

vaNATIONAL REPORTS TO THE JTA
(JTA National Report on Current and Planned Argos Use)

Year	2015
Country	Germany

Section 1. Overall Summary

1. Water masses in the Nordic Seas

Detlef Quadfasel, DETLEF.QUADFASEL@ZMAW.DE

Hamburg University, Zentrum für Meeres- und Klimaforschung, Institut für Meereskunde, Bundesstr. 53, 20146 Hamburg, Germany
ARGOS Programme Number 592

The aim of the program is to monitor the water masses in the different basins of the Nordic Seas with the data from profiling floats (Greenland Sea, Norwegian Sea, Iceland Sea, Lofoten Basin). Since 2001 floats were deployed in the Greenland Sea, since 2004 also in the Norwegian Sea and Lofoten Basin and since 2005 in the Iceland Sea. Changes in the water mass transformation processes and therefore also in the water mass characteristics are examined in the context of climate change. The floats are part of the international ARGO programme. No more floats have been deployed in the report period and only a few of the project floats are still active. *More information is available at* <http://www.ifm.zmaw.de/forschung/regionale/projekte/mersea/>



Deployment of a float during heavy weather at the Lofoten Basin in 2012 from RV Poseidon

2. GEOMAR: Mooring ARGOS beacon

Johannes Karstensen, JKARSTENSEN@GEOMAR.DE

Helmholtz-Zentrum für Ozeanforschung Kiel, GEOMAR, Düsternbrooker Weg 20, 24105 Kiel, Germany

Argos Programme number 783

The aim of the project is to monitor subsurface moorings that get accidentally released and are at drift by using ARGOS beacons. The beacons are equipped with a pressure or conductivity sensitive switch which activates them when at the sea surface: The present and envisioned activities cover all

ice free areas of the global ocean, from the shelves to the deep basins, but with a focus on the Atlantic.

3. Norwave

Kai Herklotz, kai.herklotz@bsh.de

Bundesamt für Seeschifffahrt und Hydrographie, Bernhard-Nocht-Str. 78, 20359 Hamburg, Germany

ARGOS Programme Number 948

The Norwave measurements take place at fixed monitoring stations in the North Sea and Baltic Sea (see Marnet programme). Waverider buoys are measuring sea state conditions, one of these is transmitting data through the ARGOS satellite system. Watchdog services are used for the other buoys. *More information is available at*

<http://www.bsh.de/de/Meeresdaten/Beobachtungen/Seegang/index.jsp>



Waveriderboje used at the Helogland station.

4. Bird migration in Africa and Eurasia - a pilot study

Martin Wikelski, martin@ORN.MPG.DE

Max Planck Institute for Ornithology, Migration and Immuno-ecology (Vogelwarte Radolfzell), Am Obstberg 1, 78315 Radolfzell, Germany ARGOS Programme Number 983

5. Migration of raptors

Bernd Meyburg, BUMeyburg@aol.com

World working group on birds of prey and owls (Berlin), Wangenheimstr. 32, D-14193 BERLIN, Germany.

ARGOS Programme Number 1126

The W.W.G.B.P. has been active for thirty years now and today plays an important role in the promotion of raptor conservation and research on an international level. Its membership list today comprises over 3,000 raptor specialists and enthusiasts in all parts of the world, and anybody with an interest in raptors is welcome to become a member. The W.W.G.B.O tracks birds of prey world-wide since 1992. These raptors are belonging to 14 species. Resulting publications are available as PDF

files: www.raptor-research.de". More information is available at <http://www.raptors-international.de/index.htm>



6. Migratory behaviour of Antarctic seals

Horst Bornemann horst.bornemann@awi.de

Alfred Wegener Institut, Helmholtz Zentrum für Polar- und Meeresforschung, P.O.Box 120161,
27515 Bremerhaven, Germany

ARGOS Programme Number 1535

The Marine Mammal Tracking (MMT) project of AWI and its collaborating partners, in particular the MRI (University of Pretoria, South Africa), and the IAA (Buenos Aires, Argentina), concentrates on the Southern Ocean. The project involves assessment of the at-sea movements of southern elephant seal males (*Mirounga leonina*, instrumented at Carlini Station, King George Island / Isla 25 de Mayo) and of Weddell seals (*Leptonychotes weddellii*, instrumented within southern Weddell Sea) using CTD combined-Satellite Relay Dive Loggers (CTD-SRDLs, Sea Mammal Research Unit, Cambridge, UK). MMT aims to describe (1) the seals' at-sea movements (2) the physical environments passed by the seals during their foraging migrations at sea, and (3) their behavioral responses to the oceanographic features they experience with (4) special emphasis on the region of the Filchner Trough Outflow System (FOS) around 79°S 36°W, and the Drescher Inlet (DI) at 72°52'S 20°W. FOS and DI have been in the focus of the expedition PS82 of the AWI's RV Polarstern, the expedition SAF of AWI's research aircraft Polar 6, both scheduled in synchrony with the aforementioned work at the IAA's research station Dr. Alejandro Carlini during 2013/14. More information is available at: <http://www.wdc-mare.org/projects/mmt.html> and <http://epic.awi.de/36461/>



Tagged southern elephant seal

7. GEOMAR: gliders

Gerd Krahmman, gkrahmman@geomar.de

Helmholtz-Zentrum für Ozeanforschung Kiel, GEOMAR, Düsternbrooker Weg 20, 24105 Kiel, Germany

ARGOS Programme Number 1783

The gliders are equipped with Argos beacons to be located in case other navigational and communication devices fail. There are 10-14 Gliders to be used in all parts of the Ocean. More information is available at <http://gliderweb.geomar.de/>



Glider deployment with Rubber Boat – the usual procedure

8. Tracking Penguins at sea

Klemens Pütz, klemens.puetz@ewetel.net

Antarctic Research Trust, Am Oste-Hamme-Kanal 10, 27432 Bremervörde, Germany

ARGOS Program Number 1857

In this project the foraging behavior of penguins and other seabirds in the Southern Ocean has been investigated on a seasonal and inter-annual scale between 1998 and 2011 in order to identify their foraging areas, migration corridors and wintering sites. In 2015, the project re-commenced with a study of the foraging activities of King Penguins from Tierra del Fuego, Chile. In February 2016, a comprehensive study on the winter dispersal of juvenile and adult Southern Rockhopper penguins at several breeding sites in southern South America will follow. More information is available at <http://www.antarctic-research.de>.

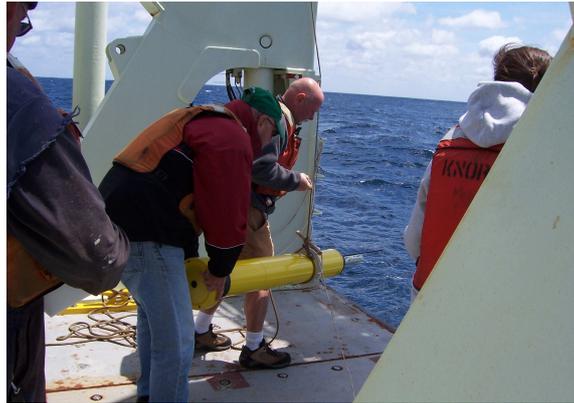
9. German-Argo/BSH

Birgit Klein, BIRGIT.KLEIN@BSH.DE

Bundesamt für Seeschifffahrt und Hydrographie, Bernhard-Nocht-Str. 78, 20359 Hamburg, Germany

ARGOS Programme Number 1895

The aim of the program is to contribute to the international Argo programme with about 50 floats per year. Presently 107 BSH floats are transmitting data, most of them (93) use the ARGOS system, while the rest (14) uses Iridium . The BSH is using Argo data to monitor water mass changes in the North Atlantic since they are changing inflow conditions for waters entering the North Sea. Main deployment areas will be the Atlantic and source regions in which deep water formation occurs in the polar areas. More information is available at <http://www.german-argo.de>.



Deployment of a float of an APEX float in the Atlantic from RV Knorr

10. Marnet, BSH

Kai Herklotz, KAI.HERKLOTZ@BSH.DE

Bundesamt für Seeschifffahrt und Hydrographie, Bernhard-Nocht-Str. 78, 20359 Hamburg, Germany

ARGOS Programme Number 2120

The Marnet program consists of 11 fixed monitoring stations in the North Sea and Baltic Sea which measure oceanic parameters as temperature, salinity, oxygen and currents in the water column. 7 Waverider buoys are measuring sea state conditions, one of these is transmitting data through the ARGOS satellite system. Watchdog services are used for the other buoys. More information is available at <http://www.bsh.de/de/Meeresdaten/Beobachtungen/MARNET-Messnetz/index.jsp>.



Measurement station Fino1 (Position 54°01' N, 06°35' E) is part of the MARNET station network in the North Sea and Baltic

11. IFM-Geomar moored data buoys

Gerd Krahnemann, gkrahmann@geomar.de

Helmholtz-Zentrum für Ozeanforschung Kiel, GEOMAR, Düsternbrooker Weg 20, 24105 Kiel, Germany

ARGOS Programme Number 2736

The programme uses surface buoys to transmit data.

12. Iffezheimer Störche auf Reisen

Herbert König, KINGSCASTLE@T-ONLINE.DE

Initiativgruppe Naturschutz, Severin-Schäfer-Str. 3, 76473 Iffezheim

ARGOS Programme Number 3100

The conservation initiative Iffezheim has ringed a storch in 2006 which hatched in Iffezheim. The Argos transmitter is used to study the migratory behaviour of this bird. More information is available at <http://www.iniffezheim.de/>



13. European Whitefronted Geese Research Project, European whitefronted goose (Blessgans)

Helmut Kruckenberg, HELMUT.KRUCKENBERG@BLESSGANS.de

Europäisches Blessgans Forschungsprogramm, Am Steigbügel 3, D-27283 Verden (Aller), Germany

ARGOS Programme Number 3189

Only three Lesser white-fronted geese are tracked with Argos tags at the moment. The tracking of the European whitefronted geese is now using GPRS beacons which allow advanced data collection and which are less expensive.



Transmitted bird (Geert) with its mate (c) K. Veldkamp

14. ESA precursor, Tracking of individual birds

Klaus-Michael Exo, MICHAEL.EXO@IFV-VOGELWARTE.DE

Institut für Vogelforschung, "Vogelwarte Helgoland", An der Vogelwarte 21, 26386 Wilhelmshaven, Germany

ARGOS Programme Number 3490

The project is carried out in the context of the ESA FlySafe activities. It analyses the technical prospects and limits in using satellite based bird tracking and monitors small scale and large scale movements. The work includes analyses of medium- and long-range bird migration behavior as well as small scale feeding flights (study species: Herring Gull *Larus argentatus*, Lesser blackbacked Gull *Larus fuscus*, Barnacle Geese *Branta leucopsis*). A report is available at

http://www.ifv-vogelwarte.de/downloads/96/esa_report_sovon_cover_2008-10.pdf



Figure 5.1 (ESA report): Colour marked Herring Gull (M.AFH) carrying a GPS PTT on the beach of Texel, Netherlands, on 24-10-2007. Photograph by Pieter Veeling

15. Cosyna

Prof. Dr. Burkard Baschek, burkard.baschek@hzg.de, Dr. Holger Brix, holger.brix@hzg.de

Helmholtz Zentrum Geesthacht

Max-Planck-Straße 1

21502 Geesthacht

Germany

ARGOS Programme Number 3932

COSYNA is a unique system that offers a new level of marine monitoring methods. COSYNA is a pre-operational system – in contrast to an experimental system. Its main characteristic is the integrated approach combining observations and numerical modelling in order to reliably deliver quality-controlled data as well as model predictions. It is used to answer scientific questions and to help inform political decision makers.



More information is available at:
http://www.hzg.de/institutes_platforms/cosyna/research_topics/index.php.en

16. Hobby falcon

Bernd Meyburg, BUMeyburg@aol.com

World working group on birds of prey and owls, Wangenheimstr. 32, D-14193 BERLIN, Germany.
 ARGOS Programme Number 4126 (sub-PGM of PGM 1126)

The W.W.G.B.P. has been active for thirty years now and today plays an important role in the promotion of raptor conservation and research on an international level. Its membership list today comprises over 3,000 raptor specialists and enthusiasts in all parts of the world, and anybody with an interest in raptors is welcome to become a member. The W.W.G.B.O tracks birds of prey world-wide since 1992. These raptors are belonging to 14 species. Resulting publications are available as PDF files: www.raptor-research.de.

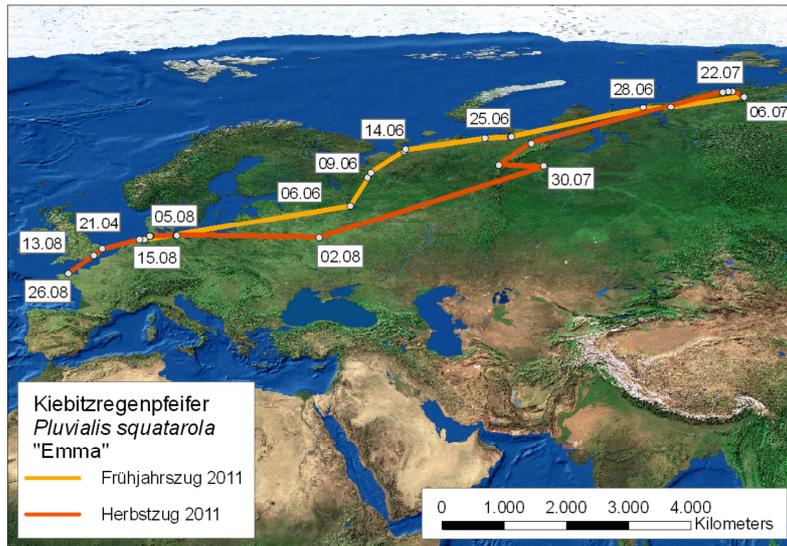
More information is available at <http://www.raptors-international.de/index.htm>

17. Studies to understand the decline in migratory waterbirds using the German Wadden Sea

Klaus-Michael Exo, MICHAEL.EXO@IFV-VOGELWARTE.DE

Institut für Vogelforschung, "Vogelwarte Helgoland", An der Vogelwarte 21, 26386 Wilhelmshaven, Germany
 ARGOS Programme Number 4852

About 40% of the birds using the Lower Saxon Wadden Sea during migration declined during the last decades. The main aim of the project is to analyze (ecological) factors that may cause the decline, therefore migration routes and connectivity between the Wadden Sea and Arctic breeding grounds as well as African wintering areas will be analyzed for a few selected species, the Grey Plover *Pluvialis squatarola* and the Bar-tailed Godwit *Limosa lapponica*, using satellite transmitters as well as geolocators.



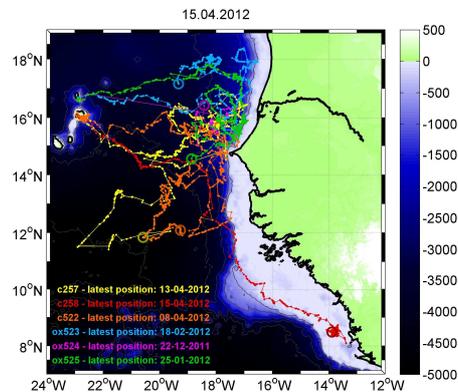
Spring and autumn migration routes of a Grey Plover marked April, 4, 2011 with a 5 g PTT (from Exo et al. 2012, Jber. Institut für Vogelforschung 10: 10-12).

18. CV Turtle Tracking

Bjoern Fiedler, bfiedler@geomar.de, Victor Stiebens vstiebens@geomar.de
 Helmholtz-Zentrum für Ozeanforschung Kiel, GEOMAR, Düsternbrooker Weg 20, 24105 Kiel,
 Germany
 ARGOS Programme Number 4810

The department of marine ecology studies the endangered Loggerhead Sea Turtle, which boasts the third largest nesting aggregation at the islands of Cape Verde. During 2011, 2012 and 2013 a couple of turtles have been tagged with satellite transmitters equipped with CTD sensors (Conductivity, Temperature and Depth) and oxygen optodes to get a grip on the habitat turtles live in. However such devices can only be mounted on adult and subadults. The program has been continued in 2014 with tags on 6 turtles, 3 males (Fra, Zé und Mingo) and three females (Bemvinda, Kika, Kamoka). In 2015 only one tag was active.

The project has benefited from the addition of numerous amazing volunteers from Turtle Foundation, the Maio Biodiversity Foundation, Projecto Vitó and the Instituto Nacional de Desenvolvimento das Pescas (INDP). The work is supervised by Dr. Christophe Eizaguirre (Evolutionary Biologist-GEOMAR, c.eizaguirre@qmul.ac.uk).



Tagged and post-nesting migration tracks for six female loggerhead turtles. Photo source Geomar.

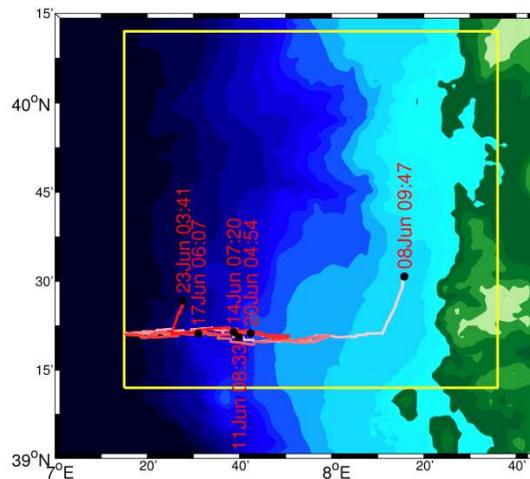
More information is available at <http://turtle-project.geomar.de/>

19. WTD 71 Gilder Fleet

wtd71posteingang@bundeswehr.org

Wehrtechnische Dienststelle für Schiffe und Marinewaffen, Maritime Technologie und Forschung,
Berliner Str. 115, 24340 Eckernförde, Germany
ARGOS Programme Number 4944

In 2014, WTD71 deployed one glider in the Mediterranean Sea west of Sardinia as part of the REP14-MED (Recognized Environmental Picture in the Mediterranean 2014) experiment. The aim of the experiment was to improve regional oceanic forecasts and observation strategies to obtain a fast and reliable picture of the marine environment. Part of the experiment was the use of a fleet of gliders from several nations. The ARGOS communication onboard the glider was used as a backup system for locating the glider in case of failure of regular communication/positioning devices.



Track of WTD71 glider west of Sardinia in June 2014

20. Satellite Tracking of Cuckoos

Dr. Andreas von Lindeiner a-v-lindeiner@lbv.de, Friederike Herzog f-herzog@lbv.de

Landesbund für Vogelschutz in Bayern e.V. , Eisvogelweg 1, 91161 Hilpoltstein, Germany
ARGOS Programme Number 5362

The aim of the project is to identify the migration routes, stop-over sites and wintering locations of German and Belorussian cuckoos. The knowledge that the study will provide, should be used for conservation measures for the endangered species. At the moment there are 7 active PTTs in the project, four from Bavarian birds and three from Belorussian cuckoos.

More information about the project is available at www.lbv.de/kuckuck.



Left: cuckoo with satellite tag from the LBV project (© LBV). Right: the 7 individual cuckoos tracked in 2015.

21. The migratory behaviour of upland and ruddy-headed geese from southern South America.

Klemens Pütz, klemens.puetz@ewetel-net

Antarctic Research Trust, Am Oste-Hamme-Kanal 10, 27432 Bremervörde, Germany

ARGOS Program Number 5526

The migratory sheldgeese (Ruddy-headed, Ashy-headed and Upland Goose) are endemic species of southern South America. All three species have been historically considered an agricultural pest by local ranchers. Although little data exist on sheldgeese ecology, hunting of these species has been encouraged across their entire range and allowed without restriction in terms of number of birds killed. Consequently, the Ruddy-headed Goose is already endangered, whilst the other two species are rapidly approaching this status. The main goal of this project is to gather essential knowledge about the migratory patterns of the three sheldgeese species and ultimately identify important areas for their conservation throughout the annual cycle. Furthermore, interactions with human activities will be evaluated in order to apply effective conservation measures.

22. Enhancing prediction of tropical Atlantic climate

Heino Fock, Heino.fock@ti.bund.de

Johann Heinrich von Thünen Institute, Federal Research Institute for Rural Areas, Forestry and Fisheries

Palmaille 9, 22767 Hamburg

Germany

Argos Programme 5658

„Diving behavior of Yellowfin tuna and Bigeye tuna are investigated around Cape Verde Islands to resolve vertical and horizontal habitat utilization.”

23. Development of a conservation plan for Hen Harrier *Circus cyaneus* in the Wadden Sea National Park of Lower Saxony

Nadine Knipping, nadine.knipping@uni-oldenburg.de

Landscape Ecology Group, Institute of Biology and Environmental Sciences

Carl von Ossietzky University of Oldenburg

D - 26111 Oldenburg

Argos Programme 5685

Identification of roosting and wintering sites of Wadden Sea breeding Hen Harrier using Satellite telemetry:

The Hen Harrier *Circus cyaneus* is one of the most endangered breeding bird species in Germany and by now highly restricted to the Wadden Sea islands within the Wadden Sea National Park of Lower Saxony. However, the Wadden Sea population size has declined significantly during the last 10 years. The reasons for this are largely unknown. In the light of the negative population trend and the high national conservation responsibility of breeding Hen Harriers in Germany, it is of essential importance to achieve a detailed ecological knowledge of the Wadden Sea breeding population in Lower Saxony. Beside already existing conservation activities continuative studies within the breeding area are carried out. Furthermore, stop-over and wintering sites of Wadden Sea Hen Harriers but also local habitat and survival conditions are largely unknown. A main research topic will be the localization of wintering areas of Wadden Sea Hen Harriers within and outside the Wadden Sea area using the ARGOS Satellite tracking System.

For more information:

<http://www.uni-oldenburg.de/landeco>

<http://www.nationalpark-wattenmeer.de/nds/nationalpark/naturschutz/kornweiher-schutzkonzept>

24. Satellite tracking of juvenile grey seals (*Halichoerus grypus*) in the German North Sea

Verena Peschko, peschko@ftz-west.uni-kiel.de

Forschungs- und Technologiezentrum Westküste (FTZ), Universität Kiel

Hafentörn 1, 25761 Büsum, Germany

ARGOS Programme Number 5757

The project studies the area use and behaviour of juvenile grey seals in the German North Sea. Wild and rehabilitated juvenile grey seals were equipped with Argos satellite tags to monitor and compare their behaviour after release in the North Sea. Through the comparison of both groups it will be analysed if rehabilitated juvenile grey seals integrate in the wild population and behave normally after being released from the rehabilitation centres.

25. Diver telemetry in the German Bight

Petra Quillfeldt, Petra.Quillfeldt@bio.uni-giessen.de

Justus-Liebig-Universität

AG Verhaltensökologie und Ökophysiologie der Tiere

Heinrich-Buff-Ring 38

D-35392 Giessen

Germany

ARGOS Programme Number 5818

Divers are a group of piscivorous aquatic birds which breed on lakes in the tundra and taiga zones of the Holarctic region. Their ecology is water-bound. Divers are excellent swimmers and dive to ten meters and more when feeding but are poorly adapted to move on land. In the German Bight the two diver species Black- and Red-throated Divers occur in large numbers during wintering. Offshore windfarm development is increasing in this area which can lead to conflicts as divers are very sensitive to anthropogenic disturbance. Within this study we are catching divers in the German Bight and implant satellite transmitters aiming to understand movement patterns of these birds during the wintering season and during their migration. Further the interactions between divers and offshore windfarms are studied as well. Habitat use, connectivity of resting areas, locations of origin plus migration patterns can be determined by analyzing the tracking data.

More information is found at: <http://www.divertracking.com/>



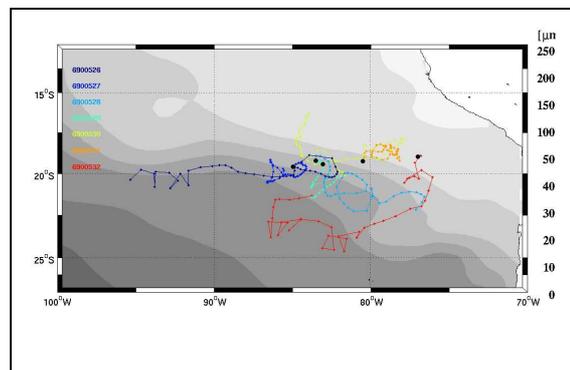
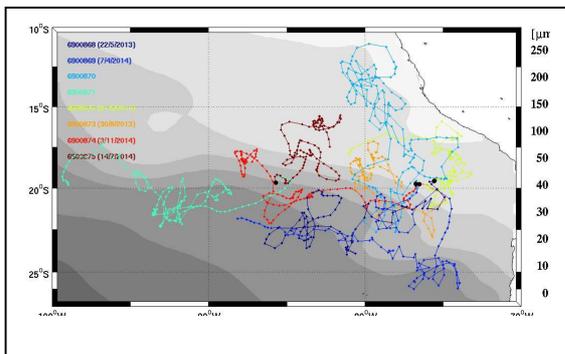
Sterntaucher (*Gavia stellata*); Photo: Jürgen Steudtner

26. Sediment trap positioning

Hannes Wagner, hwagner@geomar.de
 GEOMAR Helmholtz-Zentrum für Ozeanforschung Kiel
 Düsternbrooker Weg 20
 24148 Kiel
 Germany
 ARGOS Programme Number 5905

27. Argo Floats

Lothar Stramma, lstramma@GEOMAR.DE
 Helmholtz-Zentrum für Ozeanforschung Kiel, GEOMAR, Düsternbrooker Weg 20, 24105 Kiel,
 Germany
 ARGOS Programme Number 8165



Floats tracks at 400 m and 1000 m depth on the climatological annual mean oxygen distribution at 400 m depth of floats deployed in 2011 (left panel, 2 of 8 still active) and 2014 (right panel).

In 2014 seven floats were deployed in the eastern tropical South Pacific to continue the study of the circulation and water mass anomalies. Most of the floats were placed in eddies to investigate water mass and oxygen changes within the eddy during its westward propagation along the boundary of the oxygen minimum zone. The data transmission of the floats deployed in 2014 is made now via Iridium. The floats are equipped with oxygen sensors and were provided by the SFB-754. *More information is available at <http://www.sfb754.de>.*

28. Subsurface mooring monitoring

Gerd Rohardt, Gerd.Rohardt@awi.de

Alfred Wegener Institut, Helmholtz Zentrum für Polar- und Meeresforschung, P.O.Box 120161, 27515 Bremerhaven, Germany

ARGOS Programme Number 8919 (sub-program 919)

The aim of the project is to monitor moorings with Argos watchdogs. About 50 watchdogs have been pooled in this programme.

29. Norwave

Kai Herklotz, kai.herklotz@bsh.de

Bundesamt für Seeschifffahrt und Hydrographie, Bernhard-Nocht-Str. 78, 20359 Hamburg, Germany

ARGOS Programme Number 9948 (see 948)

The Norwave measurements take place at fixed monitoring stations in the North Sea and Baltic Sea (see Marnet programme). Waverider buoys are measuring sea state conditions, one of these is transmitting data through the ARGOS satellite system. Watchdog services are used for the other buoys. More information is available at

<http://www.bsh.de/de/Meeresdaten/Beobachtungen/Seegang/index.jsp>

30. Argo sub-surface

Olaf Boebel, OBOEBEL@AWI-BREMERHAVEN.DE

Alfred Wegener Institut, Helmholtz Zentrum für Polar- und Meeresforschung, P.O.Box 120161, 27515 Bremerhaven, Germany

ARGOS Programme Number 10919 (Sub-program of program 919)

The project studies variability and long-term changes in warm deep water in the Weddell Gyre. It also monitors convection events. The floats are equipped with special ice sensing technology to withstand the ice season during winter. The floats are part of the international ARGO programme. A total of 1 remaining floats with ARGOS communication is registered in the programme. Due to winterly surface ice coverage the transmission of the floats are switching to Iridium, due to shorter surface transmission times. *More information is available at*

http://www.awi.de/en/research/research_divisions/climate_science/observational_oceanography/projects/wecon/



A NEMO floats in the polar ocean.

31. Red Kite

Bernd Meyburg, BUMeyburg@aol.com

World working group on birds of prey and owls, Wangenheimstr. 32, D-14193 BERLIN, Germany.
ARGOS Programme Number 11126 (Sub-program of PGM 1126)

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32. Seismic ice flow drifter

Gerd Rohard, Gerd.Rohardt@awi.de

Alfred Wegener Institut, Helmholtz Zentrum für Polar- und Meeresforschung, P.O.Box 120161, 27515 Bremerhaven, Germany

ARGOS Programme Number 12919 (sub-program of 919)

The project uses Argos beacons to locate seismometers on ice floats during expeditions. The use of the beacons is suspended at the moment and will be used again in 2014-2015. A total of 6 beacons are registered in the programme.



A lonely seismic station on an ice floe

33. European whitefronted ringing Project

Helmut Kruckenberg, helmut.kruckenberg@blessgans.de

Europäisches Blessgans Forschungsprogramm, Am Steigbügel 3, D-27283 Verden (Aller), Germany

Argos Programme Number 13189

Only three Lesser white-fronted geese are tracked with Argos tags at the moment. The tracking of the European whitefronted geese is now using GPRS beacons which allow advanced data collection and which are less expensive.

34. Bird migration and conservation

Martin Wikelski, martin@ORN.MPG.DE

Max Planck Research Centre for ornithology, Migration and Immuno-ecology (Vogelwarte Radolfzell), Schloß Möggingen, Schloßallee 2, 78315 Radolfzell, Germany

Argos Programme Number 14983 (sub-program of 983)

35. Ruff breeding ecology

Mihai Valcu, valcu@orn.mpg.de

Max Planck Institute for Ornithology, Behavioural Ecology and Evolutionary Genetics

Eberhard-Gwinner Street 7

D-82319 Seewiesen

Germany

Argos Programme Number 15520

The natural history of many bird species breeding in the high Arctic is poorly known. A monitoring program based on 5g solar PTTs will help us better understand the mating system and migration patterns of the ruff (*Philomachus pugnax*).

36. MPIO Arctic foxes

Martin Wikelski, martin@ORN.MPG.DE

Max Planck Research Centre for ornithology, Migration and Immuno-ecology (Vogelwarte Radolfzell), Schloß Möggingen, Schloßallee 2, 78315 Radolfzell, Germany

Argos Programme 17983

37. Eagles

Bernd Meyburg, BUMeyburg@aol.com

World working group on birds of prey and owls, Wangenheimstr. 32, D-14193 BERLIN, Germany

ARGOS Programme Number 31136 (sub-PROGRAM OF PGM 1126)

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More information is available at <http://www.raptors-international.de/index.htm>

The following projects have not been active in 2015:

Programme 3338 'Montagu's harrier' has been moved to the Netherlands.

Section 2. Future Plans

GEOMAR activities will be continued at the same level. That is relevant for the following programs: 8165 (Argo equivalent float missions), 1783 (Glider missions), 783 (mooring watchdogs). No additional floats will be deployed within the ARGOS project 8165 in the eastern Pacific

AWI will continue to use the ARGOS system for their mooring watch dogs (program 8919) but uses Iridium communication for all of its Argo Floats.

Programme 1535 *will continue its research in 2015/2016 AT DI*

Section 3. Technological Changes that affect User Requirements

Section 4. User issues, problems, and level of satisfaction with Argos

Section 5. Successful programme use of Argos

Section 6. Analysis of Local Operational Issues

The compilation of a list of users for each individual country has helped a lot in compiling the national report. The new format for the national report is also very helpful
