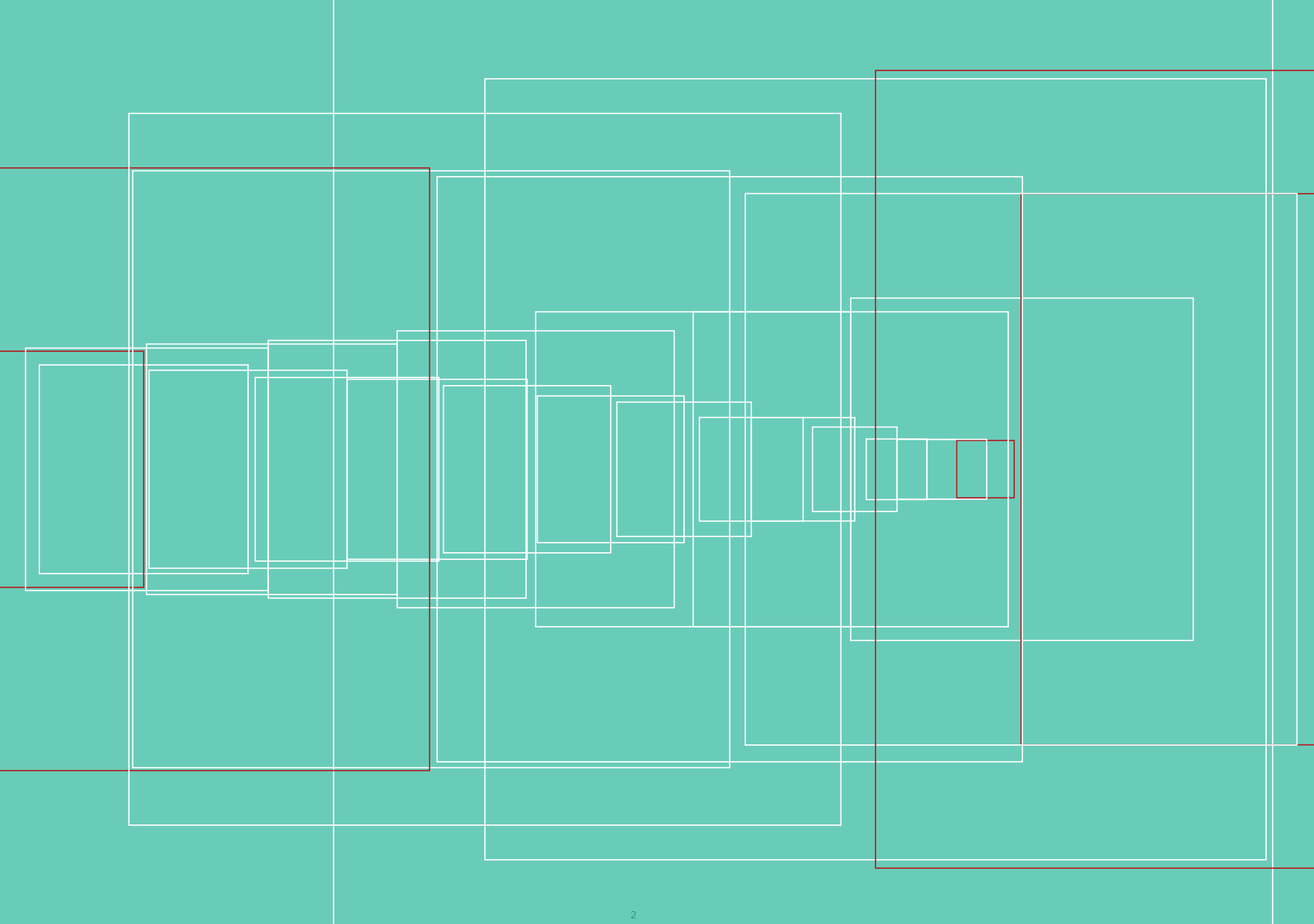
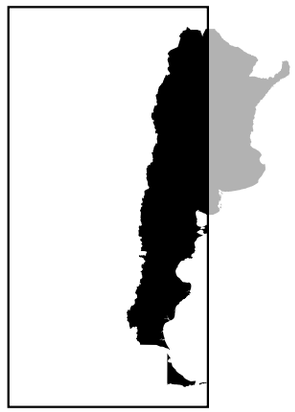


This **booklet** charts the **average yearly ozone** hole size (Southern Hemisphere). The size of the hole is compared in relation to the **total area** of one or more **continents** or **countries** in km^2 units. The chart at the right shows the **global ODS** (Ozone Depleting Substance) production for the depicted year in the tonnes measuring units.

1979 SH Ozone Hole: 100,000 km^2

South Korea: 100,210 km^2

1980 SH Ozone Hole: 1,400,000 km^2

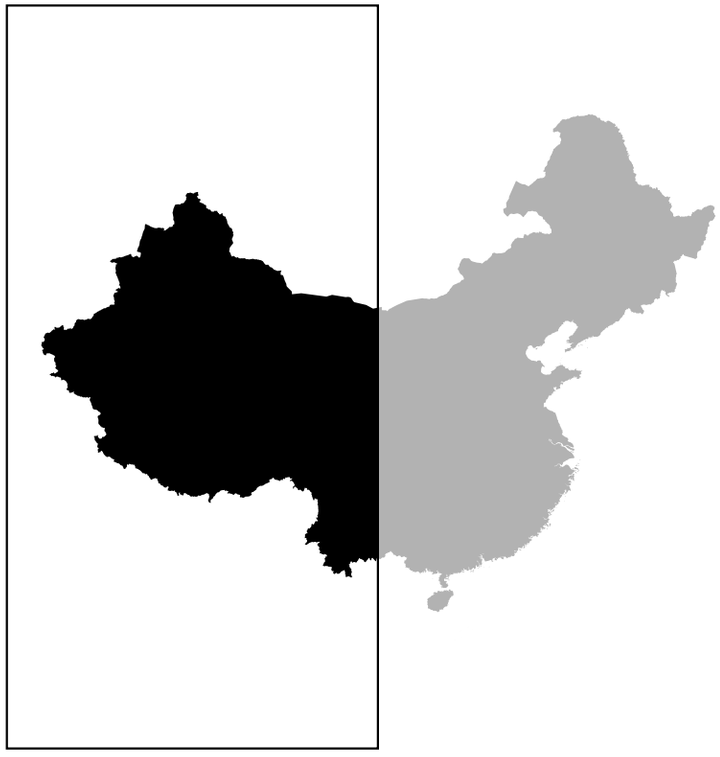


Argentina / 2: 1,390,200 km^2

1981 SH Ozone Hole: 600,000 km^2

Ukraine: 603,500 km^2

1982 SH Ozone Hole: 4,800,000 km^2

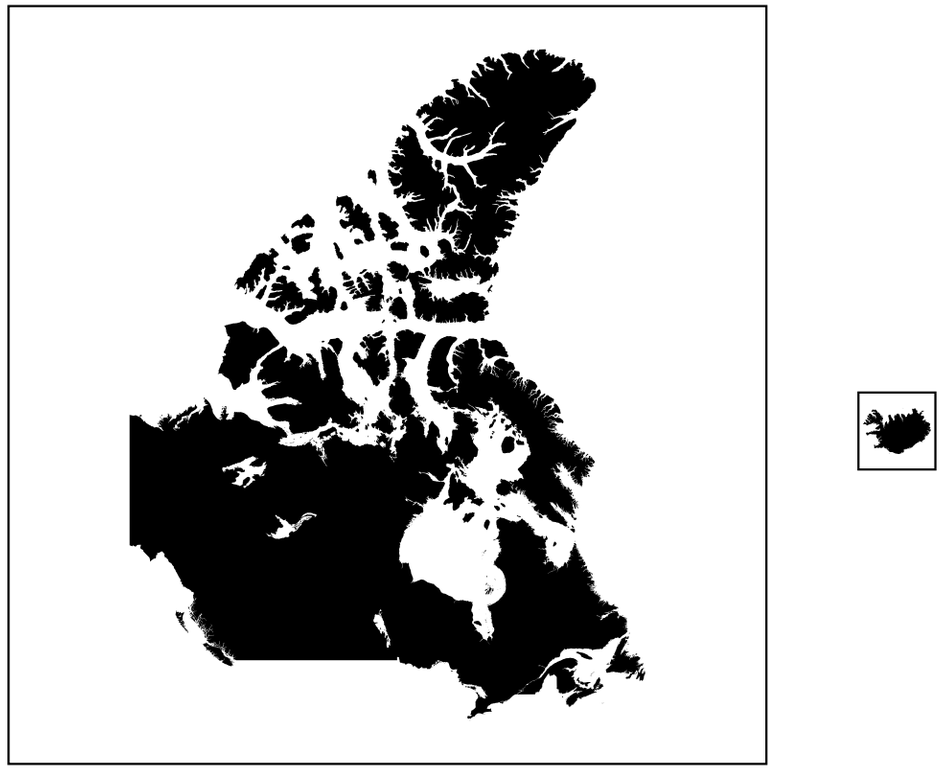


China / 2: 4,798,481 km^2

1983 SH Ozone Hole: 7,900,000 km^2

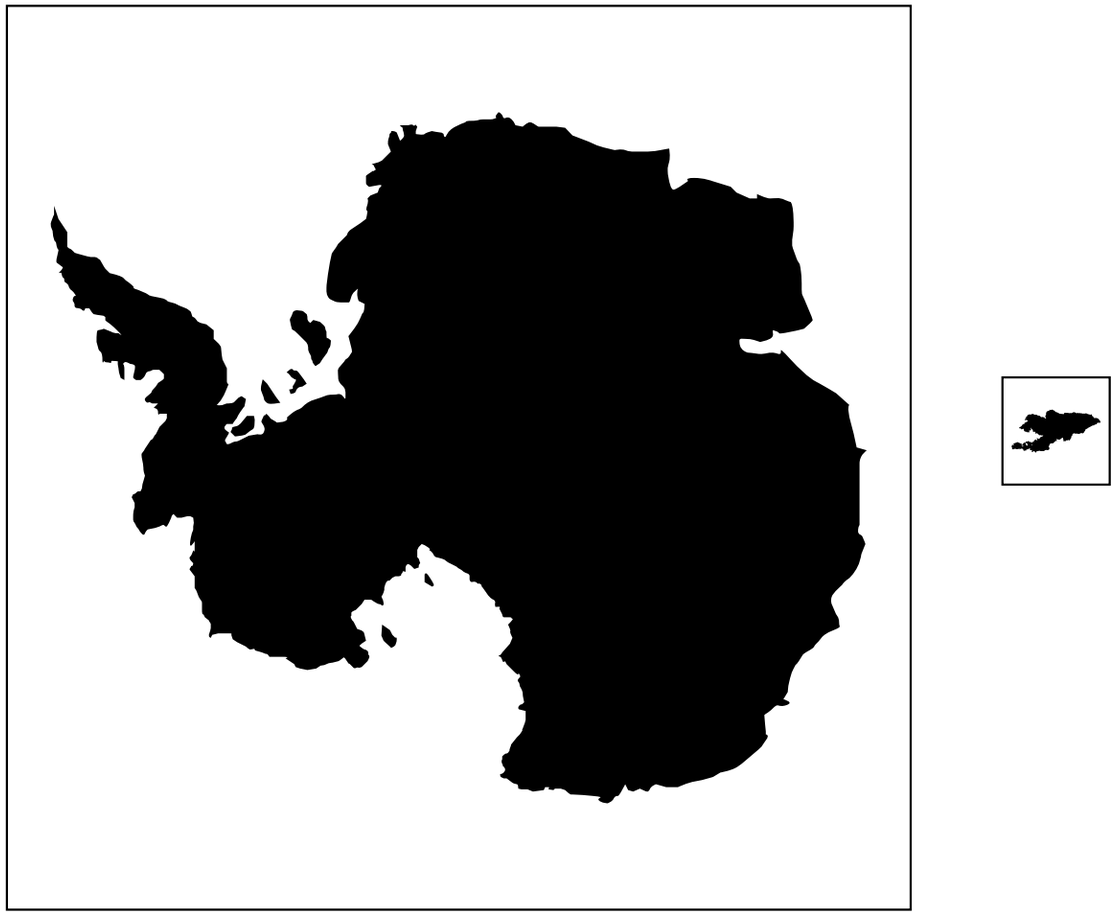
Oceania: 10,180,000 km^2 + **Kyrgyzstan:** 1,221,037 km^2

1984 SH Ozone Hole: 10,100,000 km^2



Canada: 9,984,670 km^2 + **Iceland:** 103,000 km^2

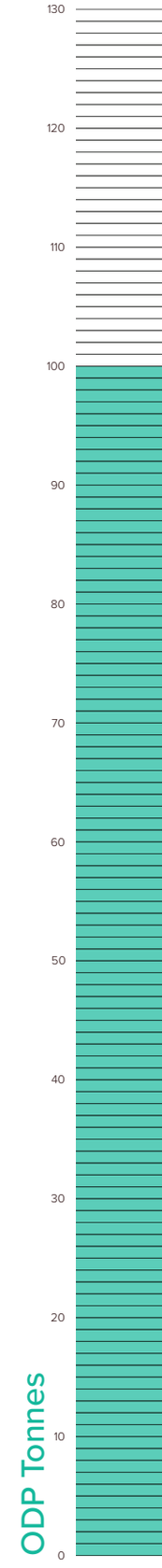
1985 SH Ozone Hole: 14,200,000 km^2



Antartica: 14,000,000 km^2 + Kyrgyzstan: 1,221,037 km^2

1986 SH Ozone Hole: 11,300,000 km^2

Europe: 10,180,000 km^2 + **South Africa:** 1,221,037 km^2



1987 SH Ozone Hole: 19,300,000 km^2

Montreal Protocol:

The Montreal Protocol, finalized in 1987, is a global agreement to protect the stratospheric ozone layer by phasing out the production and consumption of ozone depleting substances (ODS). This protocol has proven to be innovative and successful, and is the first treaty to achieve universal ratification by all countries in the world. Leveraging this worldwide participation, the Montreal Protocol has spurred global investment in alternative technologies, many developed by U.S. companies, and placed the ozone layer, which was in peril, on a path to repair.

South America: 17,840,000 km^2 + **Mongolia:** 1,564,110 km^2

1988 SH Ozone Hole: 10,000,000 km^2

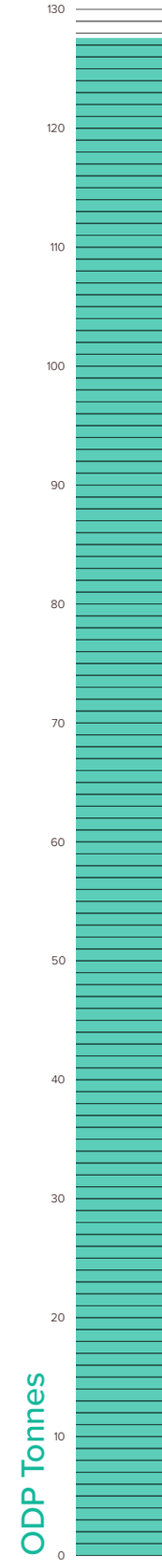
Montreal Protocol Ratified:

The United States ratified the Montreal Protocol in 1988 and has joined four subsequent amendments. The United States has been a leader within the Protocol throughout its existence, and has taken strong domestic action to phase out the production and consumption of ODS such as chlorofluo-rocarbons (CFCs) and halons.

Canada: 9,984,670 km^2

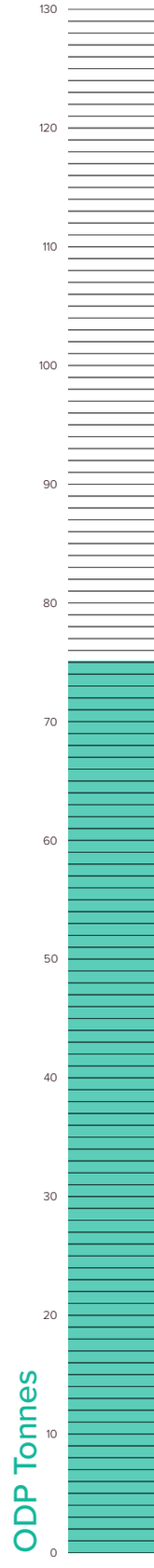
1989 SH Ozone Hole: 18,700,000 km^2

Russia: 17,098,246 km^2 + **Iran:** 1,648,195 km^2

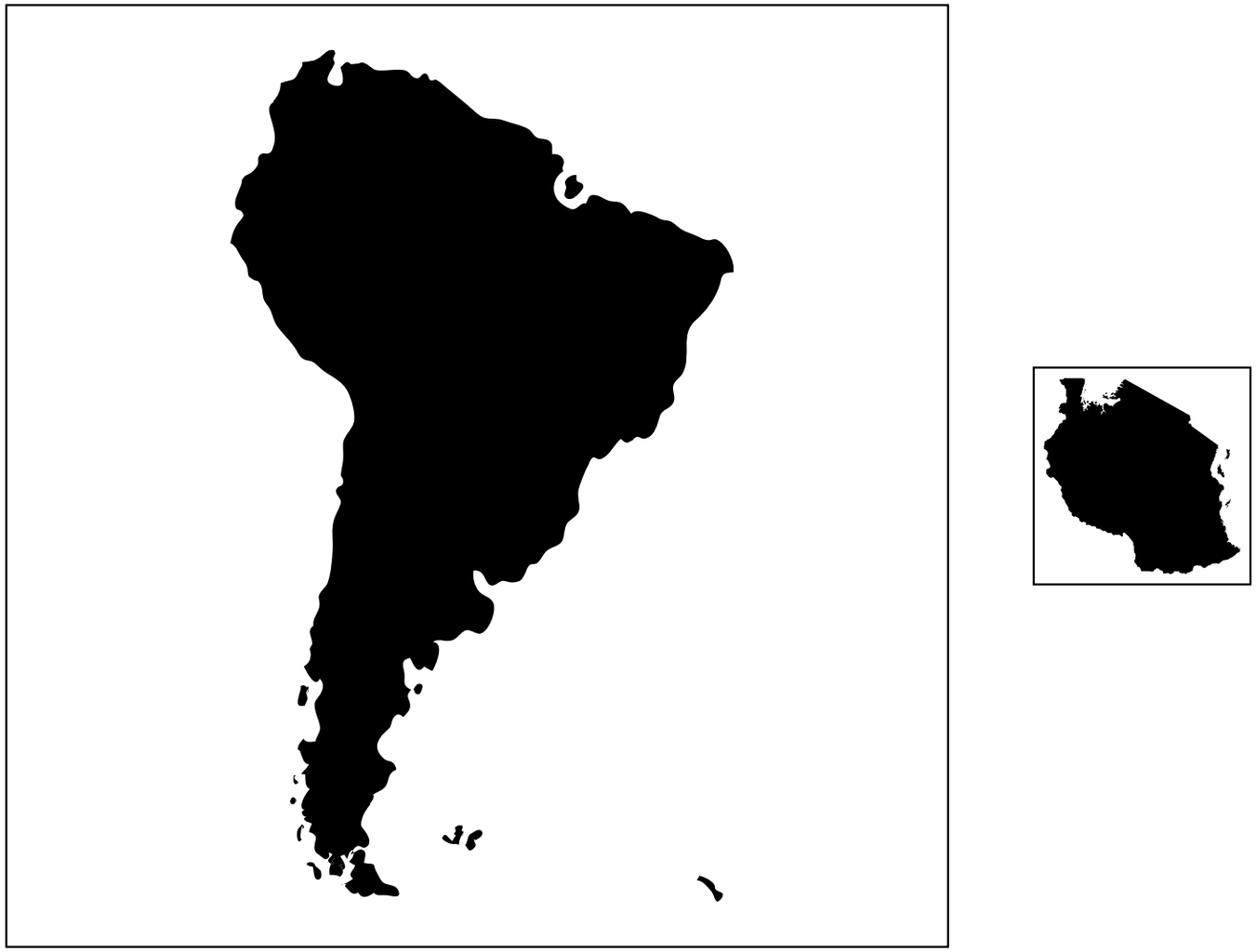


1990 SH Ozone Hole: 19,200,000 km^2

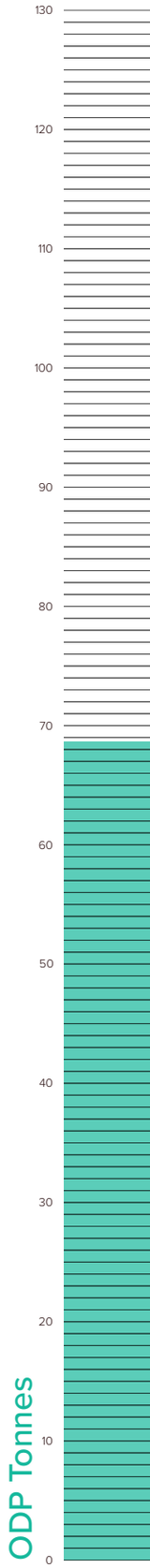
Russia: 17,098,246 km^2 + **Saudi Arabia:** 2,149,690 km^2



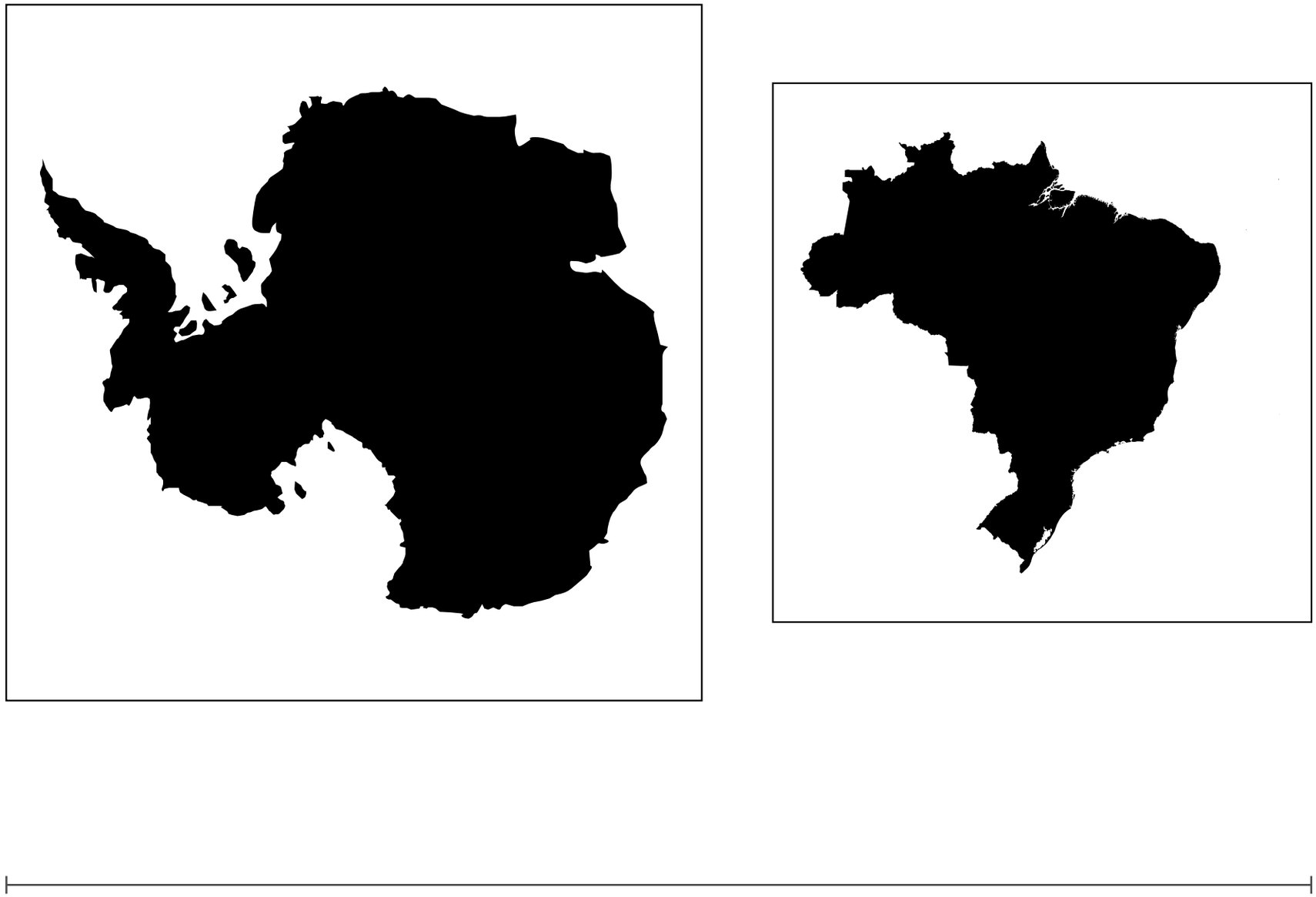
1991 SH Ozone Hole: 18,800,000 km^2



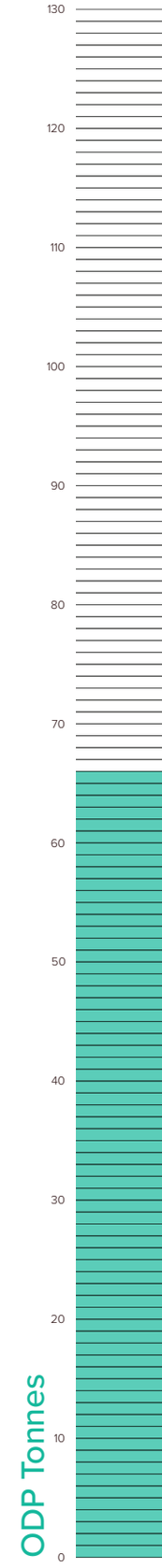
South America: 17,840,000 km^2 + **Tanzania:** 945,087 km^2



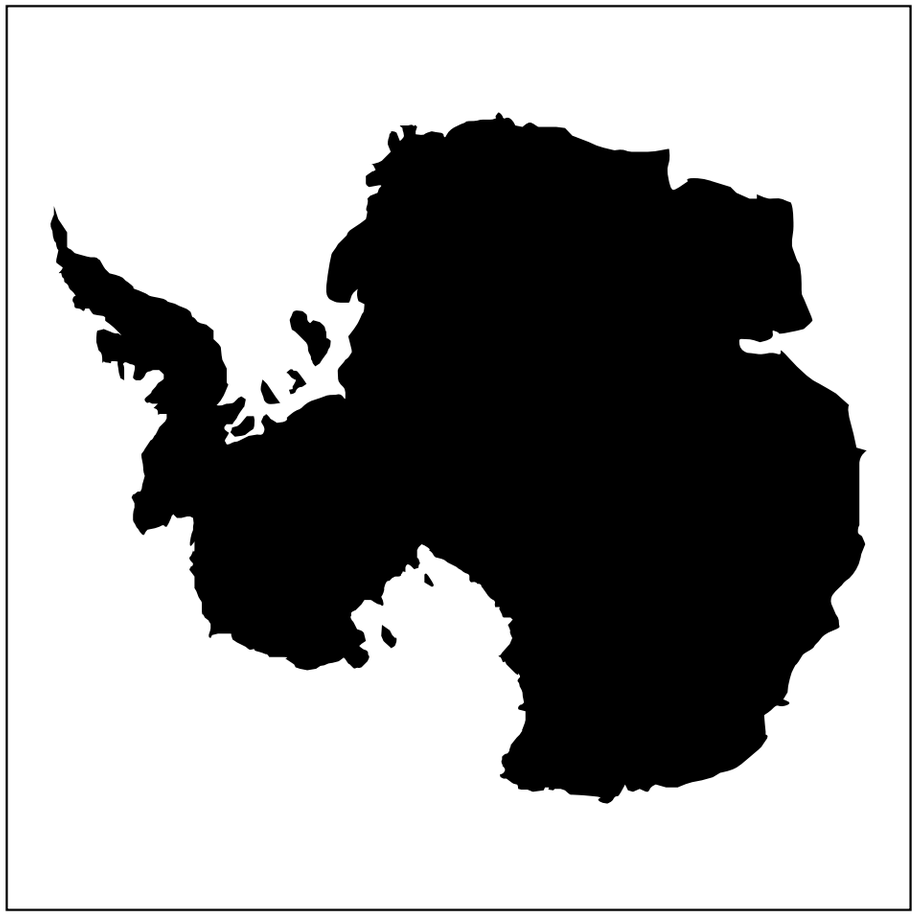
1992 SH Ozone Hole: 22,300,000 km^2



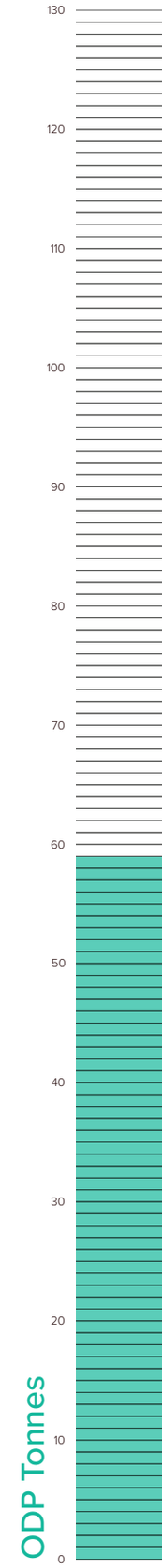
Antartica: 14,000,000 km^2 + **Brazil:** 8,515,767 km^2



1993 SH Ozone Hole: 24,200,000 km^2



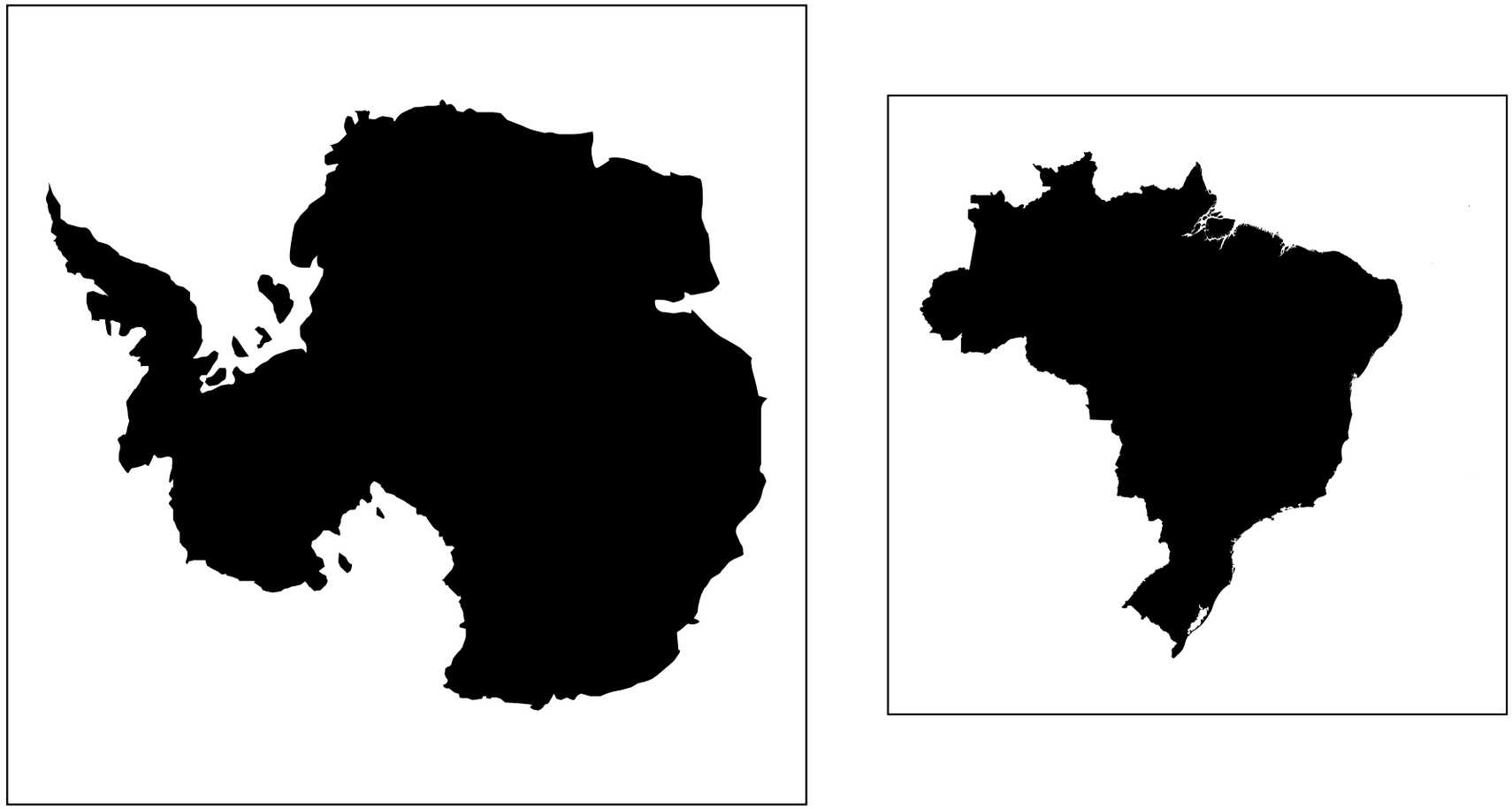
Antartica: 14,000,000 km^2 + **Europe:** 10,180,000 km^2



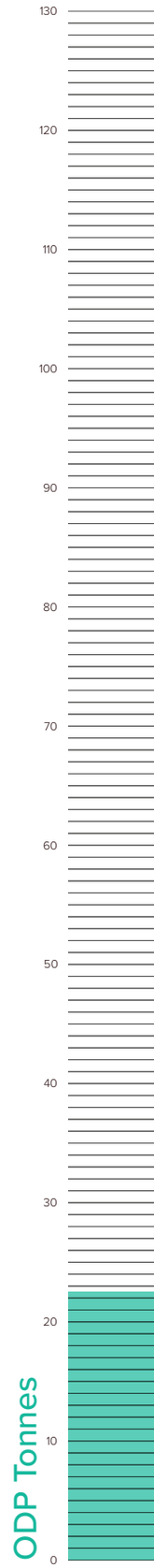
1994 SH Ozone Hole: 23,600,000 km^2

Antartica: 14,000,000 km^2 + **China:** 9,596,961 km^2

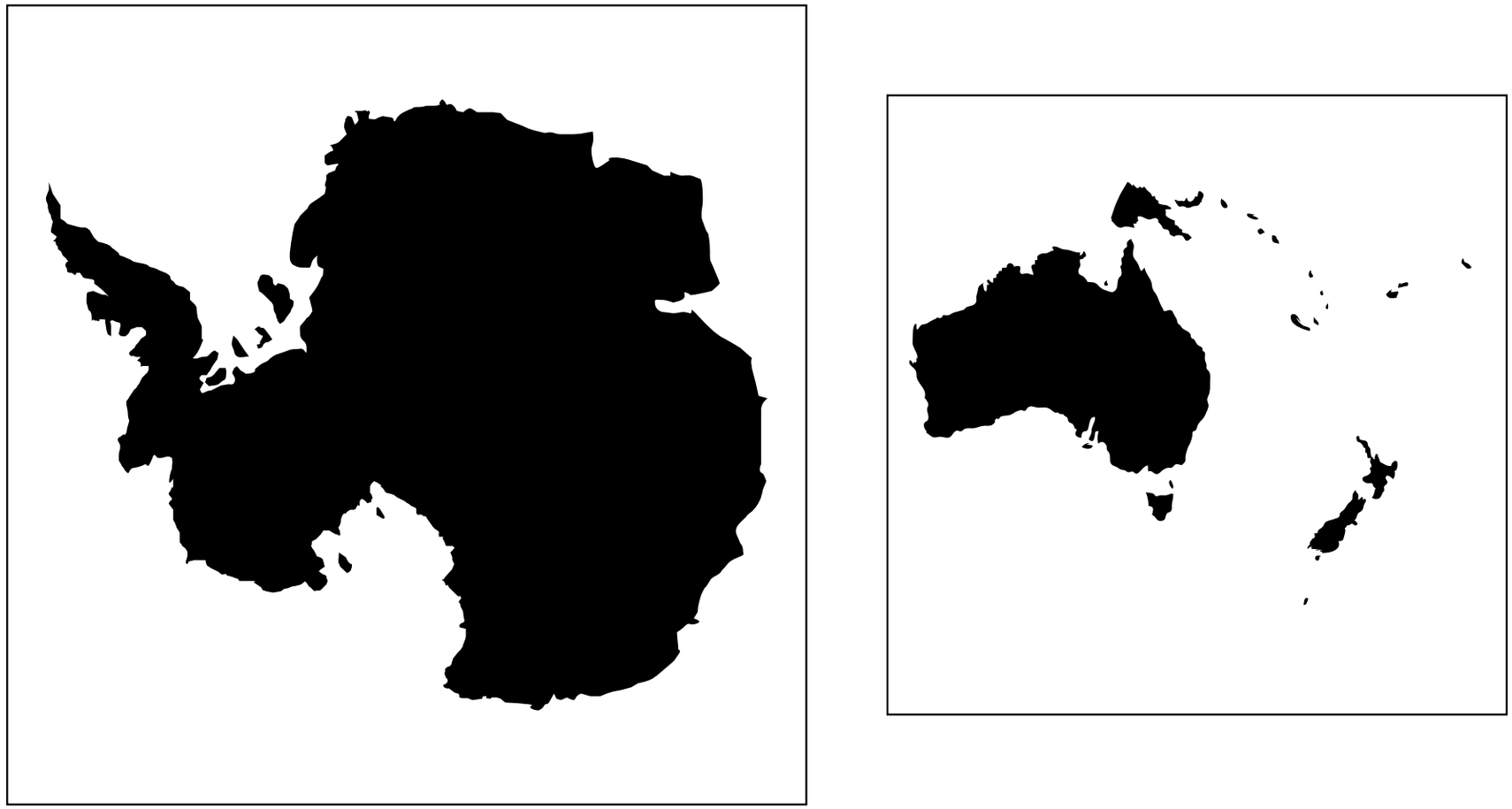
1996 SH Ozone Hole: 22,800,000 km^2



Antartica: 14,000,000 km^2 + **Brazil:** 8,515,767 km^2



1997 SH Ozone Hole: 22,100,000 km^2



Antartica: 14,000,000 km^2 + **Oceania:** 10,180,000 km^2

1998 SH Ozone Hole: 25,900,000 km^2

North America: 24,709,000 km^2 + South Africa: 1,221,037 km^2

1999 SH Ozone Hole: 23,300,000 km^2

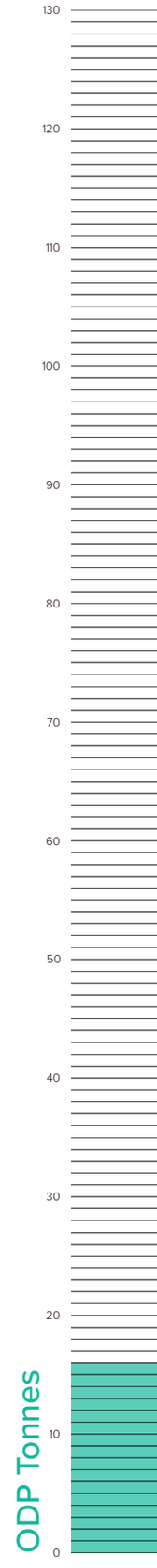
Antartica: 14,000,000 km^2 + China: 9,596,961 km^2

2000 SH Ozone Hole: 24,800,000 km^2

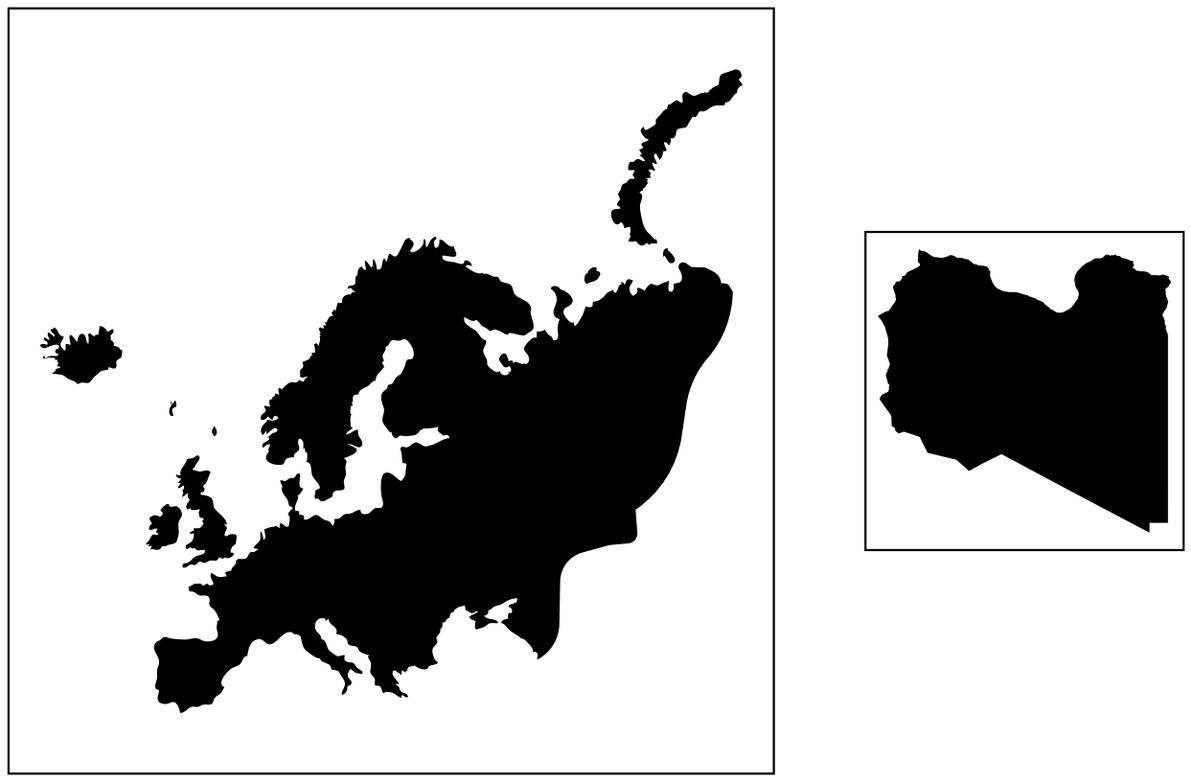
North America: 24,709,000 km^2 + Portugal: 92,226 km^2

2001 SH Ozone Hole: 25,000,000 km^2

North America: 24,709,000 km^2 + Philippines: 300,000 km^2



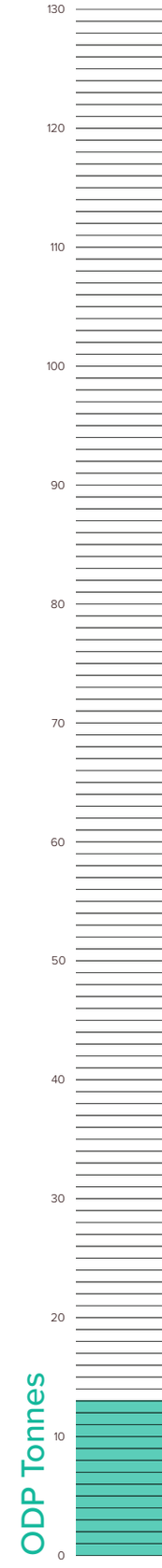
2002 SH Ozone Hole: 12,000,000 km^2



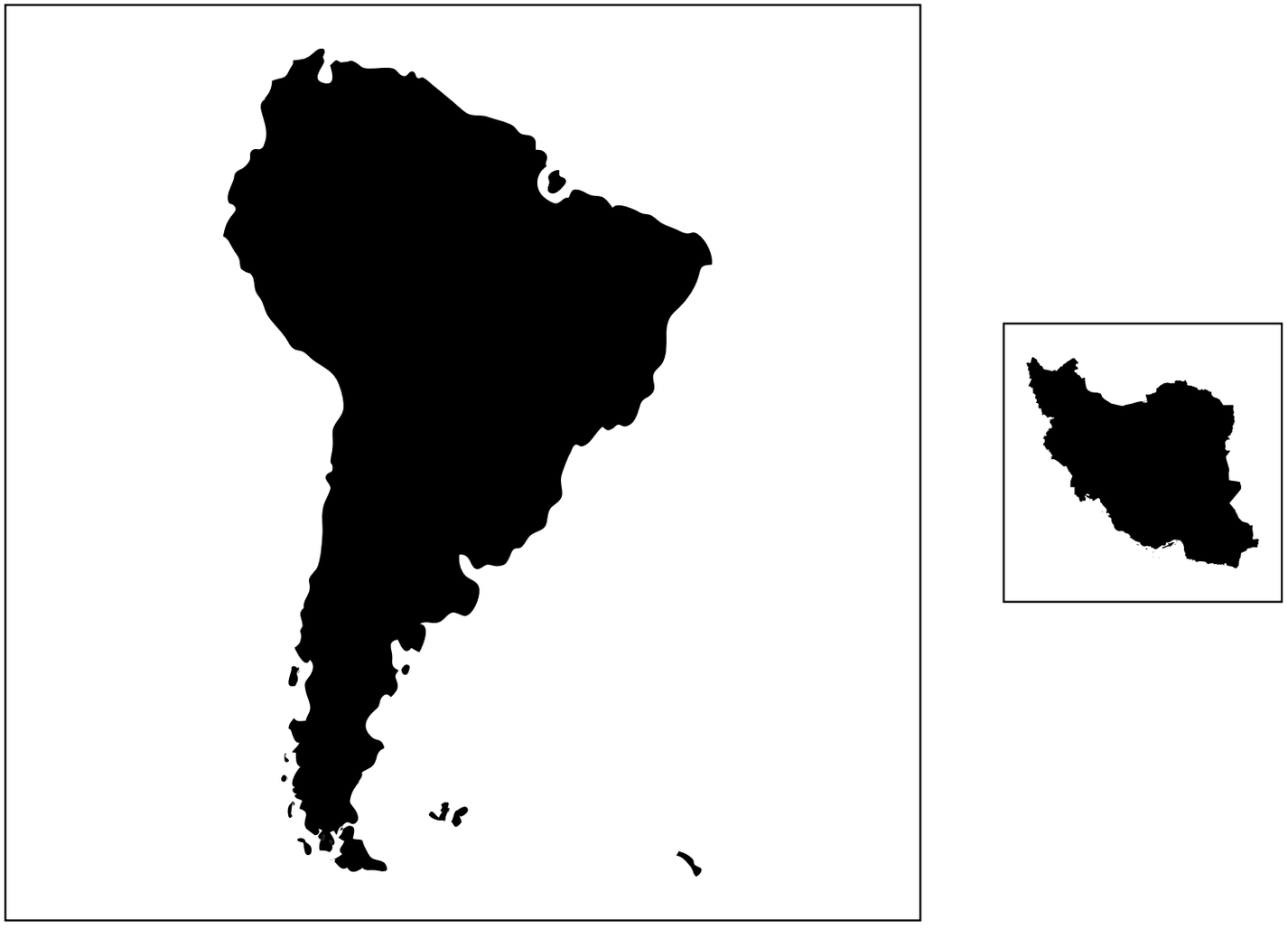
Europe: 10,180,000 km^2 + **Libya:** 1,759,540 km^2

2003 SH Ozone Hole: 25,800,000 km^2

North America: 24,709,000 km^2 + **Bolivia:** 1,098,581 km^2



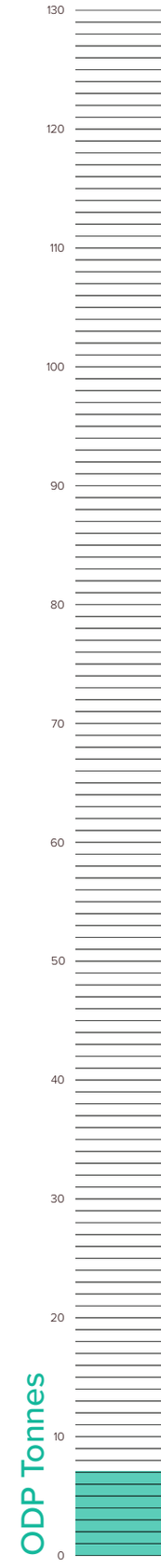
2004 SH Ozone Hole: 19,500,000 km^2



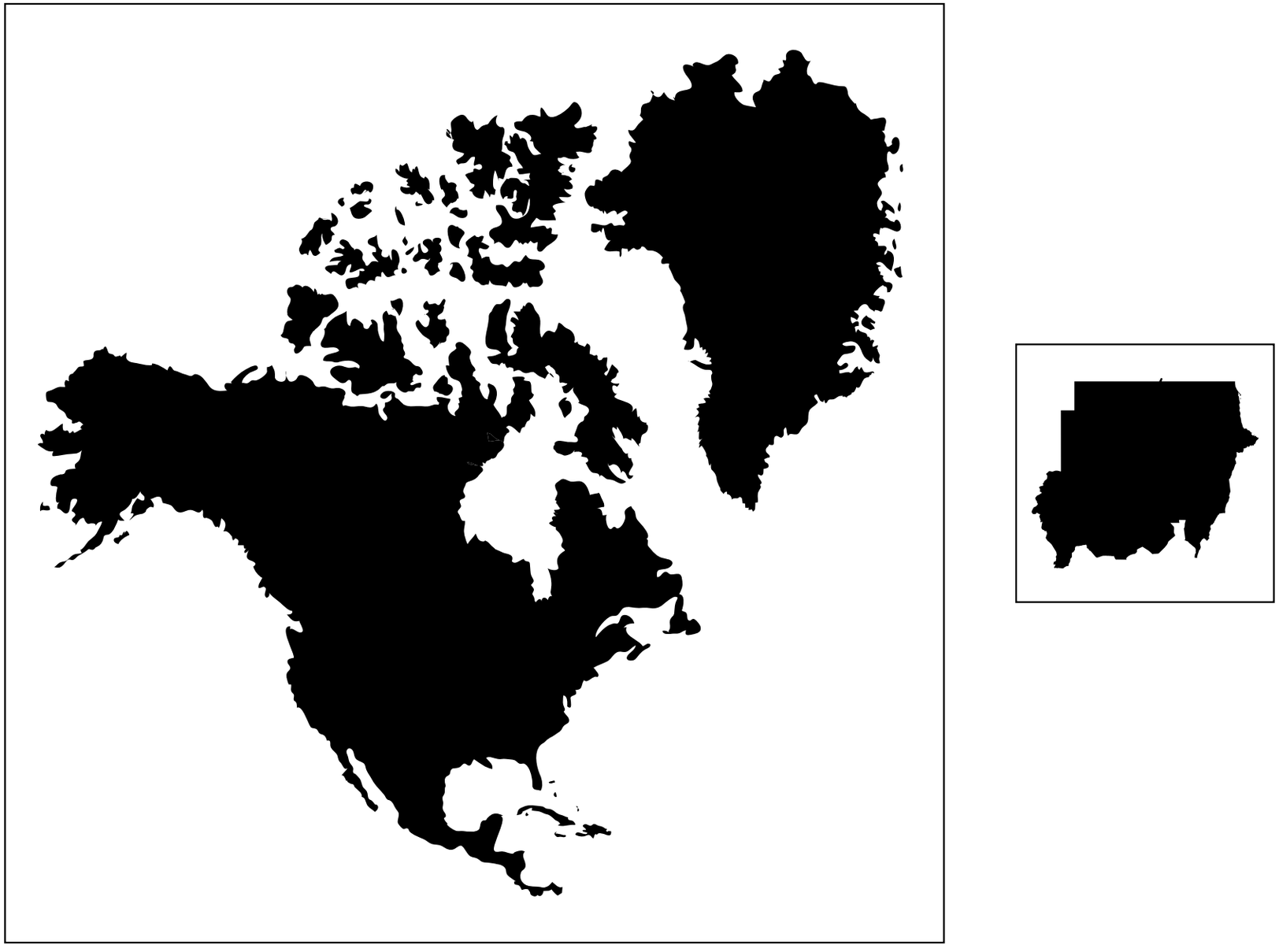
South America: 17,840,000 km^2 + Iran: 1,648,195 km^2

2005 SH Ozone Hole: 24,400,000 km^2

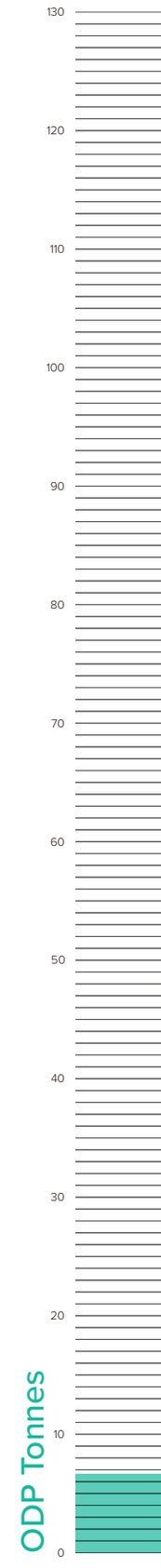
Antartica: 14,000,000 km^2 + Europe: 10,180,000 km^2



2006 SH Ozone Hole: 26,600,000 km^2

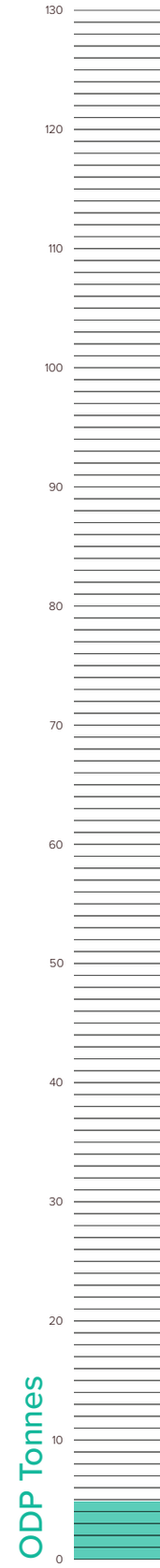


North America: 24,709,000 km^2 + **Sudan:** 1,861,484 km^2

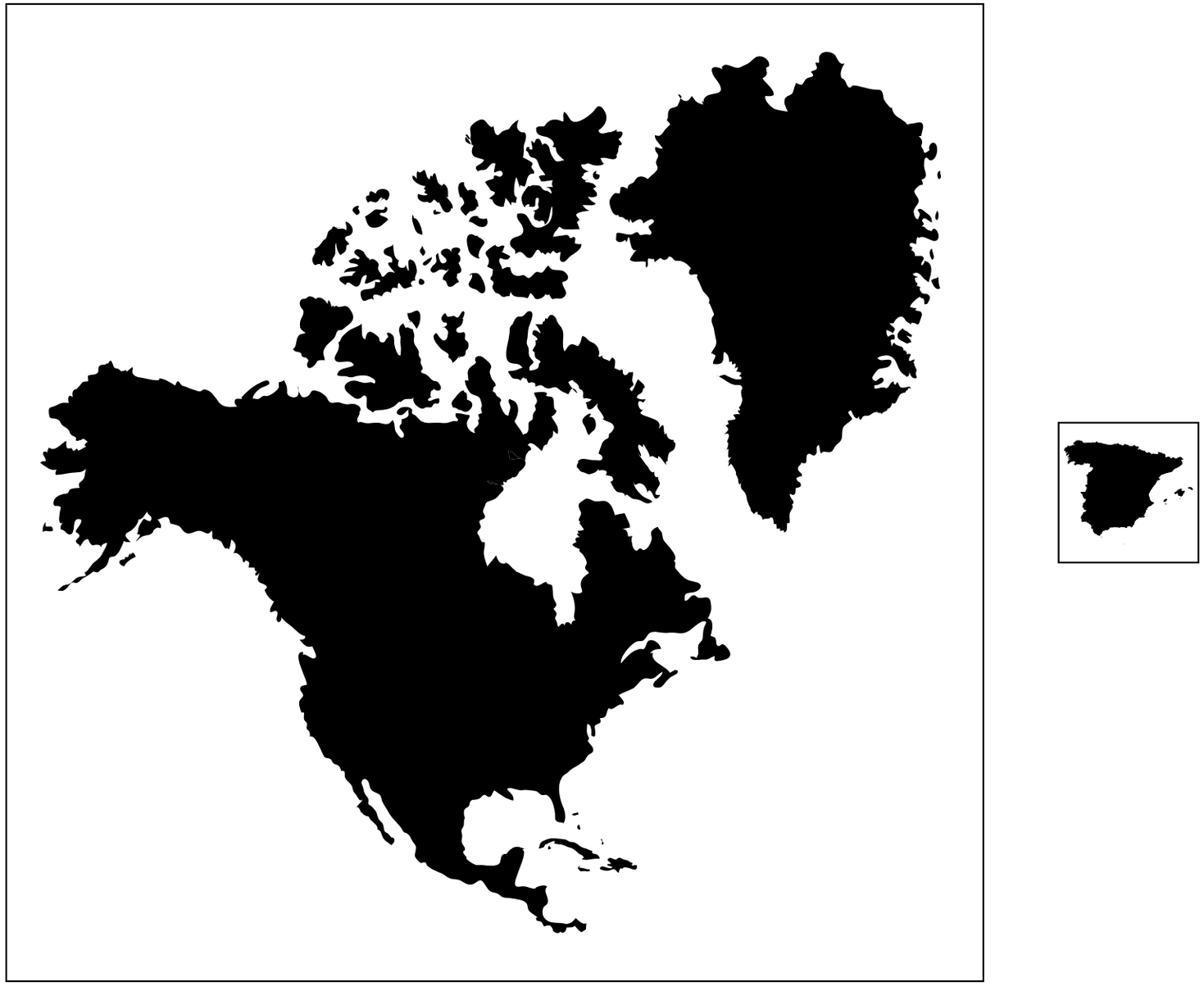


2007 SH Ozone Hole: 22,000,000 km^2

Antartica: 14,000,000 km^2 + **Oceania:** 10,180,000 km^2



2008 SH Ozone Hole: 25,200,000 km^2



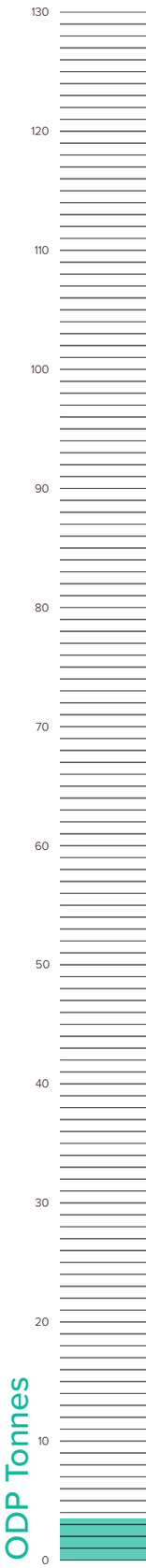
North America: 24,709,000 km^2 + **Spain:** 505,992 km^2

2009 SH Ozone Hole: 22,000,000 km^2

Antartica: 14,000,000 km^2 + **Oceania:** 10,180,000 km^2

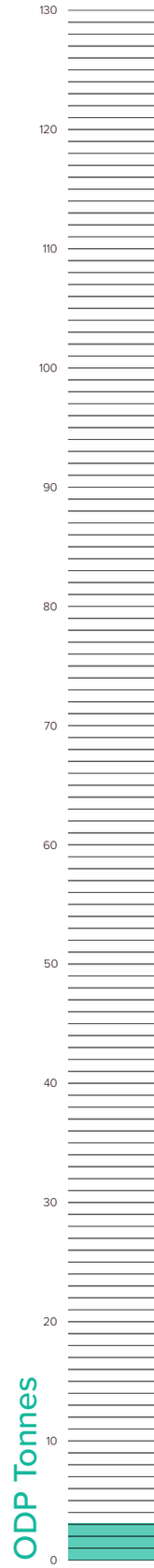
2010 SH Ozone Hole: 19,400,000 km^2

South America: 17,840,000 km^2 + **Mongolia:** 1,564,110 km^2



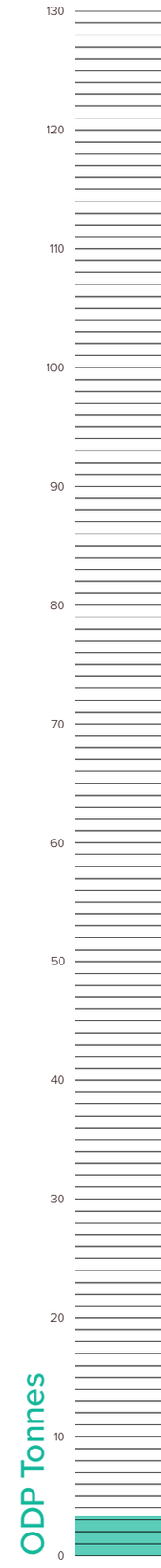
2011 SH Ozone Hole: 24,700,000 km^2

North America: 24,709,000 km^2

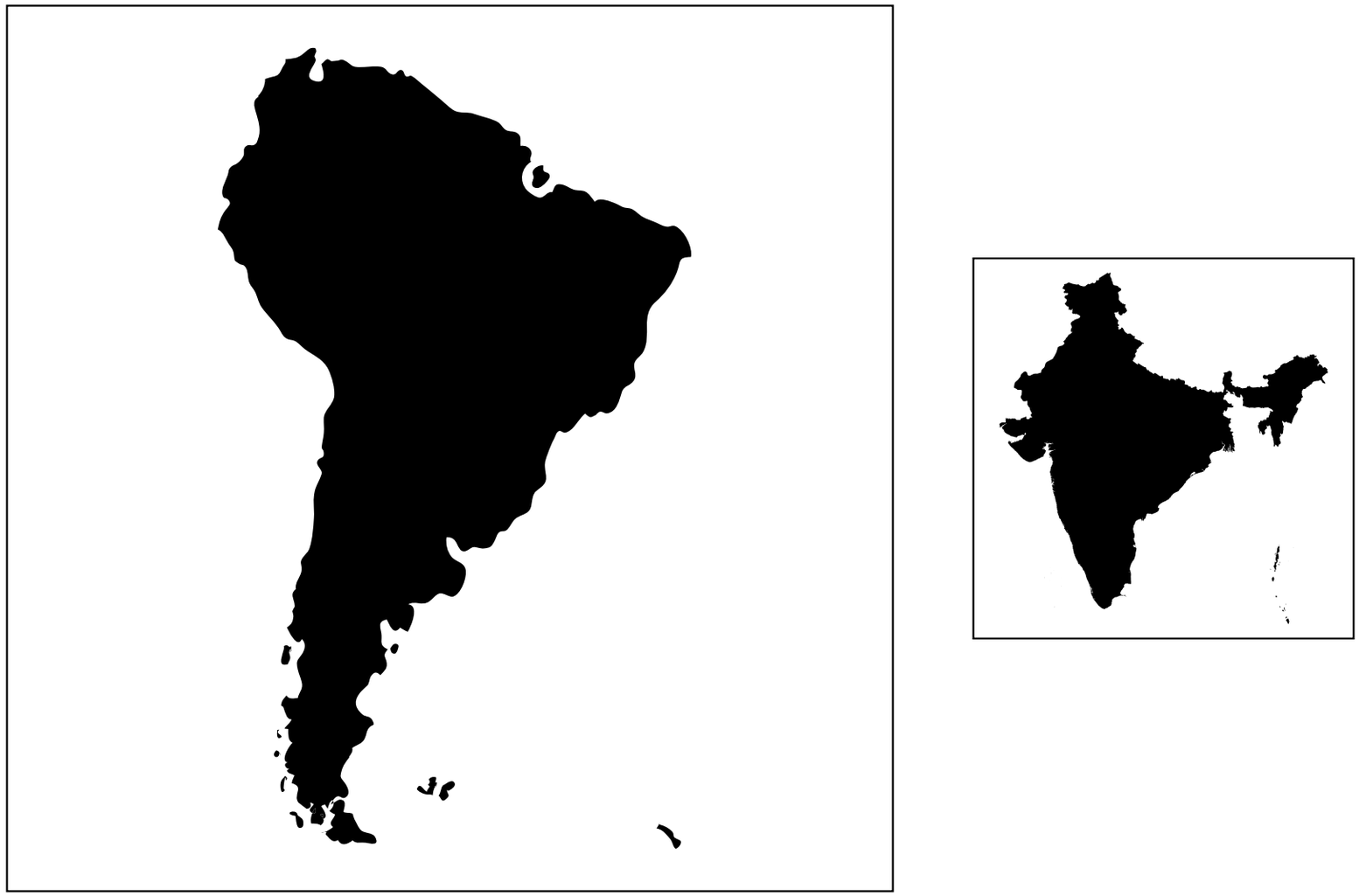


2012 SH Ozone Hole: 17,800,000 km^2

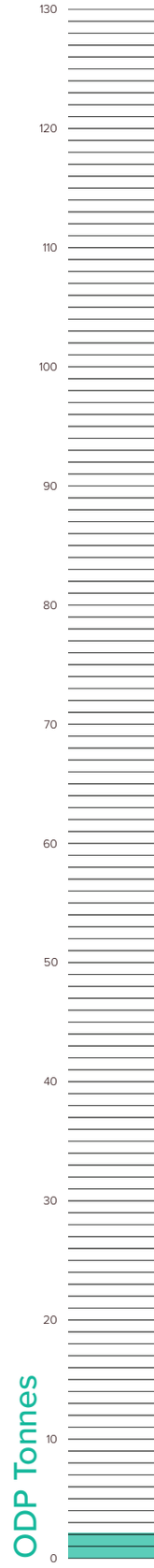
Europe: 10,180,000 km^2 + **Oceania:** 10,180,000 km^2



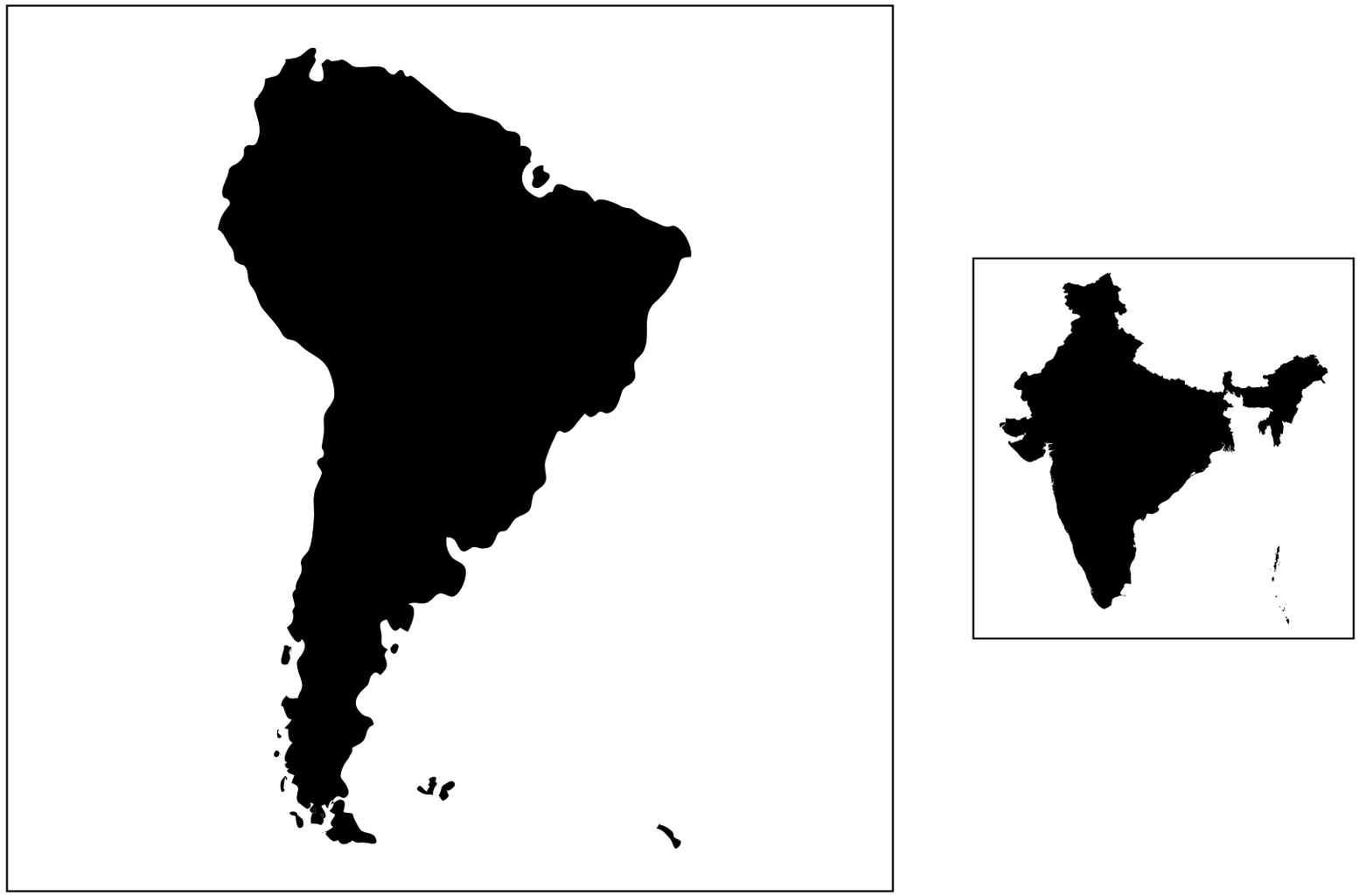
2013 SH Ozone Hole: 21,000,000 km^2



South America: 17,840,000 km^2 + **India:** 3,287,263 km^2



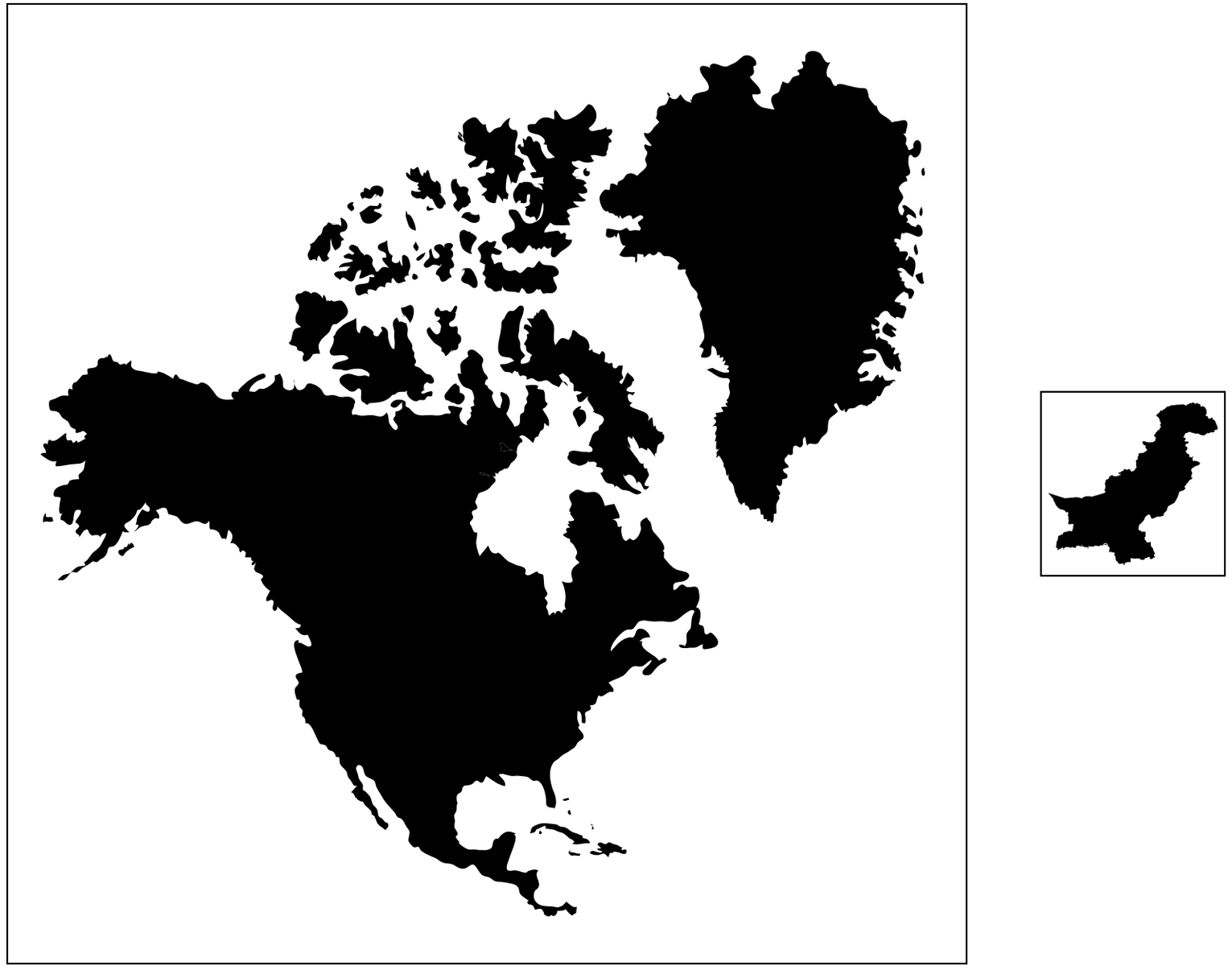
2014 SH Ozone Hole: 20,900,000 km^2



South America: 17,840,000 km^2 + **India:** 3,287,263 km^2

ODP Tonnes

2015 SH Ozone Hole: 25,600,000 km^2

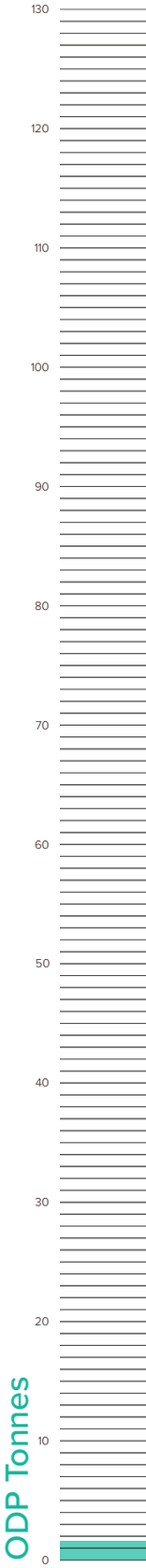


North America: 24,709,000 km^2 + **Pakistan:** 907,843 km^2

2016 SH Ozone Hole: 20,700,000 km^2

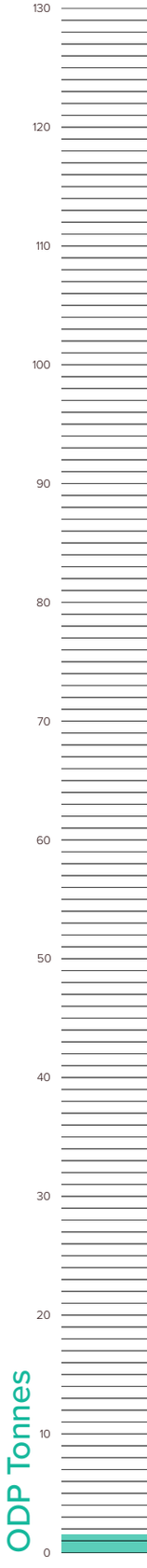
Kigali Amendment:
On October 15, 2016, Parties to the Montreal Protocol adopted the Kigali Amendment to phase down production and consumption of hydrofluorocarbons (HFCs) worldwide. HFCs are widely used alternatives to ODS such as hydrochlorofluorocarbons (HCFCs) and chlorofluorocarbons (CFCs), which are already controlled under the Protocol.

South America: 17,840,000 km^2 + **Argentina:** 2,780,400 km^2

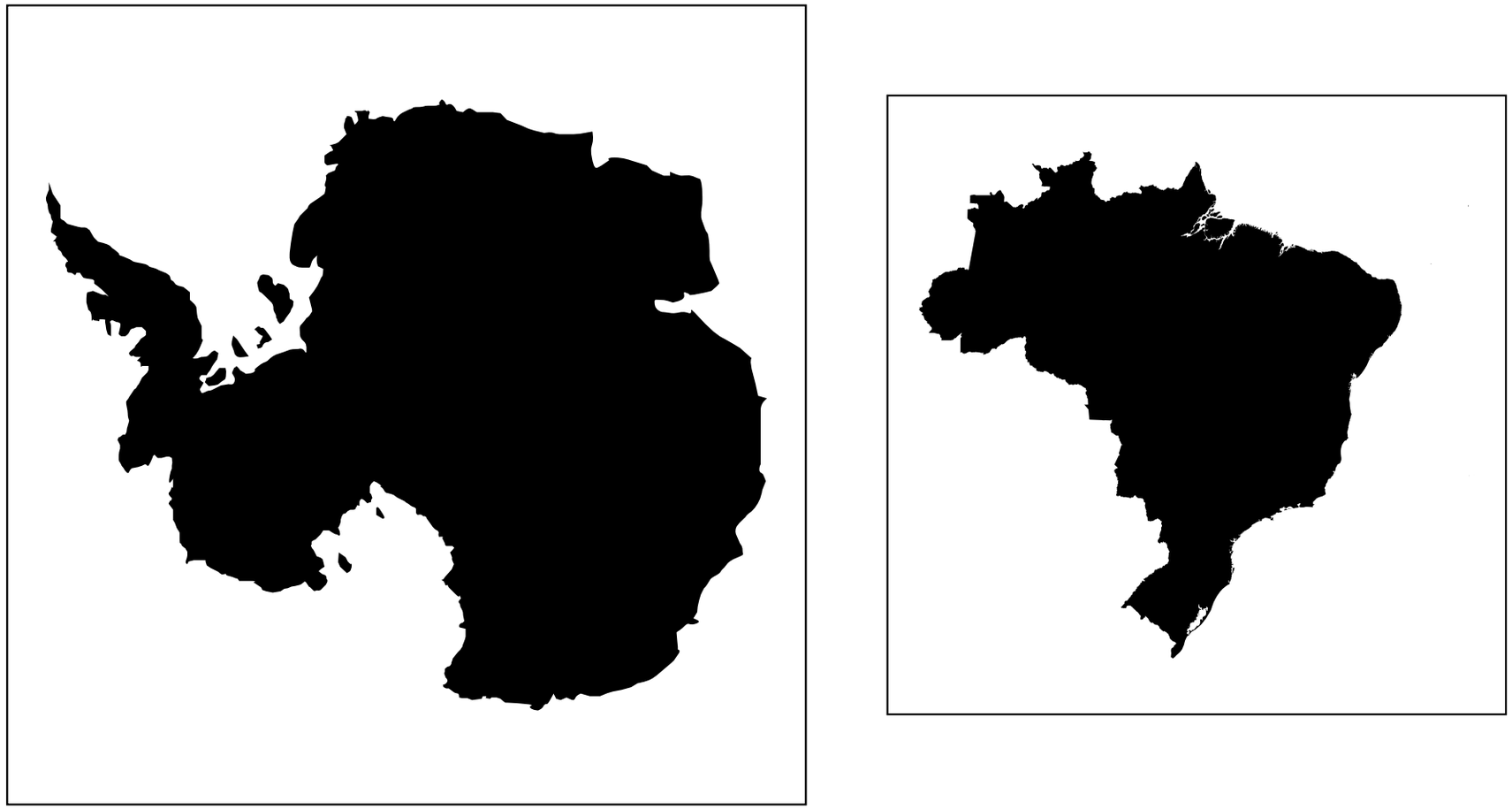


2017 SH Ozone Hole: 17,400,000 km^2

Russia: 17,098,246 km^2 + **Italy:** 301,339 km^2



2018 SH Ozone Hole: 22,900,000 km^2

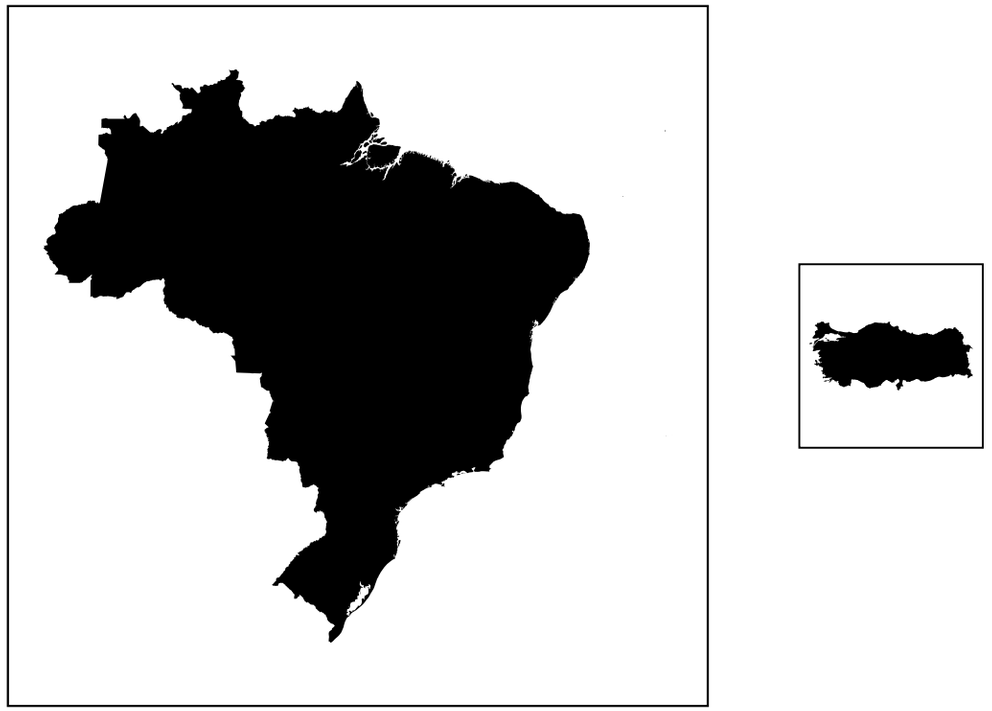


Antartica: 14,000,000 km^2 + **Brazil:** 8,515,767 km^2

ODP Tonnes

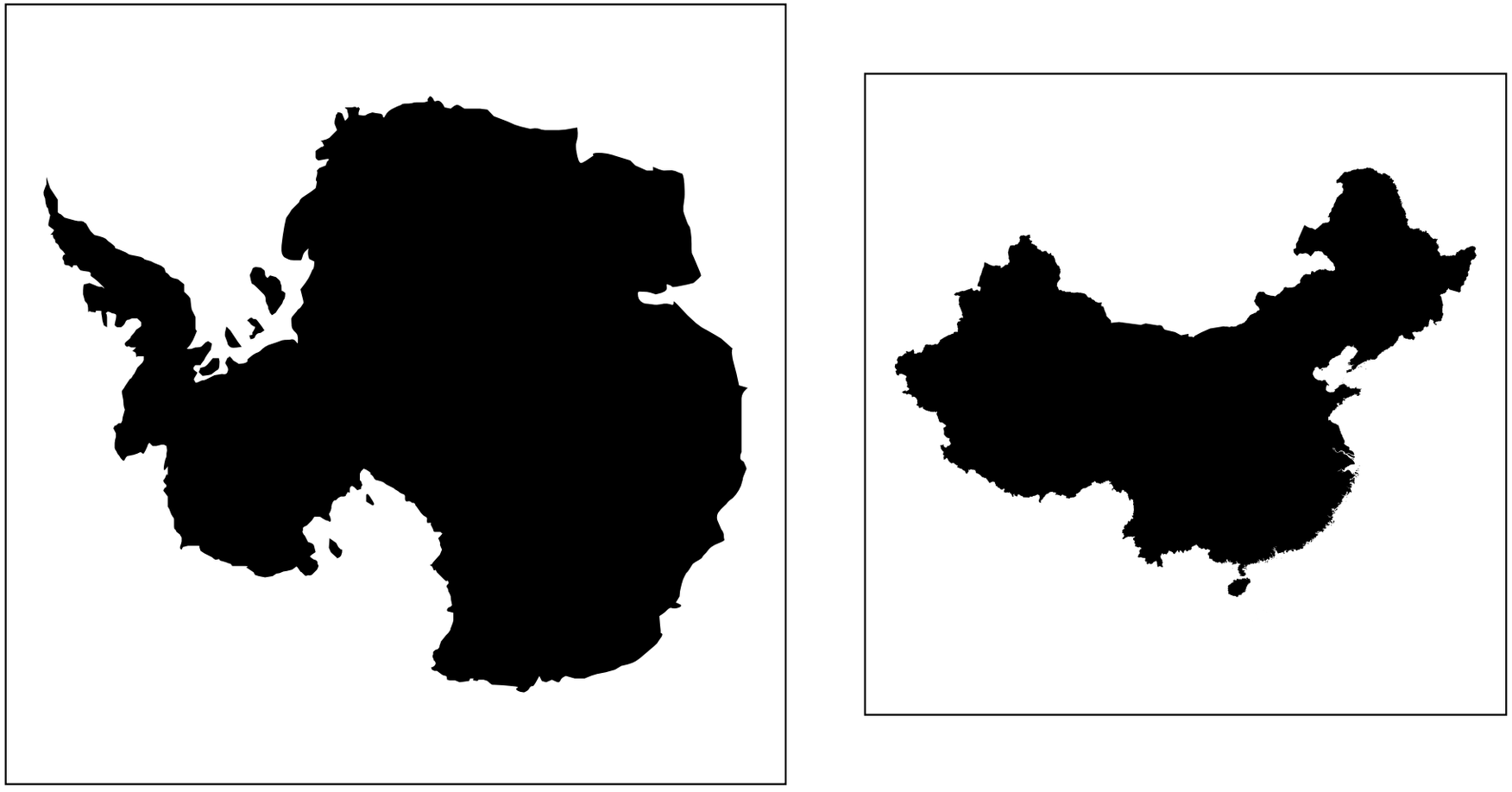
130
120
110
100
90
80
70
60
50
40
30
20
10
0

2019 SH Ozone Hole: 9,300,000 km^2



Brazil: 8,515,767 km^2 + **Turkey:** 8,515,767 km^2

2020 SH Ozone Hole: 23,500,000 km^2



Antartica: 14,000,000 km^2 + **China:** 9,596,961 km^2