Recent decline of Arctic char (*Salvelinus alpinus*) in Iceland

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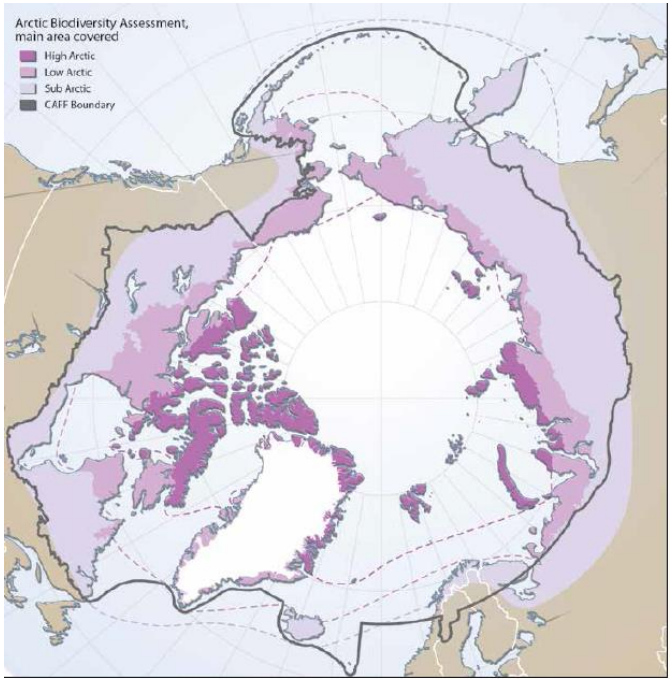
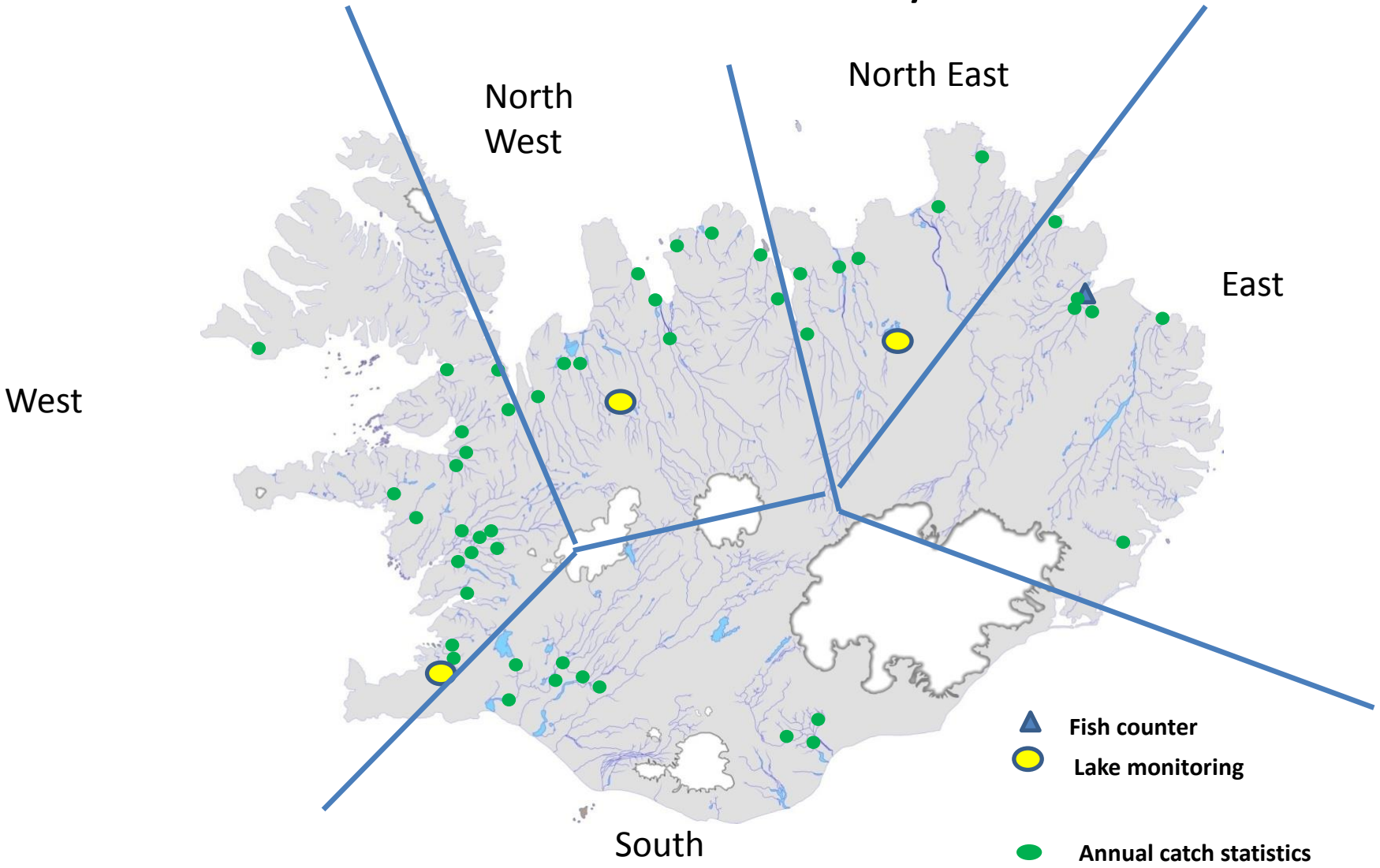
Arctic freshwater boundaries
Circumpolar distribution of Arctic char (*Salvelinus alpinus*)



Arctic freshwater boundaries
High Arctic
Low Arctic
Sub Arctic

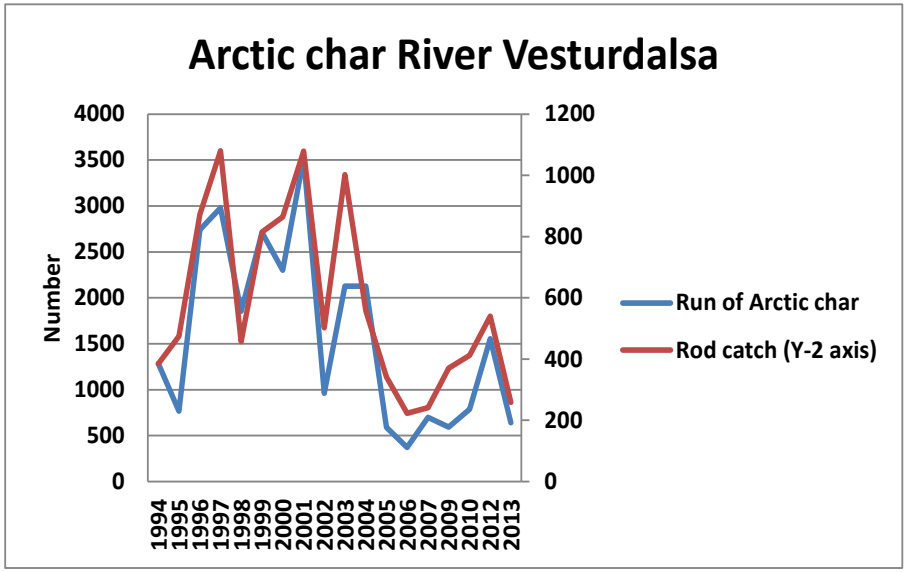
Circumpolar distribution of Arctic char
(Salvelinus alpinus)

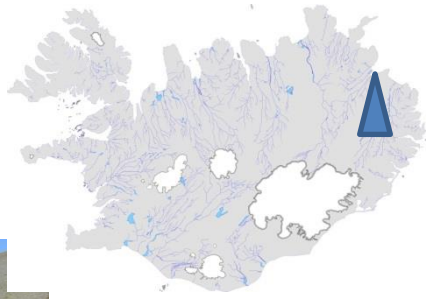
Rod catch of Arctic char in Iceland by statistical areas

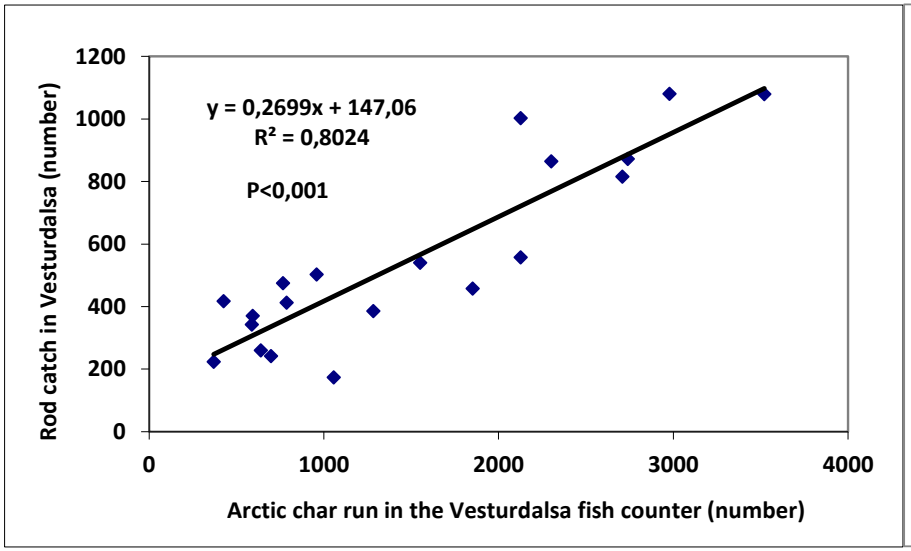


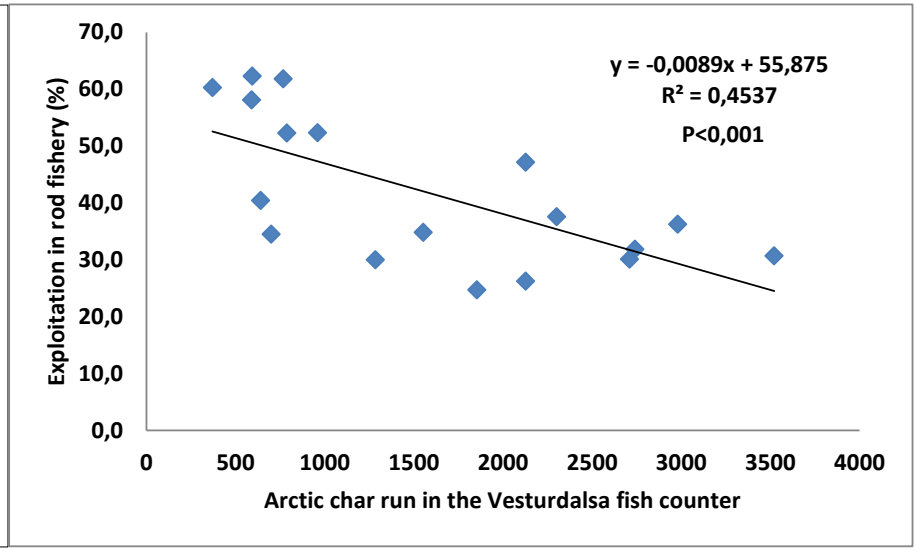
Rod catch in several rivers
Effort i.e. annual fishing period and number of rods are stable over time

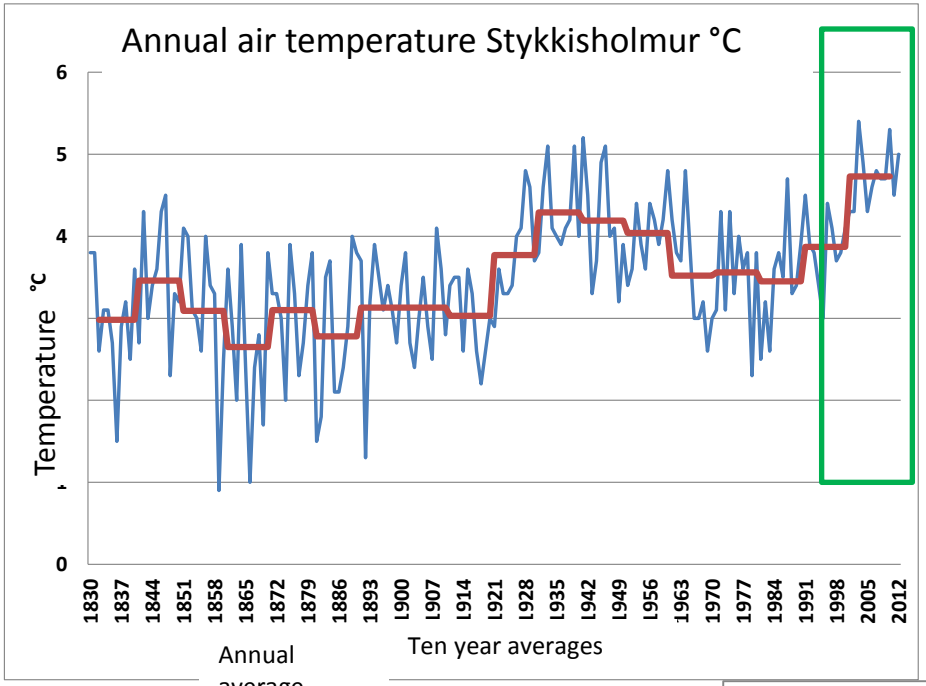
Is the rod catch statistics reflecting changes in stock size?

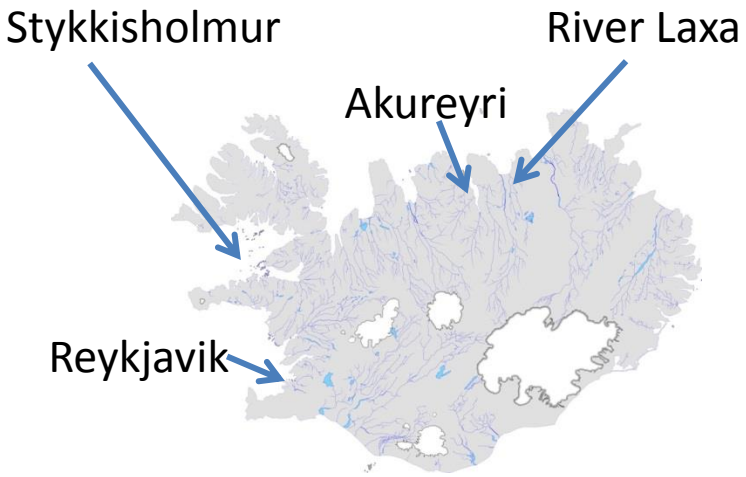


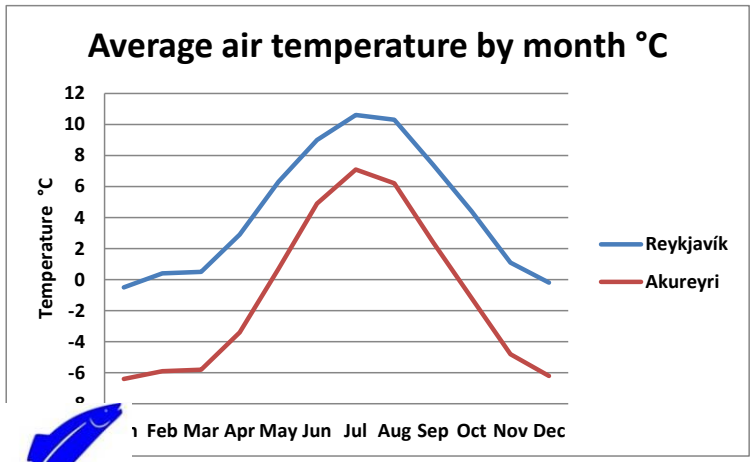


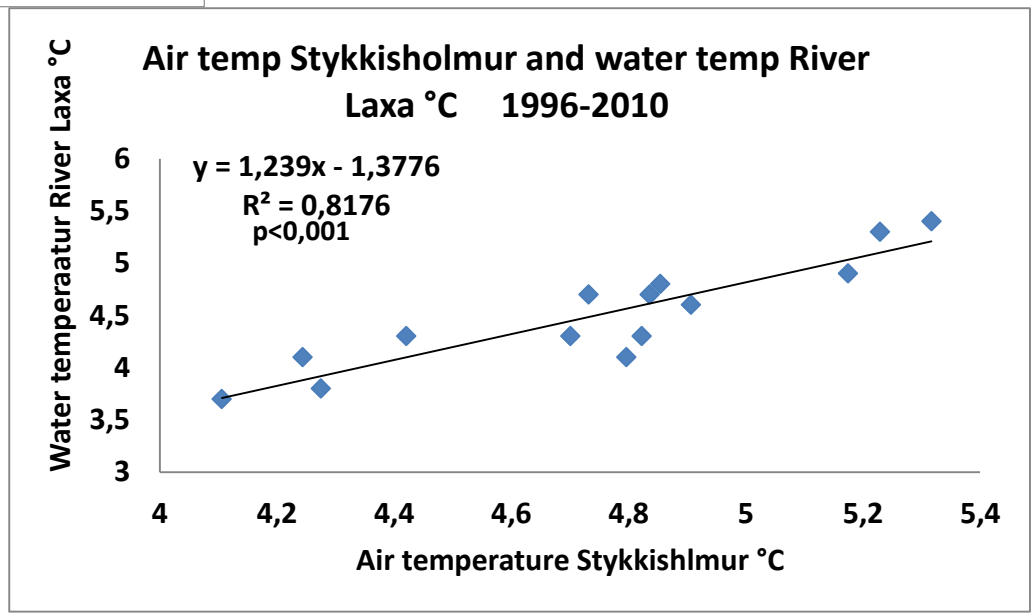


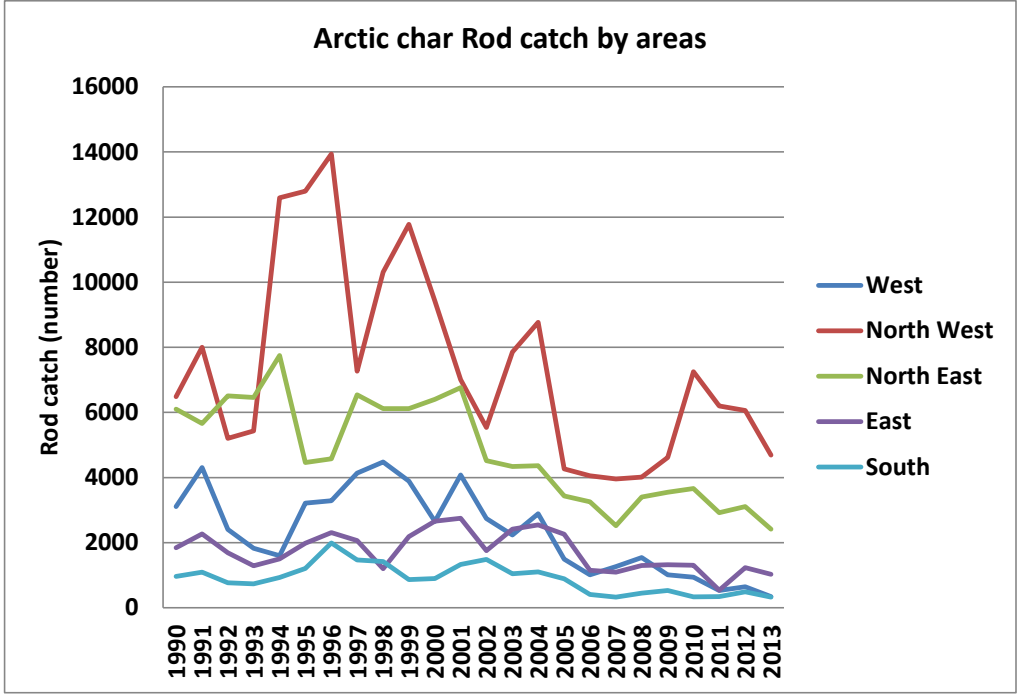


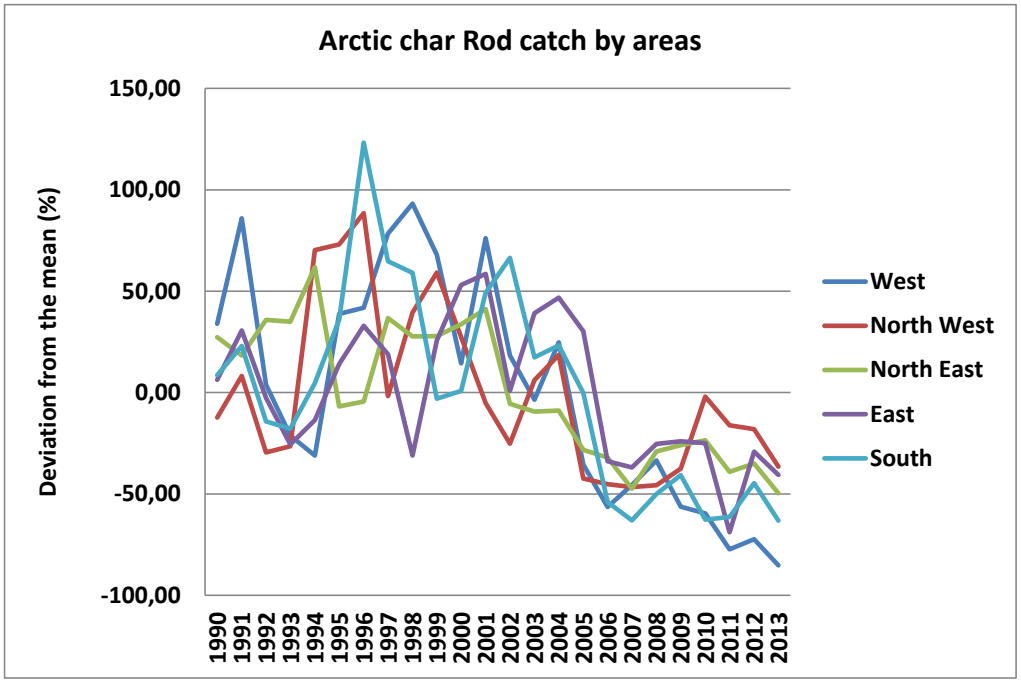

Annual air temperature Stykkisholmur °C
Temperature °C
6
5
4
0
1830
1837
1844
1851
1858
1865
1872
1879
1886
1893
1900
1907
1914
1921
1928
1935
1942
1949
1956
1963
1970
1977
1984
1991
1998
2005
2012
Annual average
Ten year averages

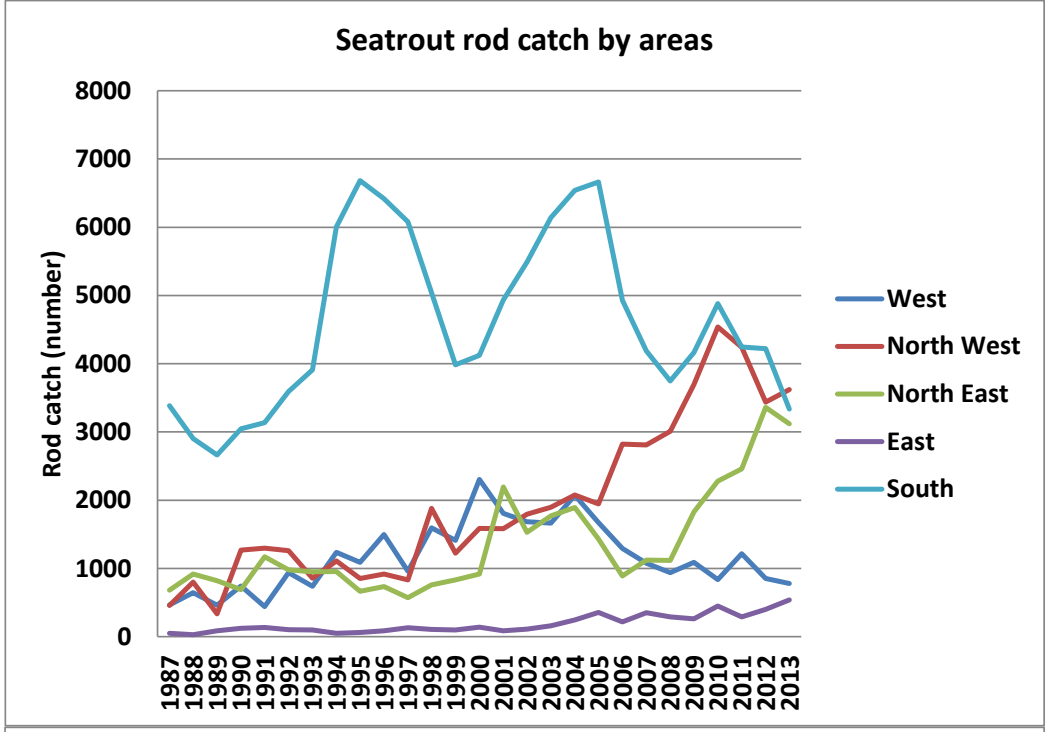

Stykkisholmur
River Laxa
Akureyri
Reykjavik

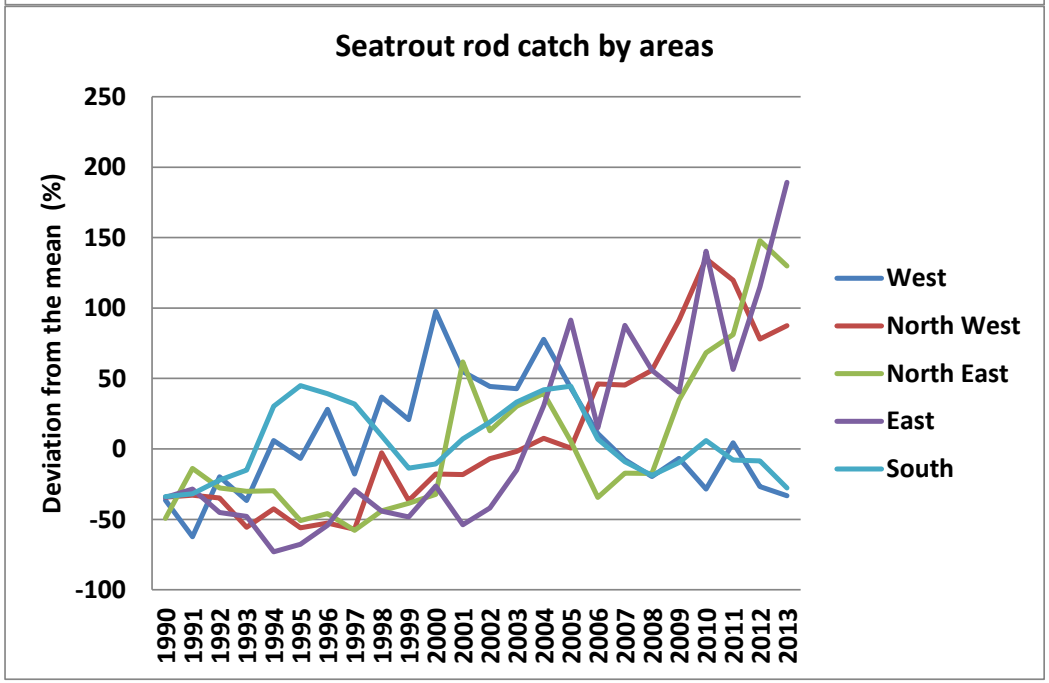

Average air temperature by month °C
Temperature °C
12
10
8
6
4
2
0
-2
-4
-6
Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Reykjavík
Akureyri


Air temp Stykkisholmur and water temp River Laxa °C 1996-2010
Water temperaatur River Laxa °C
y = 1,239x - 1,3776
R² = 0,8176
p<0,001
6
5,5
5
4,5
4
3,5
3
4
4,2
4,4
4,6
4,8
5
5,2
5,4
Air temperature Stykkishlmur °C

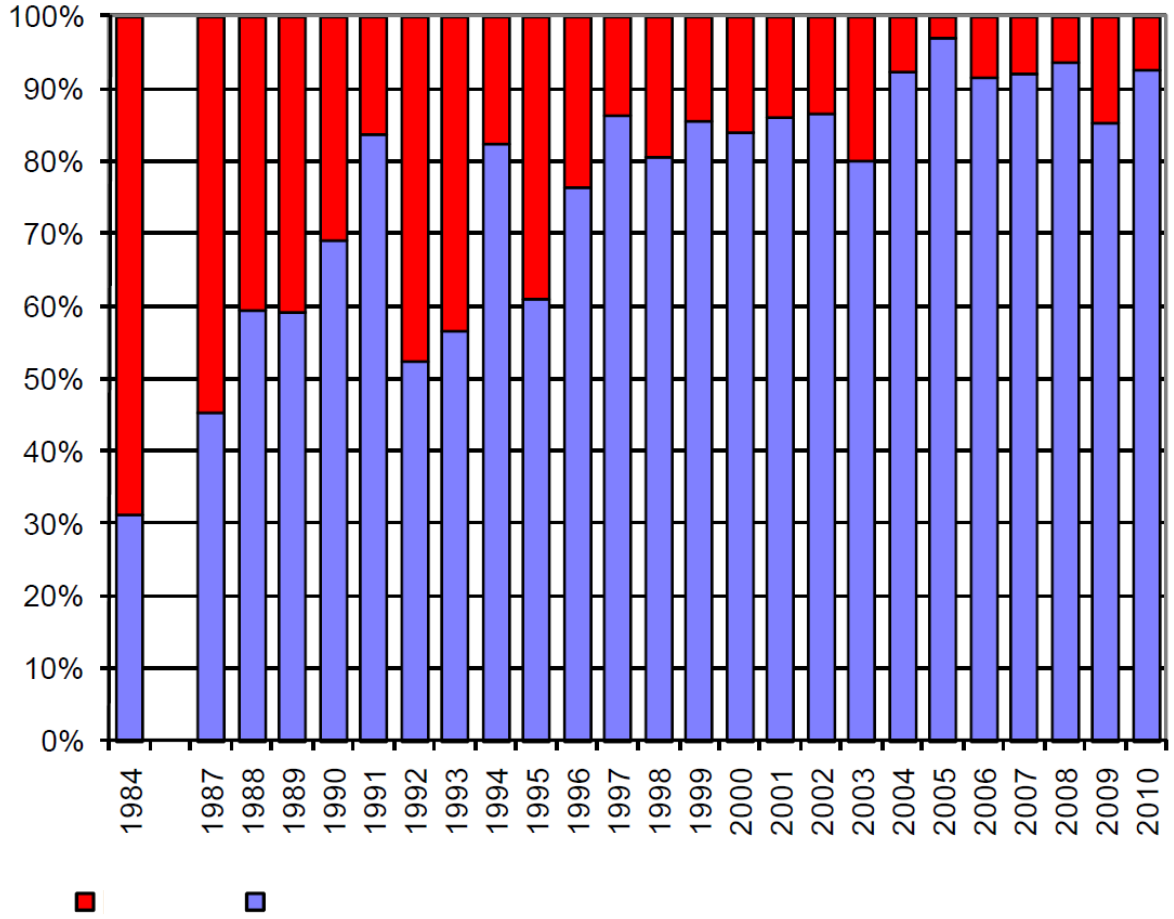

Arctic char Rod catch by areas
Rod catch (number)
16000
14000
12000
10000
8000
6000
4000
2000
0
1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
West
North West
North East
East
South


Arctic char Rod catch by areas
Deviation from the mean (%)
150,00
100,00
50,00
0,00
-50,00
-100,00
1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
West
North West
North East
East
South


Seatrout rod catch by areas
Rod catch (number)
8000
7000
6000
5000
4000
3000
2000
1000
0
1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
West
North West
North East
East
South


Seatrout rod catch by areas
Deviation from the mean (%)
250
200
150
100
50
0
-50
-100
1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
West
North West
North East
East
South

Proportion Arctic char and brown trout in Lake Ellidavatn – Gillnet survey



Th. Antonsson and F. Arnason 2010

Conclusion

- General and steep decline of Arctic char in Iceland (Both Sea run and stationary Arctic char)
- Increase of brown trout in North Iceland
- Proliferactive kidney disease (PKD) causing increasing mortality of young Arctic char
- Systematic monitoring is important as well as understanding the mechanisms for changes
- Local fishing rights owners ask for the “cure” to the problem