Draft (revision3)

Scientific Committee for Oceanographic Aircraft Research (SCOAR)
April 06, 2005
NCAR RAF, Conference Room
Jeffco Airport, Broomfield, CO 80021

Executive Summary

The UNOLS Scientific Committee for Oceanographic Aircraft Research (SCOAR) held a committee meeting at the National Center for Atmospheric Research (NCAR) aircraft facility at Jeffco Airport in Broomfield, Colorado on Wednesday April 6, 2005. On the previous day, the Interagency Coordinating Committee for Airborne Geoscience Research and Applications (ICCAGRA) held a meeting and many of the participants stayed for the SCOAR Meeting allowing for some very useful interaction between the representatives of the academic oceanography community (SCOAR) and the representatives of the broader Federal research aircraft community (ICCAGRA). A highlight of the meeting was a review of the capabilities of the new NCAR High-performance Instrumented Airborne Platform for Environmental Research (HIAPER) with a tour of the aircraft, which was undergoing installation of its scientific instrumentation. Major focuses of the meeting were research aircraft safety standards and regulations and methods for assessing the requirements of the scientific community for airborne data collection and sampling.

Recommendations: No new recommendations for CIRPAS or funding agencies.

SCOAR Committee Action Items

1. Community feedback process		
Draft white paper on how aircraft can or should support ocean sciences, what they can do.	Dan R., John B.	Draft in progress
Draft letter to ocean science community asking for feedback on aircraft requirements and current use of them.	John B.	Pending
Create a feedback questionnaire as a companion to the letter.	SCOAR, Mike P.	Pending
Develop plans for a workshop with aircraft operators and earth (or just ocean) science users and funding agencies.	SCOAR, ICCAGRA	Pending
2. Update information on CIRPAS and SCOAR web pages, reorganize to make user friendly, higher profile on Homepage.		
UNOLS Office put aircraft (Twin Otter) into rotating ships, add other quick links to aircraft on home and scheduling pages.	Office	Done
Update presentation of information on other university and agency aircraft and update links, Page with pictures, contact info.	Office	Done

Develop a method for keeping CIRPAS schedule and request information up to date.	Office, CIRPAS	Pending
Link to new CIRPAS pages as appropriate.	Office	Done
3. Stay tuned on safety standards from ICAP and continue to formulate UNOLS aircraft safety guidelines.		
When ICAP safety procedures are finalized, finish a document that articulates the standards to be met by UNOLS aircraft.	SCOAR	Ongoing

Index of Appendices

Proceeding of the meeting

Welcome and Introductions
The meeting called to order and participants were welcomed by SCOAR Chair, John Bane. Introductions were made which also included new SCOAR members Dick Zimmerman, ODU and Steve Hartz, UAK (See appendix II). Opening remarks were made by RAF Director, Jeff Stith. Dr. Stith also welcomed everyone to the facility.

Accept minutes of the November 2004 meeting - Motion, Second, Approved

Reviewed Agenda for this meeting. Appendix I.

Visualizing The Coastal Ocean and Atmosphere The Coastal Ocean and Atmosphere - John Bane showed data from a recent project using his aircraft off the coast of Oregon. Combined measurements using aircraft, ship (R/V Wecoma) and moorings were used to create a more complete picture of oceanic and atmospheric processes. Used this as an example of how aircraft can add to the data set for a coastal project Appendix III

Agency and CIRPAS Reports

UNOLS report - Mike Prince (Appendix IV)

Discussion about the fact that renewal budgets are now coming out of existing science, operations and maintenance budgets. Ken Melville remarked that the idea of providing access to aircraft might be more difficult unless it can be shown how aircraft can augment what ships can do and reduce costs of some projects.

CIRPAS report - Haf Jonsson (Appendix V)

Haf reviewed the 2004 operations. Described projects for Steve Ramp (NPS) and Dean Hegg (UW) funded by ONR, for Jens Redemann (NASA Ames) funded by NASA Ames, and for John Seinfeld (Caltech) funded by NSF/ONR/NOAA. Steve Ramp's bi-weekly surveys were part of a larger project using AUVs, ships, moorings, CODAR, etc. Three-month maintenance program at the end of the year. 2005 operations started with a continuation of the Ramp Ocean Surveys. In March, CIRPAS scheduled three weeks of test flights for new instrumentation developed under the SBIR programs. They wanted to be sure these instruments were ready for use. They have scheduled ONR programs in July and August. There are four programs that have not been firmly scheduled yet, pending decisions on funding and requirements. These programs are potentially funded by NASA, DOE and NPOESS. They also are planning to test a towed platform when they receive it with ONR funding.

Requests for next year:

• Jens Redemann is requesting about 20 hours of work in Australia, which would require about 300 hours of ferry time.
• Dave Emmitt LIDAR study in North Carolina
• Faloona/Raemer
• John Bane
• Steve Ramp/Graham Feingold surveys of cloud chemistry

New Instrumentation:

MSP Triple DMA’S

NMASS

Pro Sensing 94 Ghz cloud radar

Stabilized Radiation Platforms

Coherent Technologies wind lidar-New transceiver

Phased Doppler Cloud Spectrometer-

SP2 carbon particle spectrometer

SCAPS single particle scatter probe

LISST, S-CIP and TOWED PLATFORM

DMA's and NMASS are particle size measuring instruments.
Three more anticipated this year and several more in the works.

They need feedback on exactly what needs to be measured from the academic community. Need ocean science community input, ask with the letter about aircraft needs. Harris remarked that NOAA goes through the FAA certification program for installing new equipment on both their public use vessels and the FAA certified planes. CIRPAS uses the same procedures, but does not get FAA approval, this is all done in-house. Discussion about bringing equipment to attach to the aircraft: Is there a pod available that can be used to install instruments without going through all the approval processes? CIRPAS has an integration period, where the CIRPAS people engineer and accomplish the modifications necessary to adapt PI instruments into pods or the aircraft. This allows the PI to later install and remove instruments using the integration design. Haf showed a list of papers published as a result of CIRPAS field expeditions.

Overviews from federal agency representatives

NSF - Jim Huning
There has been reorganization at NCAR. The facility programs have been stressed to the limit. Two recent programs, RICO and NAME were extended deployments that took people beyond their normal away time. The SPOL RADAR has major refurbishment issues. The C-130 is undergoing inspection and overhaul. ALMA is an international program that would use the SPOL RADAR and the ELDORA, but this is not a high priority for NSF. This is a year of catching up, getting equipment ready for FY 06. FY06 will be a busy year with HIAPER work being the major focus. The HIAPER will be tested and operate some missions demonstrating its capabilities. Joachim Keuttner is the PI for TIREX, which will include the HIAPER, King Air and other facilities. There are some conflicts for the use of aircraft and integrated sounding system because of a lack of equipment and people to support these instrumentation requirements. Jim mentioned several studies that did not involve aircraft, other than the King Air in some cases. Getting HIAPER going is their first priority. HIAPER's MRE came in under budget and on time. Jim will be presenting a $98.40 refund check to the NSF MRE Account manager. This is a certified aircraft and all PI's developing instrumentation must use the integration handbook, so the hope is that when instrumentation shows up, integration should not be as difficult. The new policies for requesting aircraft time for large projects are posted on the web pages (NSF and NCAR). Partnerships (agency to agency, agency to institution, etc.)

Safety issues for NSF and ICAP, security issues since 9/11 including fences, locked doors, inspections for self regulation under ICAP, not inspected by FAA. ARMS inspection looks at documentation, regulations, etc.

Funding for science and facilities. NSF receives about 44,000 proposals per year and fund about 21%. The director mentioned before Congress that NSF will probably have focused priorities, but not clear what that means. The T-28 has been grounded, and they are looking at replacing it using mid-size infrastructure funding out of the division budget to obtain an A-10 Warthog as a storm penetrating platform.

ONR - John Freitag
John deferred to Ron Ferek. Ron Ferek reported that they are seeing a lot more interdisciplinary ocean/atmospheric proposals using multiple facilities. Ron sees this as a growth area and sees ocean and atmospheric scientists collaborating more and more.

Ken Melville added that it is becoming clear that you can't do coastal (air/sea/land boundary areas) work with out doing both oceanography and atmospheric work.

NOAA - Beth White and Jim McFadden
Beth went over the DOD process that NOAA is now using, Planning, Programming, Budget, Execution System (PPBES). Program managers are not forced to think about facility requirements in terms of operations and renewal. NOAA also is working on an Aviation Safety Policy.

NOAA Aircraft Facilities brief by Jim McFadden. NOAA aviation facilities are at MacDill Air Force Base just south of Tampa, Florida. They may loose their hanger space in the next few years, but would be offered an area for a new hanger on the MacDill grounds.

Jim showed the current hanger facilities and the room they had for the visiting NRL P-3, and he showed and listed the 13 aircraft in their inventory. AOC has a modernization plan that is not yet public and on its way to Congress. He showed a chart of the planned retirements of current aircraft. Next chart shows the planned acquisitions. Twin Otter in FY06, in FY08 three more, more later.

Draft Aviation Safety Plan:
Medical survey form that would let the scientist know the types of things that would be of concern. Turning in the form to a PHS physician who will review the form and give an "up-chit" if ok.

Aviation Safety Training plan - check list based on type of operations planned. Also includes a list of required safety equipment.

FY 2005 projects - showed the planned operations for the various aircraft. One program looks for aggregation of floating debris and reports location for cleanup. G-4 mostly does survey work, but is getting some chemistry work. Most of the light aircraft are kept busy with time bought by various programs. FY06 requests include more than they can support. One P-3 will be used the entire summer for non-hurricane research work. That leaves only one for hurricane reconnaissance. Jim showed two of the Pods they carry. Everything inside the Pods must be certified. They had to add fire detection and suppression systems because the Pods cannot be released.

Jim Huning asked about funding for requests from outside users. Requests are cost estimated. They charge an overhead to cover fixed costs, and estimate the variable costs that the user would pay for. It is not hard to get access as long as the aircraft is available. NOAA would know a year or so in advance more or less what the availability is. During hurricane season, the P-3's could be called away for hurricane ops. The PPBES process allows them to know their requirements a few years ahead of time. Couldn't this allow making commitments for ship-time needs earlier than they do now? Dick asked what percentage of time was available for outside users. The answer addressed more the fact that they can now know ahead of time what the internal needs are.

A tour of the HIAPER aircraft was conducted just before lunch

LUNCH

Meeting reconvened

NASA/ICCAGRA - Cheryl Yuhas (Appendix VI)
Showed the restructuring of suborbital science group

FY2005 Platform Catalog includes
• Non-NASA Commercial and University aircraft (pay as you go) e.g. Twin Otter, KingAir, etc.
• NASA and Non NASA Federal aircraft (pay as you go) GRC Learjet, NRL P3, DOE King Air, NSF C130
• NASA & Non NASA Federal Aircraft (on retainer): pays some fixed costs DFRC, ER2, JSC WB57, NASA DC8, and GSFC/WFF P3-B.
• ER2: terminate ER2 airborne science program in 2006.
• DC8: conduct safety review and risk assessment of DC8 transferring into university based operation in 2005
• P3-B: Transfer P3 missions to a commercial or other non-NASA operation, and put NASA P3-B in flyable storage.

Earth Science Capability Project
Repeat Pass Project: develop flight control capability to repeat flight path within a 10M tube, to support UAV-SAR.

UAV Missions:
NOAA UAV Mission Demonstration, http://uav.noaa.gov
Western States Fire Mission: http://geo.arc.nasa.gov/sge/WRAP/current/future_missions.html
Advance Mission Platform requirements analysis (potential platforms include Proteus II, G-V OPV, Adam Aircraft A700)
Civil UAV assessment, http://www.nasa.gov/centers/dryden/research/civuav/civ_uav_index.html
April 26-28 Workshop in Akron, Ohio. Showed chart of Missions for FY05 through FY06
Ore Validation and a 1/3 TCSP operation are the only ones shown that have not been cancelled for FY05.

TWP-ICE and Carbon work are the only FY06 missions that are not completely uncertain. Flight Request system - online system to receive requests from NASA and Non NASA PI's to ask for access to Catalogue of assets.

ICCAGRA – Appendix VII
Chartered subcommittee for a Data Systems Working Group to coordinate and establish standards for aircraft data systems.

Coordination of crew safety standards, especially medical standards for PI's. ICAP Strategic Plan to be updated next month: input to Jim Huning as ICAP co-chair. NOAA, NSF, NRL and NASA all anticipate some level of participation of aircraft in IPY, but no specifics yet.
Agreement (FINISH FROM SLIDES_)

SCOAR Activity Reports and Discussion
Letter to the community about the need for a long-range assessment of aircraft/satellite requirements and development of instrumentation through the SBIR program - Bane

Discussion about possible goals of a potential workshop, and how a letter to the community(s) would support that effort. The goals of a workshop were discussed

• Define the role of aircraft in earth observing systems.
• Define the requirements of the broader geosciences community for aircraft platforms.
• How to provide academic and institutional support for aircraft facilities.
• Limited personnel in agencies advocating for aircraft facilities.
• Benefit of long term assessment and planning is that it provides a better opportunity.

Draft Goals and Methods for community feedback and future workshops

Workshop - Community Input Process

Goals
• Recommend ongoing forum or process for coordinating utilization, improvement and renewal of aircraft facilities across all science disciplines, agencies and user communities.
• Assessment of current and future requirements for aircraft platforms.
• Assessment of measurements/sampling capabilities that the science community requires.
• Assess the current and planned future capabilities.
• Make recommendations about the need for developing new facilities or better utilization of existing facilities.
• Make recommendations about instrumentation development requirements.

Methods
• Agencies would check with senior management to determine support for a community wide workshop

on aircraft support requirements.
• White Paper with a straw-man idea of how aircraft could support Ocean Sciences.
• SCOAR Letter to ocean science community with request for feedback. What questions?
• Determine recommendations and projections from previous and planned workshops such as the NSF workshop for ATM sciences.
• Use forums such as professional societies and other organizations, AGU, AMS, ASLO, TOS, Estuarine Research Federation (ERF), Ocean.US, Orion, etc. Implement Targeted communications with key people in these organizations.
• ICCAGRA and Academic aircraft operators create a consolidated assessment of current and planned research aircraft and instrumentation.
• Define the need and goals for a broader (earth sciences) community workshop on aircraft facility requirements.

Safety standards - Flagg (Charlie Flagg was absent and sent a report by email)
• Wait to see what comes out of the ICAP process; take into account the new NOAA safety policy.
• Identify requirements to the science community, such as medical requirements.
• Articulate the type of procedures and information operators should have in place.
• No immediate action need, find out what ICAP recommends.

Scheduling information on the SCOAR website – Mike Prince

Request form changes – Mike Prince/Haf Jonsson
The SCOAR website was displayed showing the links to the CIRPAS schedule and request form. The schedule will be kept up to date by UNOLS Office with input from CIRPAS. Look at entering schedule into UNOLS system.

The online form has been used by one PI so far, John Bane. John had some suggestions for improvement that are more or less in line with suggestions from the last SCOAR meeting. The committee was asked for any other suggestions. The UNOLS Office will work with CIRPAS to make the recommended changes.

SCOAR Goals and Objectives
Open discussion about what SCOAR should be doing, in a broad sense, to enhance aircraft oceanography. The EOS and OCEANOGRAPHY articles had that sense to them, in that we were able to communicate to the general community about our committee and some of its activities and goals. What else should we be shooting for as a committee? We are entering our third year, and it may be a good time to review and contemplate who we are and what we are doing.

1. Improve visibility and clarity of info on aircraft facilities: Discussed the web page and making information available on aircraft facilities other than National Facilities.

• Fix links on web page, link to new CIRPAS page.

• Make the catalogue of aircraft a little more user friendly with pictures and links to correct information pages.
• Update and fix URLs for other aircraft operators.
• Make Aircraft more visible on the UNOLS Homepage, put Twin Otter in rotating ships file, put link to Aircraft info part of SCOAR page.
• Work with SCOAR and CIRPAS to update website info on CIRPAS and SCOAR websites.

2. Carry forward with assessing current aircraft capabilities and ocean science community's requirements for aircraft and airborne instrumentation. See earlier discussion.

3. Continue to set up the National Facility procedures and give CIRPAS feedback on improvements to support ocean sciences.

Future Business

Action item list and assignment - SCOAR

1. Community feedback process

• Draft white paper on how aircraft can or should support ocean sciences, what they can do.
• Draft letter to ocean science community asking for feedback on aircraft requirements and current use of them.
• Create a feedback questionnaire as a companion to the letter.
• Develop plans for a workshop with aircraft operators and earth (or just ocean) science users and funding agencies.

2. Update information on CIRPAS and SCOAR web pages, reorganize to make user friendly, higher profile on homepage.

• UNOLS Office put aircraft (Twin Otter) into rotating ships; add other quick links to aircraft on home and scheduling pages.
• Update presentation of information on other university and agency aircraft and update links, page with pictures, contact info.
• Develop a method for keeping CIRPAS schedule and request information up to date.
• Link to new CIRPAS pages as appropriate.

3. Stay tuned on safety standards from ICAP and continue to formulate UNOLS aircraft safety guidelines. When ICAP safety procedures are finalized, finish a document that articulates the standards to be met by UNOLS aircraft.

Next SCOAR Meeting
Discussed whether or not the next meeting should be a phone/web conference. This depends on the

agenda and length of time needed. A suggestion was made to meet at a ship operating institution such as Scripps in November and include a half-day open session for local ocean scientists. Atmospheric scientists would have a chance to tour a research vessel.

5:00PM - Adjourn

Draft Agenda

Rev. 2/28/04

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April 06, 2005
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Jeffco Airport
10802 Airport Court
Broomfield, CO 80021

8:00 to 8:30 - Coffee, Continental Breakfast

8:30 to 9:00 - Welcome and Introduction

- Welcome by SCOAR Chair and UNOLS Executive Secretary
- Introduction of participants, incl. new SCOAR member Dick Zimmerman
- Remarks by RAF Director, Jeff Stith
- Accept minutes of the November 2004 meeting
- Review Agenda for this meeting

9:00 to 10:30 - Agency and CIRPAS Reports

- UNOLS report - Mike Prince
- CIRPAS report - Bob Bluth and/or Haf Jonsson
- Overviews from federal agency representatives
    - o NSF - Jim Huning
    - o ONR - John Freitag
    - o NOAA - Beth White and/or Jim McFadden
    - o NASA/ICCAGRA - Cheryl Yuhas

10:30 to 11:00 - Break

11:00 to 12:00 - Tour of RAF

12:00 to 1:00 - Lunch

1:00 to 2:30 - SCOAR Activity Reports and Discussion

- Letter to the community about the need for a long-range assessment of aircraft/satellite requirements and development of instrumentation through the SBIR program - Bane
- Safety standards - Flagg
- Schedule info on SCOAR website – Prince
- Request form changes – Prince/Jonsson

2:30 to 2:45 - Break

2:45 to 4:30 - SCOAR Goals and Objectives

Open discussion about what SCOAR should be doing, in a broad sense, to enhance aircraft oceanography. The EOS and OCEANOGRAPHY articles had that sense to them, in that we were able to communicate to the general community about our committee and some of its activities and goals. What else should we be shooting for as a committee? We are entering our third year, and it may be a good time to review and contemplate who we are and what we are doing.

4:30 to 5:00 - Future Business

- Action item list and assignment - SCOAR
- Next meeting - SCOAR

5:00 - Adjourn

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April 06, 2005
NCAR RAF, Conference Room
Jeffco Airport
10802 Airport Court
Broomfield, CO 80021

Attendees

Last	First	Institution/Agency	Phone	Email
Bane	John	UNC Chapel Hill	(919) 962-0172	bane@unc.edu
Ferek	Ron	ONR	(703) 696-0518	ferekr@onr;.navy.mil
Freitag	John	ONR	(703) 696-4530	freitaj@onr.navy.mil
Halverson	Harris	NOAA	(301)713-1045 x173	harris.b.halverson@noaa.gov
Hartz	Steven.	UAF	(907) 224-5261	fnsjh@uaf.edu
Huning	James	NSF	(703) 292-8521	jhuning@nsf.gov
Jones	Jack	Eagle Systems, Inc.	(202)767-7632	jones@planes.nrl.navy.mil
Jonsson	Haf	CIRPAS/NPS	(831) 384-2776	hjonsson@nps.edu
McFadden	Jim	NOAA	(813) 828-3310 X3076	jim.d.mcfadden@noaa.gov
Melville	Ken	SIO	(858) 534-0478	kmelville@ucsd.edu
Prince	Mike	UNOLS	(831) 771-4410	office@unols.org
Salitsky	George	NRL	(202) 767-2273	gsalitsky@planes.nrl.navy.mil
Stith	Jeff	NCAR/RAF	(303) 497-1030	stith@ucar.edu
White	Elizabeth	NOAA	(301) 713-3435 X135	elizabeth.white@noaa.gov
Yuhas	Cheryl	NASA	(202) 358-0758	cheryl.yuhas@hq.nasa.gov
Zimmerman	Dick	ODU	(757) 683-4285	Rzimmerm@odu.edu

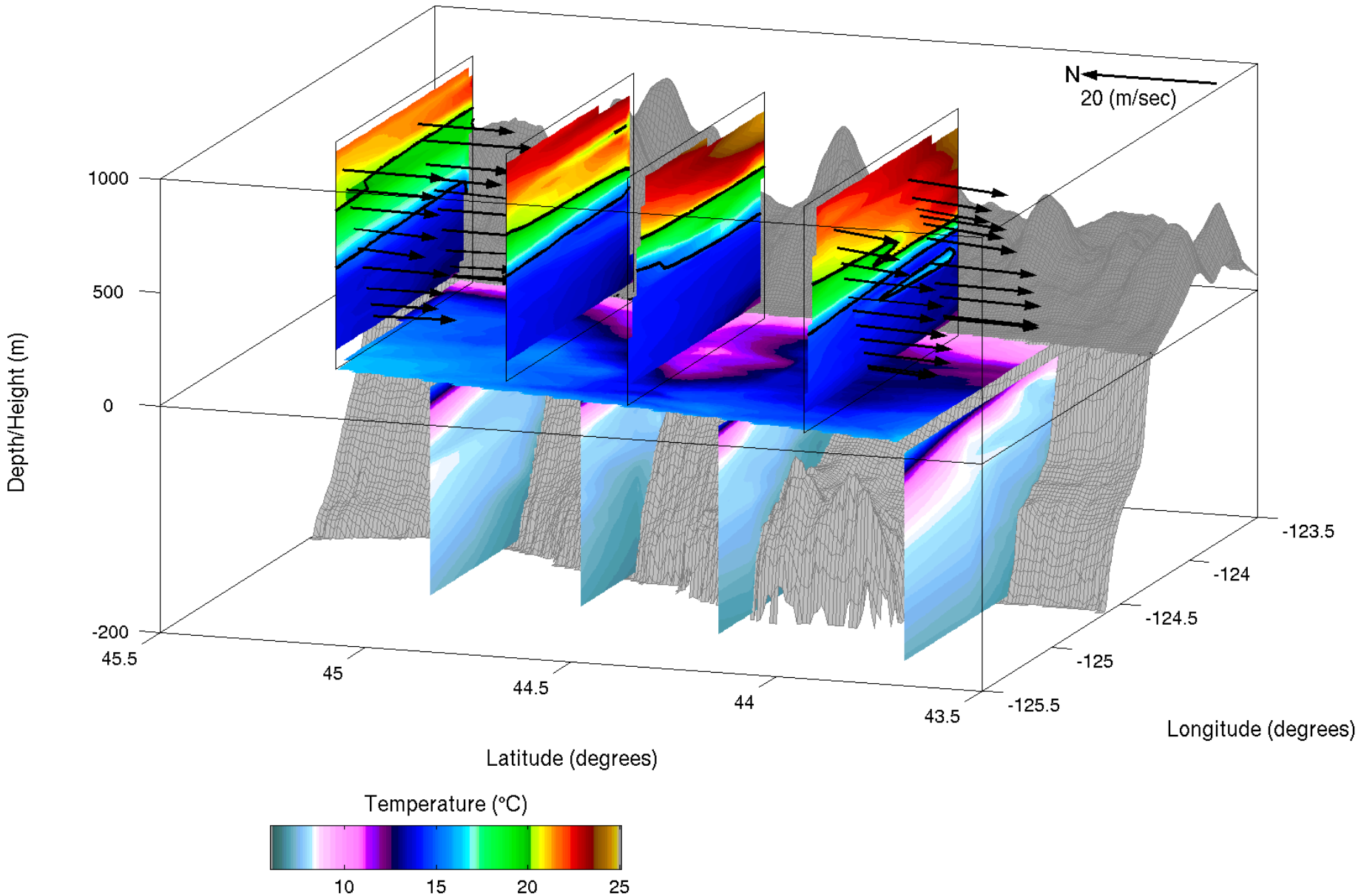
SCOAR

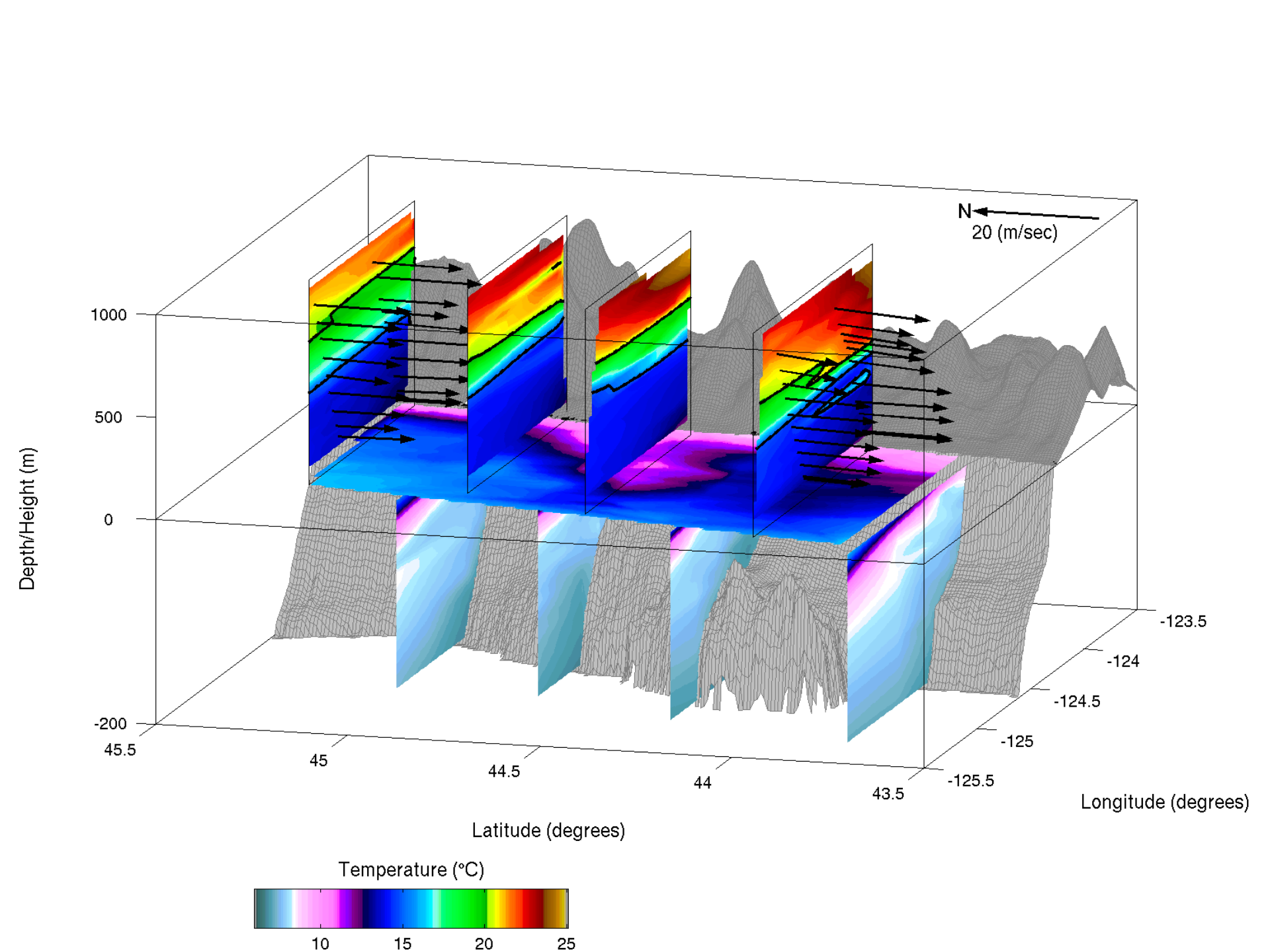
- John Bane, UNC, Physical Oceanography
- Charlie Flagg, SUNY-Stony Brook, Physical Ocn
- Ken Melville, Scripps, Physical Oceanography
- Dan Riemer, UMiami-RSMAS, Atmospheric Chemistry
- Dick Zimmerman, ODU, Marine Ecology

- Mike Prince, UNOLS
- Bob Bluth, NPS-CIRPAS
- Haf Jonsson, NPS-CIRPAS
- Steve Hartz, UAF, UNOLS-RVTEC

Visualizing The Coastal Ocean and Atmosphere

John Bane, Univ North Carolina (support: NSF)

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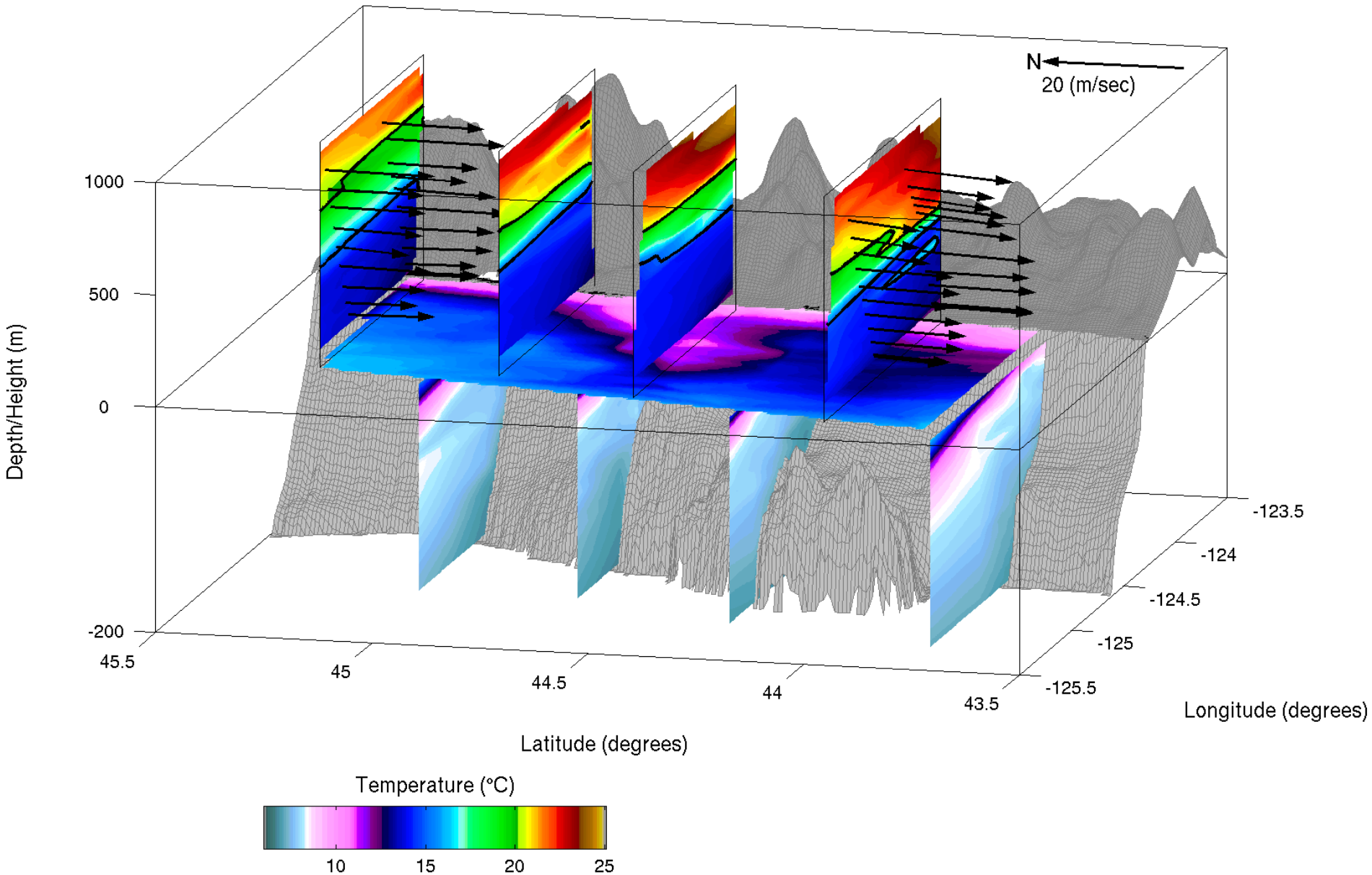
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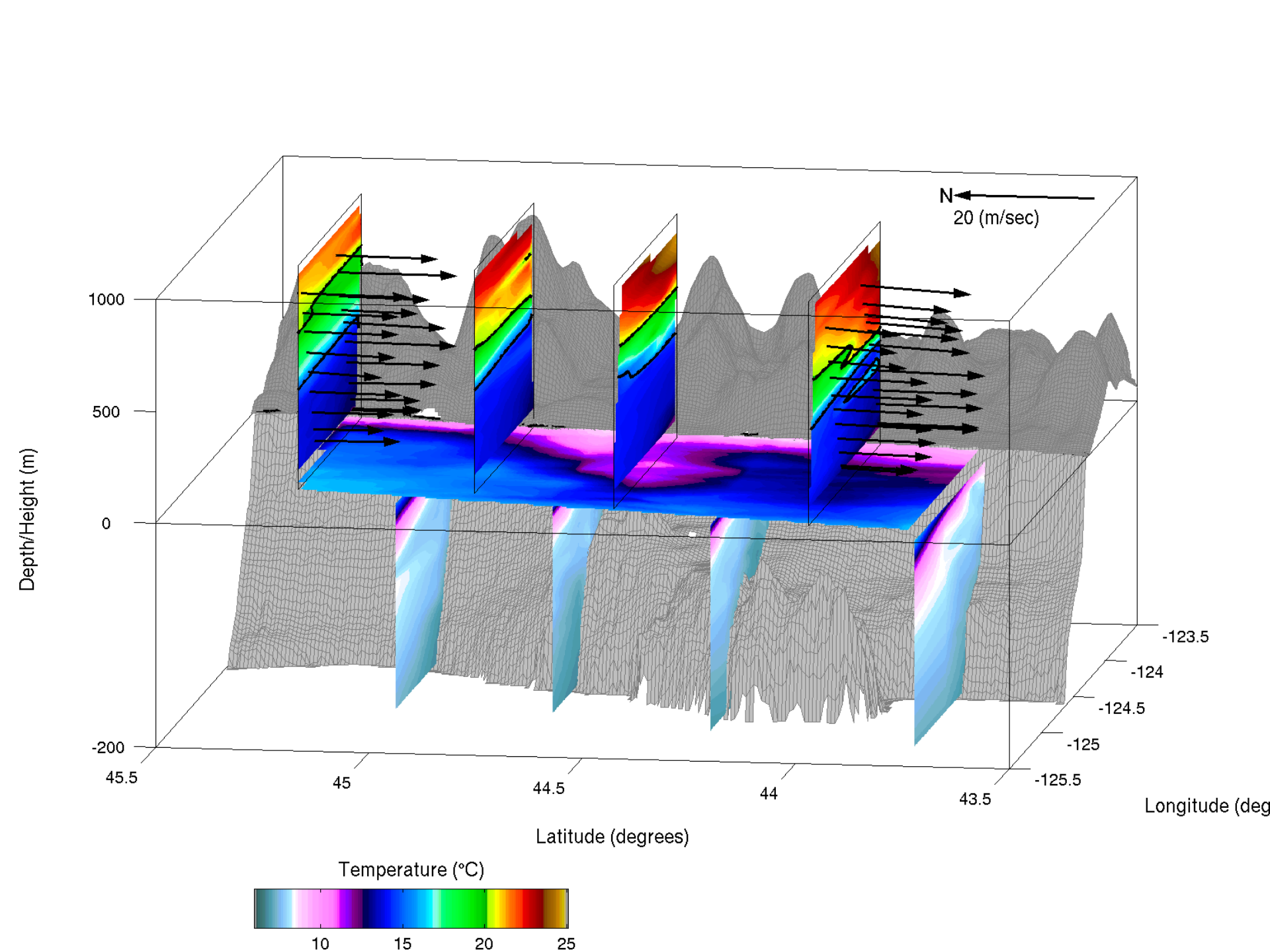
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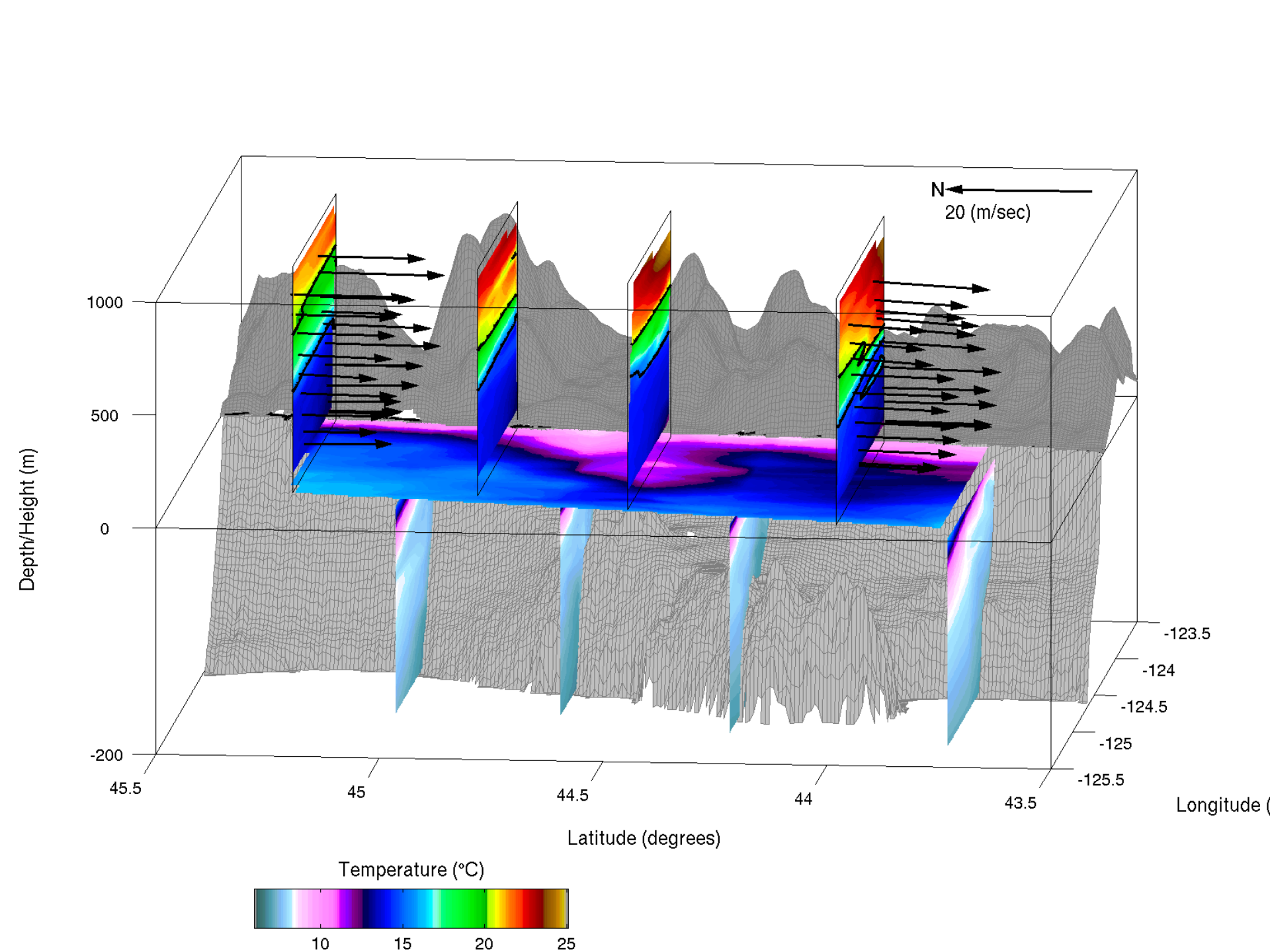
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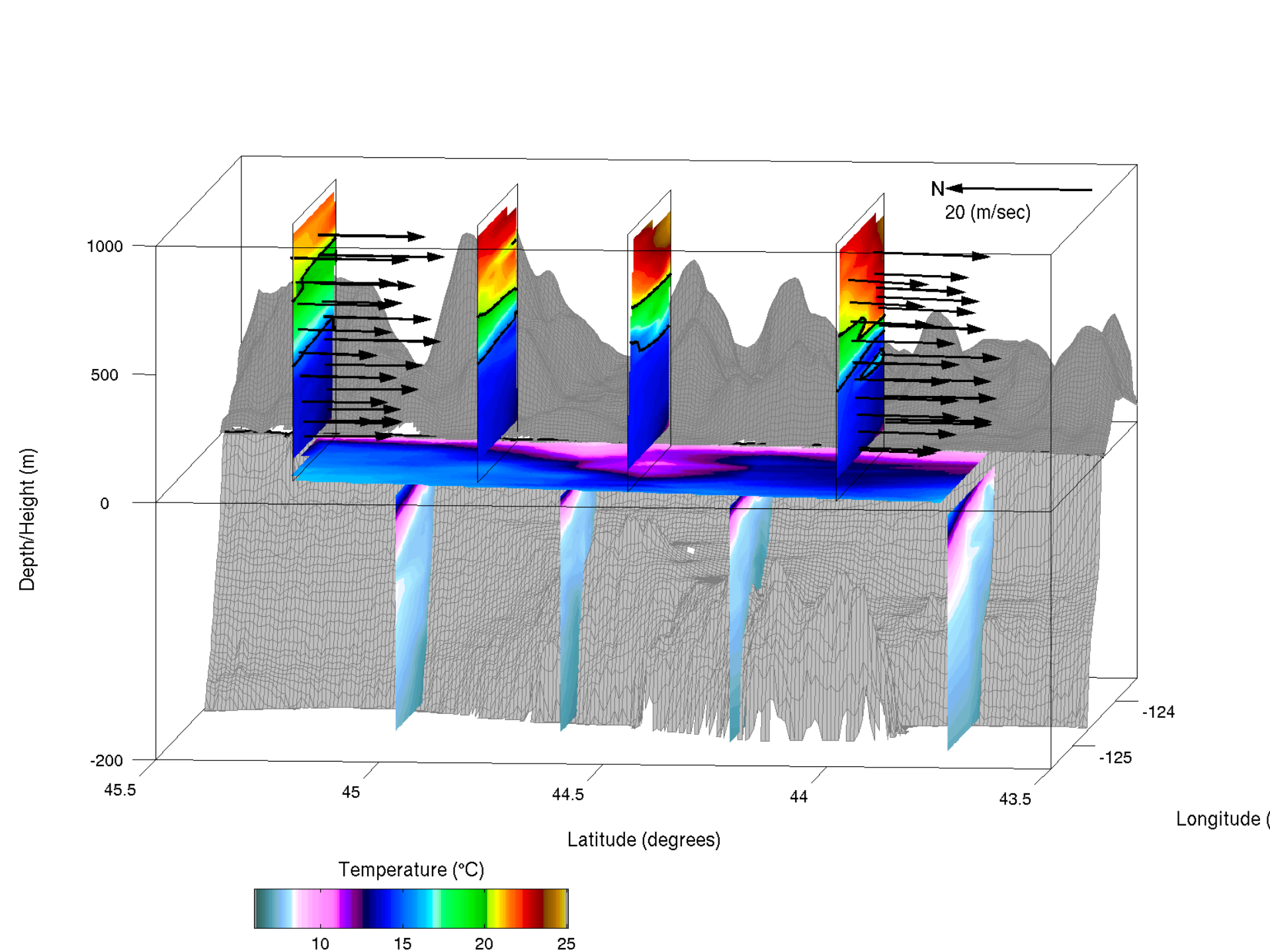
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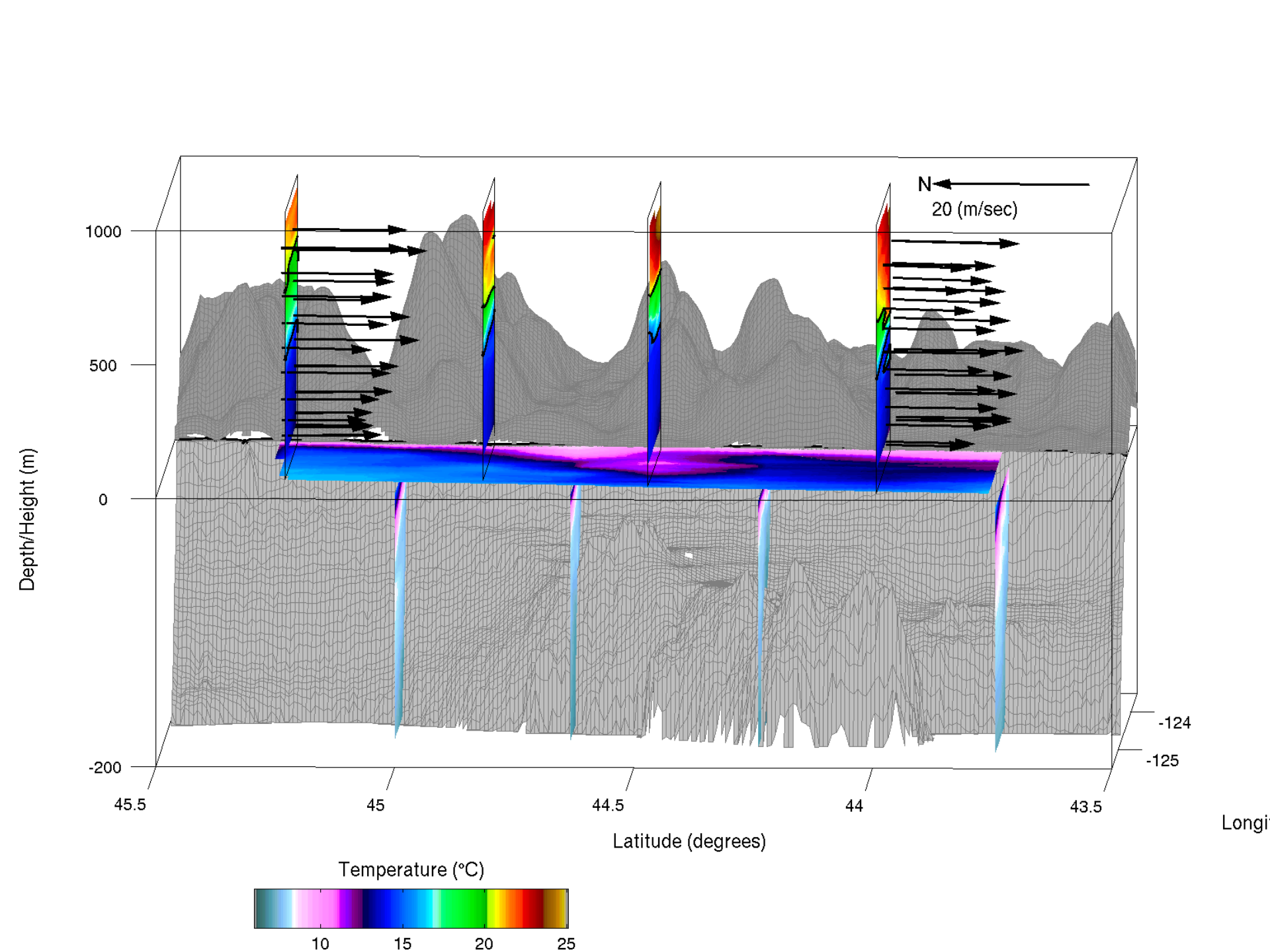
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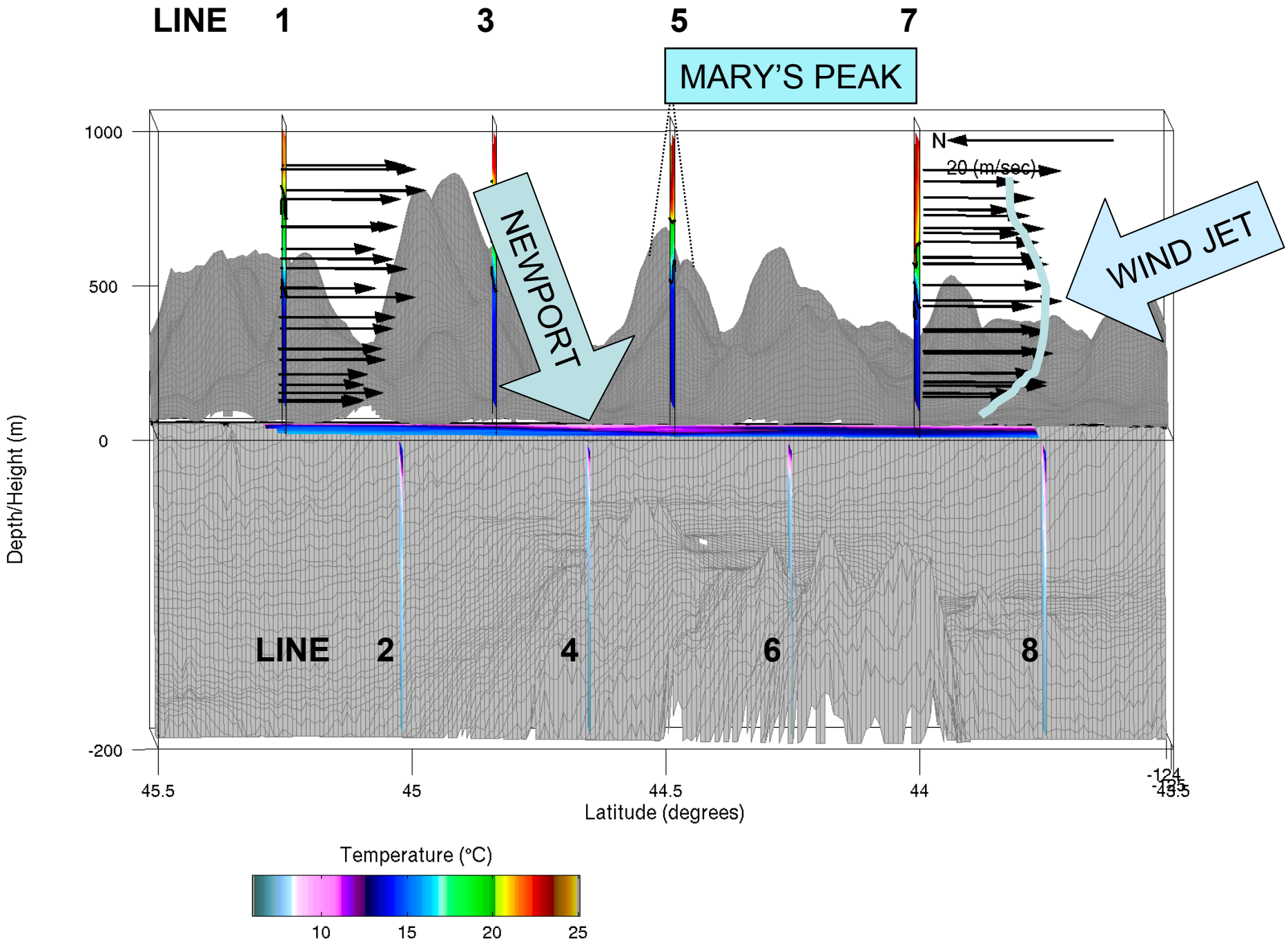
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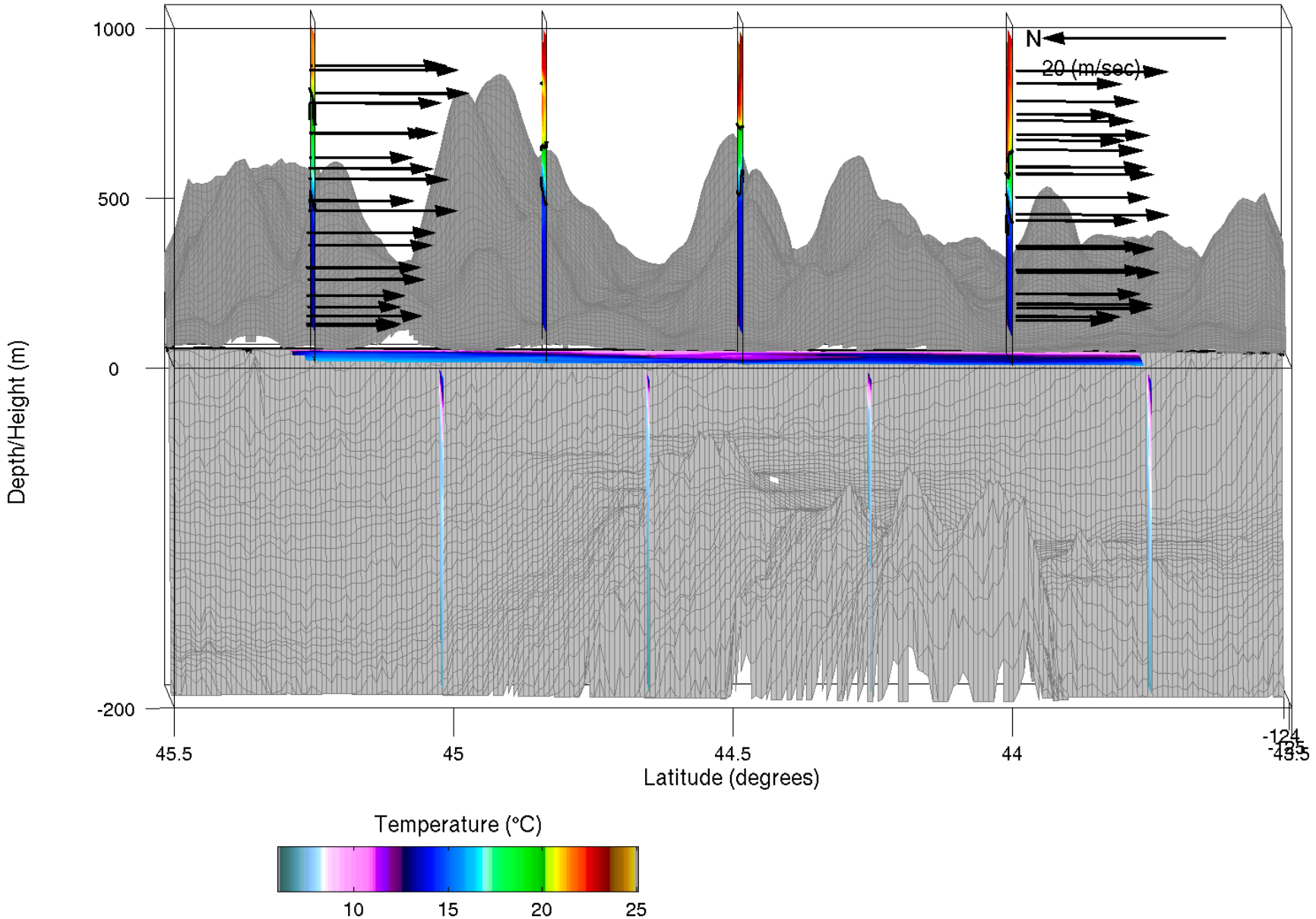
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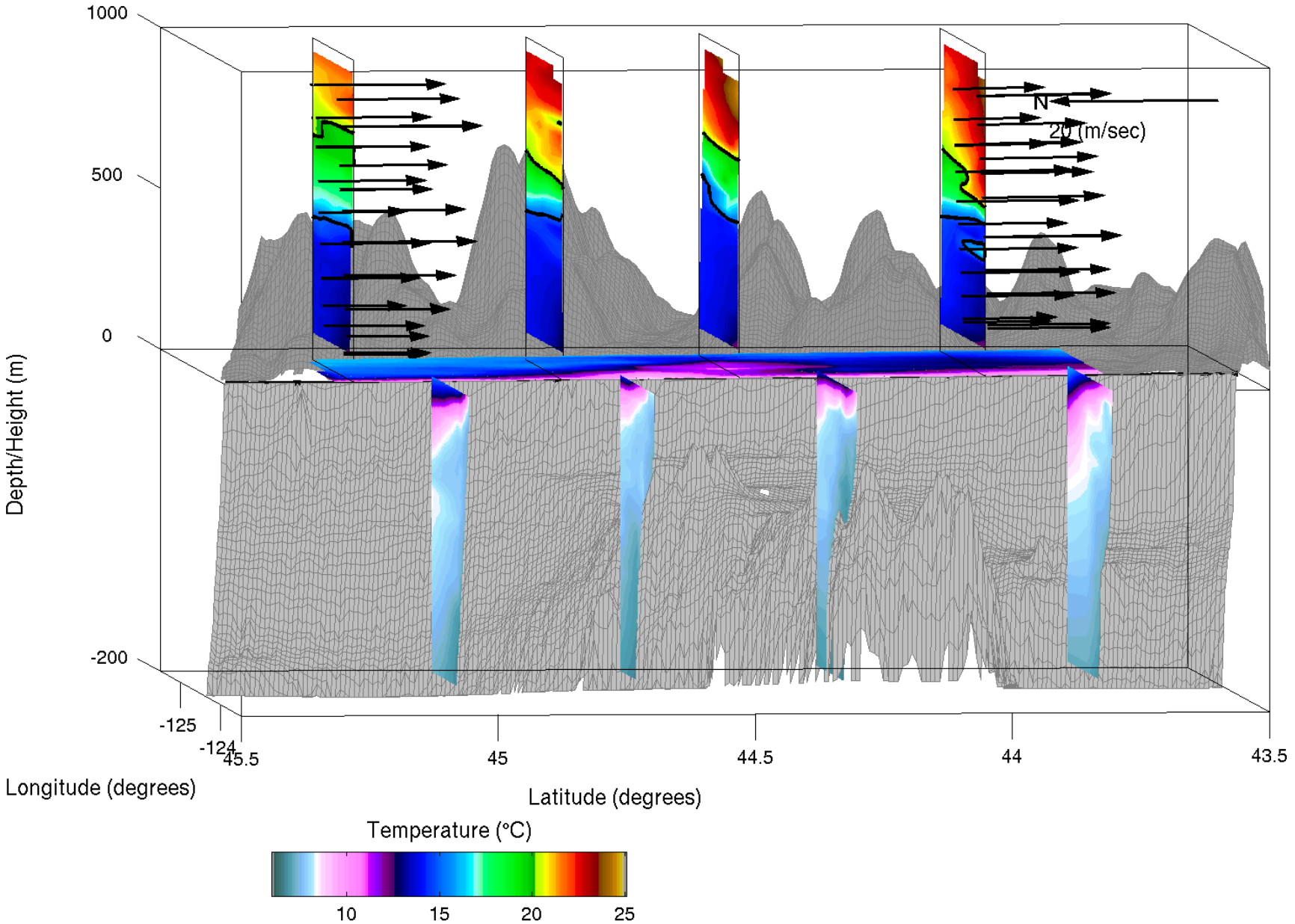
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Temperature (°C)
10
15
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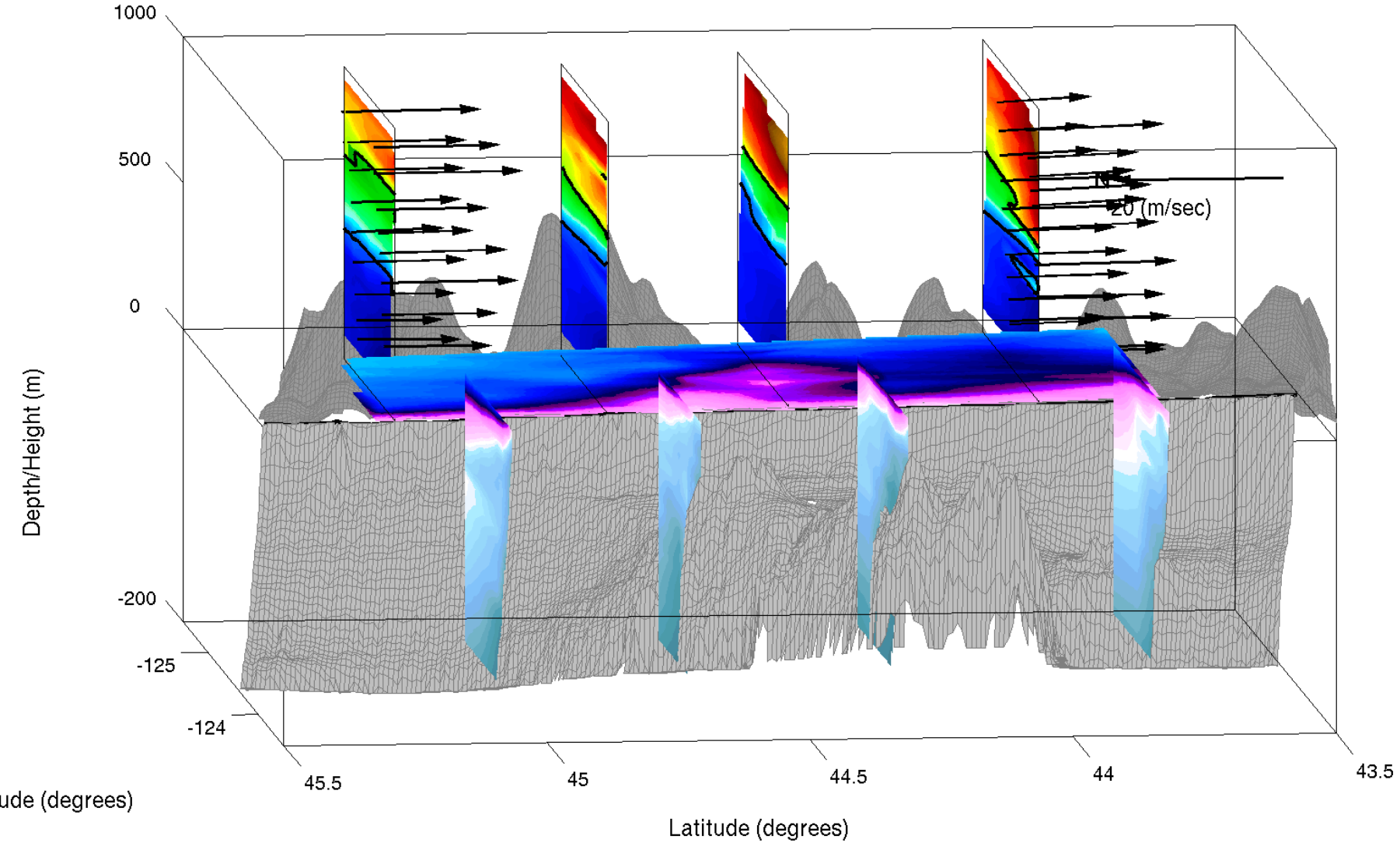
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Temperature (°C)
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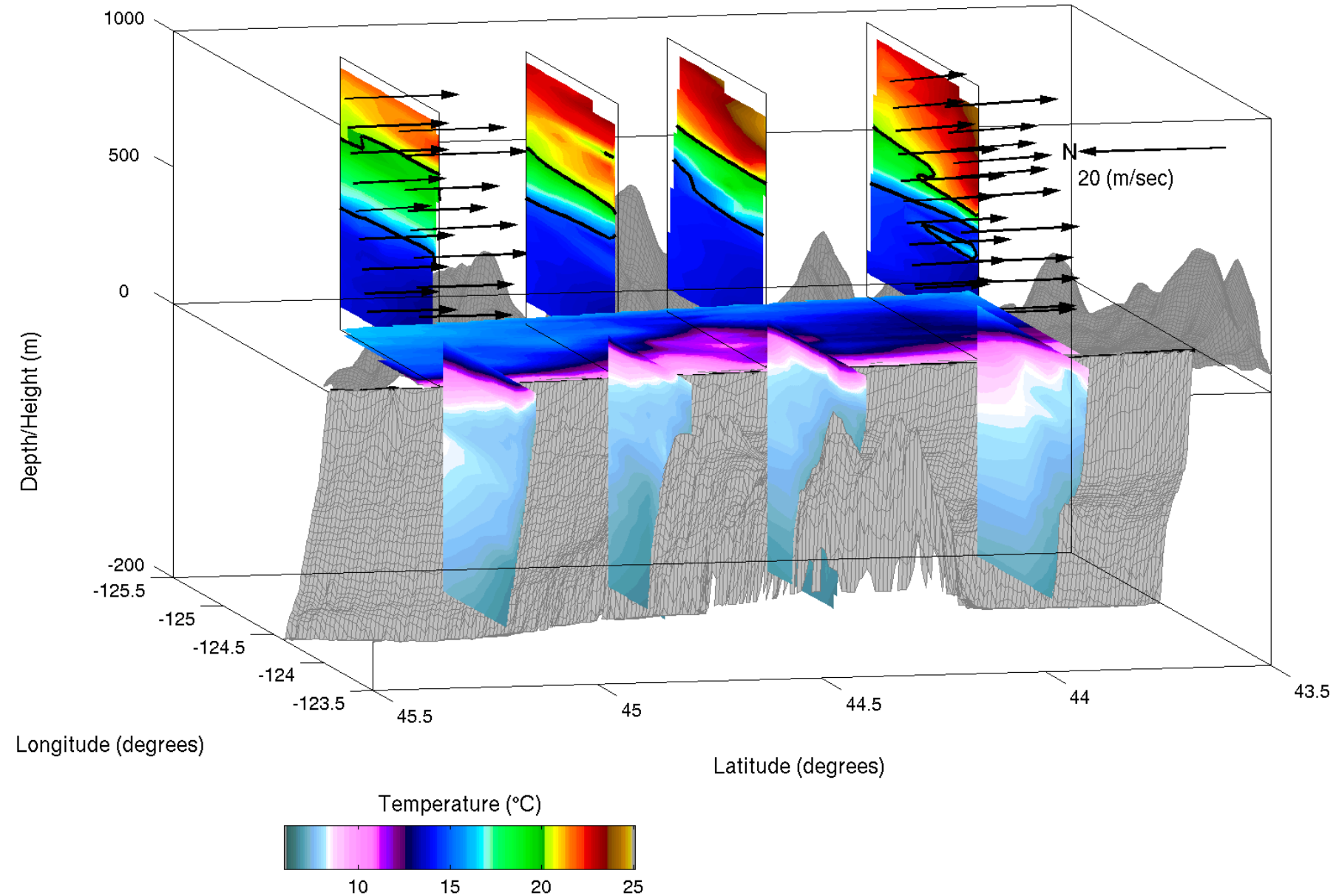
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Latitude (degrees)
Temperature (°C)
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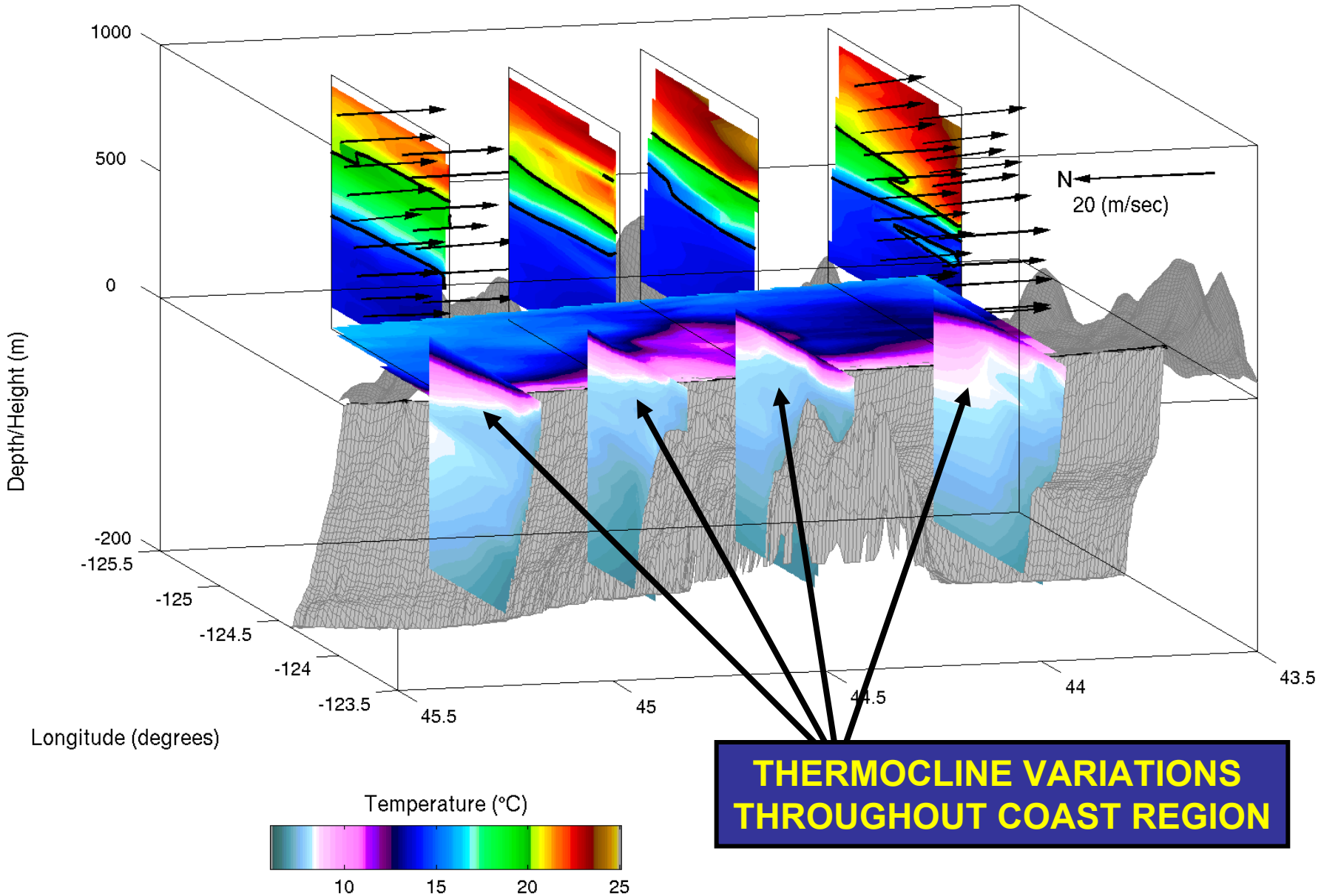
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THERMOCLINE VARIATIONS
THROUGHOUT COAST REGION
Temperature (°C)
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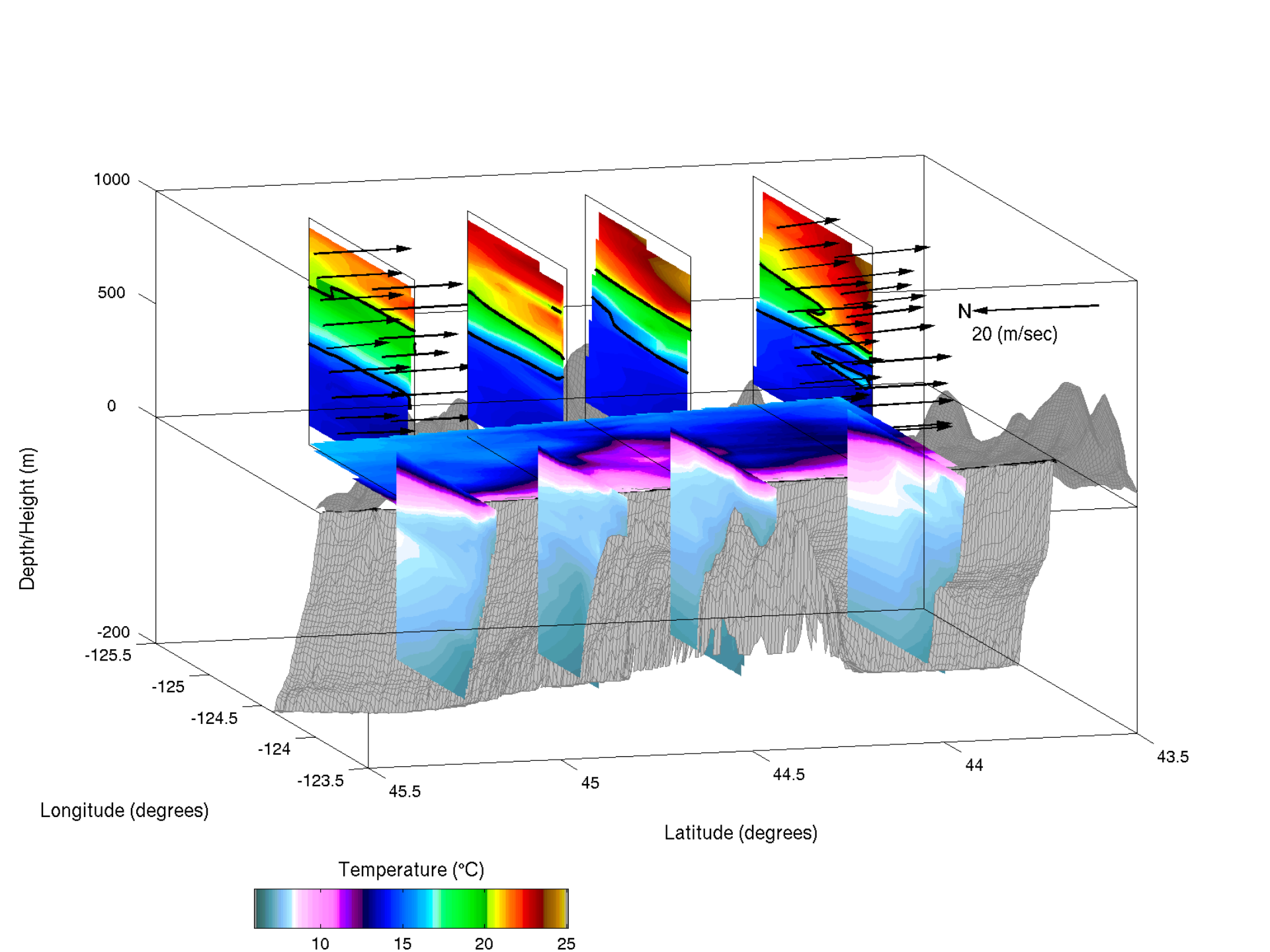
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Latitude (degrees)
Temperature (°C)
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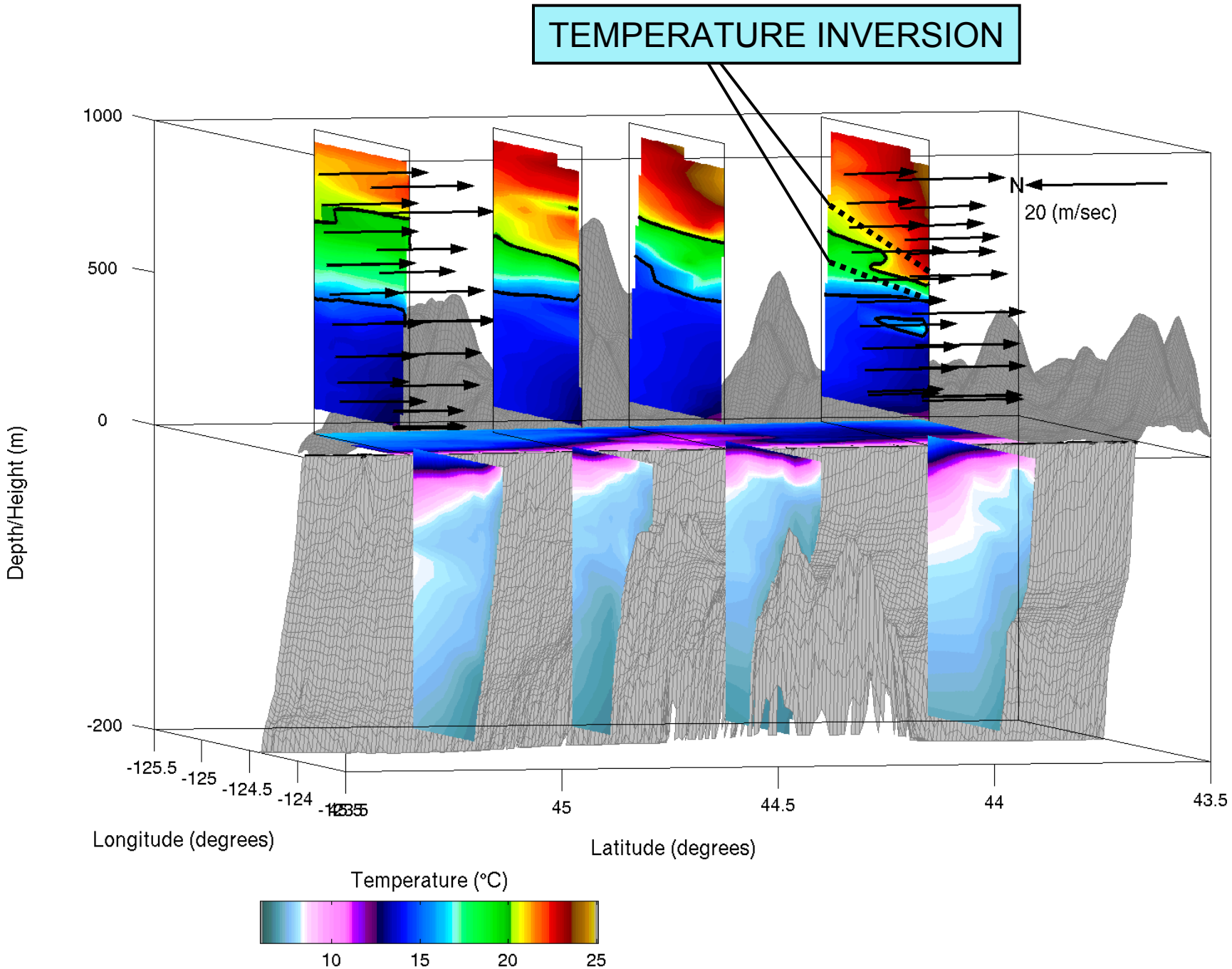
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Longitude (degrees)
Latitude (degrees)
Temperature (°C)
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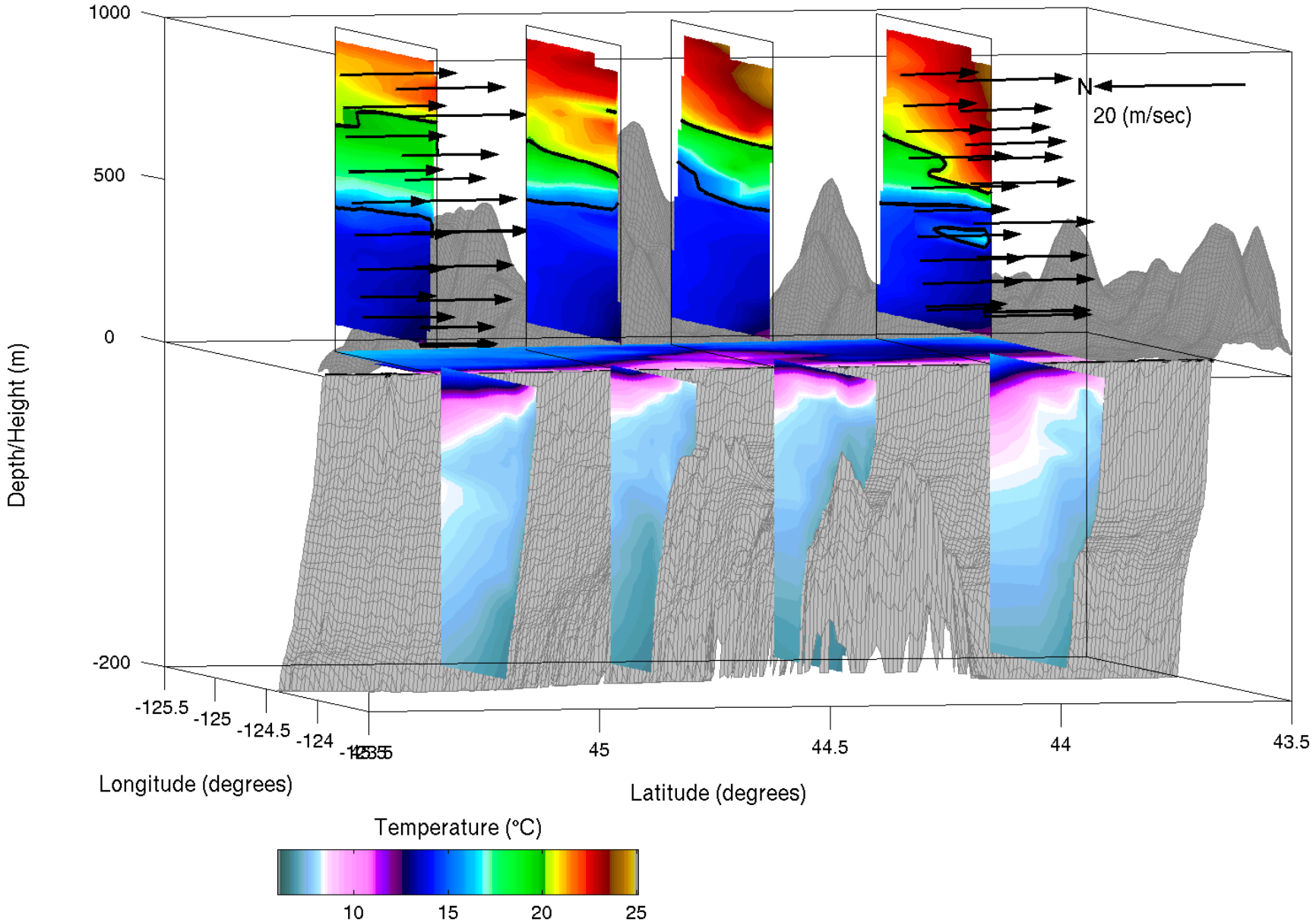
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Longitude (degrees)
Latitude (degrees)
Temperature (°C)
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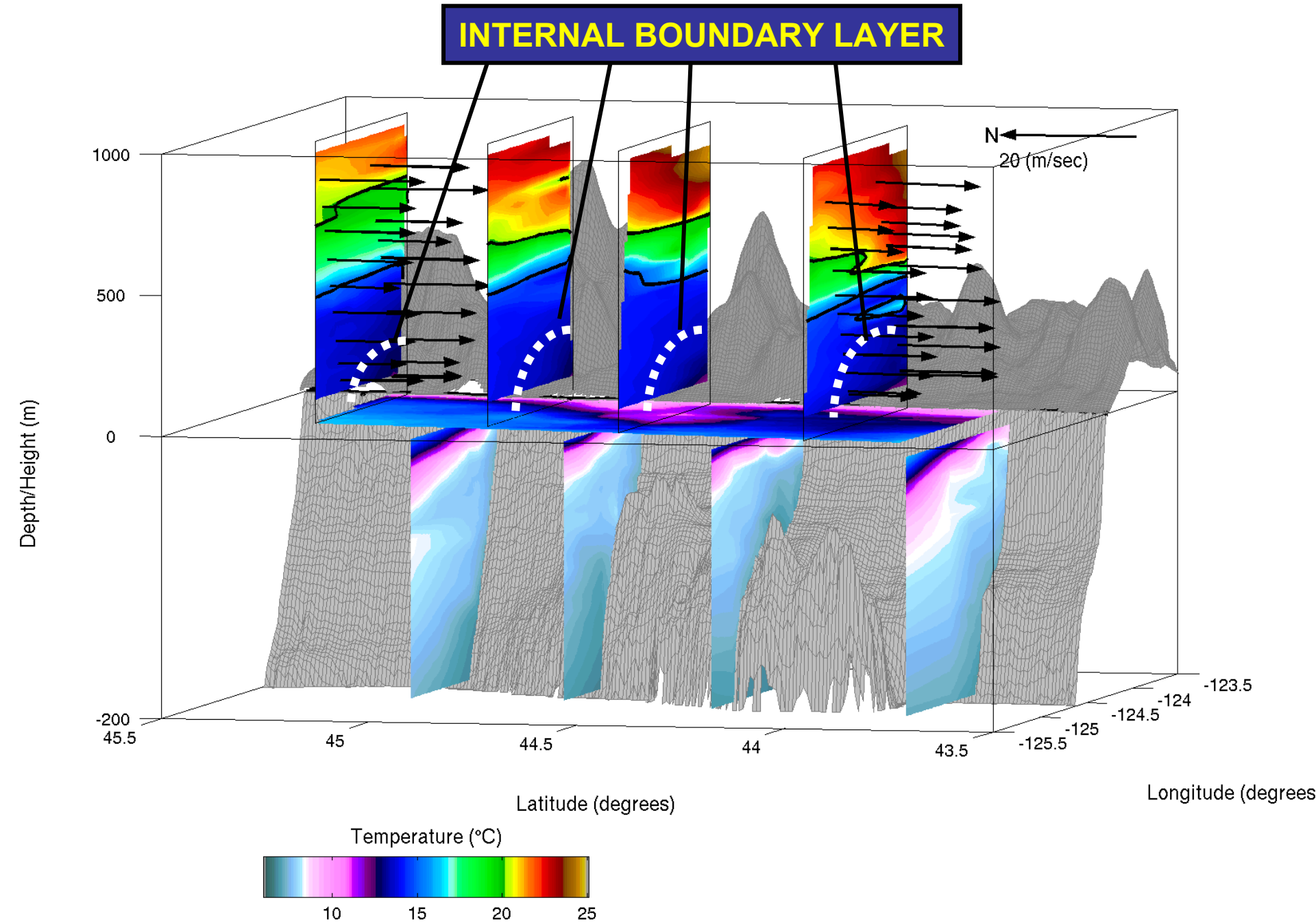
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Latitude (degrees)
Longitude (degrees
Temperature (°C)
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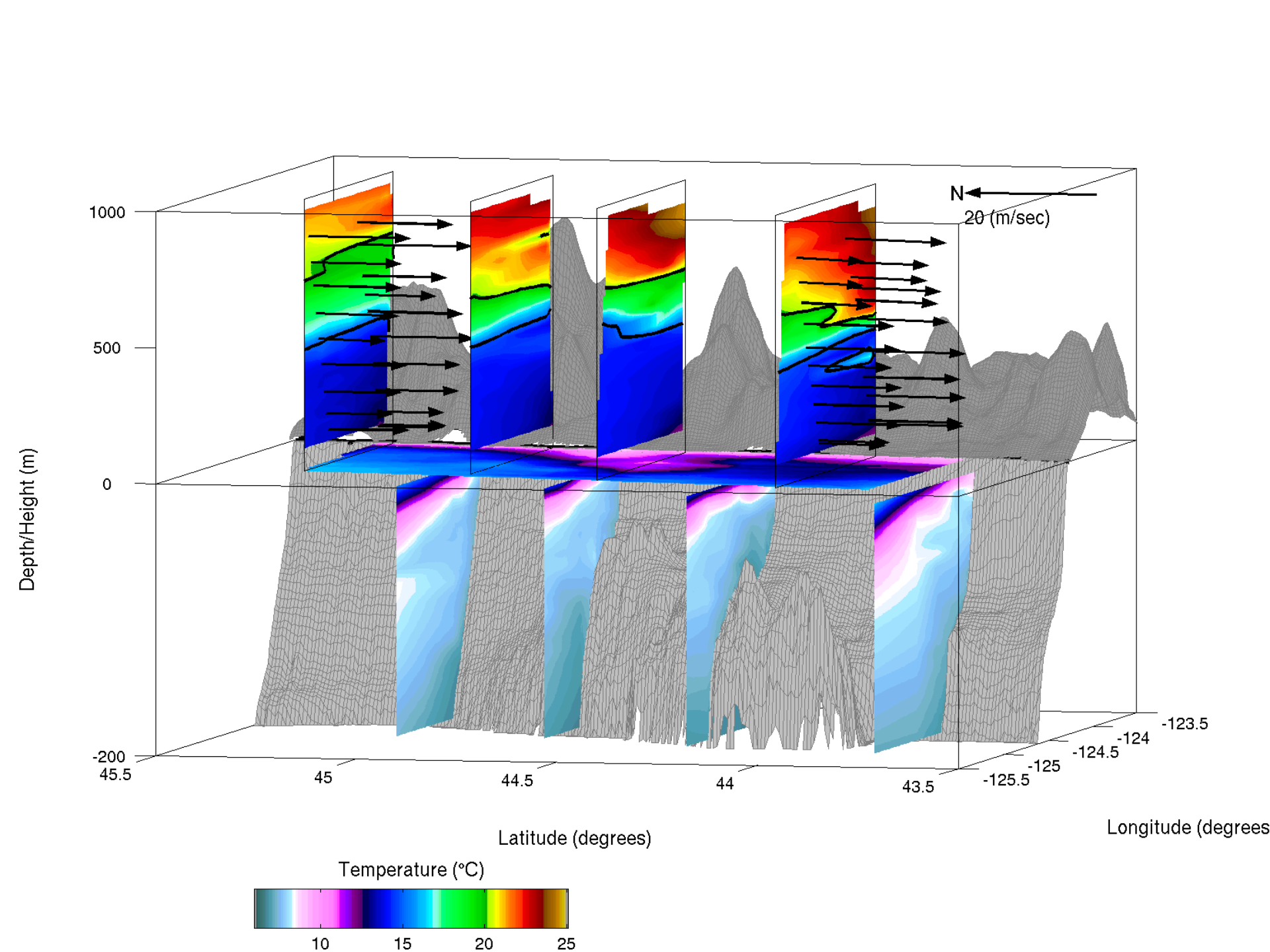
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Longitude (degrees
Temperature (°C)
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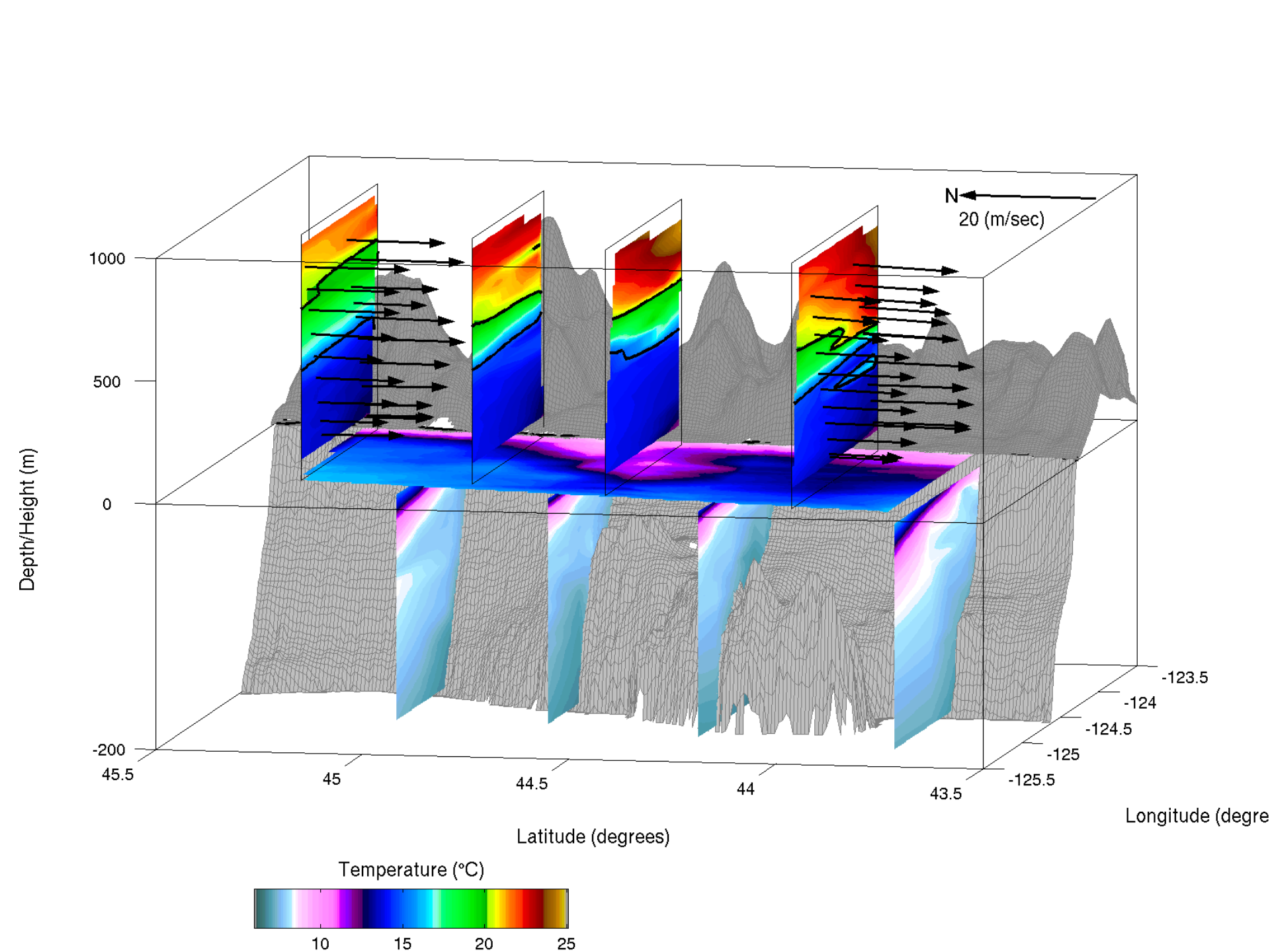
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Temperature (°C)
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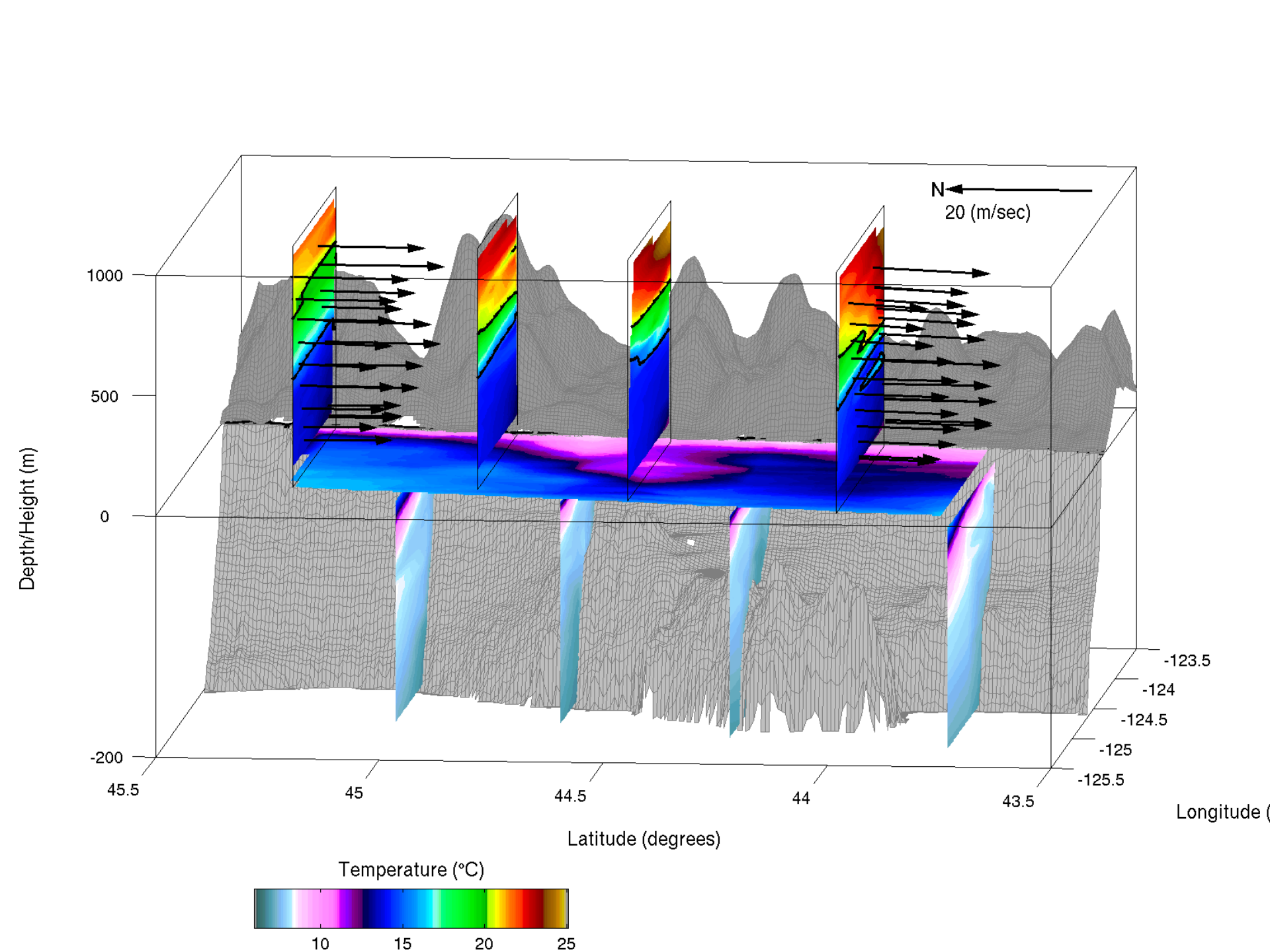
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Temperature (°C)
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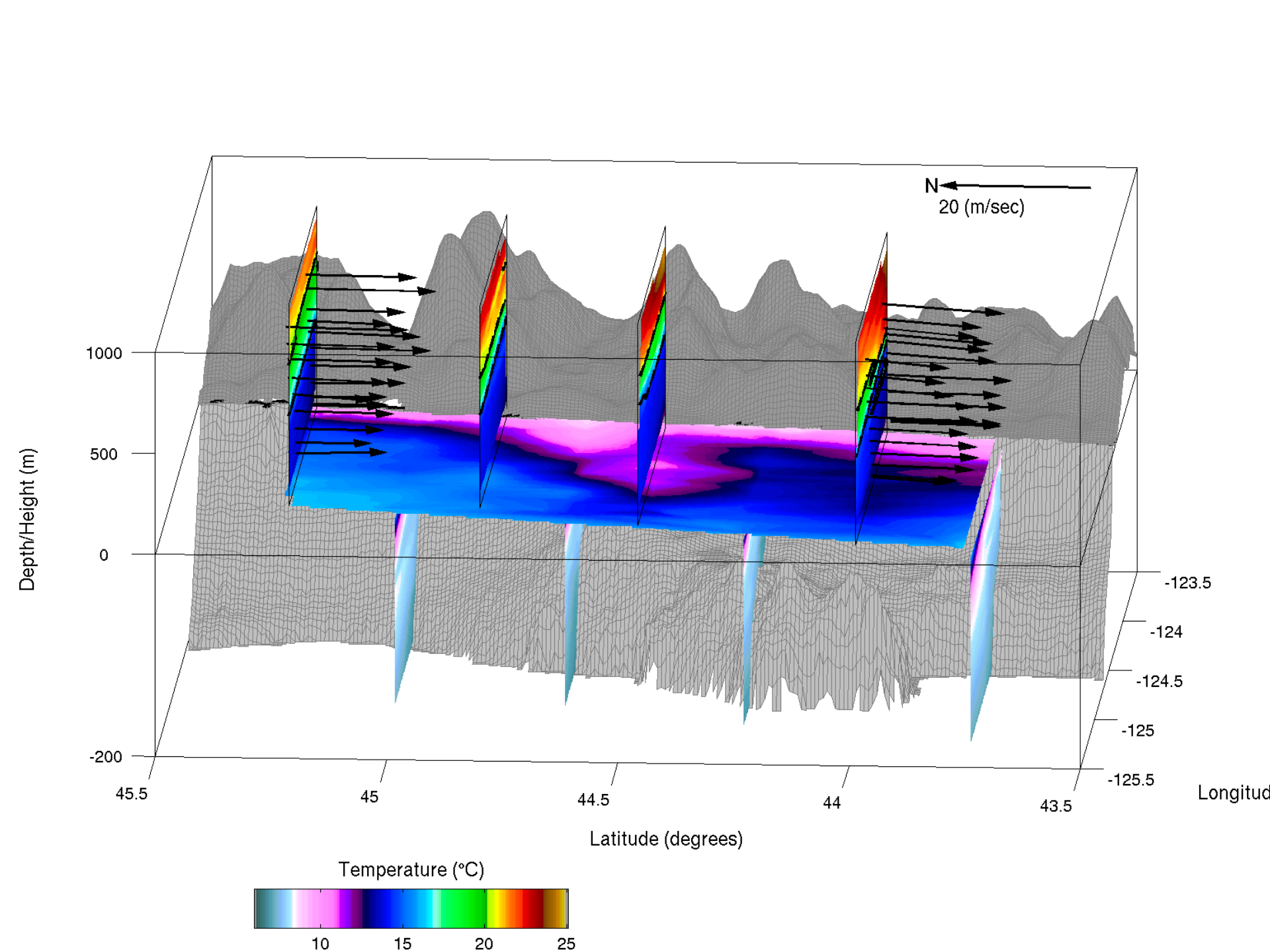
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Longitud
Temperature (°C)
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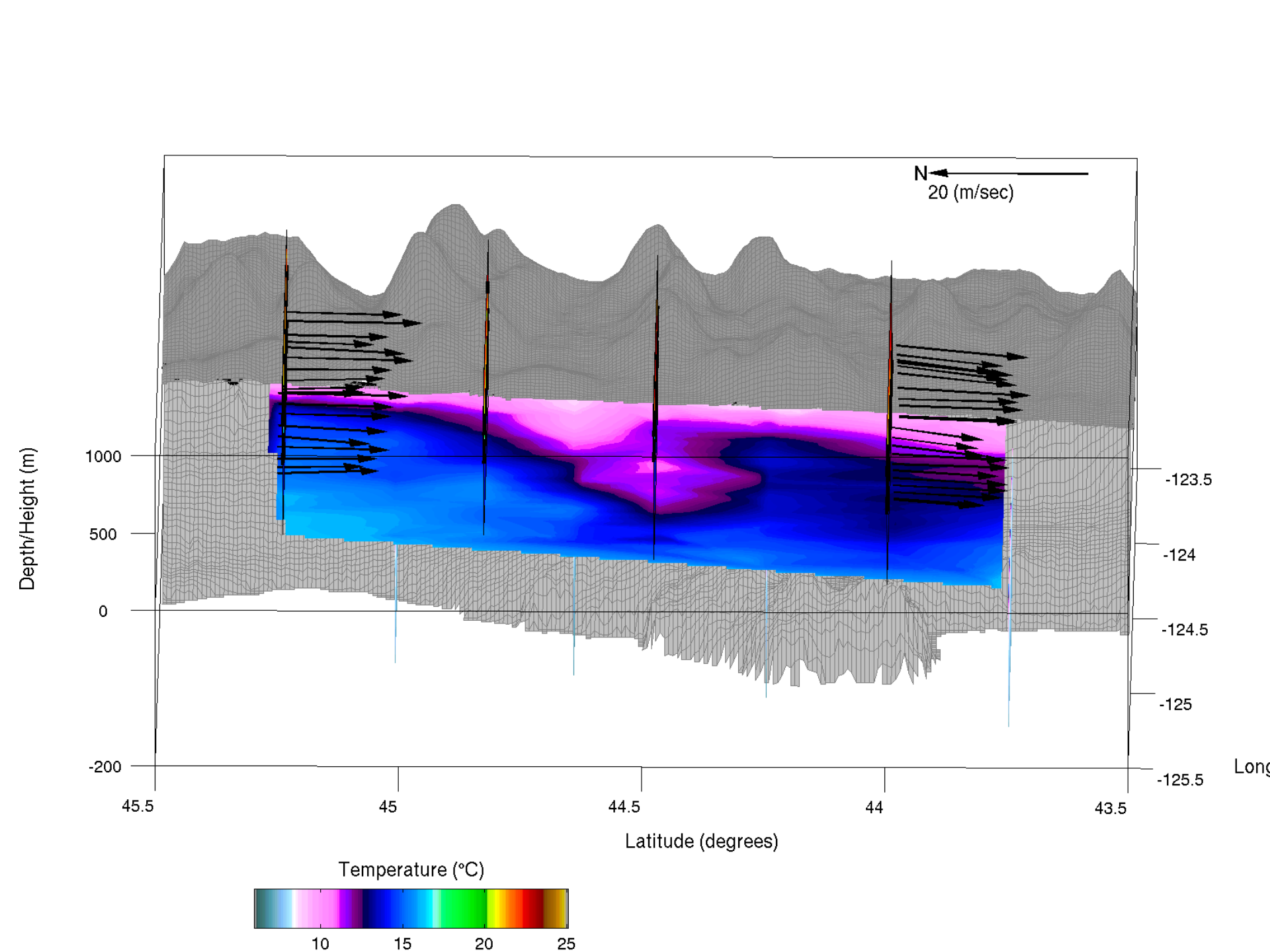
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Long
Temperature (°C)
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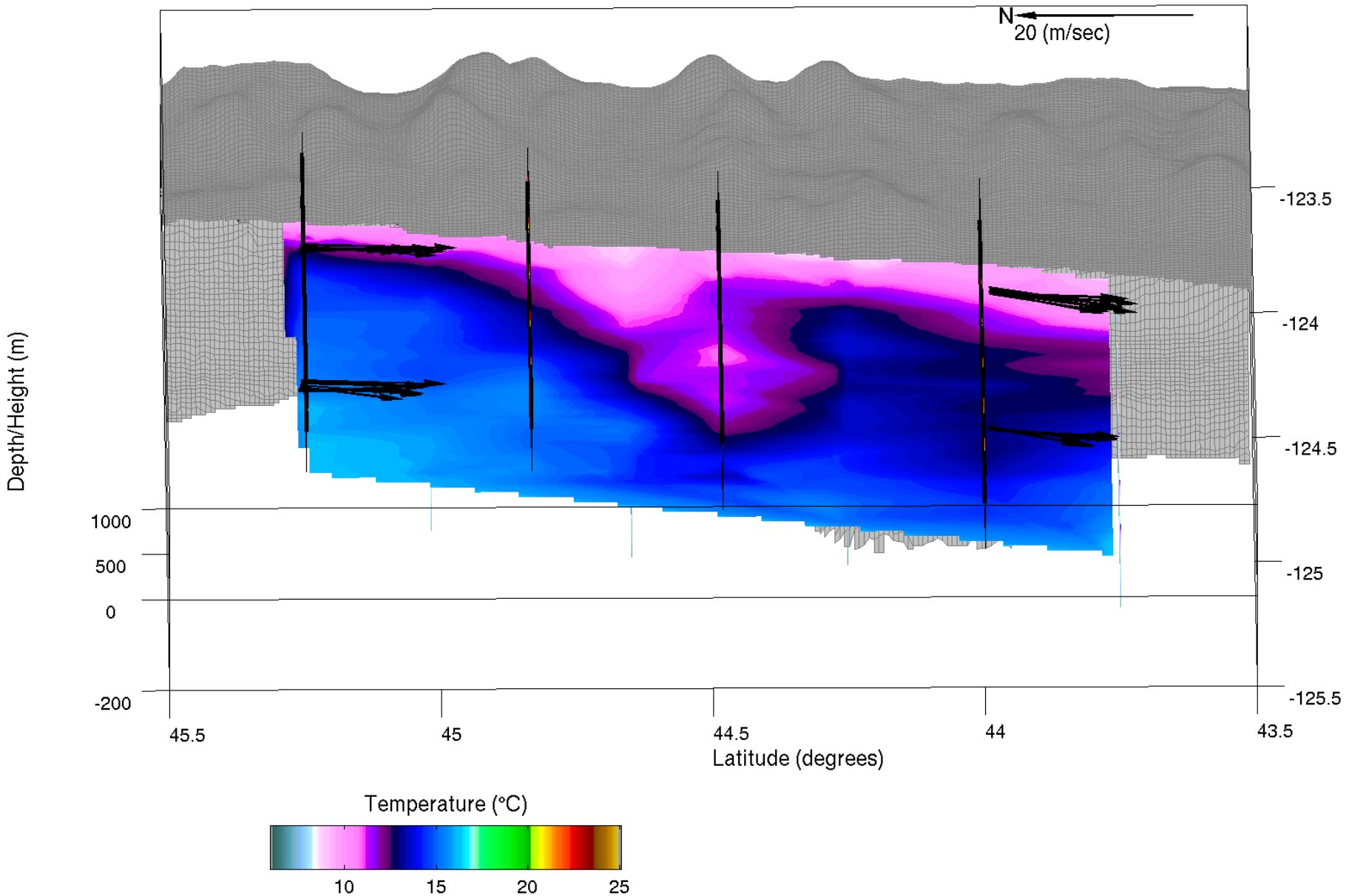
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43.5
Latitude (degrees)
Temperature (°C)
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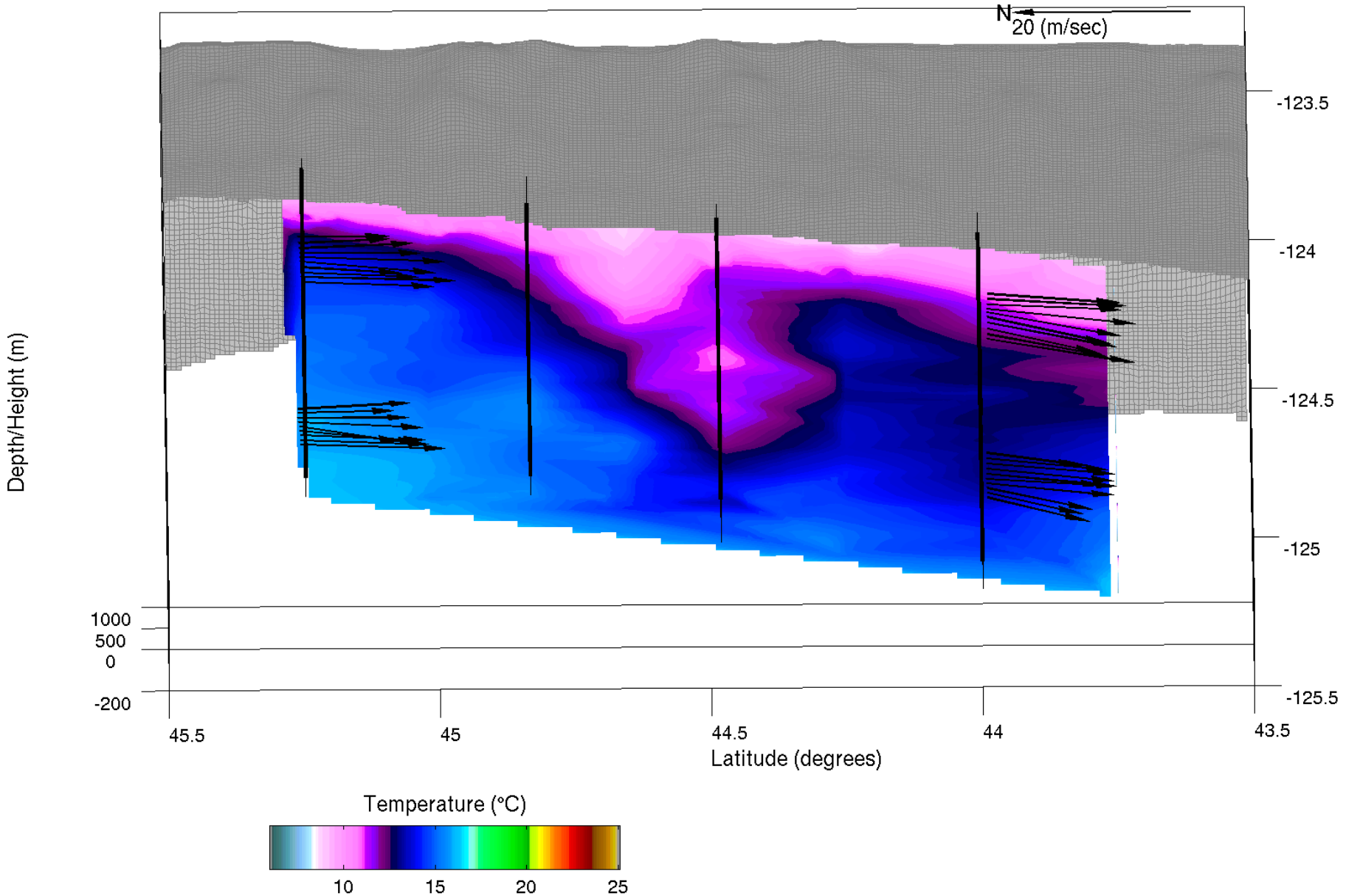
25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Depth/Height (m)
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Latitude (degrees)
Temperature (°C)
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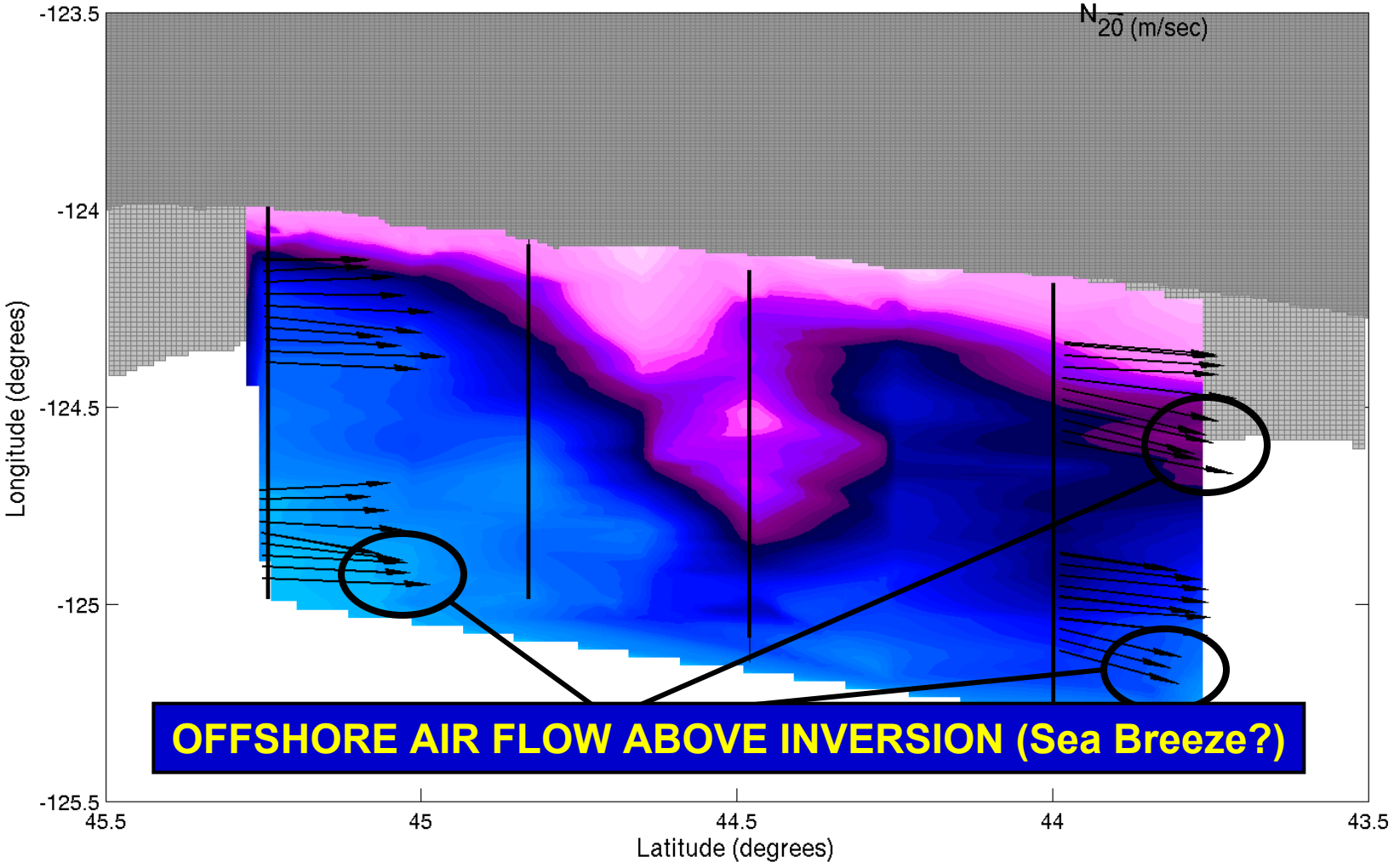
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Longitude (degrees)
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Latitude (degrees)
OFFSHORE AIR FLOW ABOVE INVERSION (Sea Breeze?)
Temperature (°C)
10
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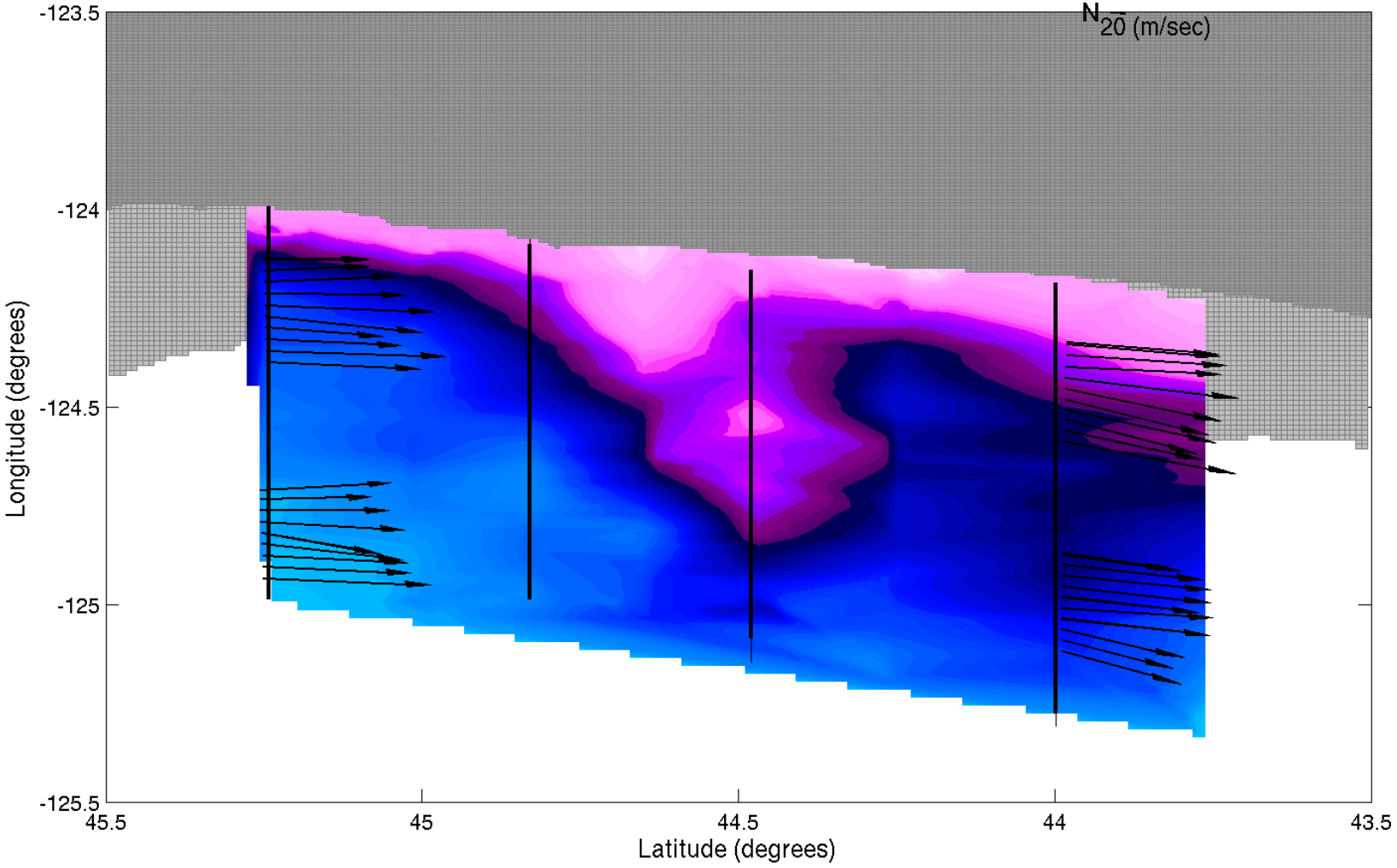
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Latitude (degrees)
Temperature (°C)
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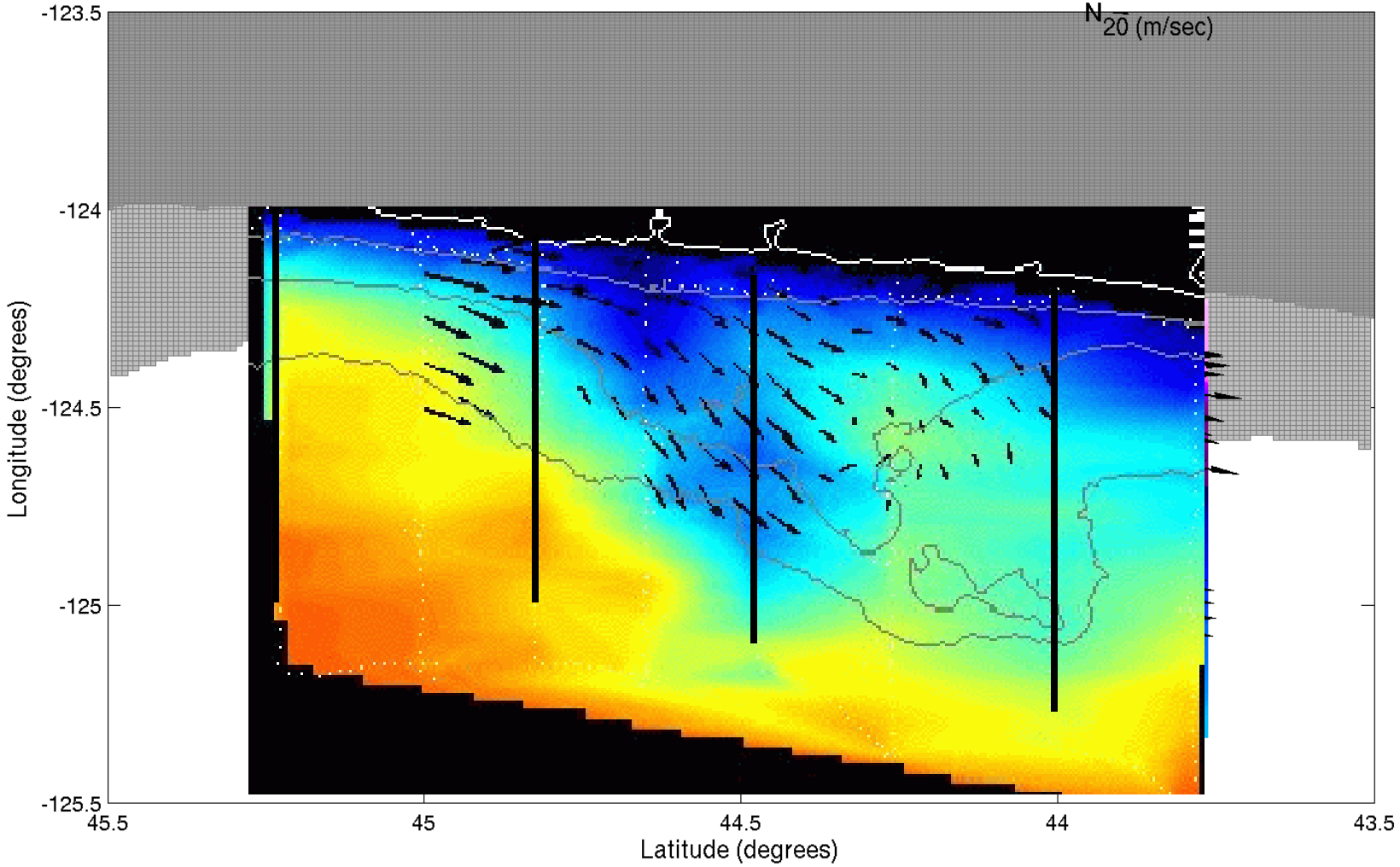
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Temperature (°C)
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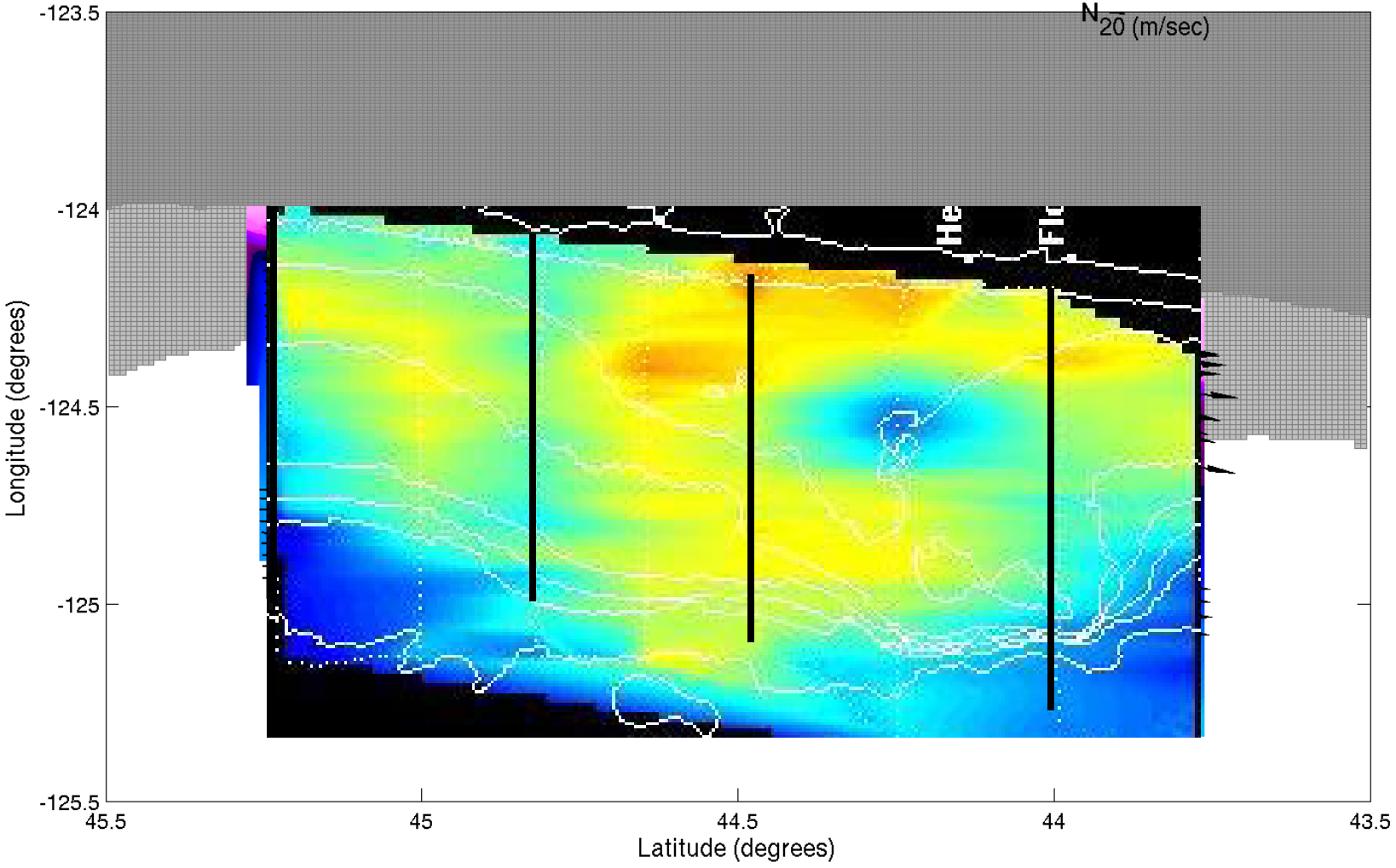
16
18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Longitude (degrees)
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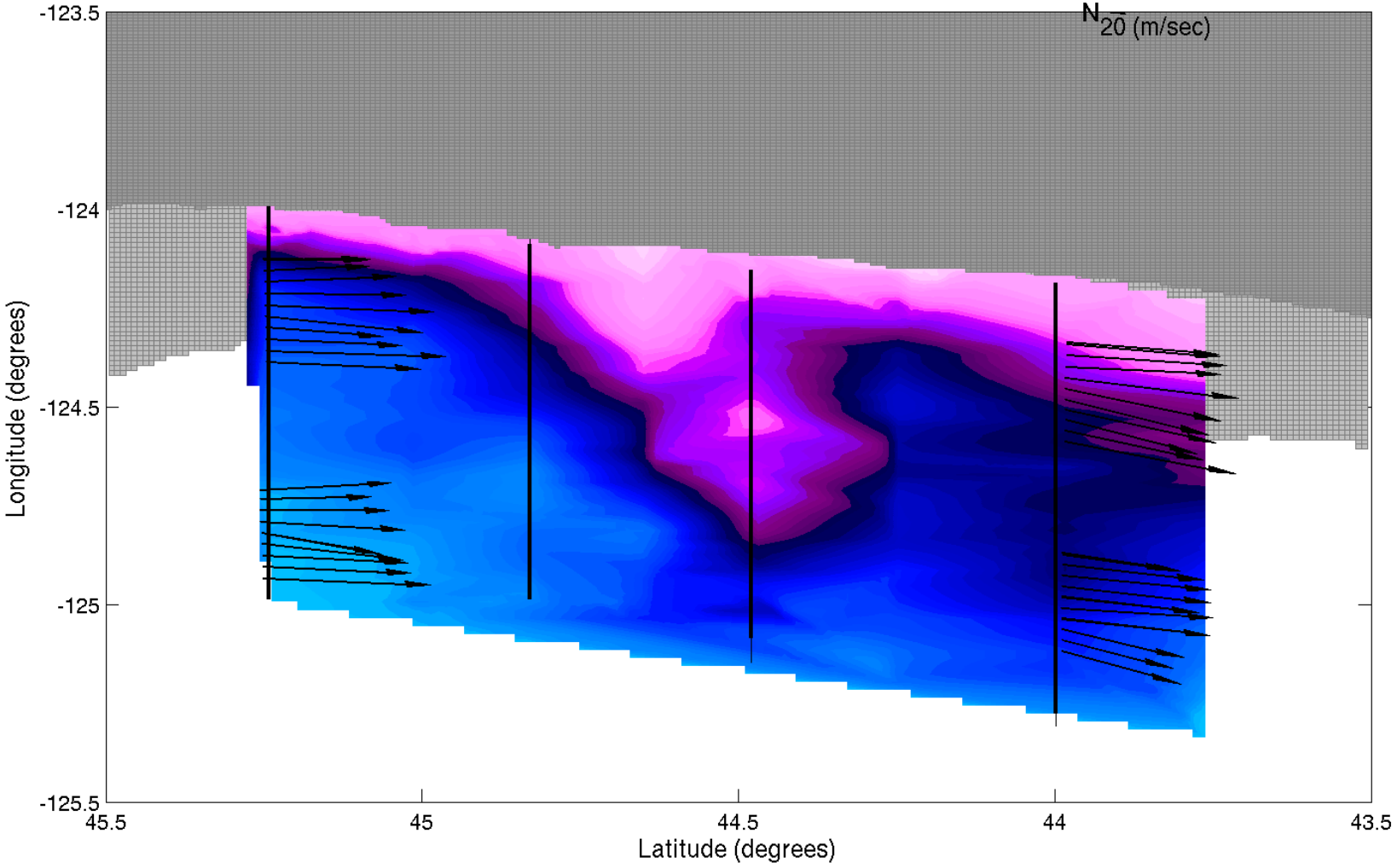
Latitude (degrees)
Chlorophyll (relative scale)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Latitude (degrees)
Temperature (°C)
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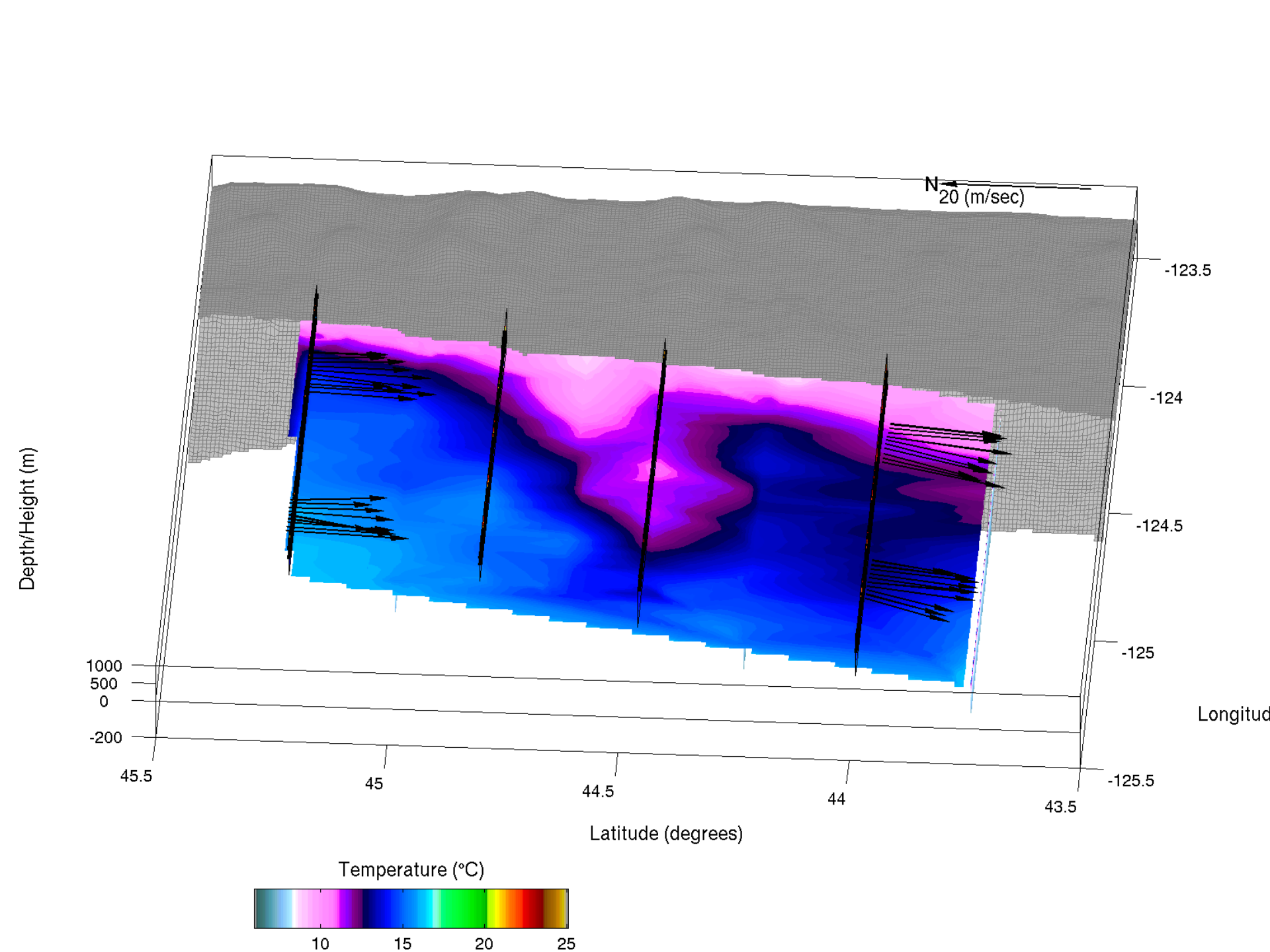
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Longitud
Temperature (°C)
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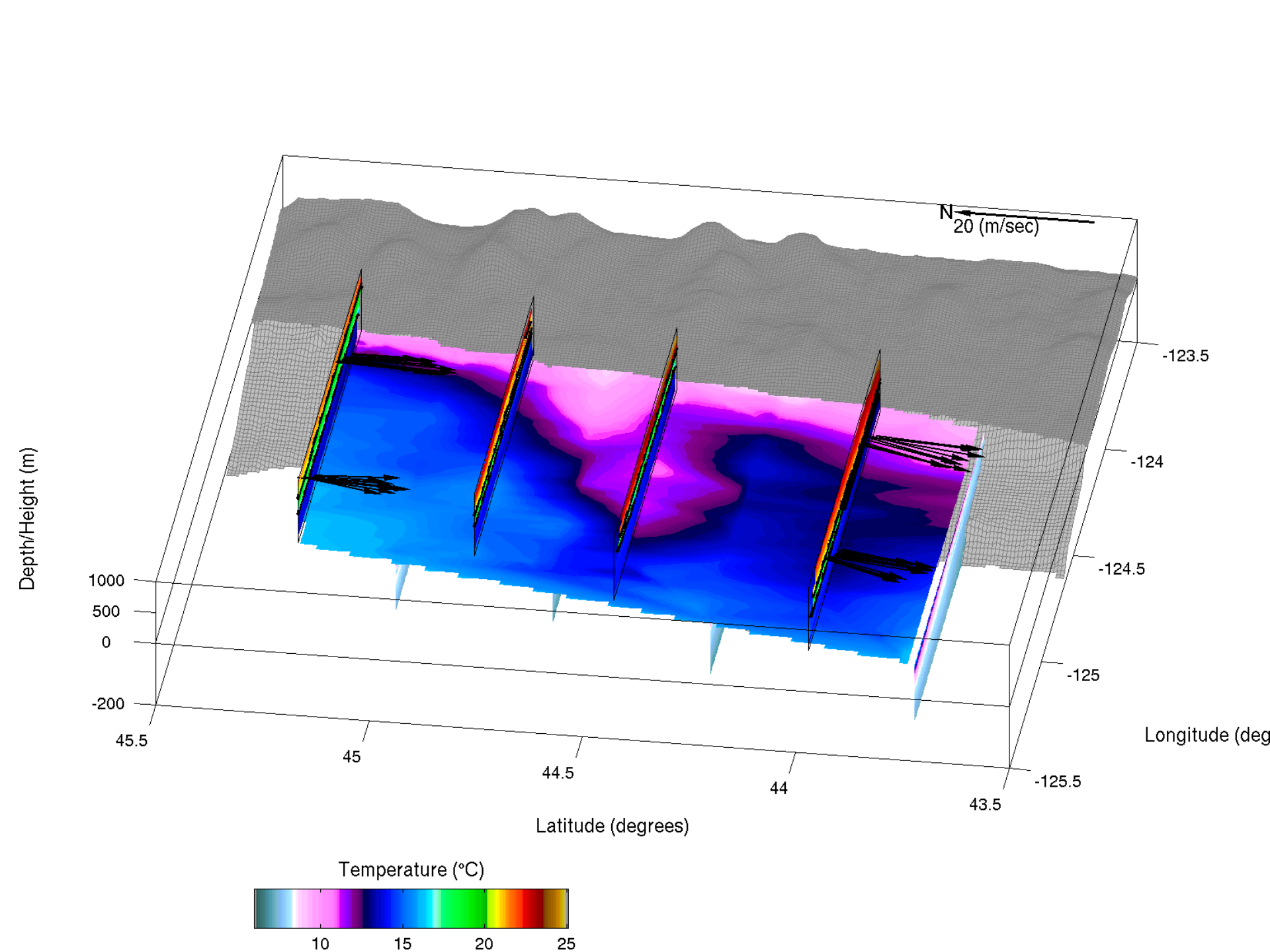
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Longitude (deg
Temperature (°C)
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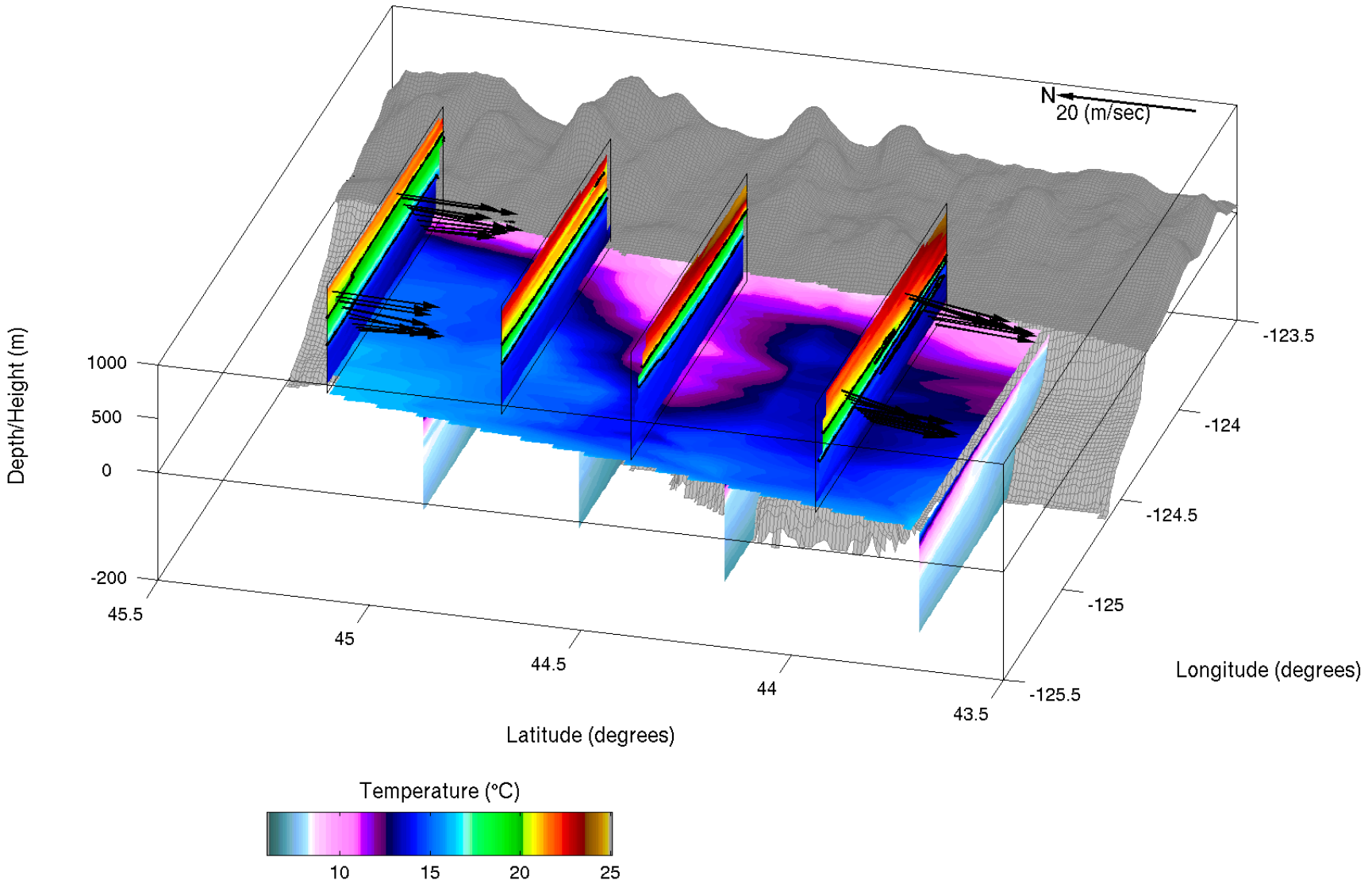
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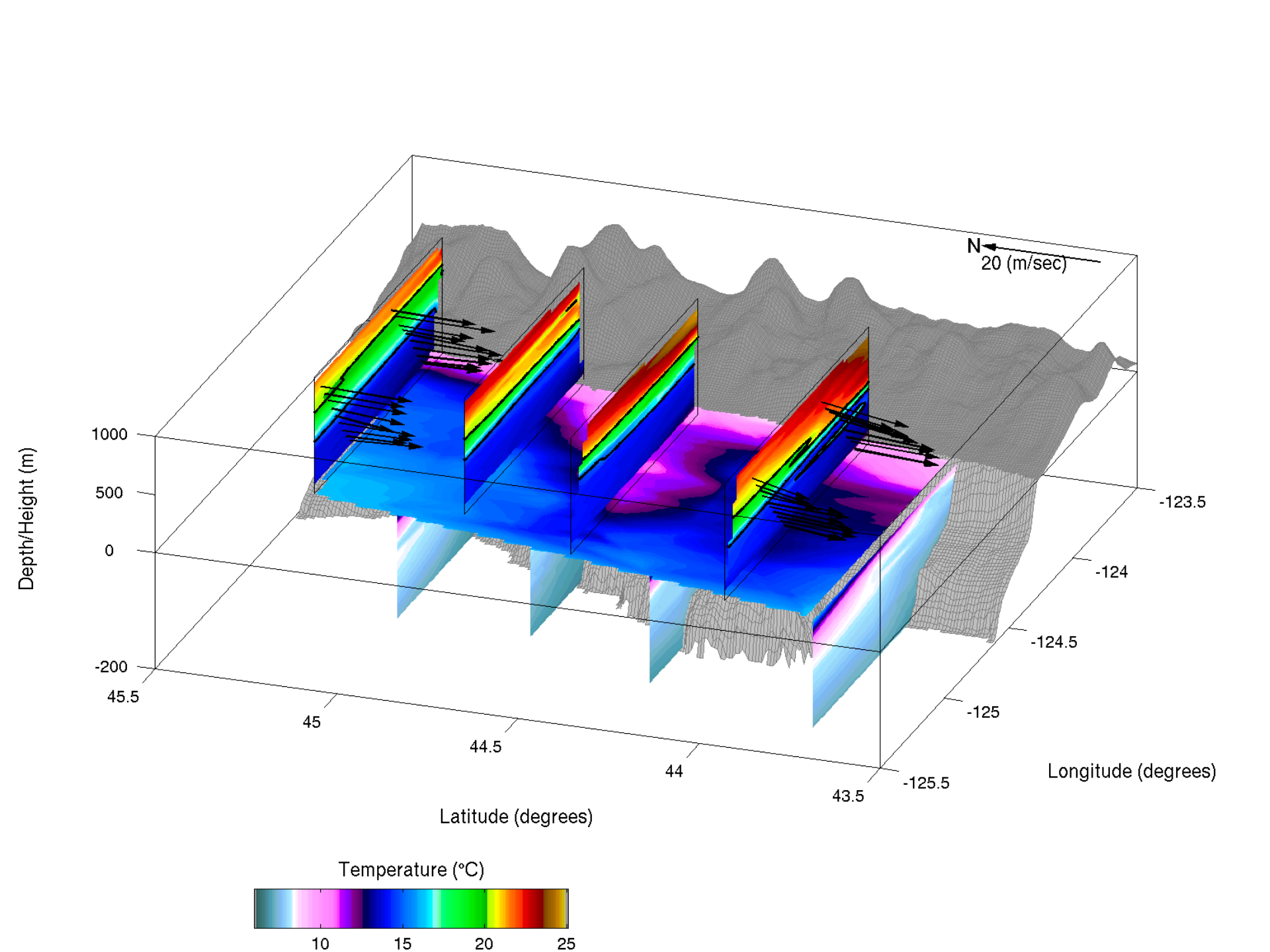
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Temperature (°C)
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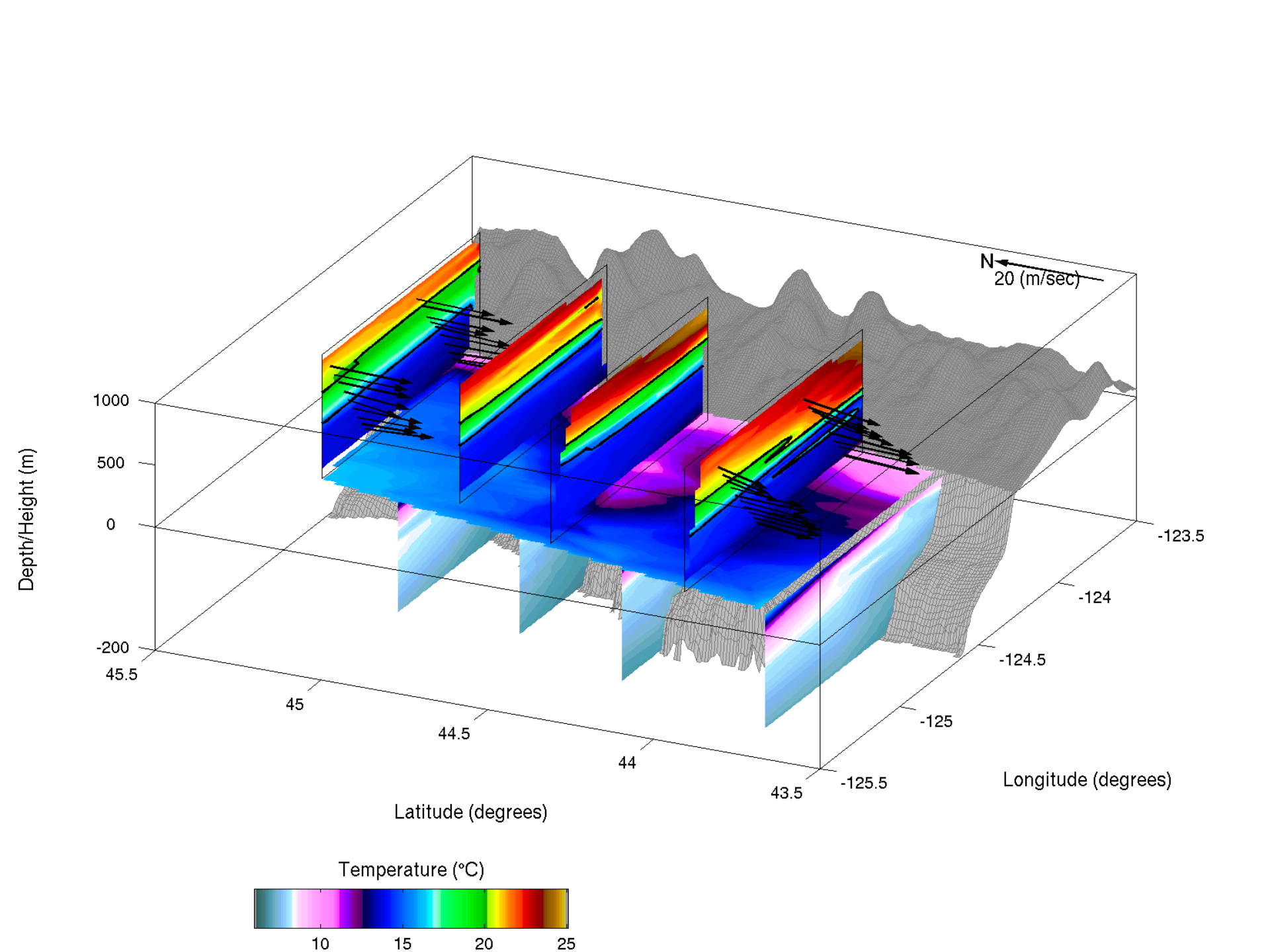
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Temperature (°C)
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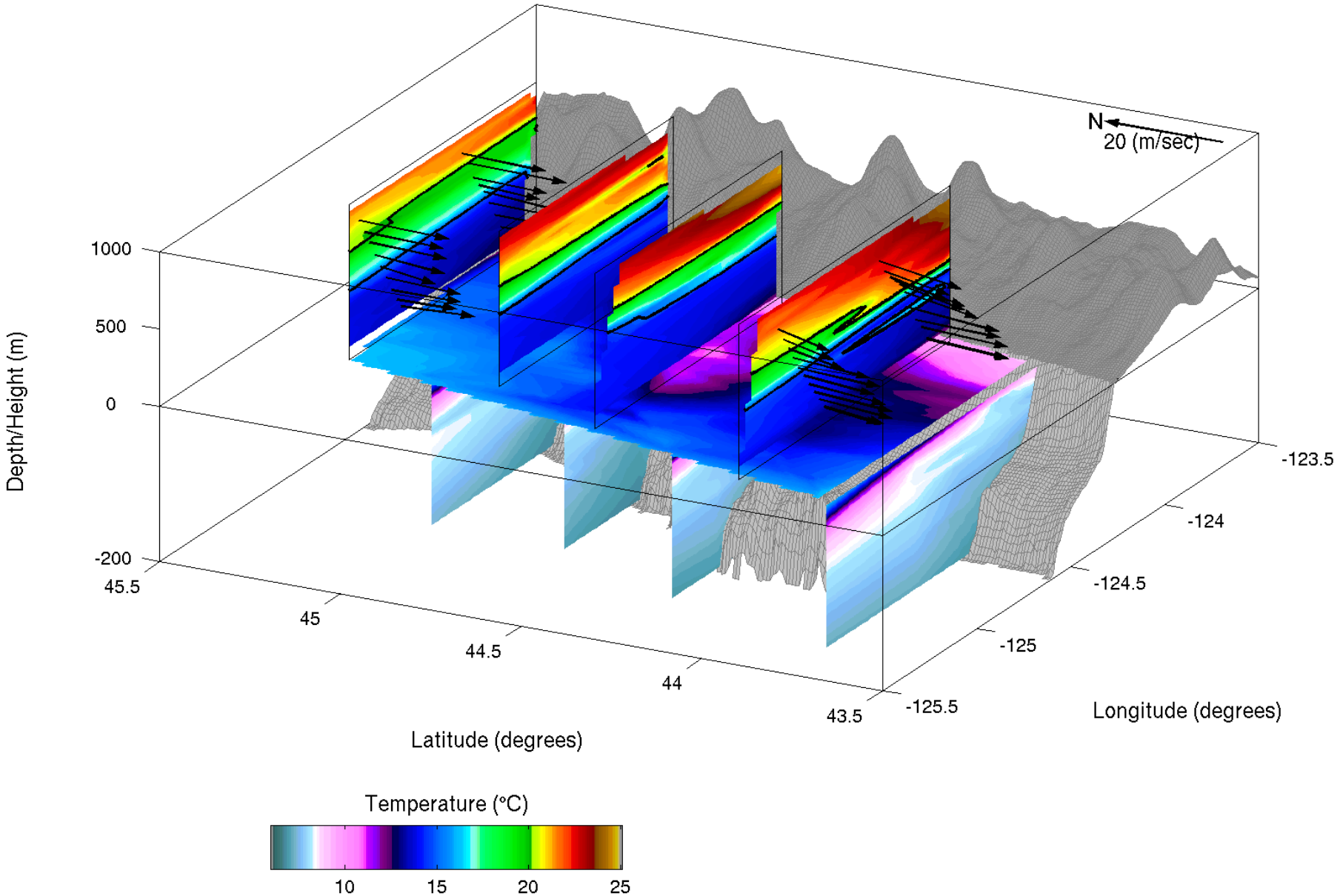
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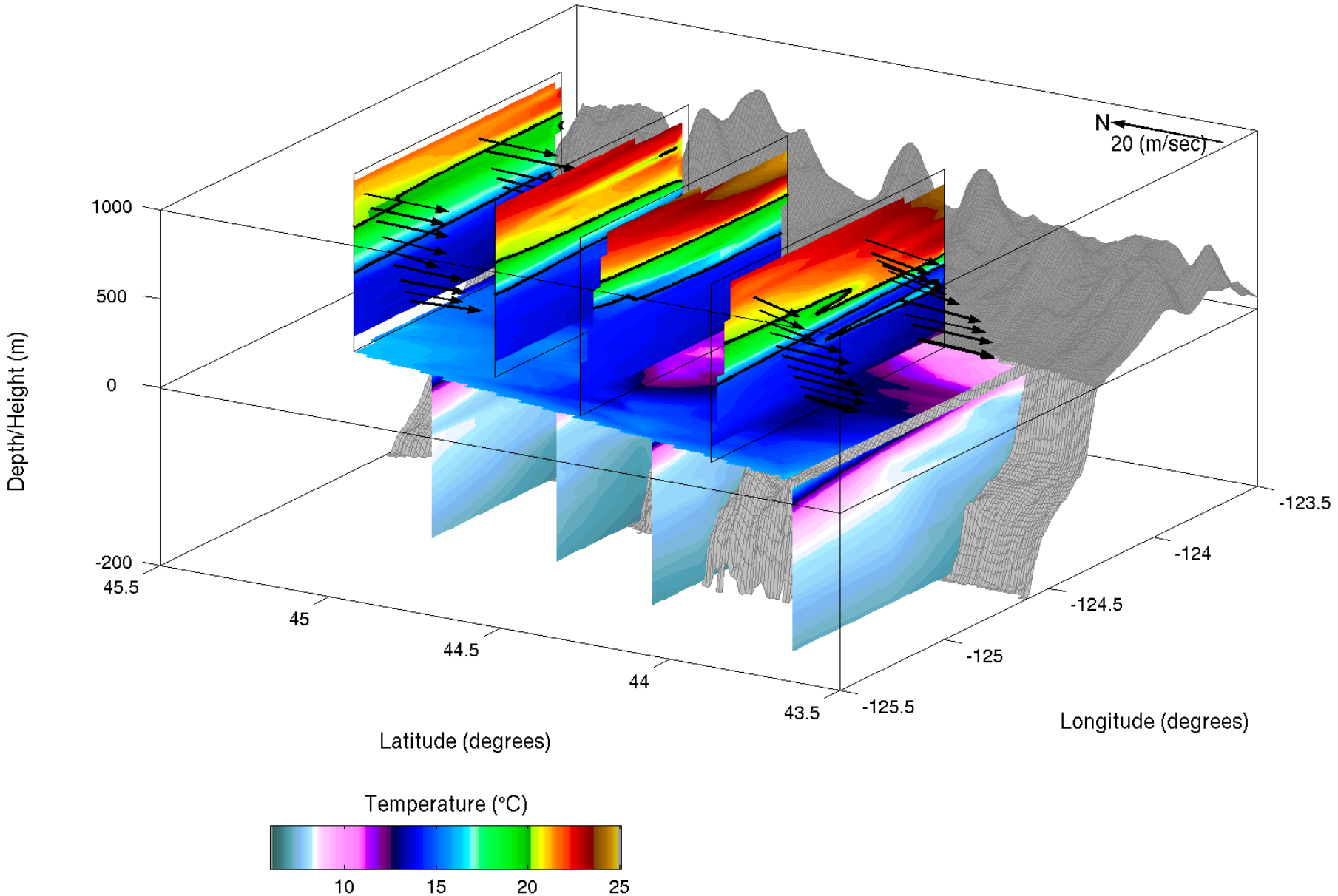
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Temperature (°C)
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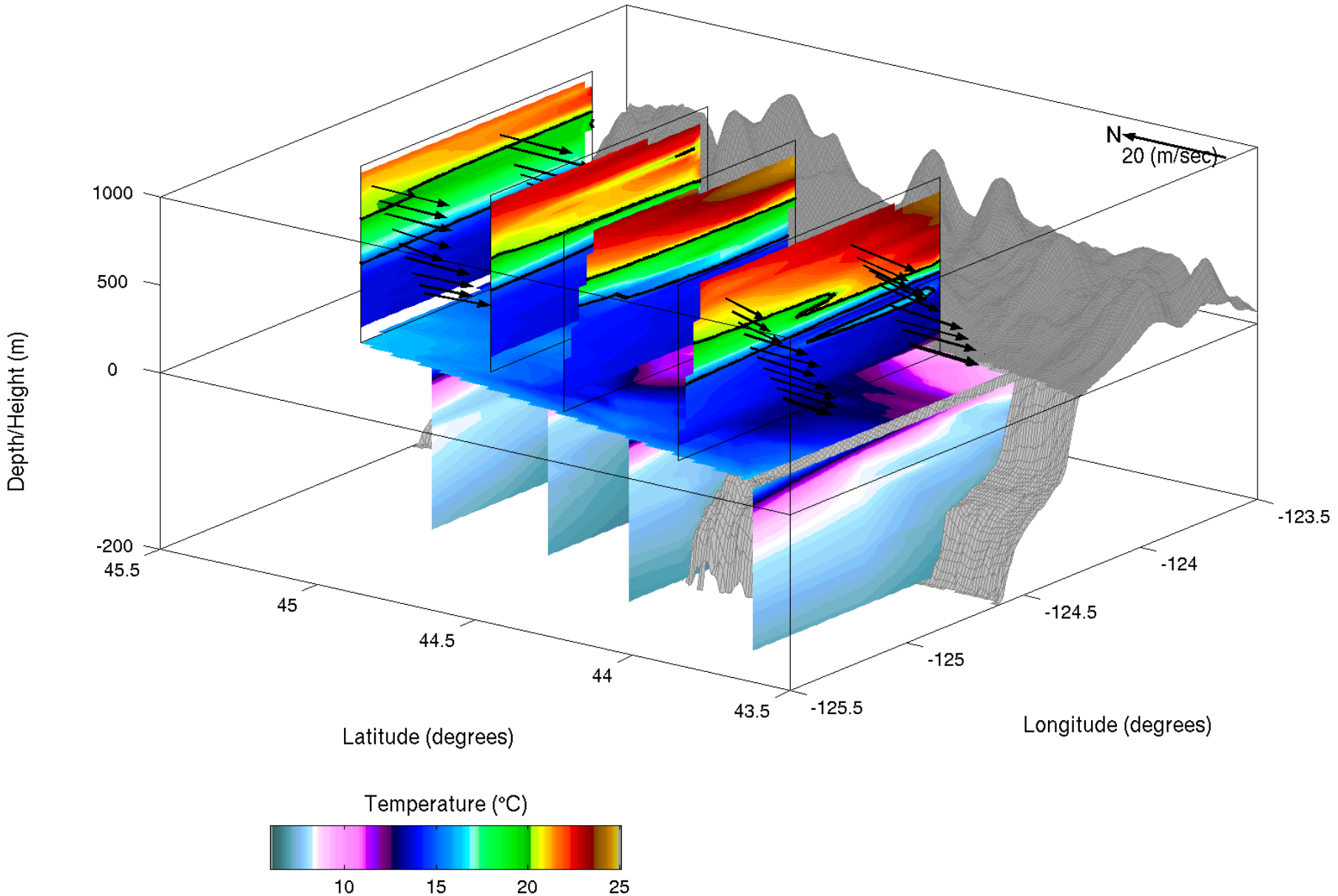
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Longitude (degrees)
Temperature (°C)
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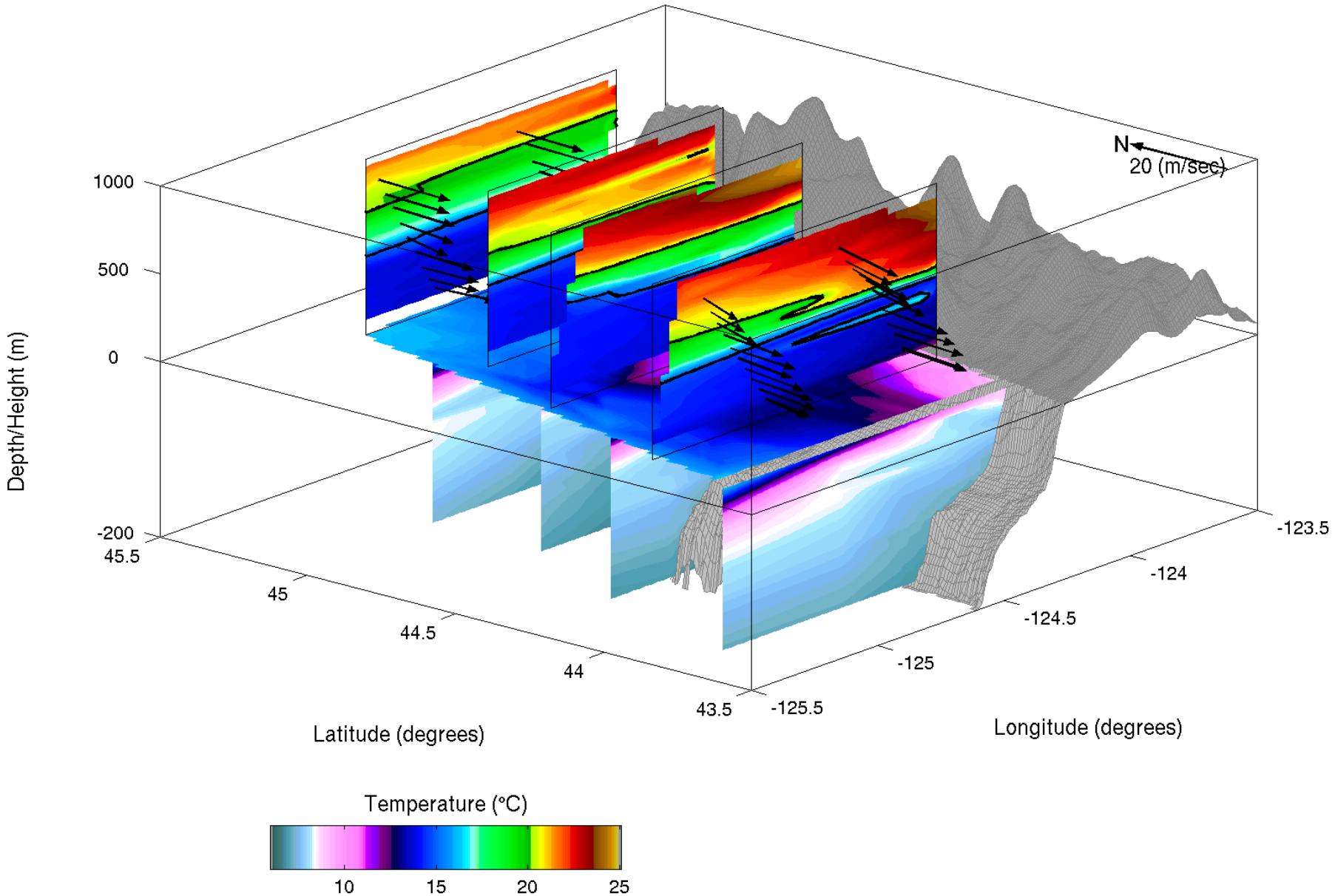
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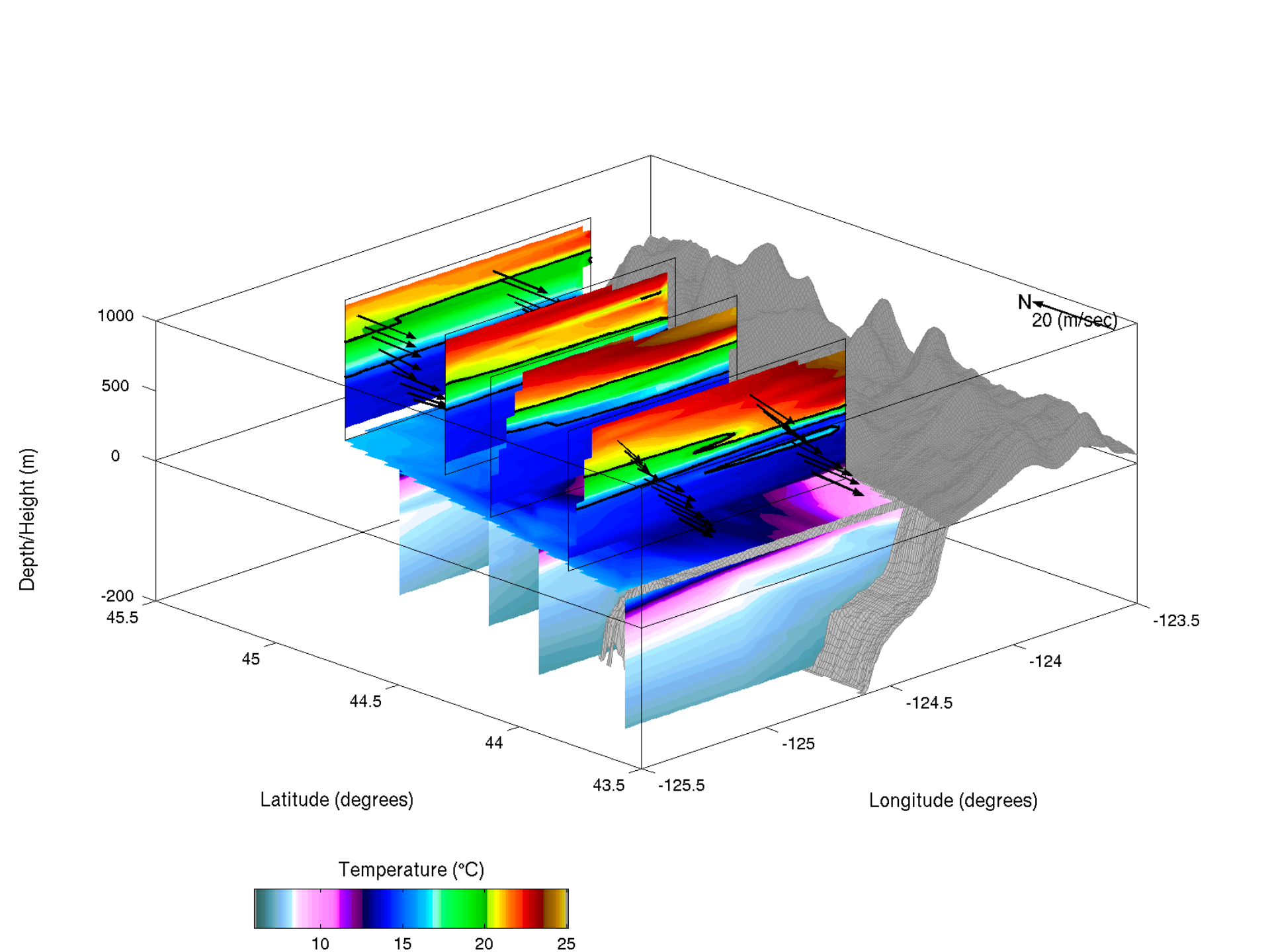
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Temperature (°C)
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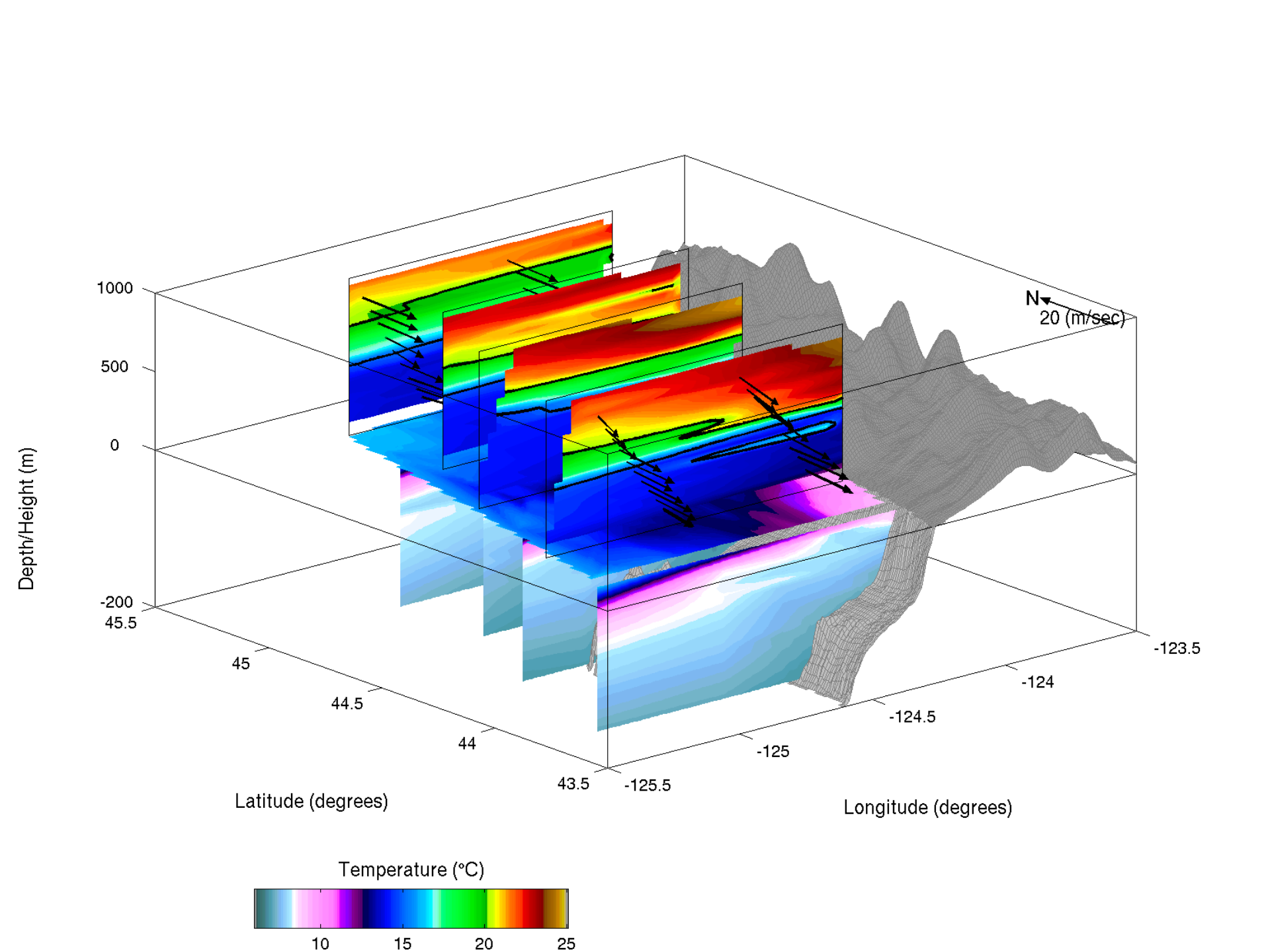
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Temperature (°C)
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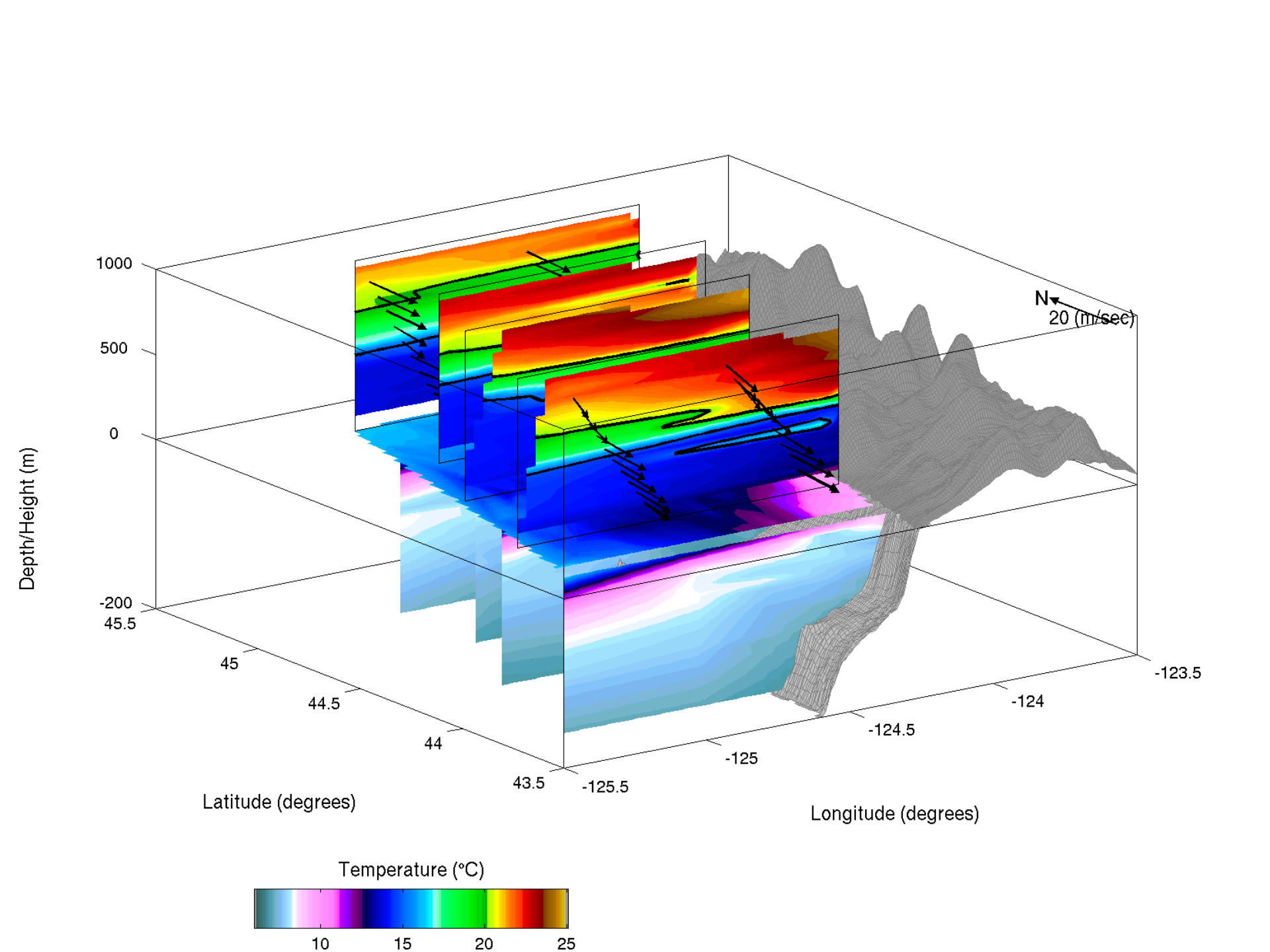
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Longitude (degrees)
N
20 (m/sec)
Temperature (°C)
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20
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UNOLS Report

SCOAR - 4/6/05

Fleet Renewal

- *FOFC Fleet Renewal Plan…leads to*
- *Cape Henlopen* Replacement Vessel
- R/V *Marcus Langseth*
- Alaska Region Research Vessel
- Regional Class Research Vessels (3)
- Ocean Class Research Vessels (4)
- Global Class Science Mission Req’ts

FOFC Plan - 1st edition - 2001

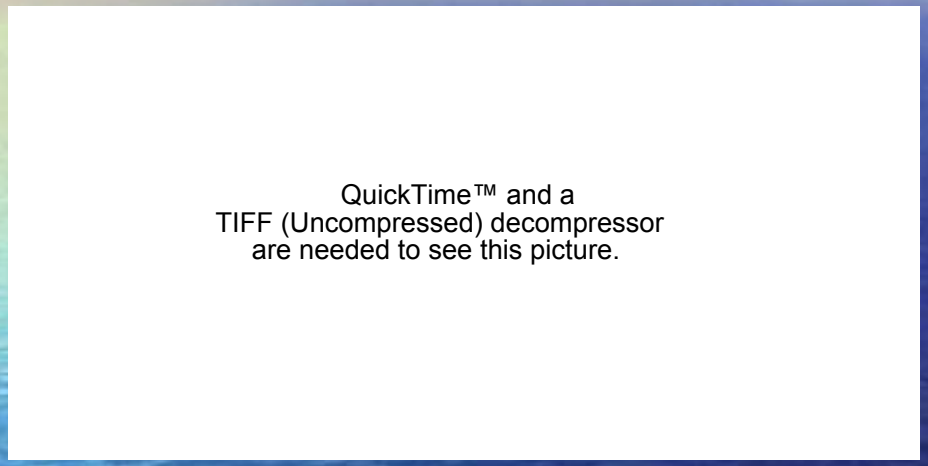
QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

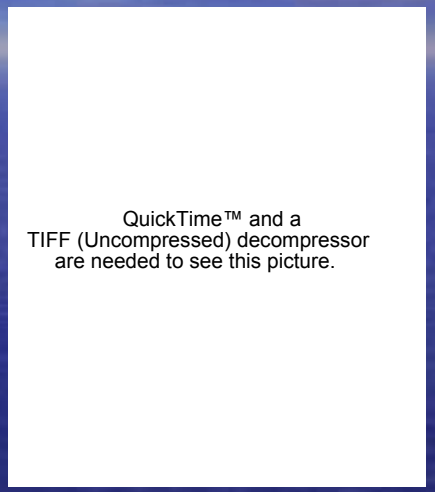
QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

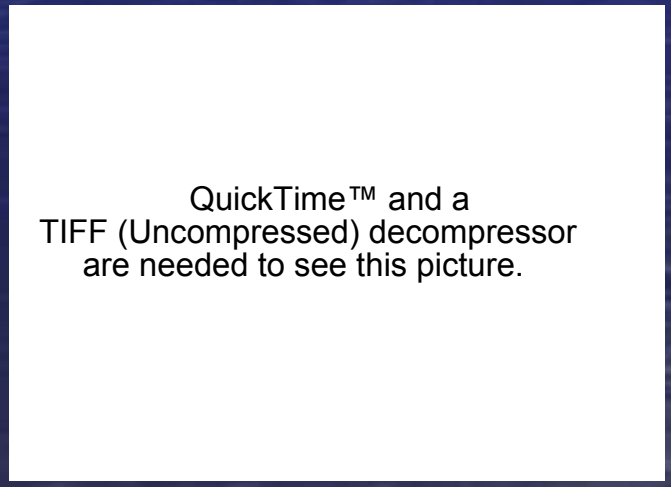
QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

Cape Henlopen Replacement Under Construction

Marcus Langseth - being converted







Alaska Region Research Vessel

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

Regional, Ocean& Global Class

- Providing input to NSF on Regional Class Performance Specs prior to their issuing an RFP
- Provided input to CNR regarding hull type required for new Ocean Class - Monohull
- Developing updated Science Mission Requirements for Global Class vessels
- Updating 1995 Fleet Improvement Plan as a complementary document to the Federal Plan
- Looking at how to incorporate ADA requirements in R/V designs

Other facilities

- New Human Occupied Vehicle - 6500 meter depth
- Hybrid - Remotely Operated Vehicle
- 3-D seismic Facility with oversight committee (Marcus Langseth)
- Aircraft?

Budget Woes

- Flat or declining budgets to support current operations
- NSF asked UNOLS for advice on cutting $6M - $8M from their ship operations costs
- Layups or Retirements?
- Answers in time for 2006 scheduling this summer…
- Some potential increases in utilization from NOAA for DART and for Navy programs, still somewhat of a ?

New Regulatory requirements

- Coast Guard changed application of international regulations, now using International Tonnage to determine
- Brings Intermediate and some Regional Class vessels under International Safety Management (ISM) rules, International Ship Safety Plan rules and non-tank vessel Oil Spill response rules.
- Increasing costs and administrative burdens on ship operators.

CIRPAS Twin Otter briefing

- 2004 summary
- 2005 schedule
- 2006 requests (as of 04/01/2005)
- Instrumentation news
- Publications

2004 missions

Project	Location	Period	Sponsor	Lead Scientist
Bi-weekly ocean surveys	Marina, CA	Jan-Mar	ONR	Steven Ramp, NPS
EVE	Marina, CA	Ap-May	NASA	Jens Redemann, NASA Ames
CARMA-II	Marina, CA	July	ONR	Dean Hegg, U. Washington
ICARTT	Cleveland, OH	August	NSF/ONR/NOAA	John Seinfeld, Caltech
Heavy maintenance		Oct-Nov		

2005 Missions

Project	Location	Period	Sponsor	Lead Scientist
Ocean survey	Marina, CA	Feb	ONR	Steven Ramp, NPS
Engineering flights	Marina, CA	Mar	SBIR	Haf Jonsson, CIRPAS
CSTRIPE-II	Marina, CA	July	ONR	John Seinfeld, Caltech
CARMA-III	Marina, CA	August	ONR	Dean Hegg, U. Washington
CALIPSO IOP-Followup Lidar-winds TOWPL	Newport, Ponca City Marina Marina	Sept Sept Oct Oct->	NASA DOE NPOESS ONR	Jens Redemann Beat Schmid Dave Emmitt Kehlif

2006 Requests

Project	Location	Period	Sponsor	Lead Scientist
Sat. Cal - Val	Darvin	Jan	DOE	Jens Redemann
Lidar Wind Study	North Carolina	Mar/Oct	NPOESS	Dave Emmitt
Ocean/Biology	California	Summer	ONR	Faloona/Raemer
Fluxes	Oregon	Summer	ONR	John Bane
Surveys Cloud chem.	Monterey Houston	August August	ONR NOAA	Steve Ramp Graham Feingold

NEW INSTRUMENTATION
Twin Otter

- MSP Triple DMA's – repaired and delivered
- NMASS – delivered
- Pro Sensing 94 Ghz cloud radar – Testflown in March
- Stabilized Radiation Platforms-Repaired and testflown in March
- Coherent Technologies wind lidar-New transceiver delivered
- Phased Doppler Cloud Spectrometer-Testflow in March
- SP2 carbon particle spectrometer – delivered
- SCAPS single particle scatter probe – delivered and testflown in March

LISST, S-CIP and TOWED PLATFORM anticipated this year.

CIRPAS Publications 2004

1) Fridlind, A. M., Andrew S. Ackerman, Eric J. Jensen, Andrew J. Heymsfield, Michael R. Poellot, David E. Stevens, Donghai Wang, Lawrence Milosevich, Darrel Baumgardner, R. Paul Lawson, James C. Wilson, Richard C. Flagan, John H. Seinfeld, **Haflidi H. Jonsson**, Timothy M. VanReken, Varutida Varutbangkul, Tracey A. Rissman, 2004: Evidence for the Predominance of Mid-Tropospheric Aerosols as Subtropical Anvil Cloud Nuclei, *Science,* 304, 718-722.

2) Kahn, R., J. Anderson, T.L. Anderson, T. Bates, F. Brechtel, C.M. Carrico, A. Clarke, S.J. Doherty, E. Dutton, R. Flagan, R. Frouin, H. Fukushima, B. Holben, S. Howell, B. Huebert, A. Jefferson, **H. Jonsson**, O. Kalashnikova, J. Kim, S-W. Kim, P. Kus, W-H. Li, J.M. Livingston, C. McNaughton, J. Merrill, S. Mukai, T. Murayama, T. Nakajima, P. Quinn, J. Redemann, M. Rood, P. Russell, I. Sano, B. Schmid, J. Seinfeld, N. Sugimoto, J. Wang, E.J. Welton, J-G. Won, S-C. Yoon, (2004), Environmental Snapshots From ACE-Asia, *J. Geophys. Res*., 2003JD004339R

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5) Hegg, D. A, P. A. Durkee, **H. H. Jonsson**, K. Nielsen, and D. S. Covert, 2004, Effects of aerosol and SST gradients on marine stratocumulus albedo *Geophys. Res. Lett.,* Vol. 31, No. 6, L0611310.1029/2003GL018909

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8) Conant, W.C., T.M. VanReken, T.A. Rissman, V. Varutbangkul, **H.H. Jonsson**, A. Nenes, J.L Jimenez, A. Delia, R. Bahreini, G. Roberts, R.C. Flagan, and J.H. Seinfeld, Aerosol-Cloud Drop Concentration Closure in Warm Cumulus, *Journal of Geophysical Research,* 109, D13204, doi:10.1029/2003JD004324 (2004).

9) Taylor, P. and **H. Jonsson**, 2004: Thunderstorm Asthma, *Current Allergy and Asthma Reports,* **4**(5), 1-6.

10) Bane, J. M., R. Bluth, C. H. Flagg, C. A. Friehe, **H. H. Jonsson**, K. Melville, M. Prince, and D. Riemer, Research Aircraft Facilities for U.S. Ocean Sciences, 2004, *Oceanography*, **17**, 176-185.

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15) Feingold, Furrer, Pilewskie, Remer, Min, and **Jonsson**, 2005, Aerosol Indirect Effect Studies at Southern Great Plains during the May 2003 Intensive Operations Period, (Submitted to *J. Geophys. Res*).

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CIRPAS Publications cntd

19) Schmid, B., R. Ferrare, C. Flynn, R. Elleman, D. Covert, A. Strawa, E. Welton, D. Turner, **H. Jonsson**, J. Redemann, J. Eilers, K. Ricci, A. G. Hallar, M. Clayton, J. Michalsky, A. Smirnov, B. Holben, J. Barnard, 2005, How well can we measure the vertical profile of aerosol extinction (Submitted to *J. Geophys. Res*).

20) Strawa, A.W., Arnott, A.P., Elleman, R., Hallar, A.G., Covert, D., Ricci, K., Provencal, R., Owano,T., **Jonsson, H**, Schmid, B., Luu, A.P., Bokarius, K., 2005, Comparison of In-Situ and Remote Aerosol Optical Property Measurements During the DOE Aerosol IOP (In preparation).

21) Jian Wang, Yin-Nan Lee, Linda Bowerman, **Haf Jonsson**, Roberto Gasparini, Don Collins, Betsy Andrews, Pat Sheridan, John Ogren, 2005, Aerosol size distributions during ARM aerosol IOP (In preparation).

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23) Arnott, P., J. W. Walker, D. S. Covert, R. E. Elleman, **H. H. Jonsson**, W. C. Conant, R. C. Flagan, and J. H. Seinfeld, Photoacoustic Insight for Aerosol Light Absorption Aloft from Meteorological Aircraft and Comparison with Particle Soot Absorption Photometer Measurements: The DOE Southern Great Planes Climate Research Facility and the Coastal Stratocumulus Imposed Perturbation Experiments (In Preparation).

Mission (Publication) Cross reference

1) Drizzle and Entrainment Cloud Study, Monterey 1999, (11)
2) Japan East Sea Experiment, Misawa Japan 2000, (12)
3) ACE ASIA, Iwakuni Japan 2001, (2, 3, 22)
4) RED, Hawai, 2001 (7)
5) CRYSTAL PHASE, Key West Florida 2002, (1,8,13)
6) DOE-IOP, Ponca City, Oklahoma, 2003 (14,15,16,17,18,1`9,20,21)
7) C-STRIPE, Marina, 2003 (23)
8) CARMA-II, Marina 2003 (4,5,6)
9) Leisure (9, 10)

Science Mission Directorate

Suborbital Science Program Update for SCOAR

Cheryl Yuhas, Suborbital Sciences Program Manager
April 6, 2005

Restructured Suborbital Science Program

Catalog

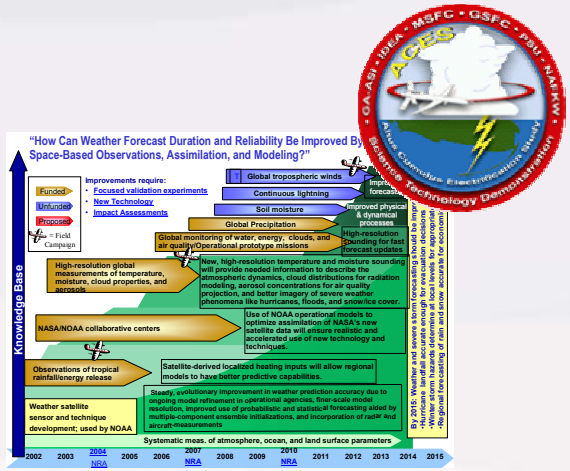
1-5yr task order arrangements for demonstrated or proven platforms from a variety of sources, selected based on 3-5 year science requirements.

New Technology Platforms

Long-term (5-10yrs) leases of experimental platforms, to enable new science from new vantage points.

Science Missions & New Sensors

Competitively-selected PI-mode style missions; potential to include sensor development to accompany new platform capabilities.



FY2005 Platform Catalog

Non-NASA Commercial/University Aircraft (pay-as-you-go): A selection of light aircraft (e.g. Twin Otter, KingAir, etc.) from non-NASA sources.

NASA & Non-NASA Federal Aircraft (pay-as-you-go): GRC Learjet, GRC S-3, NRL P-3, DOE KingAir, NSF C130, NOAA Citation.

NASA & Non-NASA Federal Aircraft (on retainer): DFRC ER2, JSC WB57, NASA DC8, and GSFC/WFF P3B.

Recommended Utilization of Current Earth-Science-Dedicated NASA Assets:

ER2 : Terminate the ER2 airborne science program in 2006 (aircraft will remain in NASA inventory) and transfer high-altitude Earth science missions to JSC's WB57 on a shared basis.

DC8: Conduct safety review and risk assessment for integration of DC8 aircraft into a university-based flight operation in 2005, with the eventual plan to shift ownership and operational control to university/consortium where the aircraft will be a national resource operated and funded by users. In Flyable Storage from now until transfer.

P3B: Transfer P3 missions to a commercial or other non-NASA operation, and put NASA P3B in flyable storage.

Earth Science Capability Project

- Repeat Pass Project: Develop flight control capability to repeat flight path within 10m tube, to support UAV-SAR.
- UAV Missions:
  - NOAA UAV Mission Demonstration, http://uav.noaa.gov
  - Western States FiRE Mission, http://geo.arc.nasa.gov/sge/WRAP/current/future_missions.html
- Advanced Mission Platform requirements analysis (potential platforms include Proteus II, G-V OPV, Adam Aircraft A700)
- Civil UAV Assessment, http://www.nasa.gov/centers/dryden/research/civuav/civ_uav_index.html
  - April 26-28 Workshop in Akron, OH

NASA 5-Year Plan

Mission	FY05	FY06	FY07	FY08	FY09	Start Date	Location	Aircraft	Payload
Atmospheric Composition									
INTEX-B						3/06	Western U.S.	DC-8, P-3	Various
Aura Validation (AVE)							NH		
						1/05	TX	DC-8	Various
						9/06	TX, Costa	WB-57	Various
						6/07	Rica	WB-57	Various
						10/07	TX	WB-57	Various
TWP-ICE (AVE)						1/06	Australia	WB-57, Prot, ER-2?	Various
TC-4 (AVE)						1/07	Guam	WB-57, DC-8	Various
						1/08	Guam	WB-57, DC-8	Various
TRACE-P Next						3/08	Japan, Guam	DC-8, P-3?	
T-REX						4/06	U.S.	WB-57	
Climate									
AIM/ICESat						5/05	Greenland	P-3	ATM/GPS
						6/05	Greenland	P-3	
Artic Sea Ice						3/06?	AK	P-3	AMSR
CALIPSO Validation						8/05	VA	Learjet, J-31?, TO?	Lidar,
						?	VA, DFRC	Learjet, DC-8?	AATS?
Water & Energy Cycle									
MODIS Validation							OK, TX	ER-2	
SMEX							U.S.	P-3	
CLPX							CO	DC-8, P-3?	PSR
							CO	DC-8, P-3?	PSR
Weather									
TCSP						6/05	Costa Rica	DC-8, ER-2, WB-57	Various
NPP/NPOESS Validation							?	WB-57, Prot?	
Carbon Cycle & Ecosystems									
NACP							U.S.	P-3, DC-8, Citation	
SOCP							S. Pacific	OPV?	
Solid Earth									
Antarctic Surveys						12/05	Chile?	DC-8, Proteus, TO, OPV/UAV	
Earthscope							?		

Flight Request System

- Suborbital online Flight Request system being developed at NASA Ames by the Earth Science Project Office (ESPO)
- Web page - http://www.espo.nasa.gov/suborbital.html
- Currently allows Investigators ability to login and submit NASA Flight Requests (FR) to database for Suborbital Science Missions.
- Future Goals will duplicate many UNOLS Ship Time Request System capabilities with the Suborbital Science Catalog Aircraft.
  1. Merge FR database with ESPO database (contacts, aircraft, missions, instruments, etc.)
  2. Allow Investigators ability to edit, update, and view FR status.
  3. Allow aircraft operators ability to view and update their specific FR online
  4. Show daily status page of aircraft, sensor, and mission status
  5. Use flight log application to track mission specifics.
  6. Possible integration with UAV Intelligent Mission Management System

Interagency Coordinating Committee for Airborne Geoscience Research & Applications (ICCAGRA)

Update for UNOLS/SCOAR

6 April 2005

NCAR Research Aviation Facility

ICCAGRA Charter

To increase the effective utilization of the Federal Airborne Fleet through improved cooperation, awareness and communication among sponsoring agencies.

8 Functions:

- Identify interagency needs & exchange research program schedules
- Improve coordination of airborne programs between agencies
- Ensure timely identification of airborne program requirements
- Enhance opportunities for sharing aircraft resources, instrumentation & data
- Provide expertise to senior agency decision makers
- Evaluation coordination processes & develop interagency agreements to facilitate transfer of assets or purchase of flight time.
- Maintain an ICCAGRA website.
- Convene a one-day program review where all participants present a review of airborne programs and plans to agency personnel.

Sponsoring agencies: NSF, NASA, NOAA, ONR

Results of April 5 Meeting

- Chartered subcommittee for a Data Systems Working Group to coordinate and establish standards for aircraft data systems.
- Coordination of crew safety standards, especially medical standards for PI's.
- ICAP Strategic Plan to be updated next month: input to Jim Huning as ICAP co-chair.
- NOAA, NSF, NRL and NASA all anticipate some level of participation of aircraft in IPY, but no specifics yet.
- Agreement to initiate planning for a joint workshop with community participation
  - define and articulate aircraft role/requirements in GEOSS
  - enable joint aircraft fleet planning and renewal.