

**APPLICATION FOR CONSENT TO CONDUCT MARINE SCIENTIFIC RESEARCH IN
AREAS UNDER NATIONAL JURISDICTION OF
UNITED KINGDOM**

Date : March 22, 2007

1 – GENERAL INFORMATION

1.1 Cruise name and/or number : EVHOE 2007

1.2 Sponsoring institution :

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2 – DESCRIPTION OF THE PROJECT

(Attach additional pages as necessary)

2.1 Nature and objectives of the project :

The French Bottom Trawl Surveys in Bay of Biscay and Celtic Sea (survey code : EVHOE)

a) Purpose of survey

The main objectives of the survey are :

- obtain abundance indices per age group and annual recruitment estimates for the sampled species ;
- build a reliable time series of those indices ;
- follow the evolution of the demographic structures of the main exploited fish populations ;
- map the spacio-temporal distribution of the fisheries resources per age group.

b) Area surveyed (fig. 1)

This French survey began in 1987. The area was limited to 48°30' N in the north and to the northern margin of Gouf de Cap Breton in the south (ICES divisions VIIh, VIIIa,b,c and d). In 1990, the survey area was extended towards the north (51°15' N) to cover the grounds of the Celtic Sea deeper than 100 meters (ICES divisions VIIe,f,g,h and j).

c) Methodology

The GOV 36/47 bottom trawl is used with a 20 mm mesh codend liner. The trawl is deployed with plane oval trawl boards of 1300 kg and with 10-20 cm rubber discs on the footrope.

The haul duration is 30 minutes and the towing speed 4 knots. Trawling is carried out during day time only.

In the Bay of Biscay (ICES divisions VIIIa,b,c and d) and in the Celtic Sea (ICES divisions VIIe,f,g,h and j), a stratified sampling scheme is used. The area is divided according to latitude into 5 blocks and the hauls were distributed in seven depth zones (15-30, 31-80, 81-120, 121-160, 161-200, 201-400, 401-600 m). 160 stations will be occupied at locations given in fig. 2.

Catch weight and catch numbers are recorded for all species, only selected finfish and shellfish are measured.

d) Extension of the study area in 1999 and 2000

Following the European contract DG XIV 98/057 " International Program of Standardised Bottom Trawl Surveys off Northwestern Europe", a comparative study of the different fish species catchabilities to the French/Irish and Irish/Scottish fishing boats/gears has been conducted in the Irish and U.K. waters (fig. 2). Following the SESITS program (1997-1998) involving the French, Spanish and Portuguese surveys, the whole study has led to the integration of the different data collected during surveys covering the area from Northern Scotland to the Strait of Gibraltar into an common international data base.

e) Improvement of knowledge on meso and bathy pelagic species

In 2001, 2002 and 2003, several hauls using a pelagic trawl have been carried out in the northern part of Bay of Biscay, at immersions between -1500 m and - 50 m, in order to collect information on species which show a vertical migration during the night and can potentially be preys of marine mammals.

2.2 Relevant previous or future research cruises :

The survey was conducted in the fourth quarter (October-November) of each year from 1987 to 1990, in 1992 and 1994, 1995, 1997, 1998, 1999 and 2000 and also in the second quarter (May-June) of 1988 and 1991. The survey is intended to be carried in the future at least in 2008 and 2009 as the objective is the construction and the maintaining a long time series.

2.3 Previously published research data relating to the project :

- A - Amara R., J.C. Poulard, F. Lagardère & Y. Désaunay, 1998. Comparison between the life cycles of two Soleidae, the common sole, *Solea solea*, and the thickback sole, *Microchirus variegatus*, in the Bay of Biscay (France). *Environmental Biology of Fishes* 53: 193-209.
- A - Bez N., J. Rivoirard & J.C. Poulard, 1995. Approche transitive et densité de poissons. *Cah. géostatistiques. Ecole des Mines, Paris* 5: 161-177.
- A - Blanchard F. & J. Boucher, 2001. Temporal variability of total biomass in harvested communities of demersal fishes. *Fish. Res.* 49: 283-293.
- A - Blanchard F. & J. Boucher, en révision. Density-dependent interactions between three Gadiforme species in the Bay of Biscay (France). *Environmental Biology of Fishes*.
- A - Blanchard F., 2001. Fishing effects on the diversity dynamics of demersal fish communities. Comparative analysis of the role of the interactions between species in the Bay of Biscay and in the Gulf of Lion (France). *CYBIUM* 25 (3) : 293-294
- A - Blanchard F., 2001. The effect of fishing on demersal fish community dynamics : an hypothesis. *ICES J. Mar. Sci.* 58(3): 711-718.
- A - Blanchard F., en révision. Analyse comparée de la diversité spécifique des peuplements de poissons démersaux exploités du golfe de Gascogne et du golfe du Lion (France). *Aquat. Living Resour.*
- A - Blanchard, F., 2001. Dynamics of harvested demersal fish communities: analysis of the species diversity in the Bay of Biscay (Atlantic Ocean) and in the Gulf of Lions (Mediterranean Sea). *Aquat. Living Resour./Ressour. Vivantes Aquat.* Vol. 14, no. 1, pp. 29-40.
- A - Blanchard, F; Vandermeirsch, F, 2005. Warming and exponential abundance increase of the subtropical fish *Capros aper* in the Bay of Biscay (1973-2002). *Comptes rendus Biologies [C. R. Biol.]*. Vol. 328, no. 5, pp. 505-509.
- A - Burgeot T., G. Bocquené, P. Truquet, L. Le Déan, J.C. Poulard, D. Dorel, A. Souplet & F. Galgani, 1993b. The dragonet (*Callionymus lyra*) a target species used for evaluation of the biological effects of chemical contaminants on French coasts. *Mar. Ecol. Prog. Ser.* 97: 309-316.
- A - Charrier G., Chenel T., Durand J.-D., Girard M., Quiniou L., Laroche J. 2005. Discrepancies in phylogeographical patterns of two European anglerfishes (*Lophius budegassa* and *Lophius piscatorius*). *Molecular Phylogenetics and Evolution*. (Sous presse).
- A - Charrier G., Coombs S., Laroche J. Genetic structure of whiting (*Merlangius merlangus*) in the North East Atlantic and adjacent waters. (Soumis à *Marine Ecology Progress Series*).

- A - Charrier G., Durand J.-D., Quiniou L., Laroche J. Limited genetic structure of pollack (*Pollachius pollachius* L.) along an European coastal continuum. (Soumis à ICES Journal of Marine Science).
- A - Chen, C. S., Pierce, G. J., Wang, J., Robin, J. P., Poulard, J. C., Pereira, J., Zuur, A. F., Boyle, P. R., Bailey, N., Beare, D. J., Jereb, P., Ragonese, S., Mannini, A. and Orsi Relini, L. 2006. The apparent disappearance of *Loligo forbesi* from the south of its range in the 1990s: Trends in *Loligo* spp. abundance in the northeast Atlantic and possible environmental influences. *Fish. Res.*, In press:1 - Cornillon P.A. & M.J. Rochet, 1999. Mixture models and comparative analysis of life history traits of teleost fishes. *C. R. Acad. Sci. Ser. 3 Sci. Vie* 322 (1): 71-74.
- A - Cornillon P.A. & M.J. Rochet, 1999. Mixture models and comparative analysis of life history traits of teleost fishes. *C. R. Acad. Sci. Ser. 3 Sci. Vie* 322 (1): 71-74.
- A - De Cardenas E., O. Cendrero, J.C. Quero & M.H. Du Buit, 1988. Record of *Cyttopsis roseus* (Pisces, Zeiformes, Zeidae) North of 49 degree N, a new species for the Celtic Sea and a new record of *Chaunax pictus* (Pisces, Lophiiformes, Chaunacidae). *Cybium* 12 (2): 168-169.
- A - Désaunay, Y., Guérault, D., Le Pape, O. and Poulard, J.-C. 2005. Changes in occurrence and abundance of northern / southern flatfishes over a 20-year period in a coastal nursery area (Bay of Vilaine) and on the eastern continental shelf of the Bay of Biscay. *Scientia Marina*, In press.
- A - Du Buit M.H. & J.C. Quero, 1989. Extension of the known geographical area for three teleost species from the North-East Atlantic ocean. *Cybium* 13 (4): 388.
- A - Du Buit M.H., C. Ozouf Costaz & J.C. Quero, 1989. Records of *Cryptosaras couesi* and *Ceratias* sp. (Pisces, Lophiiformes, Ceratiidae), new species for the French slope of the Atlantic Ocean. Distribution in the north-eastern Atlantic. *Cybium* 13 (2): 192.
- A - Galgani F., J.P. Léauté, P. Moguedet, A. Souplet, Y. Vérin, A. Carpentier, H. Goragner, D. Latrouite, D. Andral, Y. Cadiou, J.C. Mahé, J.C. Poulard & P. Nérisson, 2000. Litter on the sea floor along European coasts. *Mar. Pollut. Bull.* 40 (6): 516-527.
- A - Kacher, M. & Amara, R., 2004. Distribution and growth of 0-group European hake in the Bay of Biscay and Celtic Sea : a spatial and inter-annual analyses. *Fisheries Research*, Volume 71, Issue3, March 2005, Pages 373-378.
- A - Lundy CJ, Moran P, Rico C, Millner R, Hewitt G (1999) Macrogeographic population differentiation in oceanic environments: a case study of European hake (*Merluccius merluccius*), a commercially important fish. *Molecular Ecology*, 8, 1889-1898
- A - Lundy CJ, Rico C, Hewitt GM (2000) Extremely high levels of size homoplasy and complex mutations detected at a microsatellite locus in European hake (*Merluccius merluccius*) : implications for population divergence. (Sous presse : *Journal of Fish Biology*)
- A - Lundy CJ, Rico C, Hewitt GM (2000) Temporal and spatial genetic variation in spawning grounds of European hake (*merluccius merluccius*) in the Bay of biscay. *Molecular Ecology*, 9, 2067-2079.
- A - Moran P, Lundy C, Rico C (1999b) Isolation and characterisation of microsatellite loci in European hake *Merluccius merluccius* (Merlucidae, Teleostei). *Molecular Ecology*, 8, 1352-1362

- A - Pelletier D., 1998. Intercalibration of research survey vessels in fisheries: A review and an application. *Can. J. Fish. Aquat. Sci.* 55 (12): 2672-2690.
- A - Petitgas P., 1998. Biomass-dependent dynamics of fish spatial distributions characterized by geostatistical aggregation curves. *ICES J. Mar. Sci.* 55: 443-453.
- A - Petitgas, P., 2001. Geostatistics in fisheries survey design and stock assessment: models, variances and applications. *Fish and Fisheries* 2, 231-249.
- A - Petitgas, P., Poulard, J.-C., Biseau, A., 2003. Comparing commercial and research survey catch per unit of effort: megrim in the Celtic Sea. *ICES J. Mar. Sci.* 60, 66-76.
- A - Poulard J.-C. & J.P. Léauté, 2002. Interaction between marine populations and fishing activities : temporal patterns of landings of La Rochelle trawlers in the Bay of Biscay. *Aquat. Living Resour.* 15: 197-210.
- A - Poulard, J.-C. and Blanchard, F. 2005. The Impact of climate change on the fish community structure of the eastern continental shelf of the Bay of Biscay. *ICES Journal of Marine Science*, 62: 1436-1443.
- A - Poulard, J.-C., Blanchard, F., Boucher, J., Souissi, S., 2003. Variability in the demersal fish assemblages of the Bay of Biscay during the 1990s. *ICES Marine Science Symposia* 219, 411-414.
- A - Poulard, J.-C., Léauté, J.-P., 2002. Interaction between marine populations and fishing activities: temporal patterns of landings of La Rochelle trawlers in the Bay of Biscay. *Aquat. Living Resour.* 15, 197-210.
- A - Puillat, I., Lazure, P., Jégou, A.-M., Lampert, L. and Miller, P. I. 2004. Hydrographical variability on the French continental shelf in the Bay of Biscay, during the 1990s. *Continental Shelf Research*, 24: 1143-1163.
- A - Quéro J.C. & O. Cendrero, 1996. Incidence de la pêche sur la biodiversité ichthyologique marine : le bassin d'Arcachon et le plateau continental. *Cybiu* 20 (4): 323-356.
- A - Quero J.C., M.H. Du Buit & J.J. Vayne, 1998. Les observations de poissons tropicaux et le réchauffement des eaux dans l'Atlantique européen. *Oceanol. Acta* 21 (2): 345-351.
- A - Rochet M.J., 1998a. Short-term effects of fishing on life history traits of fishes. *ICES Journal of Marine Science* 55: 371-391.
- A - Rochet, M.-J. and Trenkel, V. 2003. Which community indicators can measure the impact of fishing? A review and proposals. *Can. J. Fish. Aquat. Sci.*, 60: 86-99.
- A - Rochet, M. J., and Trenkel, V. M. 2005. Factors for the variability of discards: assumptions and field evidence. *Canadian Journal of Fisheries and Aquatic Sciences*, 62: 224-235.
- A - Rochet, M.-J., Péronnet, I., and Trenkel, V. M. 2002. An analysis of discards from the French trawler fleet in the Celtic Sea. *ICES Journal of marine Science*, 59: 538-552.
- A - Rochet, M.-J., Trenkel, V., Bellail, R., Coppin, F., Le Pape, O., Mahé, J.-C., Morin, J., Poulard, J. C., Schlaich, I., Souplet, A., Verin, Y., and Bertrand, J. A. 2005. Combining indicator trends to assess ongoing changes in exploited fish communities: diagnostic of communities off the coasts of France. *ICES Journal of Marine Science*, 62: 1647-1664.

- A - Souissi, S., Ibanez, F., Ben Hamadou, R., Boucher, J., Cathelineau, A.C., Blanchard, F., Poulard, J.-C., 2001. A new multivariate mapping method for studying species assemblages and their habitats: example using bottom trawl surveys in the Bay of Biscay (France). *Sarsia* 86, 527-542.
- A - Teletchea, F. V. Laudet and C. Hänni. 2006. Phylogeny of the Gadidae (sensu Svetovidov, 1948) based on their morphology and two mitochondrial genes. *Molecular Phylogenetics and Evolution*, Volume 38, Issue 1, January 2006, Pages 189-199.
- A - Trenkel, V. M., and Rochet, M. J. 2003. Performance of indicators derived from abundance estimates for detecting the impact of fishing on a fish community. *Canadian Journal of Fisheries and Aquatic Sciences*. 60: 67-85.
- A - Trenkel, V. M., Pinnegar, J., Rochet, M. J., and Rackham, B. 2004. Different surveys provide similar pictures of trends in a marine fish community but not of individual fish populations. *ICES Journal of marine Science*, 61: 351-362.
- A - Trenkel, V., Rochet, M.-J., 2003. Performance of indicators derived from abundance estimates for detecting the impact of fishing on a fish community. *Can. J. Fish. Aquat. Sci.* 60, 67-85.
- A - Trenkel, V.M. et Skaug, H. 2005. Disentangling the effects of trawl efficiency and population abundance on catch data using random effects models. *ICES Journal of Marine Science*, 62: 1543-1555.
- A - Verdoit, M., Pelletier D., Bellail, R. 2003. Are Commercial Logbook and Scientific CPUE Data Useful for Characterizing the Spatial and Seasonal Distribution of Exploited Populations? The Case of the Celtic Sea Whiting. *Aquat. Living Resour.* 16 (6) 2003, 467-552.
- B - Bez N., J. Rivoirard & J.C. Poulard, 1995c. Le covariogramme : un outil structural. In Deuxième forum halieumétrique. J. Ferraris, D. Pelletier & M.J. Rochet, eds. ORSTOM Editions, Nantes. 79-86 p.
- B - Gauthiez F., 1994. Characterizing small-scale patterns in fish populations via Taylor's power law: an extended quasi-likelihood model. In Journées Internationales Ecologie et Méthodes Statistiques: 97-99.
- B - Gauthiez F., J.C. Poulard & C. Koutsikopoulos, 1995a. Analyse de la distribution spatiale à petite échelle des poissons benthiques et démersaux en mer Celtique. In Deuxième forum halieumétrique. J. Ferraris, D. Pelletier & M.J. Rochet, eds. ORSTOM Editions, Nantes. 99-110 p.
- B - Quéro J.C., 2000. Impact des pêcheries sur la biodiversité ichtyologique marine : comparaisons de 2 chalutages effectués en 1910 puis en 1990. *Ozeanografika* 3: 293-299.
- B - Quéro J.C., M.H. Du Buit & J.J. Vayne, 1997. Les captures de poissons à affinités tropicales le long des côtes atlantiques européennes. *Ann. Soc. Sci. nat. Charente-Marit.* 8 (6): 651-673.
- B - Quéro J.C., M.H. Du Buit, B. Kergoat, J.L. Laborde & F. Morandeau, 1991. Observations ichtyologiques effectuées en 1990. *Ann. Soc. Sci. nat. Charente-Marit.* 7 (9): 1065-1071.
- B - Quéro J.C., M.H. Du Buit, G. Delmas, J. Fonteneau & J.J. Vayne. 1989. Observations ichtyologiques effectuées en 1988. *Ann. Soc. Sci. nat. Charente Marit.* 7 (7): 849-852.

- B - Quéro J.C., M.H. Du Buit, J. Fonteneau & J.J. Vayne, 1988. Observations ichtyologiques effectuées en 1987. *Ann. Soc. Sci. nat. Charente Marit.* 7 (6): 721-725.
- B - Quéro J.C., M.H. Du Buit, J. Fonteneau, F. Morandeau & J.J. Vayne, 1990. Observations ichtyologiques effectuées en 1989. *Ann. Soc. Sci. nat. Charente Marit.* 8 (2): 961-967.
- B - Quéro J.C., M.H. Du Buit, J.L. Laborde & J.J. Vayne, 1996. Observations ichtyologiques effectuées en 1995. *Ann. Soc. Sci. nat. Charente-Marit.* 8 (5): 577-584.
- B - Quéro J.C., M.H. Du Buit, N. Caill, M.N. Casamajor, N. Cazeils, A. Dewez, G. Morandeau & J.J. Vayne, 1999. Observations ichtyologiques effectuées en 1998. *Ann. Soc. Sci. nat. Charente-Marit.* 8 (8): 925-934.
- B - Quéro J.C., P. Lorance & E. Tardy, 2000. Observations ichtyologiques effectuées en 1999 à bord du navire de recherche "Thalassa". *Ann. Soc. Sci. nat. Charente-Marit.* 8 (9): 1047-1058.
- C - Quéro J.C., 1989. Les poissons du golfe de Gascogne. Ifremer / Mus. nat. Hist. nat., Brest. 229 p.
- D - Abbes R., H. Beucher, R. Chevalier & J. Guéguen, 1988. Preliminary results of a groundfish survey in the Bay of Biscay (october 1987). ICES, C.M. 1988/G:17.
- D - Anon, 1994. Report of the Study Group on the Coordination of Bottom Trawl Surveys in sub-reas VI, VII and VIII and division IXa. ICES, C.M. 1994/G:6.
- D - Bellail, R., Bertrand, J., Le Pape, O., Mahé, J.-C., Morin, J., Poulard, J.-C., Rochet, M.-J., Schlaich, I., Souplet, A., Trenkel, V., 2003. A multispecies dynamic indicator-based approach to the assessment of the impact of fishing on fish communities. ICES CM 2003/V:02 12.
- D - Blanchard F. & J. Boucher, 2000. Dynamique des peuplements de poissons démersaux et impact de l'exploitation par pêche dans le golfe de Gascogne : voies d'analyse. VIIe colloque international d'Océanographie du golfe de Gascogne, Biarritz, 4-6 avril 2000.
- D - Blanchard F. & T. Do Chi, 2000. Caractéristiques comparées de la dynamique de peuplements de poissons démersaux soumis à différents niveaux d'exploitation par pêche. Colloque UOF, zones littorales et anthropisation : gestion et nuisances, La Rochelle, 4-6 juillet 2000. Colloque UOF, zones littorales et anthropisation : gestion et nuisances, La Rochelle, 4-6 juillet 2000.
- D - Blanchard F., 1999. Hypothesis on fishing effect on the demersal fish community dynamics. ICES young scientists conference on marine ecosystem perspectives. 20-24 November 1999.
- D - Blanchard,-F., Do-Chi,-Thang 2000 (Comparative approach of the dynamics of the demersal fish communities exploited for fishing.), Approche comparative de la dynamique des peuplements de poissons demerseaux exploites par la peche. Littoral-zones-and-anthropization:-management-and-nuisance,-La-Rochelle,-4-5-6-July-2000-Zones-littorales-et-anthropisation:-Gestion-et-nuisances,-La-Rochelle,-4-5-6-juillet-2000. Miramand,-P.-(ed.); Guyot,-T.-(ed.); Alligner,-N.-(ed.) 2001 vol. 26, no. 3, pp. 95-97
- D - Blanchard,-F.; Boucher,-J.,2001. (Dynamics of the demersal fish community in the bay of biscay investigated by analysing). Dynamique des peuplements de poissons demersaux et impact de la peche dans le golfe de Gascogne: voies d'analyse. Proceedings-of-the-7th-international-symposium-on-oceanography-of-the-bay-of-Biscay,-Biarritz,-4-6-April-2000-Actes-du-7eme-colloque-international-d'-oceanographie-du-golfe-de-Gascogne,-Biarritz,-4-6-avril-2000. Elbee,-J.-d'-(ed.); Prouzet,-P.-(ed.) Plouzane-France Ifremer 2001 no. 31, pp. 181-186

- D - Chen C.-S., G.J. Pierce, J. Wang, J.-P. Robin, J.C. Poulard, J. Pereira, A.F. Zuur, P.R. Boyle, N. Bailey, D.J. Beare, I. Sobrino and L. Orsi Relini, 2004. The apparent disappearance of *Loligo forbesi* from the south of its range in the 1990s: trends in *Loligo* spp. abundance in the Northeast Atlantic. ICES CM 2004/CC 34D - Désaunay Y., D. Guérault, P. Grellier & G. Williamson, 1996. *Anguilla anguilla* (L.) larvae caught by French R.V. *Thalassa* at the Bay of Biscay continental slope in November 1995 : otolith marking experiment and daily ring validation (preliminary information). EIFAC-ICES Working Party on Eel, Ijmuiden (NL).
- D - Duplissa D. & F. Blanchard, 2000. Variability in the North Sea fish community at different level of species aggregation in an ecological hierarchy. American Society of Limnology and Oceanography 2000 Aquatic Sciences Meeting : Research Across Boundaries, Copenhagen (Danemark), 5-9 juin 2000.
- D - Guéguen J. & A. Picollier, 1988. Infestation of mackerel (*Scomber scombrus*) by anisakidae. French observations in 1987 and 1988. ICES CM 1988/H:18.
- D - Mahé J.C. and J.C. Poulard, 2005. Spatial distribution and abundance trends of main elasmobranches species in the Bay of Biscay and Celtic Sea from bottom trawl surveys. ICES CM 2005/N:04
- D - Mahé J.C., 2001a. Estimation of abundance indices at age in research surveys. - A comparison of sampling strategies. ICES. CM 2001/P:10. 13 p.
- D - Petitgas P. & J.C. Poulard, 1989. Applying stationary geostatistics to fisheries : a study on hake in the Bay of Biscay. ICES CM 1989/G/62 Sess. U. 21 p.
- D - Petitgas P., J.C. Poulard & A. Biseau, 1999. Comparaison of commercial and scientific cpue data to analyse catchability: melgrim in the Celtic Sea. ICES 1999/R:08. 19 p.
- D - Poulard J.C. & J. Boucher, 1997. Spatial distribution of species assemblages in the Celtic Sea and the Bay of Biscay. Working document, ICES Working Group on Ecosystem Effects of fishing, Copenhagen. 17 p.
- D - Poulard J.C., 1996. Spatialisation et structure trophique des assemblages d'espèces pêchées en mer Celtique et dans le golfe de Gascogne. Colloque Résultats/Prospective du Réseau Diversité Marine. Biodiversité en Milieu Dispersif. MNHN, Paris 18-20 novembre 1996. In Résultats/Prospective du Réseau Diversité Marine. Biodiversité en Milieu Dispersif, MNHN, Paris 18-20 novembre 1996.
- D - Poulard J.C., 1997. Depth and Spatial Distributions of Hake by Age Group in the Bay of Biscay and Celtic Sea. Document de travail présenté à la réunion du "ICES Working Group on Ecosystem Effects of Fishing". ICES, Copenhagen. 12 p.
- D - Poulard J.C., I. Peronnet & J.J. Rivoalen, 1993. Depth and spatial distributions of *Lepidorhombus whiffiagonis* (Walbaum, 1972) by age group in Celtic Sea and Bay of Biscay. Poster. ICES CM 1993/G:43.
- D - Poulard JC and F Blanchard, 2004. Spatio-temporal distribution of hake in the Bay of Biscay. BECAUSE Meeting, Athens, 1 - 4 November 2004
- D - Poulard, J.-C.; Mahé, J., 2004. Structure and spatial distribution of fish assemblages in the Celtic sea. Working Paper to 2004 ICES Working Group IBTS 14 pp.

- D - Poulard, J.-P., Trenkel, V.M. 2005. Relationship between survey abundance and weight indices, survey design and wind conditions: the French groundfish survey in Bay of Biscay. ICES Annual Science Conference, Aberdeen, ICES CM 2005/Z: 02, 17 pp.
- D - Poulard Jean-Charles and Verena Trenkel, 2005. General year effect on survey catchability. Fisboat meeting Fontainebleau 31 janvier - 04 février 2005.
- D - Quéro J.C., 1997. Changes in the Euro-Atlantic fish species composition as resulting from fishing and ocean warming. Ninth International Congress of European Ichthyologists. (CEI 9). Fish Biodiversity.
- D - Reid D., D.J. Beare, J.C. Mahé, P. Connolly, C.G. Davis & A.W. Newton, 2000. Quantifying Variability in Gear Performance on IBTS Surveys: Swept area and volume with depth. ICES CM 2000/K:28. 20 p.
- D - Rochet M.J., 1998b. A Modelling Approach to the Effect of Fishing on Multispecies Size Spectra. In Alcalá 1st International Conference on Mathematical Ecology, Alcalá (Spain).
- D - Rochet M.J., J.C. Poulard & J. Boucher, 1997. Analysis of the spatial and temporal variability of the size spectrum of the fish community in the Bay of Biscay, 1987-1995. Document de travail présenté à la réunion du "ICES Working Group on Ecosystem Effects of Fishing". ICES, Copenhagen. 16 p.
- D - Rochet M.J., V. Trenkel, J.-C. Poulard & I. Péronnet, 2000. Using discards estimates for assessing the impact of fishing on biodiversity. ICES CM 2000/ Mini:06. 13 p.
- D - Rochet, M. J., and Trenkel, V. M. 2001. An attempt to measure the impact of fishing on the Celtic Sea groundfish community, The Reykjavik Conference on Responsible Fisheries in the marine ecosystem, Reykjavik, Island, FAO.
- D - Trenkel, V. et Rochet, M-J. 2005. Comment détecter des changements dans la dynamique des indicateurs? Conférence de l'AFH, Nantes, juin 2005.
- D - Trenkel, V. M., and Rochet, M. J. 2002. Towards a theory for discarding behaviour. ICES CM 2002/ V:03, 10.
- D - Trenkel, V., Rochet, M.-J., and Sari, T. 2004. A new class of predator prey models with interactions described by thresholds. ICES CM 2004/FF:04, 5.
- D - Trenkel, V.M., Pinnegar, J.K. Blanchard, J.L., Tidd, A.N. 2004. Can multispecies models be expected to provide better assessments for Celtic sea groundfish stocks? ICES Annual Science Conference, Vigo, ICES CM 2004/FF:05, 26 pp.
- D - Verdoit M. & D. Pelletier, 2000b. Characterizing the spatial and seasonal dynamics of the whiting population in the Celtic Sea from the analysis of commercial catch and effort data and scientific survey data. ICES CM 2000/ K : 36. 15 p.
- D - Woillez, M., Petitgas, P., Rivoirard, J., Poulard, J.-C. and Bez, N. 2005. Indices for capturing spatial pattern and change accross years of fish population: an application on European hake (*Merluccius merluccius*) in the Bay of Biscay. ICES CM 2005/L:16, 15pp.
- F - Beare D, J Castro, J Cotter, O van Keeken, L Kell, A Laurec, J-C Mahé O Moura, S Munch-Petersen, J R Nielsen, G Piet, J Simmonds, D Skagen, P J Sparre, 2003. Evaluation of

Research Surveys in Relation to Management Advice (EVARES - FISH/2001/02 - Lot 1)
Final Report to European Commission Director-General Fisheries : 324 p.

- F - Borges L., F. Cardador, A. Fernandez, J. Gil, P. Moguedet, P. Panterne, J.C. Poulard, R. Sanchez & I. Sobrino, 1999. Evaluation of demersal resources of southwestern Europe from standardised groundfish survey. IPIMAR - IEO - Ifremer, Lisbon, Portugal - Santander, Cadiz, Spain - La Rochelle, Nantes, France. Final report. DG X IV Study contract 96-029. 195 p.
- F - Guéguen J. & al., 1988. Evaluation des ressources halieutiques de l'Ouest de l'Europe par campagnes de chalutages programmés, EVHOE 871. IFREMER DRV NANTES. Rapport final du contrat CEE n°2610. CEE.
- F - Mahé J.C. ed 2001. International program of standardised trawl surveys (IPOSTS). Study EC-DGXIV N° 98-057. Ifremer - Marine Institute - Marine laboratory: 122 p.
- F - Poulard J.C. & al., 1989. Distribution saisonnière et évaluation des ressources halieutiques du golfe de Gascogne. IFREMER, DRV, Lorient. Rapport final du contrat CEE n°3941. 246 p.
- F - Quéro J.C. & O. Cendrero, 1995. Incidence des activités de pêche sur les poissons dans les eaux marines d'Arcachon du 18ème siècle à nos jours. Rapport final du contrat Commission des Communautés Européennes. n° PEM/93/009. 126 p.
- F - Reid D. ed 1997. Shelf Edge Fisheries and Oceanography Study (SEFOS). Final report of the AIR 2931105 programme.
- F - Sanchez F. ed 1999. Evaluation of demersal resources of southwestern Europe from standardised groundfish surveys (SESITS). Study EC-DGXIV N° 96-029. IEO - Ifremer - Ipimar: 195 p.
- I - Anon, 1993. Identification biogéographique des principaux stocks exploités en Manche, relations avec ceux des régions voisines. IFREMER. Rapport Interne DRV. n°93-028. 262 p.
- I - Bertrand, J.A., (éditeur) 2004. L'état des communautés exploitées au large des côtes de France. Application d'indicateurs à l'évaluation de l'impact de la pêche. Ifremer/DRV/RH/RS/04-001, 170 pp
- I - Bertrand Jacques, Marie-Laure Cochard, Coppin Franck, Olivier Le Pape, Jean-Claude Mahé, Jocelyne Morin, Jean-Charles Poulard, Marie-Joëlle Rochet, Ivan Schlaich, Verena Trenkel, Arnauld Souplet et Yves Vérin, 2005. Poissons et invertébrés au large des côtes de France. Indicateurs issus des pêches scientifiques. Bilan 2002. Ifremer, Nantes, EMH: 05-001, 60 pp.
- I - Rochet M.J., E. Benoît, F. Blanchard, J. Boucher, J.-C. Poulard, A. Souplet & Y. Vérin, 1999. La pente de la structure en taille multispécifique : un indicateur de l'effet de la pêche sur les peuplements de poissons exploités. Rapport final. Programme interdisciplinaire de recherche "Environnement, vie et sociétés". Méthodologies et pertinence d'indicateurs d'interactions populations humaines-milieus. 23 p.
- J2 - Sanchez F., F. De La Gandara & Poulard. J.C., 1993. Campana de calibracion Cornide-Baka/Thalassa-GOV. 52 p.
- J2 - Sanchez F., J.C. Poulard & F. de la Gandara, 1994. Experiencias de calibración entre los artes de arrastre BAKA 44/60 y GOV 36/47 utilizados por los B/O Cornide de Saavedra y Thalassa. Inf. Téc. Inst. Esp. Oceanogr. 48 p.

- J3 - Chantrelle P., 2003. Traits et stratégies biologiques des poissons démerso-benthiques du golfe de Gascogne et de la mer Celtique : assemblages, structuration et tendances. Université Claude Bernard - Lyon I. Mémoire de stage de DEA (analyse et modélisation des systèmes biologiques) 31 p.
- J3 - Houise C., 1993. Etude de la population du merlan (*Merlangius merlangus* L.) du golfe de Gascogne. Université, Aix Marseille II. Mémoire de stage de DEA. 45 p.
- J3 - Lauroz K., 1993. Description et cartographie des associations d'espèces vagiles (poissons et invertébrés) dans le golfe de Gascogne et sur le plateau Celtique. Université Aix Marseille II. Mémoire de DEA. 28 p.
- J3 - Mariotti E., 1994. Etude préliminaire du protocole d'échantillonnage d'une campagne d'intercalibration de deux navires de recherche. Mémoire de DEA de Modélisation Statistique et Stochastique. 110 p.
- J3 - Schaan O., 1989. Description des associations d'espèces dans le golfe de Gascogne, d'après des résultats de chalutage, par des méthodes d'ordination et de classification. Université de Bretagne Occidentale. Mémoire de DEA. 32 p.
- J3 - Zendera N., 1990. Typologie du golfe de Gascogne à partir de l'analyse des associations faunistiques. Université Pierre et Marie Curie (Paris VI). Mémoire de DEA. 42 p.
- L - Blanchard F., 2000c. Effets de l'exploitation par pêche sur la dynamique de diversité des peuplements de poissons démersaux. Analyse comparée du rôle des interactions entre espèces dans le golfe de Gascogne et dans le golfe du Lion. Thèse: Bretagne occidentale, Brest. 225 p.
- L - Charrier G., 2005. Structure génétique des populations de poissons dans l'Atlantique Nord-Est. Thèse de Doctorat, Université de Bretagne Occidentale, Brest, 187p.
- L - Gauthiez F., 1997. Structuration spatiale des populations de poissons marins démersaux. Thèse: Claude Bernard - Lyon I. 251 p.
- L - Kacher, M., 2004. Le merlu du golfe de Gascogne et de la mer Celtique : croissance, répartition spatiale, écologie alimentaire et assemblages. Thèse de Docteur d'Université. Université du Littoral Côte d'Opale 62930 Wimereux.
- L - Ould el Kettab M., 1993. La pêcherie des gadidés de Mer Celtique : description, analyse de l'exploitation et évaluation des stocks. Tentative de gestion par un modèle bio-économique. Thèse: Bretagne Occidentale. 207 p.
- L - Petitgas P., 1991. Contributions géostatistiques à la biologie des pêches maritimes. Thèse: Ecole Nationale des Mines, PARIS. 211 p.
- L - Taverny C., 1991. Contribution à la connaissance de la dynamique des populations d'Aloses (*Alosa alosa* et *Alosa fallax*) dans le système fluvio-estuarien de la Gironde : pêche, biologie et écologie. Etude particulière de la dévalaison et de l'impact des activités humaines. Thèse: Université de Bordeaux I, Bordeaux. 451 p.
- P2 - Bertignac M., Fablet R., Guyader O., Mahévas S., De Pontual H. & Poulard J.C, 2005. Le merlu dans le golfe de Gascogne : bilan et prospective. Colloque défi golfe de Gascogne, Brest, 22-24 mars 2005.

- P2 - Bertrand J., Bellail R., Coppin F., Le Pape O., Mahé J.C., Morin J., Poulard J.C., Rochet M.J., Schlaich I., Souplet A., Trenkel V. et Vêrin Y. 2005. Tendances récentes de l'état des communautés démersales exploitées le long des côtes de France. Colloque défi golfe de Gascogne, Brest, 22-24 mars 2005.
- P2 – Blanchard F, Boucher J and Poulard J.C., 2002. General trends in the fish community of the Bay of Biscay from 1973 to nowadays: Ecosystem effects of fishing or climate? . Communication au 8ème colloque International d'Océanographie du golfe de Gascogne. Gijon (Espagne) avril 2002
- P2 - Blanchard, F., Boucher, Poulard, J.-C. 2003. Changement au sein du peuplement de poissons : interactions pêche et climat ? Tchatches 2003, 2-3 décembre 2003, Port en Bessin.
- P2 - Blanchard F, J Boucher and JC Poulard, 2004. Comparative analysis of fishing and climate effects on the fish community structure of the Bay of Biscay. ICES Symposium on "The Influence of Climate Change on North Atlantic Fish Stocks". 11-14 May 2004 Bergen, Norway.
- P2 - Blanchard F., Poulard J.C. et Boucher J, 2005. Effets interactifs du changement climatique et de l'exploitation par la pêche sur le peuplement de poissons du Golfe de Gascogne. Colloque défi golfe de Gascogne, Brest, 22-24 mars 2005.
- P2 - Borges M.F., A. Silva, C. Porteiro, P. Abaunza, A. Eltink, M. Walsh, J.C. Poulard & S. Iversen, 1995. Distribution and migration of horse mackerel. Poster. ICES CM 1995/H:18.
- P2 - Désaunay Y., D. Guérault & P. Grellier, 1998. Validation of daily increments in the otoliths of *Anguilla anguilla* (L.). 2ème Symposium International "Fish Otolith Research and Application", Bergen (Norvège). poster.
- P2 - Désaunay Yves, Daniel Guérault, Olivier Le Pape & Jean-Charles Poulard, 2002. Changes in occurrence and abundance of northern / southern flatfishes over a 20-year period in a coastal nursery area (Bay of Vilaine) and on the eastern continental shelf of the Bay of Biscay. Communication au 8ème colloque International d'Océanographie du golfe de Gascogne. Gijon (Espagne) avril 2002. Papier à paraître dans *Oceanologica Acta*
- P2 - F Blanchard, J Boucher and JC Poulard, 2004. The effects of fishing and climate warming on the fish community in the Bay of Biscay during the last 3 decades : The answer of some indicators. Poster présenté au symposium Quantitative ecosystem indicators for fisheries management (SCOR-Unesco, Paris, 31 mars - 3 avril
- P2 - F Blanchard, J Boucher, JC Poulard, C. Hily and F. Leleco'h, 2004. Effects of climate and fishing: the necessity to take regime shifts into account in fisheries management objectives. Fourth World Fisheries Congress. Vancouver, BC, Canada. May 2 - 6, 2004
- P2 - Fritsch M., Morizur Y., Poulard J.C. et Carpentier A, 2005. Le bar commun en Atlantique Nord : Quelles évolutions ? Colloque défi golfe de Gascogne, Brest, 22-24 mars 2005.
- P2 - Pereiro F.J., F. Gonzales, A. Eltink, J.C. Poulard, F. Cardador & M. Walsh, 1996. Distribution of hake in european waters. Poster. ICES C.M. 1996/S:17.
- P2 - Poulard JC and F Blanchard, 2004. Impact of climate change on the fish community structure of the eastern continental shelf of the Bay of Biscay. ICES Symposium on "The Influence of Climate Change on North Atlantic Fish Stocks". 11-14 May 2004 Bergen, Norway.

- P2 - Poulard, J.-C., Blanchard, F., Boucher, J., Souissi, S., 2001. Variability in the demersal fish assemblages of Bay of Biscay during the 1990s. ICES Symposium. Hydrobiological Variability in the ICES Area, 1990-1999. Edinburgh, Scotland 8-10 August 2001 POSTER
- P2 - Rochet, M.-J., Trenkel, V., Bertrand, J., Bellail, R., Coppin, F., Le Pape, O., Mahé, J., Morin, J., Poulard, J.-C., Schlaich, I., Souplet, a., Vérin, Y., 2004. Is the impact of fishing on the fish communities around France increasing? Poster présenté au symposium "Quantitative ecosystem indicators for fisheries management" (SCOR-Unesco, Paris, 31 mars - 3 avril 2004)
- P2 - Spitz, J., Poulard, J.-C., Richard, E., Meynier, L., Pusineri, C., Ridoux, V., 2003. May changes in the diet of striped dolphins (*Stenella coeruleoalba*) from the Bay of Biscay reflect trends from groundfish surveys ? Seventeenth Annual Conference of the European Cetacean Society, Las Palmas de Gran Canaria, Spain. 9-13 March 2003.

3 – METHODS AND MEANS TO BE USED

3.1 Particulars of vessel

Name : *THALASSA*

Nationality : French

Owner : Ifremer

Operator : Genavir

Overall length : 74,5 m

Maximum draught : 5,8 m

Gross tonnage : 2 803 UMS

Propulsion : Diesel Electric

Maximum speed : 11 Knots

Call sign : FNFP

Method and capability of communication (including telex, frequencies) :

Inmarsat B : Tel : 00.870.3.227.297.21 - Fax : 00.870.3.227.297.30

Inmarsat B2 : Tel : 00.870.3.227.297.50 - Fax : 00.870.3.227.297.60

Itinérís : 06.07.32.44.87 (standard auto) - 06.16.87.10.69 (captain)

Telex Inmarsat C1 : 058x.4.227.297.10 - *Telex Inmarsat C2* : 058x.4.227.297.11
(Atlantic East : 0581 ; Atlantic West : 0584 ; Pacific : 0582 ; Ocean Indian: 0583)

email : TL.Commandant@thalassa.ifremer.fr

Name of master : M. Delbarre

Number of crew : 25

Number of scientists on board : 25

3.2 Aircraft of other craft to be used in the project : NIL

3.3 Particulars of methods and scientific instruments

Types of samples and data	Methods to be used	Instruments to be used
biological observations on fish	trawling	bottom trawl GOV 36/47 Echo sounders
hydrographic observations	Temperature and salinity	CTD Seabird 19

3.4 Indicate whether harmful substances will be used : NIL

3.5 Indicate whether drilling will be carried out : NIL

3.6 Indicate whether explosives will be used : NIL

4 – INSTALLATIONS AND EQUIPMENTS

Details of installations and equipment (dates of laying, servicing, recovery, exact locations and depth) : NIL

5 – GEOGRAPHICAL AREAS

5.1 Indicate geographical areas in which the project is to be conducted (with reference in latitude and longitude) :

The survey will be conducted in Bay of Biscay and Celtic Sea from : 43°20' N to 52°30 N and 1°20' W to 12°00' W, the western limit of the studied area by bottom trawl will follow the 600 metres depth and 2000 metres depth for pelagic trawl.

5.2 Attach chart (s) at an appropriate scale showing the geographical areas of the intended work and, as far as practicable, the positions of intended stations, the tracks of survey lines, and the locations of installations and equipment.

See figures 1 and 2

6 - DATES

6.1 Expected dates of first entry into and final departure from the research area of the research vessel:

From 31st October 2006 to 5th December 2007 in Celtic Sea.

6.2 Indicate if multiple entry is expected :

Yes

7 – PORT CALLS

7.1 Dates and names of intended ports of call in UK : NIL

7.2 Any special logistical requirements at ports of call

7.3 Name/Address/Telephone of shipping agent (if available) :

8 - PARTICIPATION

8.1 Extent to which UNITED KINGDOM will be enabled (name of coastal State) to participate or to be represented in the research project :

One or two scientists could participate to the survey.

8.2 Proposed dates and ports for embarkation/disembarkation :

Embarkation at Brest (France): 18 October 2007

Disembarkation at Lorient (France) : 30 October 2007. Mainly Fishing grounds of South and Centre of Bay of Biscay

or

Embarkation possible at Lorient (France) : 31 October 2007

Disembarkation at Brest (France) : 15 November 2007. Fishing grounds of North of Bay of Biscay and South of Celtic Sea.

or

Embarkation possible at Brest (France) : 16 November 2007

Disembarkation at Brest (France) : between 1st and 5 December 2007. Fishing grounds of West and North-East of Celtic Sea.

9 – ACCES TO DATA, SAMPLES AND RESEARCH RESULTS

9.1 Expected dates of submission to UK of preliminary reports which should include the expected dates of submission of the final results :

Cruise report within two months of the cruise ending

9.2 Proposed means for access by United Kingdom to data and samples :

Research data will be available on ASCII files two months after the cruise ending.

9.3 Proposed means of making research internationally available :

All information will be available through the ICES International Bottom Trawl Surveys Working Group.

ANNEX

List of the scientific team

Not available yet

Scientific manager leg 1: Jean.Pierre.Leaute@ifremer.fr

Scientific manager leg 2: Robert.Bellail@ifremer.fr

Scientific manager leg 3: Jean.Claude.Mahe@ifremer.fr

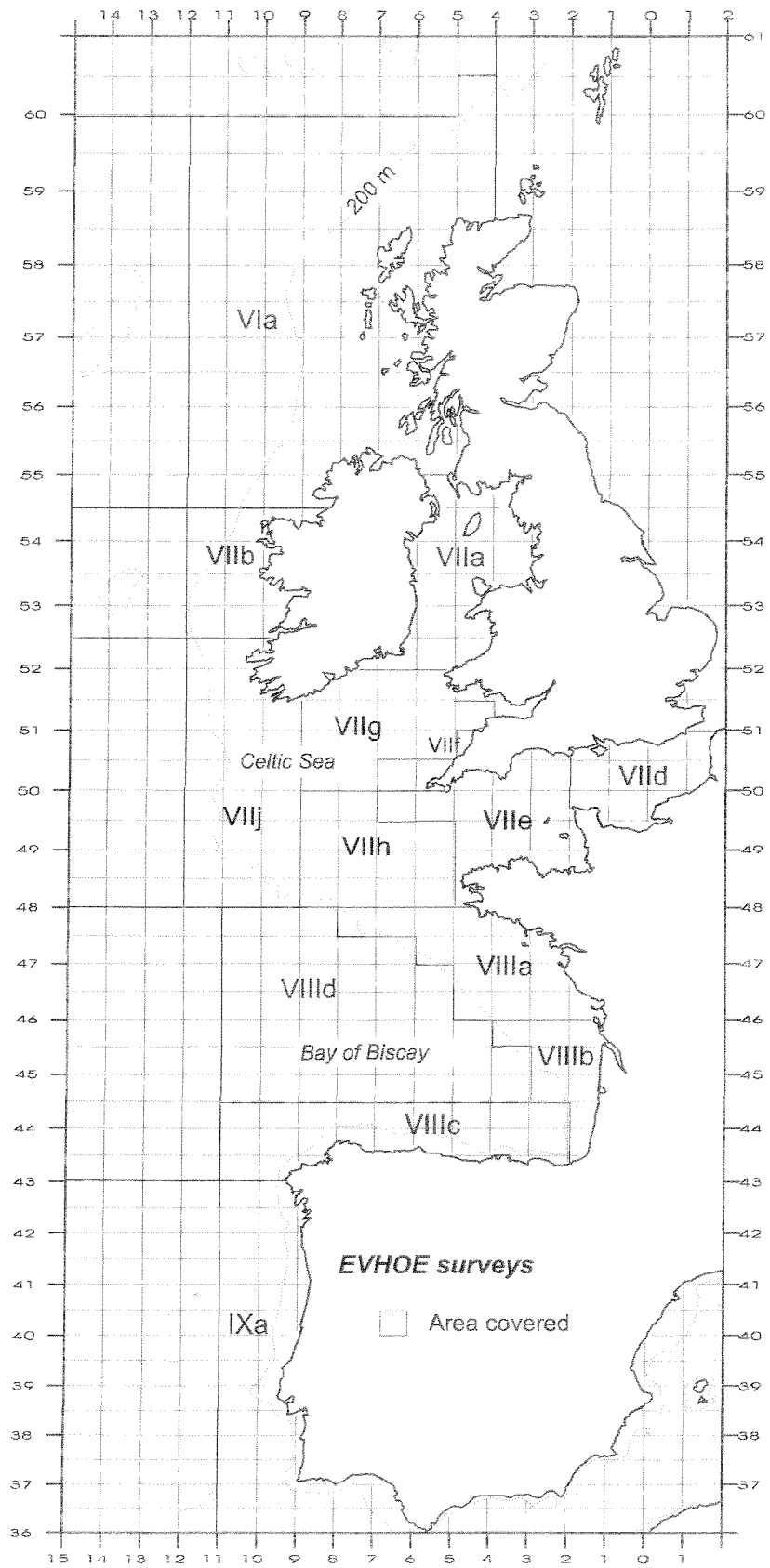


Fig. 1. - North-East Atlantic ICES Statistical Areas and area covered during the EVHOE surveys.