau

■ **Introduction of Overseas Participants**

《Australia》

Dr. Jimin Hwang	Memorial University of Newfoundland, Labrador's University

《Kingdom of Belgium》

Dr. Gaston R. Demarée	Royal Meteorological Institute of Belgium

《Canada》

Dr. Neil Bose	Memorial University of Newfoundland, Labrador's University
Dr. Mathieu Plante	Environnement et Changement Climatique Canada

《Norway》

Prof. Arild Moe	Fridtjof Nansen Institute
Prof. Kjell Stokvik	Nord University

《United Kingdom》

Dr. Emilian Parau	University of East Anglia

■ **Introduction:** Foreign Students of Kitami Institute of Technology

■ **Attraction:** Dance by Mombetsu Otani Kindergarten

■ **Opening Event** *(in Japanese language only)*

Gachapin's Antarctic Report by Gachapin
(a member of the 64th Japanese Antarctic Research Expedition (JARE 64))

18:00-19:30 ◇ **Memorial Reception (Banquet)** 【3F】

Monday 19 February **Mombetsu Arts & Culture Center**

【1F Main Hall】

9:00-9:10 **Opening Address** Shuhei Takahashi (Chair of the Symposium Committee)

9:10-10:30 **Keynote Address Session A**

9:10 **A-1** Climate-driven shifts of marine biodiversity in the Arctic waters
Irene D. Alabia, Jorge Garcia Molinos, Takafumi Hirata (Hokkaido University.),
Franz J. Mueter (University of Alaska Fairbanks, USA) and
Carmen L. David (Wageningen University and Research, Netherlands)

9:50 **A-2** Development of Russia's Northern Sea Route in the context of climate change and international tensions
Arild Moe (Fridtjof Nansen Institute, Norway)

Monday 19 February **Mombetsu Arts & Culture Center**

10:40-11:40 **Scientific Session B : Meteorology and Climate** **【1F Main Hall】**

13:30-17:20 **Workshop C : Sustainable Arctic Sea Routes in a Rapidly Changing Environment**

【3F Special Conference Room】

10:00-12:00 **Public Program :** ***(in Japanese language only)***

Forum on Disasters, Oil Pollution Countermeasures, and Environmental Protection

Ⅰ. The activities of the Self-Defense Forces — Shin Taniguchi (Japan Self-Defense Forces)
Ⅱ. The mystery of the mirage — Hiromu Ishihara (Okhotsk Sea Ice Museum)
Ⅲ. What is happening in the sea now — Kuniaki Sasaki (Yudaku-Consultant)

13:30-16:30 **Public Program : Our Home Okhotsk Sea** ***(in Japanese language only)***

Ⅰ. Activities of the Youth Club of Mombetsu Fisheries Cooperative
Yuta Ozaki (Youth Club Mombetsu Fish. Coop.)

Ⅱ. The utilization of yellowtail *Seriola quinqueradiata* caught in Hokkaido, Japan
Yumi Hamakawa (Abashiri Fish. Res. Inst., Hokkaido Res. Org.)

Ⅲ. Current situation of kelp fishery in Hokkaido and potential for land-based cultivation of unutilized seaweeds collected along the coast of Hokkaido
Takashi Maeda (Wakkanai Fish. Res. Inst., Hokkaido Res. Org.)

Ⅳ. Recent status of chum salmon and pink salmon stocks in the Okhotsk area
Hayato Saneyoshi (Salmon Freshwater Fish. Res. Inst., Hokkaido Res. Org.)

【3F Meeting Room】

10:40-12:30 **Workshop D : Feasibility and Perspective of the Arctic Shipping, Today and Future (Organized by HAI-FES Project)**

13:30-17:00 **Scientific Session E : Snow, Ice and Human Life**

Mombetsu Municipal Museum

13:30-15:20 **Scientific Session F : Sea Ice Measurement and Observation**

15:30-17:30 **Scientific Session G : Oceanography**

Tuesday 20 February **Mombetsu Arts & Culture Center**

【1F Main Hall】

16:00-18:00 **Public Program :** ***(in Japanese language only)***

Consideration of Winter Weather Disasters in the Okhotsk Region

Lecture: Ⅰ. Characteristics of Heavy Snowstorms in Okhotsk Area ~Effective use of Disaster Prevention Information~
Yuya Matsushita (Abashiri Local Meteorological Office, Japan Meteorological Agcy.)

Ⅱ. Response to natural disaster by Hokkaido Regional Development Bureau
Hisayoshi Oba (Abashiri Develop. Constr. Dept, Hokkaido Develop. Bu.)

Panel Discussion: Learn about Self-help and Mutual Help

Tuesday 20 February — **Mombetsu Arts & Culture Center**

【3F Special Conference Room】

9:00-12:35 **Workshop H : Sea Ice and Waves: from the MIZ to the Fast Ice**

13:30-17:50 **Workshop I : Recent Advances in the Antarctic and Arctic Climate Research**

13:30-14:30 **Scientific Session J : Cold Region Engineering** 【3F Meeting Room】

12:30-13:00 **P : Poster Session** 【3F Lobby】

Mombetsu Municipal Museum

9:00-11:50 **Scientific Session K : Marine Biology and Fisheries in the Ice-Covered Waters**

13:30-15:40 **Workshop L : Appearances of Plankton in Cold Waters and their Ecology**

15:50-17:50 **Workshop M : Recent Research Towards Sustainable Management of Pacific Salmon in the Coastal Area of the Sea of Okhotsk**

[Keynote Speech]

M-1 Research and development of supporting system for sustainable use of salmon resource under changing climate using multiple satellite datasets
Sei-Ichi Saitoh (Hokkaido University/Digital Hokkaido/Green & Life Innovation, Inc.,)

Wednesday 21 February — **Mombetsu Arts & Culture Center**

【1F Main Hall】

11:00-11:30 **Prize-awarding Ceremony of the Aota Masaaki Award**

(in Japanese language only)

14:00-16:00 **Public Program : Symposium on the Forest-Ocean Linkage**

Ⅰ. Thoughts of a graduate of Hokkaido College of Northern Forestry
~What newly recruited employees want from Hokkaido's forestry industry ~
Shouji Ogasawara (Hokkaido Okhotsk General Subpref. Bu.)

Ⅱ. Foresters in Central European countries nurturing rich forests
-7 ideas to make forestry an attractive career
Mikihiro Nakamura（Gifu Pref. Kamo Region Agric. Forestry Office）

【3F Special Conference Room】

9:00-16:40 **Workshop N : Sea Ice Variations and their Impacts on the Biogeochemical Cycles**

16:40-17:00 **Closing Session**

- A Review of the Symposium
- Closing Remarks, Shuhei Takahashi (Chair of the Symposium Committee)

Wednesday 21 February **Mombetsu Municipal Museum**

(in Japanese language only)

13:30-17:10 **Public Program：The Okhotsk Terroir Symposium 2024 in Mombetsu**

Part 1 **Keynote Speech,** What Okhotsk culture has left behind

Part 2 **Lecture,** Experience of sustainable life by recycling things around us in the Okhotsk

Part 3 **Free discussion,** The future and possibilities of Okhotsk Tourism as seen from Okhotsk culture Japan's new legacy project: Okhotsk Ruins Road Project

Mombetsu Citizens' Public Hall

13:10-14:30 **Symposium on Sea Ice for Children** *(in Japanese language only)*

Ⅰ. Drift ice in the Sea of Okhotsk and the global environment
Shuhei Takahashi (Okhotsk Sea Ice Museum)

Ⅱ. The land of snow and ice: Winter life in the heart of Eurasia
Marina Lomaeva (Univ. Hokkaido)

Ⅲ. Drift Ice Quiz

Monday 19 - Wednesday 21 February **Mombetsu Arts & Culture Center**

Observation Equipment Technology Exhibition **【1F Lobby】**

【3F Lobby】

Demonstration：Envisioning Future Globe through Understanding the Arctic: The Challenge of the Arctic Trans-Disciplinary Community of Practice

-Let's think the future of the Arctic together-

by Arctic Research Center, Hokkaido University

The Arctic Trans-Disciplinary Community of Practice brings together researchers, government officials, business people, NPOs, students in various fields on a regular basis to share different views and exchange perspectives about complex environmental and social economic changes in the Arctic region and their impacts on the entire globe including Japan.

We exhibit our reports and audio-visual materials created through our workshops. We hope that visitors broaden their interest on the Arctic and have an opportunity to deepen considerations on the connection between the Arctic and the globe.

Tuesday 20 February **Hotel Okhotsk Palace**

19:00～20:30 **Dinner Party for Friendship between Scientists & Volunteers**

Saturday 10 - Thursday 29 February **Okhotsk Sea Ice Museum**

Sponsorship Event

Drift-ice Textile Exhibition

Monday 19 Feb. 2024

Arts & Culture Center, 1F Hall

9:00	**【Opening Session】** Chair, Seiji Katakura (City of Mombetsu) Opening Address: Shuhei Takahashi (Chair of the Symposium Committee)
	【A：Keynote Speech】 Chair, Shuhei Takahashi (Okhotsk Sea Ice Museum)
9:10	**A-1** Climate-driven shifts of marine biodiversity in the Arctic waters ○Irene D. Alabia, Jorge Garcia Molinos, Takafumi Hirata (Hokkaido Univ.), Franz J. Mueter (Univ. Alaska Fairbanks, USA) and Carmen L. David (Wageningen Univ. Res., Netherlands)
9:50	**A-2** Development of Russia's Northern Sea Route in the context of climate change and international tension Arild Moe (Fridtjof Nansen Inst., Norway)
10:30	Break
	【B：Meteorology and Climate】 Chair, Kazutoshi Sato (NIPR/SOKENDAI)
10:40	**B-1** Intra-seasonal and interannual variations in snowfall and rainfall during winter in Rikubetsu, inland Hokkaido, Japan ○Naohiko Hirasawa (NIPR/SOKENDAI) and Hiroyuki Konishi (Osaka Kyoiku Univ.)
11:00	**B-2** Development of a monitoring system for forecasting the occurrence of superior mirage ○Kazutaka Tateyama, Tomoko Sato, Minoru Hasegawa and Kento Imaizumi (Kitami Inst. Tech.)
11:20	**B-3** ENSO: Research history of "equilibrium of imbalances" Solving the "temperature-pressure" relationship on the Earth's surface ○Takao Nakajin (Tokai Univ.)
11:40	Lunch
	【C：Workshop, Sustainable Arctic Sea Routes in a Rapidly Changing Environment】
13:30	**Introduction:** Akihisa Konno (Kogakuin Univ.) Chair, Akihisa Konno (Kogakuin Univ.)
13:35	**C-1** Maritime route choice in computational general equilibrium model -Application in the case of Artic shipping- ○Trang Tran and Ryuichi Shibasaki (Univ. Tokyo)
13:50	**C-2** Model-based evaluation of future utilization of Northern Sea Route for technology roadmapping ○☆**A** Kazunari Morikami, Ryota Wada, Ryuichi Shibasaki (Univ. Tokyo) and Natsuhiko Otsuka (Hokkaido Univ.)
14:05	**C-3** Impact analysis of Arctic shipping routes by the multi-commodity global logistics intermodal network simulation model ○☆**A** Koki Kawachi, Ryuichi Shibasaki, Naoki Kosuge (Univ. Tokyo) and Chathumi Ayanthi Kavirathna (Univ. Kelania, Sri Lanka)
14:20	**C-4** Investigation of beset incidents in the Northern Sea Route by risk index and sea ice convergence ○Natsuhiko Otsuka and Shotaro Uto (Hokkaido Univ.)
14:35	**C-5** Mid-term Arctic sea ice forecast in 2023 ○Motomu Oyama, Hajime Yamaguchi (NIPR) and Noriaki Kimura (Univ. Tokyo)
14:50	Break
	Chair, Natsuhiko Otsuka (Hokkaido Univ.)
15:05	**C-6** Preliminary assessment of Arctic oil spill response viability using high-resolution metocean data ○Takatoshi Matsuzawa (Natl. Mar. Res. Inst.), Akihisa Konno (Kogakuin Univ.) and Motomu Oyama (NIPR)
15:20	**C-7** Experimental study on the flexural strength of saline ice ○Junji Sawamura (Osaka Univ.), Toshihiro Ozeki (Hokkaido Univ. Educ. Sapporo) and Shinji Kioka (Civil Eng. Res. Inst. Cold Region)
15:35	**C-8** A method for detecting deformed ice using image recognition techniques for Sentinel-1 SAR images ○Kentaro Ono and Akihisa Konno (Kogakuin Univ.)
15:50	**C-9** Exploration of methods for utilizing sea ice motion information to estimate sea ice conditions in coastal areas ○☆**A** Akuto Kaneko and Akihisa Konno (Kogakuin Univ.)
16:05	Break

○☆**A** The Aota Masaaki Award Candidate

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【C：Workshop, Sustainable Arctic Sea Routes in a Rapidly Changing Environment】

Chair, Takatoshi Matsuzawa (Natl. Mar. Res. Inst.)

16:20 **C-10** Evaluation of fluid forces on an ice piece downstream of packed ice floes: Numerical analysis with OpenFOAM and comparison to basin experiments
○Shun Nemoto, Akihisa Konno (Kogakuin Univ.), Daisuke Kitazawa and Jinxin Zhou (Univ. Tokyo)

16:35 **C-11** Flow analysis with solid collision around ships and ice pieces using the incompressible smoothed particle hydrodynamics
○Kaisei Koshiishi and Akihisa Konno (Kogakuin Univ.)

16:50 **C-12** Estimation of water spray particle size distribution at the ship bow for ship hull icing assessment
○Kentaro Suizu and Akihisa Konno (Kogakuin Univ.)

17:05 **C-13** Laboratory experiments on spray icing with urea-doped water using flat and cylindrical specimens
○Toshihiro Ozeki (Hokkaido Univ. Educ. Sapporo), Takatoshi Matsuzawa (Natl. Mar. Res. Inst.), Shingo Nomura (Hokkaido Univ. Educ. Sapporo), Satoru Adachi (Snow Ice Res. Ctr.), Taiki Tokudome and Akihisa Konno (Kogakuin Univ.)

Monday 19 Feb.

Mombetsu Arts & Culture Center, 3F Meeting Room

【D：Workshop, Feasibility and Perspective of the Arctic Shipping, Today and Future (Organized by HAI-FES Project)】 Chair, Yuji Kodama (Hokkaido Univ.)

10:40 **D-1** Current status of the Northern Sea Route by satellite AIS observation
○Kjell Stokvik (Nord Univ., Norway)

10:55 **D-2** Possible environmental risk due to the navigation along the Northern Sea Route
○Natsuhiko Otsuka (Hokkaido Univ.)

11:10 **D-3** Feasibility and perspective of the Arctic shipping, today and future -Navigability perspective-
○Shotaro Uto (Hokkaido Univ.)

11:25 **D-4** Feasibility of the Arctic shipping from the economic and maritime logistics perspective
○Ryuichi Shibasaki (Univ. Tokyo)

11:40 **D-5** Arctic geopolitics and its developments: The impacts of the Ukrainian War
○Fujio Ohnishi (Hokkaido Univ.)

11:55 **D-6** How Japan's scientific community has been tackling with the rapid change of the Arctic? -Perspective from the ArCS II project-
○Hiroyuki Enomoto (NIPR)

12:10 Discussion

12:30 Lunch

【E：Snow, Ice and Human Life】 Chair, Kei Horio (Utsunomiya Univ.)

13:30 **E-1** Frederick William Beechey's Narrative of the Voyage of the *Blossom* to the Pacific and the Arctic
○Gaston Demarée (Royal Meteorological Inst. Belgium, Belgium) and Yoshio Tagami (Univ. Toyama)

13:50 **E-2** Improving winter life in Hokkaido: Proposals by Nitobe College Graduate Program students and collaboration with the regional and municipal governments
○Marina Lomaeva, Artem Suslov (Hokkaido Univ.), Tatsuo Nakajima (Hokkaido Govt.), Juha Saunavaara and Atsushi Miura (Hokkaido Univ.)

14:10 **E-3** Impact of climate change on environment and society in northwest Greenland: Incorporate indigenous perspectives to better understand the changing climate
○☆**A** Monica Ogawa, Ryo Kusaka, Yuta Sakuragi, Shin Sugiyama (Hokkaido Univ.) and Yoko Mitani (Kyoto Univ.)

14:30 **E-4** Arctic convoys and Polar Seas in Soviet and British military naval fiction
○☆**A** Artem Suslov (Hokkaido Univ.)

14:50 **E-5** Snow Power generation in cold region -The potential of Stirling Engines for cold climate disasters-
○☆**A** Rikuto Kano, Kouki Toyama and Muhammad Najib Bin Roslan (Utsunomiya Univ.)

15:10 Break

○☆**A** The Aota Masaaki Award Candidate

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	【E：Snow, Ice and Human Life】 Chair, Marina Lomaeva (Hokkaido Univ.)
15:20	**E-6** The efficiency of exothermic reaction of aluminium and quicklime (calcium oxide) -Monozukuri PBL for cold region disaster preparedness- ○☆**A** Kosuke Kushibiki, Naoto Asakura and Dalilati Afiqah Binti Che Azhar (Utsunomiya Univ.)
15:40	**E-7** The intersection of aesthetic practice and scientific practice: Possibilities explored through the artwork 'Drifting Scenery' with the theme of drift ice ○☆**A** Hyunjung Park (Hokkaido Univ.)
16:00	**E-8** Characteristics and effects of wet snow in severe winter season in Hokkaido, Japan ○☆**A** Hina Ishii and Tatsuo Shirakawa (Kitami Inst. Tech.)
16:20	**E-9** Mechanism of utilizing snow and ice of Torne River in ICEHOTEL creation in the Arctic ○Takafumi Fukuyama (Hokkaido Univ.)
16:40	**E-10** Learning the Arctic through the board game: An educational tool for experiencing the changing Arctic ○Hajime Kimura (JAMSTEC)
17:00	Arctic Board Game

Monday 19 Feb.

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	【F：Sea Ice Measurement and Observation】 Chair, Kazutaka Tateyama (Kitami Inst. Tech.)
13:30	**F-1** New method for estimating sea ice age ○Noriaki Kimura and Hiroyasu Hasumi (Univ. Tokyo)
13:50	**F-2** Sea ice conditions in the Sea of Okhotsk in the 2022/2023 winter season ○Naoto Hori, Hideki Kaneko, Keiji Hamada and Yuji Akasaka (Japan Meteorological Agcy.)
14:10	**F-3** On the applicability of the LiDAR video fusion sensor to sea ice observation ○Shotaro Uto, Koh Izumiyama (Hokkaido Univ.), Hroki Okada, Yoshiteru Takayama, Susumu Kashiwase and Masanori Annoura (KYOCERA Corp.)
14:30	Break
14:40	**F-4** The possibilities of UAVs with multispectral camera and autonomous driving Rover ○Kanichiro Matsumura (Tokyo Univ. Agric.) and Vitaly Kuzin (Nizhny Novgorod State Tech. Univ. n.a. R. E. Alekseev, Russia)
15:00	**F-5** On methods for solving inverse problems in spectroellipsometry and spectrophotometry ○Ferdenant Mkrtchyan (Kotelnikov Inst. Radioengineering Electronics, Russia)
15:20	Break
	【G：Oceanography】 Chair, Shotaro Uto (Hokkaido Univ.)
15:30	**G-1** On the distribution of pollutants in the Arctic Basin ○Ferdenant Mkrtchyan (Kotelnikov Inst. Radioengineering Electronics, Russia)
15:50	**G-2** Features of hydrological conditions of the Sea of Okhotsk in the spring and fall periods of 2023 ○Egor Yurevich Malygin (Russian Federal Res. Inst. Fish, Oceanography, Russia)
16:10	**G-3** Microplastics baseline study in the Sea of Okhotsk ○Alexandra Ershova, Valeriia Proschakova and Ekaterina Golubeva (Russian State Hydrometeorological Univ., Russia)
16:30	**G-4** Tidal oscillation expands the wintertime mixed layer region over the Bering Sea ○Hung-Wei Shu (JAMSTEC), Humio Mitsudera, Tomohiro Nakamura (Hokkaido Univ.), Hiroaki Tatebe, Satoshi Osafune (JAMSTEC), Shinichiro Kida (Kyushu Univ.), Tomonori Azumaya (Japan Fish. Res. Educ. Agcy.) and Shinya Kouketsu (JAMSTEC)
16:50	**G-5** Features of tidal exchange in the Kuril Straits based on modeling data ○Vsevolod Ilyich Ilin and Victor Semyonovich Arkhipkin (Moscow State Univ., Russia)
17:10	**G-6** Features of ice conditions in the Bering Sea as extension of the NSR in 2004 -2022 ○Evgeniya Pavlova (Arctic Antarctic Res. Ins., Russia), Tatiana Alekseeva (Arctic Antarctic Res. Inst., Russia/Space Res. Inst., Russia) and Alexander Yulin (Arctic Antarctic Res. Inst., Russia)

*Underlined title-numbers show Online Presentations

○☆**A** The Aota Masaaki Award Candida

【H：Workshop, Sea Ice and Waves: from the MIZ to the Fast Ice】

9:00 **Introduction:** Takuji Waseda (Tokyo Univ.) Chair, Tsubasa Kodaira (Tokyo Univ.)

9:05 **H-1** Direct observation of submesoscale and mesoscale eddies by ocean surface drifters near the sea ice edge in the Canada Basin, Arctic Ocean
○Tsubasa Kodaira (Tokyo Univ.), Takuji Waseda (Tokyo Univ./JAMSTEC), Tomotaka Katsuno (Tokyo Univ.), Masafumi Kimizuka (Tokyo Metropolitan Coll. Indus. Tech.), Yasushi Fujiwara (Kobe Univ.), Takehiko Nose, Yusuke Kawaguchi (Tokyo Univ.) and Amane Fujiwara (JAMSTEC)

9:25 **H-2** Observation and model estimation of ocean wind wave development under the off-ice wind conditions in the Arctic Ocean
○☆**A** Tomotaka Katsuno, Takehiko Nose, Tsubasa Kodaira (Univ. Tokyo) and Takuji Waseda (Univ. Tokyo/JAMSTEC)

9:45 **H-3** Spatial patterns and origins of sediment-laden ice in the Arctic: A remote sensing approach
○Amane Fujiwara (JAMSTEC), Noriaki Kimura (Univ. Tokyo), Hisatomo Waga (NIPR/Univ. Alaska Fairbanks, USA) and Satoshi Kimura (JAMSTEC)

10:05 **H-4** Sea-ice deformation in submesoscale and below in melting season
○Satoshi Kimura (JAMSTEC), Jinro Ukita (Univ. Tokyo), Amane Fujiwara and Takashi Kikuchi (JAMSTEC)

10:25 **H-5** Sea-ice deformations derived from Sentinel-1 & RADARSAT Satellite Mission SAR imagery
○Mathieu Plante, Jean-François Lemieux (Environ. Changement Climatique Canada, Canada), L. Bruno Tremblay, Amélie Bouchat, Damien Ringeisen (McGill Univ., Canada), Philippe Blain (Service Météorologique Canadien, Canada), Stephen Howell, Mike Brady, Alexander Komarov (Environ. Climate Change Canada, Canada), Béatrice Duval, Lekima Yakuden and Frédérique Labelle (McGill Univ., Canada)

10:45 Break

Chair, Takuji Waseda (Univ. Tokyo)

10:55 **H-6** Deformation of fast-ice prior to the 2023 ice breakup event in the Lützow-Holm Bay
○Takuji Waseda (Univ. Tokyo), Kazutaka Tateyama (Kitami Inst. Tech.), Ryosuke Uchiyama, Takehiko Nose, Tsubasa Kodaira, Tomotaka Katsuno (Univ. Tokyo), Takeshi Tamura (NIPR), Takenobu Toyota (Hokkaido Univ.), J. Rebault (Met., Norway, Norway), M. Hoppmann (Alfred-Wegener-Inst., Norway) and Daisuke Shimizu (NIPR)

11:15 **H-7** Fluctuations in distribution, type and thickness of sea ice off the Lützow-Holm Bay, East Antarctica
○Kazutaka Tateyama (Kitami Inst. Tech.), Takuji Waseda, Ryosuke Uchiyama (Univ. Tokyo) and Yuji Yoshida (Kitami Inst. Tech.)

11:35 **H-8** Attenuation of nonlinear water waves in the marginal ice zone
Alberto Alberello, ○Emilian Parau, Ben Humphries (Univ. East Anglia, UK) and Amin Chabchoub (Kyoto Univ./Univ. Sydney, Australia)

11:55 **H-9** Unstable wave dynamics in sea ice
Alberto Alberello, Emilian Parau (Univ. East Anglia, UK) and ○Amin Chabchoub (Kyoto Univ./Univ. Sydney, Australia)

12:15 **H-10** Research on spectral downshifting of waves propagating under sea ice
○☆**A** Koya Sato (Univ. Tokyo), Takuji Waseda (Univ. Tokyo/JAMSTEC), Tsubasa Kodaira (Univ. Tokyo), Yasushi Fujiwara (Kobe Univ.), Takehiko Nose and Tomotaka Katsuno (Univ. Tokyo)

12:35 Lunch [Poster Session, Coretime：12:30-13:00, Mombetsu Arts & Culture Center 3F Lobby]

○☆**A** The Aota Masaaki Award Candidate

【I：Workshop, Recent Advances in the Antarctic and Arctic Climate Research】

13:30 **Introduction:** Jun Inoue (NIPR/SOKENDAI) Chair, Jun Inoue (NIPR/SOKENDAI)

13:35 **I-1** Precipitation observation by X-band doppler radar at Syowa Station, Antarctica
○Katsushi Iwamoto (City of Mombetsu), Hiroyuki Konishi (Osaka Kyoiku Univ.), Naohiko Hirasawa (NIPR) and Yasushi Fujiyoshi (Hokkaido Univ.)

13:50 **I-2** Supercooled liquid water clouds in the mid-troposphere over the Southern Ocean
○Jun Inoue, Kazutoshi Sato (NIPR/SOKENDAI) and Shingo Shimizu (Natl. Res. Inst. Earth Sci. Disaster Resilience)

14:05 **I-3** Ice cloud formation related to oceanic supply of ice-nucleating particles: A case study in the Southern Ocean near an atmospheric river in late summer
○Kazutoshi Sato and Jun Inoue (NIPR/SOKENDAI)

14:20 **I-4** The climatological characteristics of atmospheric rivers observed in the 64th Japanese Antarctic Research Expedition
○☆**A** Kazu Takahashi (SOKENDAI), Kazutoshi Sato, Naohiko Hirasawa and Jun Inoue (NIPR/SOKENDAI)

14:35 **I-5** Analysis of short-term sea ice fluctuations occurring at Lützow-Holm Bay in JARE 64
○Yuji Yoshida and Kazutaka Tateyama (Kitami Inst. Tech.)

14:50 Break

Chair, Koji Shimada (Tokyo Univ. Mar. Sci. Tech.)

15:05 **I-6** Introduction of R/V MIRAI polar research cruises and the evolution of its support information
○Souichiro Sueyoshi (Nippon Mar. Enterprises, Ltd.)

15:20 **I-7** Impact of wildfire over western Canada on Arctic ice cloud formation: A case study in the Arctic Ocean near an atmospheric river in early autumn
○Kazutoshi Sato and Jun Inoue (NIPR/SOKENDAI)

15:35 **I-8** Forecasts of an Arctic cyclone in September 2018 by multi-resolution coupled atmosphere–ocean predictions
○Akio Yamagami (Ctr. Environmental Sci, Saitama/Meteorological Res. Inst.), Takahiro Toyoda, Shogo Urakawa, Hideyuki Nakano, Eiki Shindo, Hiromasa Yoshimura, Yuma Kawakami, Kei Sakamoto (Meteorological Res. Inst.), Takuya Nakanowatari (Japan Fish. Res. Educ. Agcy.), Hung Wei Shu (JAMSTEC) and Goro Yamanaka (Meteorological Res. Inst.)

15:50 **I-9** Regime shift and variations of sea ice outflow velocities through the Fram Strait
○Koji Shimada, Wakana Sawada, Rin Harada, Kohei Hayakawa (Tokyo Univ. Mar. Sci. Tech.) and Eri Yoshizawa (JAXA)

16:05 **I-10** Impact of freshwater outflow from the Ob-Yenisei River on sea ice area in the Barents-Kara Sea
○☆**A** Takumi Yano and Koji Shimada (Tokyo Univ. Mar. Sci. Tech.)

16:20 Break

Chair, Eun Yae Son (Univ. Tokyo)

16:35 **I-11** Enhanced turbulent mixing associated with lee wave generation over rough topography in the Chukchi Borderland, Arctic Ocean
○☆**A** Eun Yae Son and Yusuke Kawaguchi (Univ. Tokyo)

16:50 **I-12** A parameterization of the ice-ocean drag coefficient depending on the roughness of sea ice floes
○☆**A** Rin Harada and Koji Shimada (Tokyo Univ. Mar. Sci. Tech.)

17:05 **I-13** Sensitivity experiments of sea ice thickness category parameterization in an OGCM
○Takahiro Toyoda, L. Shogo Urakawa, Kei Sakamoto, Yuma Kawakami, Kunihiro Aoki and Hideyuki Nakano (Meteorological Res. Inst.)

17:20 **I-14** Modeling on future changes in the Arctic Ocean interior associated with the sea-ice reduction in a low-resolution ice-ocean coupled model
○Jun Ono, Yoshiki Komuro (JAMSTEC) and Takao Kawasaki (Univ. Tokyo)

17:35 Discussion

○☆**A** The Aota Masaaki Award Candidate

Tuesday 20 Feb. 2024

Arts & Culture Center, 3F Lobby

12:30	**【P：Poster Session】**
|	**P-1** The cumulative amount of drift ice in Okhotsk Mombetsu and the secular change in ice formation in the port ○Katsushi Murai (Mombetsu Mar. School)
13:00	**P-2** Estimating sea ice thickness of drift ice and fast ice in coastal areas by means of UAV-SfM photogrammetry ○Yuki Ouchi, Kazutaka Tateyama and Tatsuya Watanabe (Kitami Inst. Tech.)
	P-3 Relationship between wind direction and differences in snow accumulation in heavy snowfall areas and non-heavy snowfall areas ○Ryo Yamamoto and Yoshihiro Tachibana (Mie Univ.)
	【Extra】 Intra-seasonal and interannual variations of sea ice along the Okhotsk coast of Hokkaido from the viewpoint of atmospheric circulation Yuki Asazuma, Masaya Kuramochi and Hiroaki Ueda (Univ. Tsukuba)

Tuesday 20 Feb.

Mombetsu Arts & Culture Center, 3F Meeting Room

	【J：Cold Region Engineering】 Chair, Keisuke Anzai (Japan Mar. United Corp.)
13:30	**J-1** Simulation of ice sheet transport during tsunami event inside river channels using a particle method ○☆**A** Takaaki Abe and Hiroya Ogushi (Civil Engineering Res. Inst. Cold Region)
13:50	**J-2** Numerical estimation of ship resistance in drift ice fields using Bullet physics engine ○Keisuke Anzai, Shigeya Mizuno and Yutaka Yamauchi (Japan Mar. United Corp.)
14:10	**J-3** How does a year-round gyre and the related middle layer upwelling form in the northwest Gulf of Alaska? ○Yuan Nan and Humio Mitsudera (Hokkaido Univ.)
14:30	Break

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	【K：Marine Biology and Fisheries in the Ice-Covered Waters】 Chair, Junya Hirai (Univ. Tokyo)
9:00	**K-1** Ten-year changes in the distribution of eelgrass beds in Lake Notoro using a quantitative echo sounder ○☆**A** Ito Keizo (Hokkaido Univ.), Shiori Sonoki (Kushiro Fish. Res. Inst.), Kenji Minami, Yanhui Zhu (Hokkaido Univ.), Susumu Chiba, Hiroyuki Matsumoto (Tokyo Univ. Agric.), and Kazushi Miyashita (Hokkaido Univ.)
9:20	**K-2** Local heatwaves affect behavior and physiology of *Pandalus latirostris* in subarctic seagrass beds -Local heatwaves affect *Pandalus latirostris*- ○☆**A** Hiroyuki Matsumoto, Shun Ochiai, Noriko Azuma and Susumu Chiba (Tokyo Univ. Agric.)
9:40	**K-3** Seasonal changes in fish communities in the Okhotsk Sea coast of Hokkaido inferred from environmental DNA analysis ○☆**A** Takuma Yonago, Tatsuya Kawakami (Hokkaido Univ.), Hitomi Yoshida (Okhotsk Garinko & Tower), Seiji Katakura (City of Mombetsu), Tomoyasu Yamazaki (Rankoshi Town), Takashi Kuwahara (Okhosk Sea Ice Museum), Yoshizumi Nakagawa (Tokyo Univ. Agric.) and Akihide Kasai (Hokkaido Univ.)
10:00	**K-4** The artificial reef effect on fish at the Okhotsk Tower ○Yukinori Nakane (Central Res. Inst. Electric Power Indus.), Seiji Katakura, Katsushi Iwamoto (City of Mombetsu), Yuta Urabe (Okhotsk Garinko Tower) and Seiya Abe (Central Res. Inst. Electric Power Indus.)
10:20	Break
	Chair, Irene Alabia (Hokkaido Univ.)
10:30	**K-5** Comparative analysis of age determination methods for giant grenadier (*coryphaenoides pectoralis*) based on different age-recording structures of scales and otoliths ○Andrey I. Alferov, Oleg Z. Badaev and Alina.O. Erulina (Russian Federal Res. Ins. Fish. Oceanography, Russia)
10:50	**K-6** Spatial distribution of seals during summer in Inglefield Bredning, northwestern Greenland ○☆**A** Yuta Sakuragi, Monica Ogawa, Mayuko Otsuki, Jean-Baptiste Thiebot, Yefan Wang, Shin Sugiyama (Hokkaido Univ.) and Yoko Mitani (Kyoto Univ.)
11:10	**K-7** Marine mammal conservation and management in the North Pacific: The case of the northern fur seal, with a focus on Japan and Russia ○Marina Lomaeva (Hokkaido Univ.), Yoko Mitani (Kyoto Univ.), Juha Saunavaara (Hokkaido Univ.) and Tatsuo Nakajima (Hokkaido Government)
11:30	**K-8** Stable isotope ratios in minke whale baleen in the Sea of Okhotsk ○Yoko Mitani, Heping Li (Kyoto Univ.), Monica Ogawa, Shiho Furumaki, Yuta Sakuragi (Hokkaido Univ.), Takeharu Bando and Tsutomu Tamura (Inst. Cetacean Res.)
11:50	Lunch [Poster Session, Coretime：12:30-13:00, Mombetsu Arts & Culture Center 3F Lobby]

*Underlined title-numbers show Online Presentations

○☆**A** The Aota Masaaki Award Candidate

【L：Workshop, Appearances of Plankton in Cold Waters and their Ecology】

Chair, Satoshi Nagai (Japan Fish. Res. Educ. Agcy.)

13:30 **L-1** Exploring small eukaryotes by eDNA analysis in marine sediments in the Arctic region
○Satoshi Nagai (Japan Fish. Res. Educ. Agcy.), Minoru Kobayashi, Masanori Arai and Masanobu Yamamoto (Hokkaido Univ.)

13:50 **L-2** Differences in phytoplankton assemblages and their controlling factors in the southern Sea of Okhotsk between winter and spring
○Yanxu Sun, Jun Nishioka, Takenobu Toyota and Koji Suzuki (Hokkaido Univ.)

14:10 **L-3** Differentially expressed genes associated with food availability in *Neocalanus plumchrus* (Calanoida: Copepoda)
○☆**A** Takuya Ohnishi, Yukiko Taniuchi and Hiromi Kasai (Japan Fish. Res. Educ. Agcy.)

14:30 Break

14:40 **L-4** The occurrence of *Gyrodinium* species (Dinophyceae) in the Indian sector of the Southern Ocean
○☆**A** Ryo Matsuda (Soka Univ.), Keigo D. Takahashi (Soka Univ./NIPR), Masayoshi Sano (NIPR), Ryosuke Makabe (NIPR/ SOKENDAI/ Tokyo Univ. Mar. Sci. Tech.), Shintaro Takao (Natl. Inst. Environmental Studies), Masato Moteki (NIPR/ Tokyo Univ. Mar. Sci. Tech.) and Norio Kurosawa (Soka Univ.)

15:00 **L-5** Metabarcoding analysis of zooplankton communities during a period of sea ice in the Okhotsk Sea
○Junya Hirai (Univ. Tokyo), Seiji Katakura (City of Mombetsu), Hiromi Kasai (Japan Fish. Res. Educ. Agcy.), Nakako Tamamushi (Univ. Tokyo) and Satoshi Nagai (Japan Fish. Res. Educ. Agcy.)

15:20 **L-6** Biological response of scallop larvae to different *p*CO2 concentrations in seawater
○Katsunori Kimoto, Masahide Wakita (JAMSTEC), Keisuke Shimizu (Waseda Univ.), Takashi Yusa (Aomori Pref. Indus. Tech. Res. Center), Masahiko Fujii (Univ. Tokyo) and Shinichi Takabatake (Wakkanai Fish. Res. Inst.)

15:40 Break

【M：Workshop, Recent Research Towards Sustainable Management of Pacific Salmon in the Coastal Area of the Sea of Okhotsk】

Chair, Hayato Saneyoshi (Salmon Freshwater Fish Res. Inst.)

[Keynote Speech]

15:50 **M-1** Research and development of supporting system for sustainable use of salmon resource under changing climate using multiple satellite datasets
○Sei-Ichi Saitoh (Hokkaido Univ./Digital Hokkaido/Green & Life Innovation, Inc.,)

16:20 **M-2** Recent status of chum salmon and pink salmon stocks in the Okhotsk area
○Hayato Saneyoshi, Yosuke Koshino and Kyosuke Kuraya (Salmon Freshwater Fish. Res. Inst.)

16:40 Break

16:50 **M-3** Characteristics of juvenile chum salmon off the coast of Hokkaido in the southern Sea of Okhotsk
○Kiyoshi Kasugai, Yosuke Koshino, Kazutaka Shimoda (Salmon Freshwater Fish. Res. Inst.) and Ryotaro Ishida (Kushiro Fish. Res. Inst.)

17:10 **M-4** Effects of dam and fishway constructions on stream-dwelling salmonids: A lesson from a tributary of the Tokoro River basin, Hokkaido, Japan
○☆**A** Sho Fukui, Yusuke Obata, Kaisei Iba and Kenta Shiraishi (Tokyo Univ. Agric.)

17:30 **M-5** Spawning escapement of wild salmon in the Okhotsk coastal area
○☆**A** Yosuke Koshino (Salmon Freshwater Fish. Res. Inst.), Takashi Mori (Shari Town) and Yasuyuki Miyakoshi (Kitami Salmon Enhance Program Assoc.)

○☆**A** The Aota Masaaki Award Candidate

	【N：Workshop, Sea Ice Variations and their Impacts on the Biogeochemical Cycles】
9:00	**Introduction:** Jun Nishioka (Hokkaido Univ.) Chair, Jun Nishioka (Hokkaido Univ.)
9:05	**N-1** Warm conveyor belt and warm currents causing the retreat of sea ice along the coast of the Sea of Okhotsk ○☆**A** Youichi Kamae and Mone Yokota (Univ. Tsukuba)
9:25	**N-2** Atmospheric phenomena reducing sea ice extent in the southern Sea of Okhotsk in March 1998 ○☆**A** Mone Yokota and Youichi Kamae (Univ. Tsukuba)
9:45	**N-3** Sea ice melting associated with vertical mixing driven by extratropical cyclones in the Sea of Okhotsk ○☆**A** Yuka Sawa, Tatsuro Karaki, Hiroaki Ueda (Univ. Tsukuba), Ryu Saiki, Humio Mitsudera (Hokkaido Univ.) and Hiroshi Kuroda (Japan Fish. Res. Educ. Agcy.)
10:05	Break
11:00	**【Prize-awarding Ceremony of the Aota Masaaki Award】** The place for the Award Ceremony is the hall on the first floor
12:00	Lunch
	Chair, Jun Nishioka (Hokkaido Univ.)
13:00	**N-4** Numerical modeling study on sea ice iron flux in the Sea of Okhotsk ○Takuya Nakanowatari (Japan Fish. Res. Educ. Agcy.), Eiji Watanabe (JAMSTEC), Tomohiro Nakamura, Jun Nishioka and Humio Mitsudera (Hokkaido Univ.)
13:20	**N-5** Outline of field observations during winter in seasonal sea ice area in Siorapaluk, Greenland ○Sumito Matoba, Yoshinori Iizuka, Yuzo Miyazaki (Hokkaido Univ.), Keiichiro Hara (Fukuoka Univ.), Takayuki Kuramoto (Tokai Univ.), Yutaka Kurosaki, Mai Matsumoto (Hokkaido Univ.), Tetsuhide Yamasaki (Avangnaq) and Teruo Aoki (NIPR)
13:40	**N-6** Characteristics of water masses and nutrient properties in the southern Sea of Okhotsk ○Jun Nishioka, Takenobu Toyota, Youhei Yamashita, Koji Suzuki, Aiko Murayama, Kazuya Ono, Tomohiro Nakamura, Kay I. Ohshima and Humio Mitsudera (Hokkaido Univ.)
14:00	Break
	Chair, Sumito Matoba (Hokkaido Univ.)
14:10	**N-7** Ocean monitoring and ship observations around Shiretoko: 2 ○Tomohiro Nakamura (Hokkaido Univ.), Takahiro Nobetsu (Shiretoko Nature Foundation), Hiroshi Shimada, Tadashi Misaka (Kushiro Fish. Res. Inst.), Jun Nishioka (Hokkaido Univ.), Yoko Mitani (Kyoto Univ.), Orio Yamamura and Humio Mitsudera (Hokkaido Univ.)
14:30	**N-8** Long-term variability of water masses in the southern Okhotsk Sea using public and unpublished data ○Kaoru Ito, Tomohiro Nakamura (Hokkaido Univ.) and Tadashi Misaka (Kushiro Fish. Res. Inst.)
14:50	**N-9** Difference of pre-conditioning between heavy-ice-year and light-ice year in the Okhotsk Sea ○Ryu Saiki, Humio Mitsudera (Hokkaido Univ.), Takuya Nakanowatari, Hiroshi Kuroda (Japan Fish. Res. Educ. Agcy.), Tomoshige Inoue, Hiroaki Ueda (Univ. Tsukuba) and Katsushi Iwamoto (City of Mombetsu)
15:10	**N-10** Prediction of sea ice variations off Hokkaido in the southern Sea of Okhotsk ○Humio Mitsudera, Ryu Saiki (Hokkaido Univ.), Tomoshige Inoue, Hiroaki Ueda (Univ. Tsukuba), Takuya Nakanowatari and Hiroshi Kuroda (Japan Fish. Res. Educ. Agcy.)
15:30	Break
	Chair, Tomohiro Nakamura (Hokkaido Univ.)
15:40	**N-11** Iron supply processes in the southern Sea of Okhotsk ○Momoka Imai, Aiko Murayama, Kazuya Ono, Youhei Yamashita, Koji Suzuki, Tomohiro Nakamura, Kay I. Ohshima, Humio Mitsudera and Jun Nishioka (Hokkaido Univ.)
16:00	**N-12** Assessment of primary production processes in the southern Sea of Okhotsk: A combined analysis using modelling, satellite remote sensing, and in-situ observation data ○Yuki Tanoue (Hokkaido Univ.), Pat Wongpan, Peter Strutton (Univ. Tasmania, Australia), Yuri Fukai (Hokkaido Univ./JAMSTEC), Takenobu Toyota, Jun Nishioka and Koji Suzuki (Hokkaido Univ.)
16:20	**N-13** Continuous measurement of atmospheric organic aerosols and relevant parameters at the Mombetsu Okhotsk Tower ○Yuzo Miyazaki, Eri Tachibana (Hokkaido Univ.), Hitomi Yoshida (Okhotsk Garinko Tower Co., Ltd.), Sumito Matoba (Hokkaido Univ.), Kazuma Aoki (Univ. Toyama), Katsushi Iwamoto and Seiji Katakura (City of Mombetsu)

○☆**A** The Aota Masaaki Award Candidate

Wednesday 21 Feb. 2024 — **Arts & Culture Center, 3F Special Conference Room**

16:40 – 17:00	**【Closing Session】** Chair, Seiji Katakura (City of Mombetsu) ・A Review of the Symposium, ・Closing Remarks, Shuhei Takahashi (Chair of the Symposium Committee)

Mon. 19 - Wed. 21 Feb. — **Arts & Culture Center, 3F Lobby**

9:00 – 17:00	**【Demonstration：Envisioning Future Globe through Understanding the Arctic: The Challenge of the Arctic Trans-Disciplinary Community of Practice】** Let's think the future of the Arctic together *by Arctic Research Center, Hokkaido University*

Public Program

Monday 19 Feb. — **Arts & Culture Center, 3F Special Conference Room**

10:00	**【Public Program, Forum on Disasters, Oil Pollution Countermeasures, and Environmental Protection】** ***(in Japanese language only)*** I. The activities of the Self-Defense Forces — Shin Taniguchi (Japan Self-Defense Forces) II. The mystery of the mirage — Hiromu Ishihara (Okhotsk Sea Ice Museum) III. What is happening in the sea now — Kuniaki Sasaki (Yudaku-Consultant)
12:00	Lunch
	【Public Program, Our Home Okhotsk Sea】 ***(in Japanese language only)*** Chair, Nobuyuki Kano (City of Mombetsu)
13:30	Introduction, Hiroaki Takahashi (City of Mombetsu)
13:35	Ⅰ. Activities of the Youth Club of Mombetsu Fisheries Cooperative Yuta Ozaki (Youth Club Mombetsu Fish. Coop.)
14:05	Ⅱ. The utilization of yellowtail *Seriola quinqueradiata* caught in Hokkaido, Japan Yumi Hamakawa (Abashiri Fish. Res. Inst., Hokkaido Res. Org.)
14:50	Break
15:00	Ⅲ. Current situation of kelp fishery in Hokkaido and potential for land-based cultivation of unutilized seaweeds collected along the coast of Hokkaido Takashi Maeda (Wakkanai Fish. Res. Inst., Hokkaido Res. Org.)
15:45	Ⅳ. Recent status of chum salmon and pink salmon stocks in the Okhotsk area Hayato Saneyoshi (Salmon Freshwater Fish. Res. Inst., Hokkaido Res. Org.)
16:30	Closing Remarks, Nobuyuki Kano (City of Mombetsu)

Tuesday 20 Feb. — **Mombetsu Arts & Culture Center 1F Hall**

	【Public Program, Consideration of Winter Weather Disasters in the Okhotsk Region】 ***(in Japanese language only)*** Chair, Hidehiko Ninomiya (Abashiri Develop. Constr. Dept., Hokkaido Develop. Bu.)
16:00	Introduction, Shuhei Takahashi (Okhotsk Sea Ice Museum /Chair of the Symposium Committee)
16:05	Ⅰ. Characteristics of Heavy Snowstorms in Okhotsk Area ~Effective use of Disaster Prevention Information~ Yuya Matsushita (Abashiri Local Meteorological Office, Japan Meteorological Agcy.)
16:25	Ⅱ. Response to natural disaster by Hokkaido Regional Development Bureau Hisayoshi Oba (Abashiri Develop. Constr. Dept, Hokkaido Develop. Bu.)
16:40	Break

Tuesday 20 Feb. 2024 — **Mombetsu Arts & Culture Center 1 F Hall**

	【Public Program, Consideration of Winter Weather Disasters in the Okhotsk Region】 *(in Japanese language only)*
16:50	Panel Discussion Coordinator, Masahiro Nemoto (Japan Red Cross Hokkaido College of Nursing) 「Learn about Self-help and Mutual Help」 〔Panelists〕 Kimihiro Ito (Abashiri Local Meteorological Office, Japan Meteorological Agcy.) Daisuke Kubo (Mombetsu Shokotsu Junior High School, City of Mombetsu) Tomohiro Iwaya (Mombetsu City Social Welfare Council) Ryo Hamada (Hokkaido Okhotsk General Promotion Bu.) Makoto Ishikawa (City of Mombetsu) Review, Masahiro Nemoto (Japan Red Cross Hokkaido College of Nursing)
17:55	Closing Remarks, Hideyuki Fukuhara (Abashiri Develop. Constr. Dept., Hokkaido Develop. Bu.)

Wednesday 21 Feb. — **Mombetsu Arts & Culture Center 1 F Hall**

11:00	**【Prize-awarding Ceremony of the Aota Masaaki Award】**
12:00	Lunch
	【Public Program, Symposium on the Forest-Ocean Linkage】 *(in Japanese language only)*
14:00	Introduction, Masatoshi Nakamura (City of Mombetsu)
14:05	Ⅰ. Thoughts of a graduate of Hokkaido College of Northern Forestry ~ What newly recruited employees want from Hokkaido's forestry industry ~ Shouji Ogasawara (Hokkaido Okhotsk General Subpref. Bu.)
15:00	Break
14:45	Ⅱ. Foresters in Central European countries nurturing rich forests - 7 ideas to make forestry an attractive career Mikihiro Nakamura（Gifu Pref. Kamo Region Agric. Forestry Office）

Wednesday 21 Feb. — **Mombetsu Municipal Museum**

	【Public Program, The Okhotsk Terroir Symposium 2024 in Mombetsu】 *(in Japanese language only)*
13:30	Introduction, Hiroshi Daikoku (Okhotsk Terroir)
13:40	Part 1 **Keynote Speech** What Okhotsk culture has left behind
14:20	Part 2 **Lecture** Experience of sustainable life by recycling things around us in the Okhotsk
15:10	Break
15:20 | 17:10	Part 3 **Free Discussion** The future and possibilities of Okhotsk Tourism as seen from Okhotsk culture Japan's new legacy project: Okhotsk Ruins Road Project

Wednesday 21 Feb. — **Mombetsu Citizens' Public Hall, 1F Main Hall**

13:10 | 14:30	**【Symposium on Sea Ice for Children】** *(in Japanese language only)* Ⅰ. Drift ice in the Sea of Okhotsk and the global environment Shuhei Takahashi (Okhotsk Sea Ice Museum) Ⅱ. The land of snow and ice: Winter life in the heart of Eurasia Marina Lomaeva (Univ. Hokkaido)

Sat. 10 Feb. - Thu. 29 Feb. — **Okhotsk Sea Ice Museum**

	【Sponsorship Event, Drift-ice Textile Exhibition】

Photo by Akihiro Yoda

Photo by Yuki Ohuchi

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