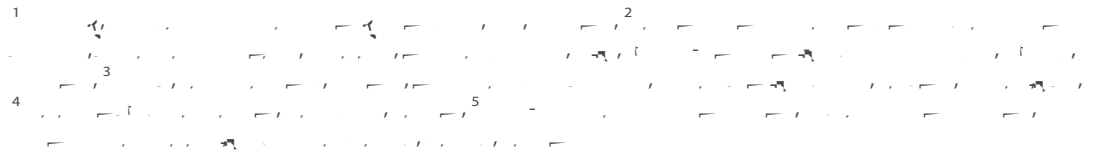


Plio-Pleistocene evolution of water mass exchange and erosional input at the Atlantic-Arctic gateway

Claudia Teschner^{1,2}, Martin Frank¹, Brian A. Haley³, and Jochen Knies^{4,5}



Abstract

Abstract text describing the study's findings, including the evolution of water mass exchange and erosional input at the Atlantic-Arctic gateway during the Plio-Pleistocene. The abstract mentions a significant change in the Atlantic Meridional Overturning Circulation (AMOC) around 2.7 Ma, with a decrease in strength from approximately 15.5 Sv to 11.0 Sv. This change is associated with a shift in the position of the AMOC maximum and a corresponding increase in the strength of the North Atlantic Current (NAC). The study also discusses the impact of these changes on the erosion of the Atlantic continental shelf and the resulting input of sediments into the North Atlantic. The abstract concludes that the Plio-Pleistocene evolution of the Atlantic-Arctic gateway was characterized by a significant reorganization of the AMOC and a corresponding increase in erosion and sediment input.

1. Introduction

Introduction text discussing the background of the study, including the evolution of the Atlantic Meridional Overturning Circulation (AMOC) and the North Atlantic Current (NAC) during the Plio-Pleistocene. The introduction highlights the importance of understanding the changes in the AMOC and NAC for reconstructing the Earth's climate history and the evolution of the Atlantic-Arctic gateway. It also discusses the role of erosion and sediment input in the North Atlantic and the impact of these changes on the global climate system. The introduction concludes by stating the objectives of the study and the methods used to reconstruct the AMOC and NAC during the Plio-Pleistocene.

() 45 Moran et al., 2006
38 30 Eldrett et al., 2007,
Wolf-Welling et al., 1995; Wolf and Thiede, 1991; Jansen and Sjøholm, 1991. 3.3
Jansen et al.,
2000; Kleiven et al., 2002; Knies et al., 2014.
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De Schepper et al., 2013. 3.29 2.97
Dowsett et al., 2012, 2013
6 (2.72) , Knies et al., 2014, 2014 ; Kleiven et al., 2002; Jansen et al.,
2000; Fronval and Jansen, 1996.

Roberts et al., 2010, 2012; Piotrowski et al., 2012; Kraft et al., 2013; Tachikawa et al., 2014.

() 50 Schaule and Patterson, 1981; Erel et al., 1994

Frank, 2002; Gutjahr et al., 2009; Crocket et al., 2013; Wilson et al., 2015.

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..., Jeandel et al., 1998; Lacan and Jeandel, 2005; Wilson et al., 2013, 2015. Lacan and Jeandel, 2004, 2005; Lacan and Arsouze et al., 2009; Rempfer et al., 2011. Lacan and Arsouze et al., 2009; Rempfer et al., 2011. Andersson et al., 2008; Porcelli et al., 2009. Eisenhauer et al., 1999; Haley et al., 2008; Andersson et al., 2008; Porcelli et al.

87 / 86 206 / 204 6
 1.7
 (), Dausmann et al. 2015
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 Haley et al. 2008, 2008 Chen et al. 2012
 Bayon et al. 2002 Gutjahr et al. 2007 15
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 Aagaard et al., 1985,
 Haley et al., 2008
 79 Maccali et al., 2012
 , Werner et al. 2014
 8500
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2. Material and Methods

911 (151) 906 (80 28.466' , 08 13.640')
 Knies et al., 2002, 2009, Knies et al. 2009
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 Knies et al. 2014, 2014 Mattingsdal et al. 2014
 Grøsfjeld et al. 2014. 12
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$^{87}\text{Sr}/^{86}\text{Sr}$
 5.2
 Gutjahr et al., 2007.
 12
 Haley et al. 2008.
 3
 + 180 3
 + 4 190
 50 μm 1-28
 (100-200) Lugmair and Galer 1992.
 0.8 50
 212 (200-400) Barrat et al., 1996. 50 μm
 (50-100) Horwitz et al. 1992 Bayon et al. 2002.
 2 (50-100) Le Fèvre and Pin, 2005.
 Nu Plasma
 0.7219 $^{146}\text{Nd}/^{144}\text{Nd}$
 143 $^{143}\text{Nd}/^{144}\text{Nd}$ -1 0.512115 Tanaka et al., 2000.
 ϵ (2σ ; n=120) 16 ≤ 80
 $^{86}\text{Sr}/^{88}\text{Sr} = 0.1194$ Steiger and Jäger,
 1977 $^{86}\text{Sr}/^{88}\text{Sr} = 0.710245$
 () 987
 0.000032 (2σ ; n=70). 1
 2 Albarède
 et al. 2004,
 $^{981}\text{Sm}/^{206}\text{Sm} = 16.9405$, $^{207}\text{Pb}/^{204}\text{Pb} = 15.4963$,
 $^{208}\text{Pb}/^{204}\text{Pb} = 36.7219$ Abouchami et al., 1999. (2σ ; n=88). 1
 0.008 $^{206}\text{Pb}/^{204}\text{Pb}$, 0.009 $^{207}\text{Pb}/^{204}\text{Pb}$, 0.033 $^{208}\text{Pb}/^{204}\text{Pb}$, 0.0009 $^{208}\text{Pb}/^{206}\text{Pb}$,
 0.0002 $^{207}\text{Pb}/^{206}\text{Pb}$ ≤ 1.45

3. Results

3.1. Neodymium and Strontium Isotopic Signatures of Leachates and the Detrital Sediment Fraction

ϵ -6.9 -12.1 (n=2). (0-3)
 -11.0 Lacan and Jeandel, 2004 ;
 Andersson et al., 2008 (n=3). ϵ 2.7
 (). 2.7 ϵ -8.5
 -11.5 (ϵ -10.4 3 ϵ), 2.7 ϵ
 5.2 ϵ -6.9 -12.1.
 ϵ -11.5, (n=2).

..., 2007, 2008;

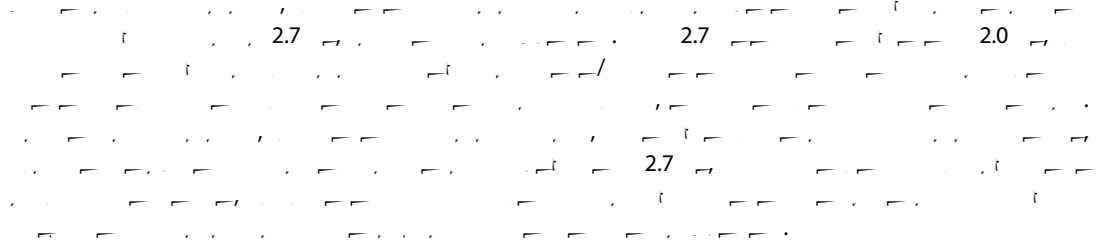
Andersson et al, 2008 (p. 3).
Henrich et al, 2002. Ganopolski and
Rahmstorf 2001.

(5.2–3.6), 25 Belt and Müller, 2013; Knies et al., 2014, 3.9
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8, 2 Haley et al., 2008
25† 3.0 Knies et al., 2014 (3).
3.29, 2.97 Dowsett et al., 2012, 2013, 3.3, 2.7
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Burton et al., 1999; Reynolds et al., 1999

1.7 Winter et al., 1997
1 Haley et al., 2008 ;
Reynolds et al



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