

**Report of the cruise  
369 of the FRV Walther Herwig III  
German Greenland groundfish survey  
Oct 07 – Nov 11, 2013**

Scientist in charge: Dr. Heino O. Fock

**Background**

The German survey off Greenland is conducted since 1981, aiming at monitoring groundfish stocks in particular of cod and redfish, collecting environmental data and conducting ecosystem studies in the area.

**Sampling**

WH369 was carried out in October and November 2013.

The report contains updated figures until 2012, but only tentative figures and results for 2013. In particular, data base work, age readings and the analysis of hydro-acoustic data still need to be carried out.

Survey goals were fully accomplished. 106 stations were sampled in 2013 as compared to 101 in 2012. The sampling area was subdivided into 9 regional strata. The new stratification was approved during the ICES North-Western Working Group in 2012 (Fig 1).

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West Greenland :                Stratum 1 (NAFO 1C), north of 61°N  
    Stratum 2 (NAFO 1D), north of 61°N  
    Stratum 3 (NAFO 1E), party north of 61°N  
    Stratum 4 (NAFO 1F), SW Greenland

East Greenland :                Stratum 5&6 (SE Greenland), south of 63°N  
    Stratum 7 (E Greenland), north of 63°N  
    Stratum 8 (E Greenland), northeast of 63°N  
    Stratum 9 (E Greenland), east of 33°W

## Meetings

In 2013, a workshop was held in Nuuk on Nov 1, with fisheries scientists from the Greenland Institute of Natural Resources and TI-SF taking part, where first results were being discussed from both the Greenlandic and the German surveys.

## Cod

### Trends

Trends are given in terms of survey standard unit catches (CPUE). To compare with the historical situation, CPUEs are scaled to the long-term maximum value, which was observed in 1988 in stratum 2. This value was set to 100.

Results are given Table 1 and Figure 2.

### West Greenland:

Overall, an increase was found for West Greenland, most particular in SW Greenland (stratum 4). The declining trend observed in previous years apparently ceased. As stated in 2012, this increase in cod is likely linked to a southward movement of young cod that was observed in 2011 and 2012.

### East Greenland:

In the main fishing areas off East Greenland, strata 5&6, 7 and 8, the cod stock remains low. In stratum 9, the slow increase observed until 2012 has been halted.

### Overall:

Compared to the highs in 2006 (West GL) and 2007 (East GL), CPUEs in 2012 are still at a very low level.

### Age Distribution of Cod

In East Greenland, ages > 6 were dominating in stratum 5&6 and strata 7 and 9. Still, with sizes mainly between 80 and 100 cm. These cod are likely to constitute an important component of the spawning stock of the so-called bank cod, whose offspring is then drifted to SE and W Greenland.

In West Greenland in the areas analysed so far, mainly younger cod were encountered. The size distribution indicates that this in the year class 2009 with an average size of about 50 cm.

No 0-groups were hardly encountered. However, it must be noted, that the catchability of cod younger than 3 years old is low with the nets deployed during the survey.

### Evaluation of survey results and assessment for cod

- (1) East GL cod has not recovered despite management measures at Kleine Bank. The increase in East GL cod observed in the Greenlandic survey is not reflected in the German survey.
- (2) In West GL, the increase in cod is likely linked to a southward movement of young cod that was also observed in 2011 and 2012.
- (3) As pointed out in the last reports, the distribution of the year class 2009 off West Greenland shows (a) the relevance of a significant spawning stock off East Greenland, and (b) a potentially new strong year class incoming.

#### Redfish (*S. mentella* and *S. marinus*)

##### Survey trends

High abundance for *S. mentella* is only encountered in stratum 8 of the German survey. Catch rates for *Sebastes mentella* decline sharply in stratum 8, after opening the fisheries in 2010. The CPUE declined in this area for 97 % from 2009 to 2013 (Table 2). This strong negative trend has been stated in this report since 2011.

Golden redfish *Sebastes marinus* is by-caught in the *S. mentella* fisheries and CPUE is also declining until 2012 (Table 3), though not so sharply. In 2013, a slight increase was observed for East GLD, now clearly exceeding CPUE for *S. mentella* in relative and absolute terms.

##### Evaluation of survey results

- (a) Present catch rates are not likely to maintain the redfish population on the stock. The demersal *S. mentella* fisheries on the shelf is likely not sustainable.
- (b) The survey results indicate trends of redfish above 400 m depth only. The deeper part of the stock is not covered by the survey, but is considered in the ICES advice.

#### **Cruise participants**

##### Name and function

- 1 Dr. Heino Fock. Cruise leader TI\_SF, Hamburg
- 2 Annika Elsheimer. Ozeanographie TI\_SF, Hamburg
- 3 Jörg Appel, Fischereibiologie TI\_SF, Hamburg
- 4 Wolfgang Brenoe, Fischereibiologie TI\_SF, Hamburg
- 5 Lars Christiansen, Fischereibiologie TI\_SF, Hamburg
- 6 Stephanie Czuday, Fischereibiologie TI\_SF, Hamburg
- 7 Kerstin Hübner, Fischereibiologie TI\_SF, Hamburg
- 8 Linda Olmos-Pino, Fischereibiologie TI\_SF, Hamburg
- 9 Iris Bagge, Schadstoffforschung MRI, Hamburg
- 11 Julian Münster, Parasitologie BiK-F

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Dr. Heino O. Fock

## Tables and Figures

Table 1 : Trends for standard unit catches (CPUE) for cod in the German offshore survey in Greenland waters by stratum, 1981 to 2013. Values scaled to maximum value in 1988, stratum 2 (=100%); - = no data.

Jahr	West Greenland					East Greenland		
	Stratum1	Stratum2	Stratum3	Stratum4	Strat5&6	Stratum7	Stratum8	Stratum9
1982	0	16	9	10	1	2	1	2
1983	0	7	10	7	1	1	1	4
1984	0	2	2	3	1	1	0	0
1985	0	4	4	2	1	3	1	2
1986	1	6	9	6	1	4	1	1
1987	27	70	49	9	3	4	2	1
1988	9	100	14	18	3	2	1	2
1989	0	6	98	24	23	16	3	0
1990	0	1	2	6	2	6	2	1
1991	0	0	1	1	1	1	1	2
1992	0	0	0	0	0	0	0	0
1993	0	0	0	0	0	0	0	0
1994	0	0	0	0	0	0	0	0
1995	0	0	0	0	0	1	0	0
1996	0	0	0	0	0	1	0	0
1997	0	0	0	0	0	0	0	3
1998	0	0	0	0	0	0	0	1
1999	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	1	0	0
2001	0	0	1	0	0	2	0	3
2002	0	0	0	1	0	7	0	2
2003	0	0	0	0	0	19	1	3
2004	0	0	0	1	0	5	1	3
2005	0	0	1	5	4	16	1	5
2006	0	19	1	14	0	17	2	10
2007	0	1	4	32	3	0	2	6
2008	0	0	6	8	4	0	1	9
2009	0	0	0	0	1	48	2	11
2010	0	1	2	2	0	25	2	8
2011	0	0	1	5	3	8	2	13
2012	8	2	5	13	5	12	2	19
2013	1	3	4	29	3	9	2	3

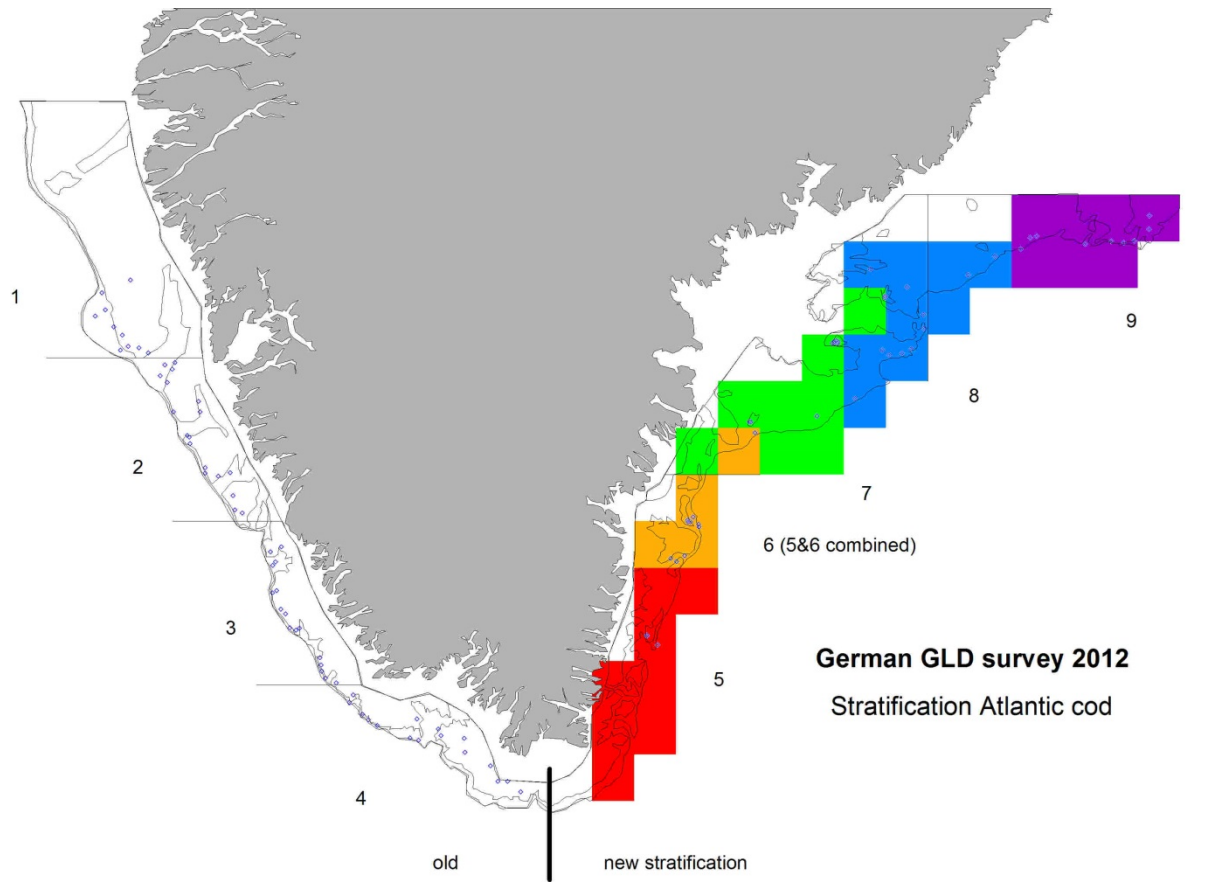
Table 2 : Trends for standard unit catches (CPUE) for deep-sea redfish *Sebastes mentella* in the German offshore survey in Greenland waters by stratum, 1996 to 2013. Values scaled to maximum value in 2009, stratum 8 (=100%); - = no data.

Year	Str1	Str2	Str3	Str4	Str5&6	Str7	Str8	Str9
1996	0	0	0	0	2	0	32	1
1997	0	0	0	0	1	0	63	1
1998	0	0	0	0	2	0	36	0
1999	0	0	0	0	0	1	13	0
2000	0	0	0	0	3	1	7	0
2001	0	0	0	0	2	2	11	1
2002	0	0	0	0	2	0	17	4
2003	0	0	0	0	1	0	54	4
2004	0	0	0	0	0	0	65	8
2005	0	0	0	0	1	0	83	1
2006	0	0	0	0	0	1	47	2
2007	0	0	0	0	3	1	68	1
2008	0	0	0	0	0	0	36	0
2009	0	0	0	0	0	0	100	0
2010	0	0	0	0	0	0	37	0
2011	0	0	0	0	0	0	10	0
2012	0	0	0	0	0	0	15	0
2013	0	0	0	0	0	0	3	0

Table 3 : Trends for standard unit catches (CPUE) for golden redfish *Sebastes marinus* in the German offshore survey in Greenland waters by stratum, 1996 to 2013. Values scaled to maximum value in 2009, stratum 8 (=100%); - = no data.

	Str1	Str2	Str3	Str4	Str5&6	Str7	Str8	Str9
1996	0	0	0	0	1	0	2	0
1997	0	0	0	0	1	0	2	0
1998	0	0	0	0	0	0	3	1
1999	0	0	0	0	0	2	4	0
2000	0	0	0	0	1	12	5	1
2001	0	0	0	0	4	5	2	2
2002	0	0	0	0	1	0	18	15
2003	0	0	0	0	1	0	13	2
2004	0	0	0	1	0	6	17	8
2005	0	0	0	1	1	5	36	7
2006	0	0	0	3	0	3	15	24
2007	0	0	0	3	73	6	77	24
2008	0	0	0	1	3	2	67	9
2009	0	0	0	1	32	5	100	4
2010	0	0	1	3	0	1	67	19
2011	0	0	0	2	13	0	41	19
2012	0	0	1	2	22	0	54	9
2013	0	0	2	6	45	0	62	32

**Fig. 1: New stratification scheme for the German Greenland survey, introduced in 2012 and applied since.**



**Figure 2 : Trends for CPUE for cod from the German offshore survey off Greenland. Stratum affiliation see Table 1. Stratum 1 not sampled in 2011.**

