USE OF AIRBORNE LIDAR FOR RESEARCH CARRYING OUT IN THE INTEREST OF FISHERIES OCEANOGRAPHY INFORMATION ENSURING

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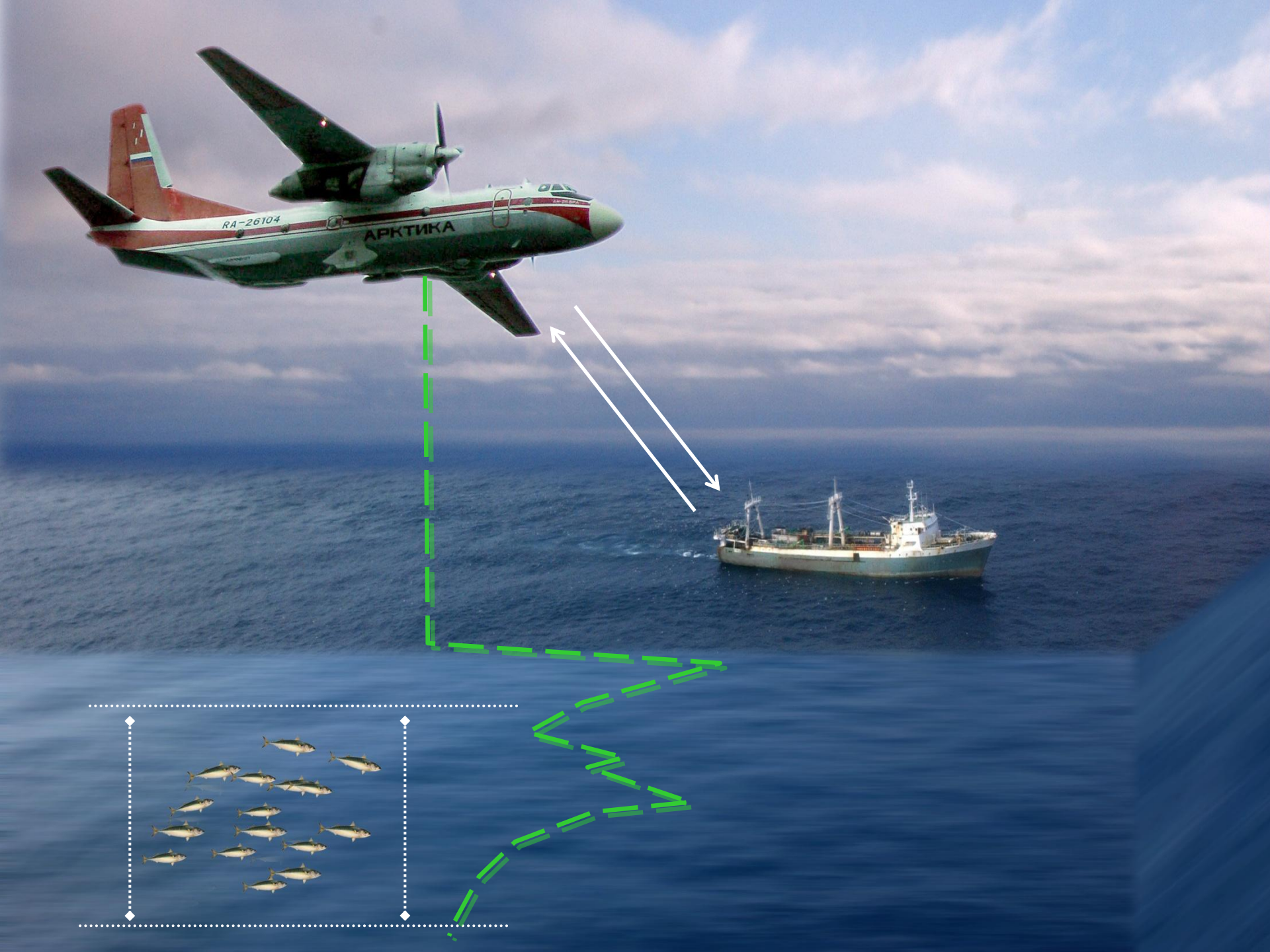
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АРКТИКА

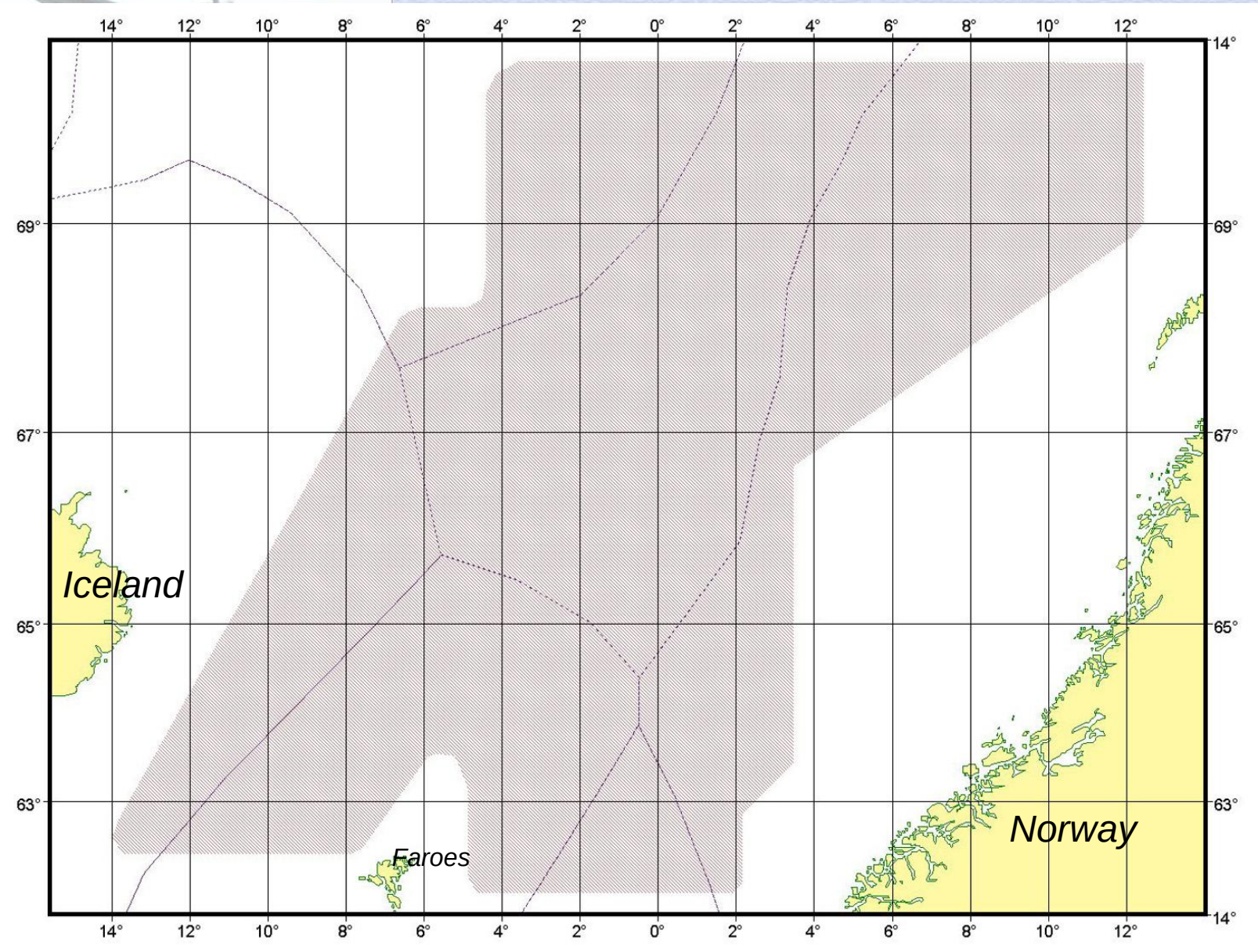
THIS RESEARCH CARRY OUT UNDER FOLLOWING:

- INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA (ICES) WORKING GROUPS (WG) RECOM-MENDETIONS;
- PROTOCOLS OF ANNUAL JOINT RUSSIAN- NORWE-GIAN FISHERIES COMMISSION (JRNFC);
- AGREEMENTS OF ANNUAL PINRO AND INSTITUTE OF MARINE RESEARCH (IMR, NORWAY) SCIENTIST MEETING;
- PROGRAM FOR THE JOINT RUSSIAN- NORWEGIAN INVESTIGATIONS IN THE NORWEGIAN SEA;
- RUSSIAN NATIONAL FISHERIES RESEARCH ANNUAL PLAN AND PROGARAMME

PRINCIPAL PURPOSES THESE RESEARCH:

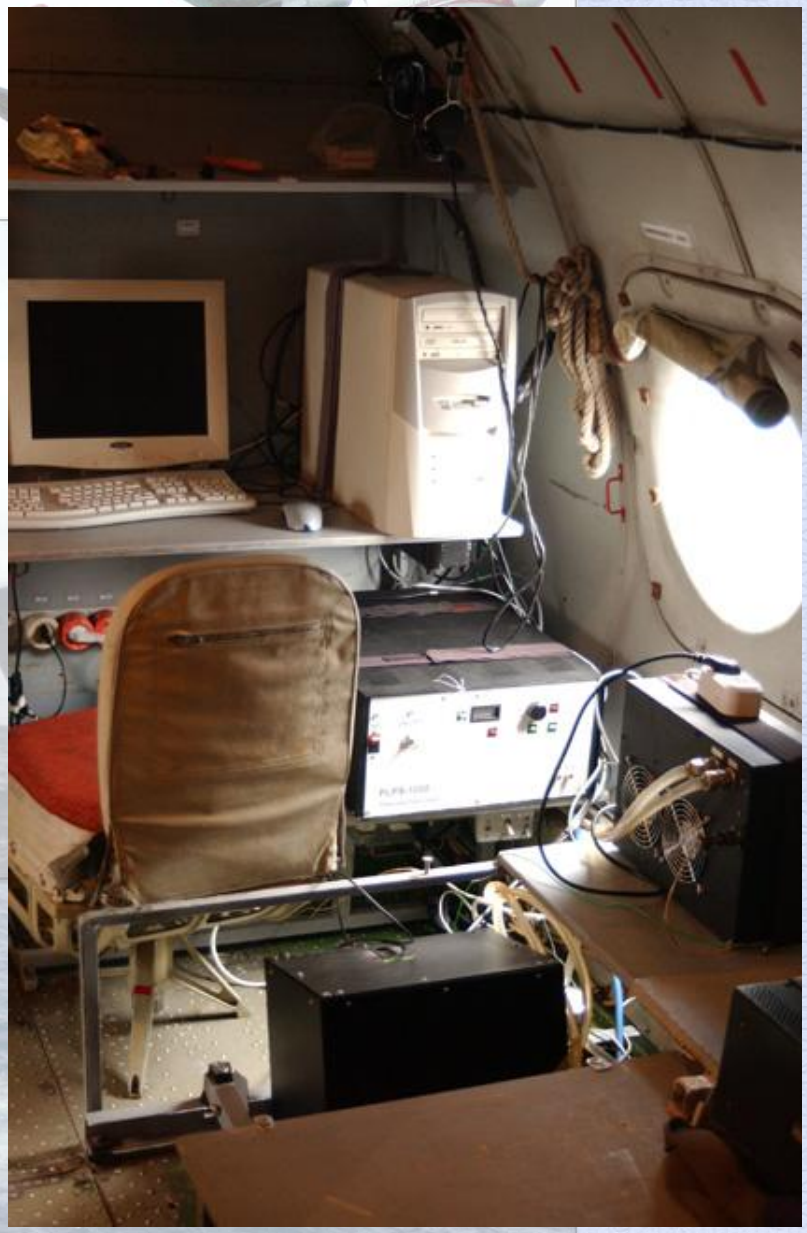
CARRYING OUT AIRBORNE OCEANOGRAPHY COMPLEX SURVEY WHERE LIDAR (SO NAMED POLIARIZATION AVIATION LIDAR – PAL-1 WHICH ARE WORKED AND CREATED BY JSC “MULTITECH”, S.-PETERSBURG) USING IS A VERY IMPORTANT PART IN THE FIRST FOR FEEDING MACKEREL IN THE NORWEGIAN SEA (IN JULY), INCLUDING COLLECT DATA ABOUT MARINE CURRENT CONDITIONS, AND ALSO OBSERVATIONS FOR DISTRIBUTION AND NUMBERS OF MARINE MAMMALS TO RECEIVE INFORMATION ABOUT THEIR INFLUENCE AS PREDATORS ON FEEDING MACKEREL STOCK AND ABOUT THEIR BEHAVIOUR PECULIARITIES, INCLUDING JOINT EXPERIMENTS WITH VESSELS

MAIN AIR SURVEYS AREA IN THE INTERST OF FISHERIES OCEANOGRAPHY INFORMATION ENSURING IN THE NORWEGIAN SEA FOR FEEDING MACKEREL STUDY



TWO ENGING RESEARCH AIRCRAFT ANTONOV-26 (AN-26) NAMED “ARKTIKA” (IN ENGLISH IS “ARCTIC”)

LIDAR – PAL-1 INSIDE “ARKTIKA”

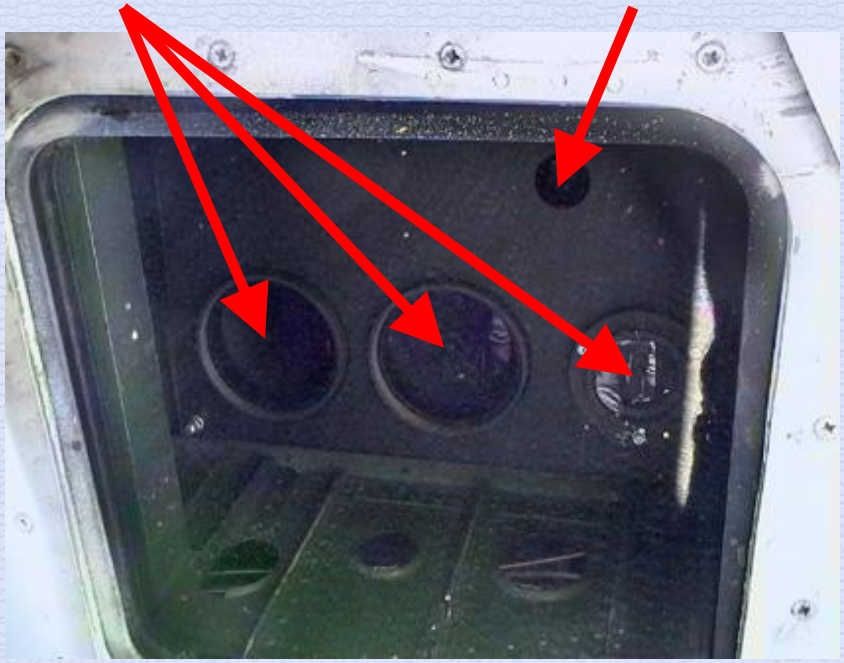


WORKING PLACE FOR PAL -1 OPERATOR

LIDAR IN THE HATCH

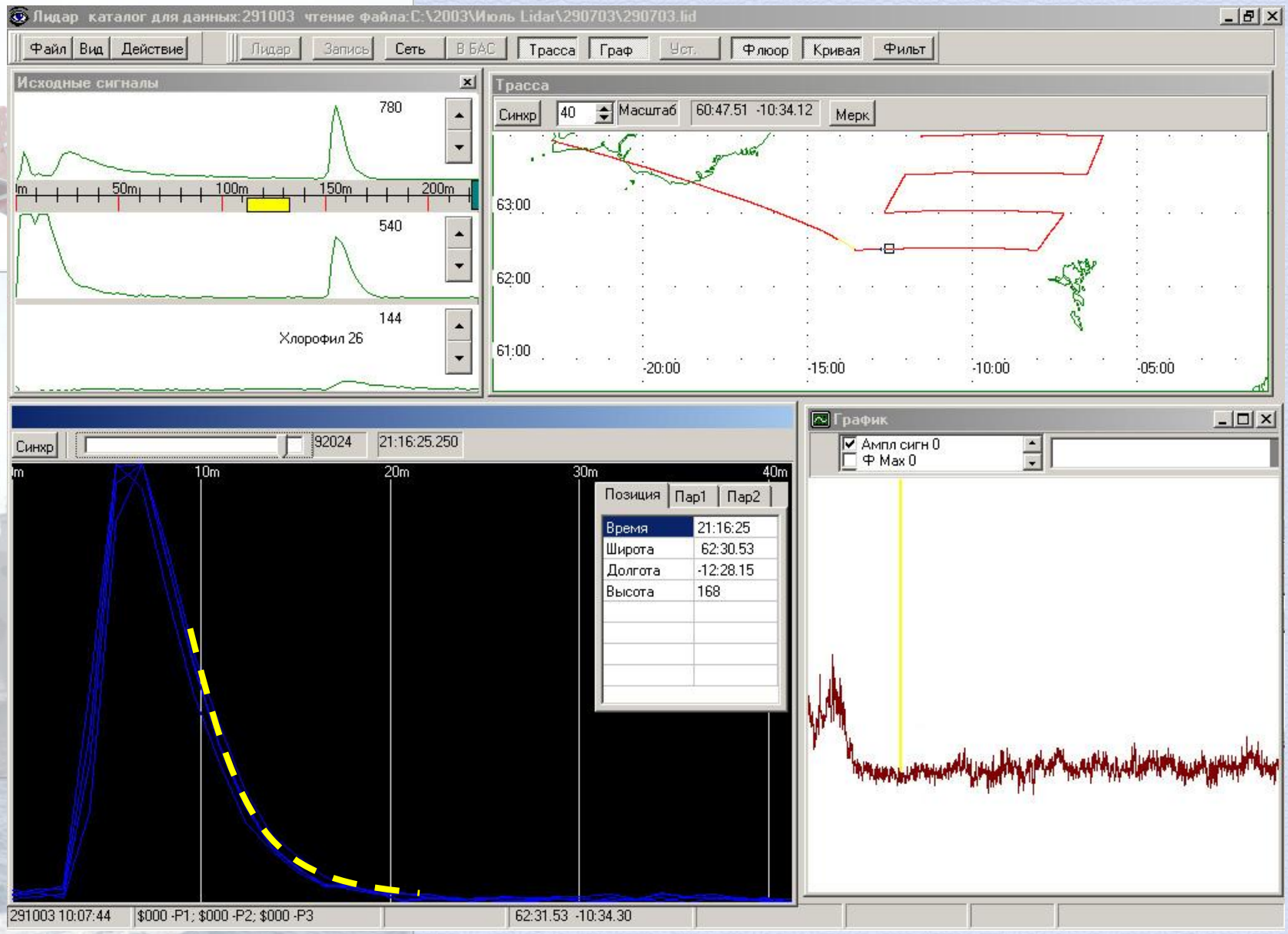
RECEIVED APERTURES

RADIATED OUTLET



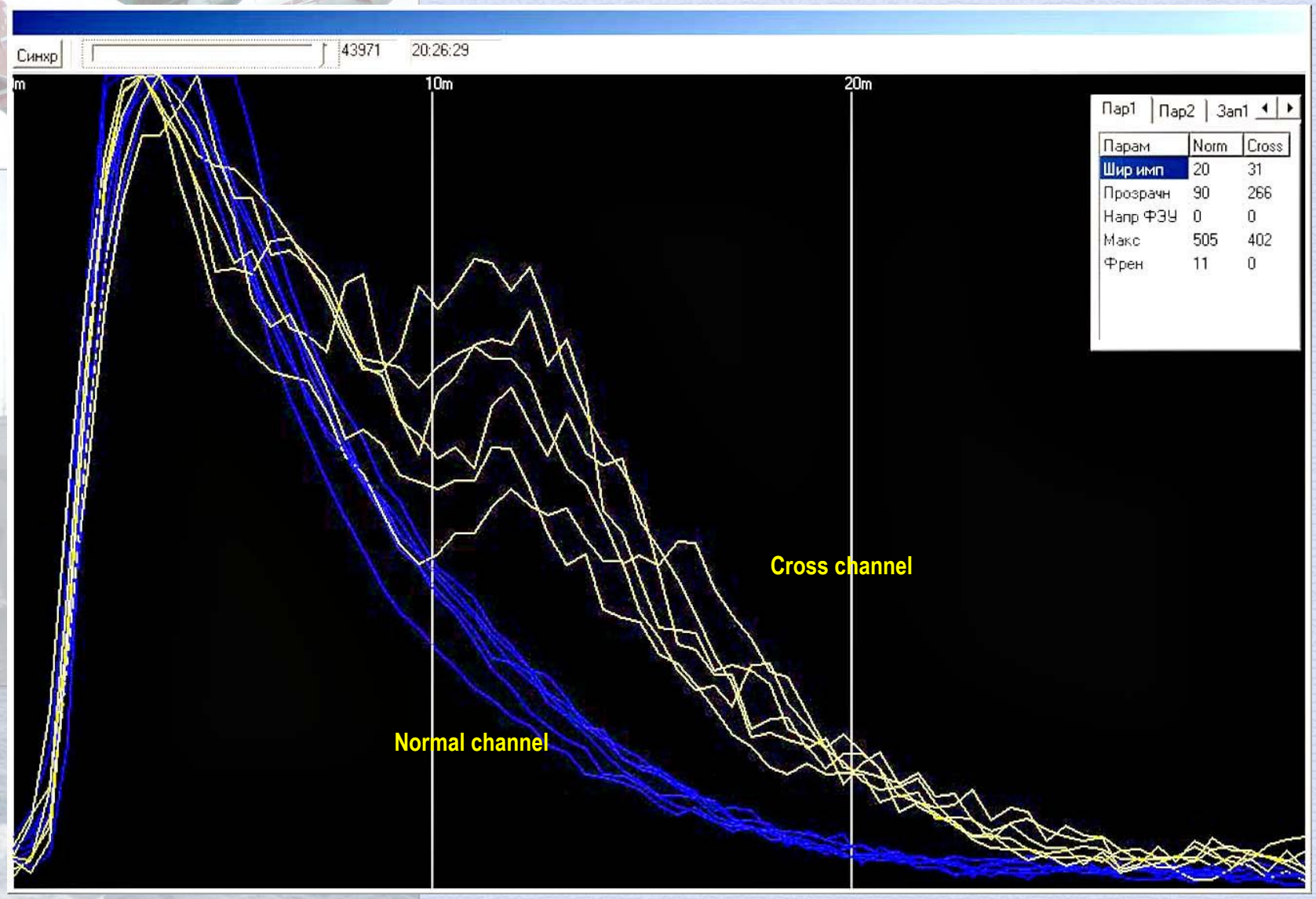
PAL-1 MAIN TECHNICAL SPECIFICATIONS

Radiation Wavelength, nm	1064,532
Pulse Energy (532 nm), mJ	120
Pulse Lenght on Level 0.5 ns	no more 10
Repetition Rates, Hz	1…40
Radiate, °	1.5 - 3
Radiation	polarizable
Sample Rate, Mhz	80
Number of Receiver Channel	3 (co-linear,cross, fluorescence)
Weight, kg	70

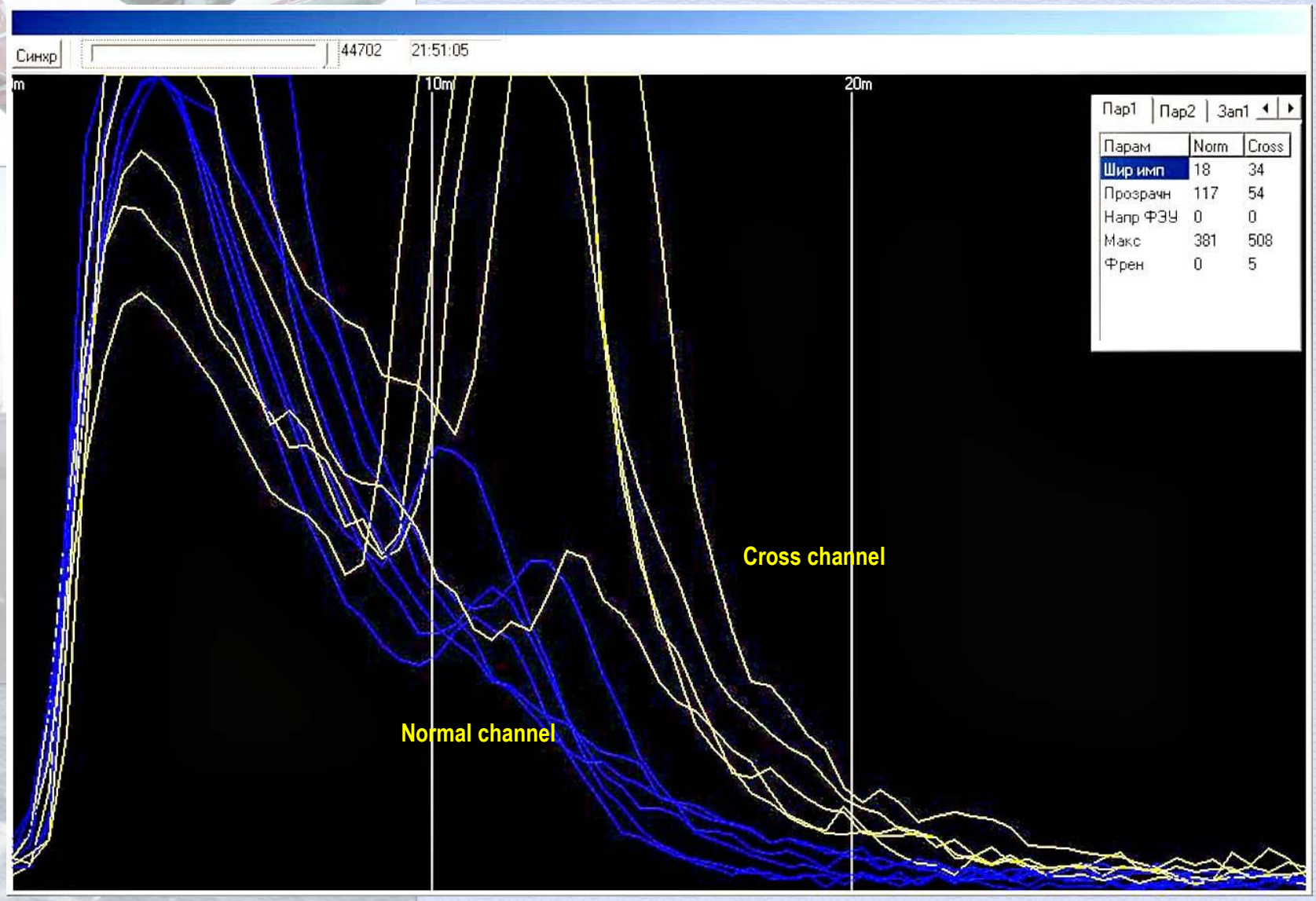


EXAMPLE OF LIDAR SIGNAL WHICH DESCRIBE WATER TRANSPARENCY

EXAMPLE OF LIDAR SIGNAL FROM PLANKTON

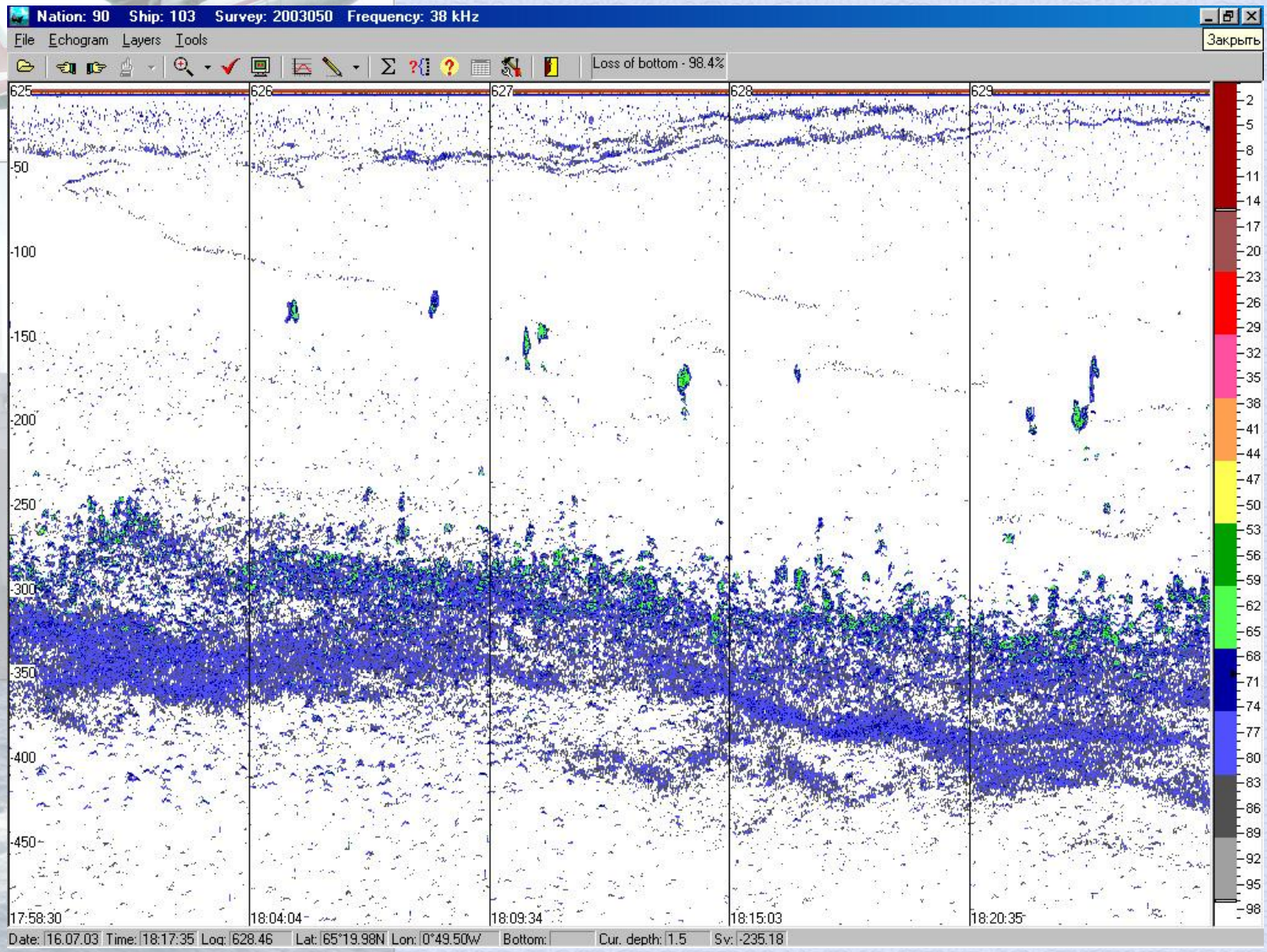


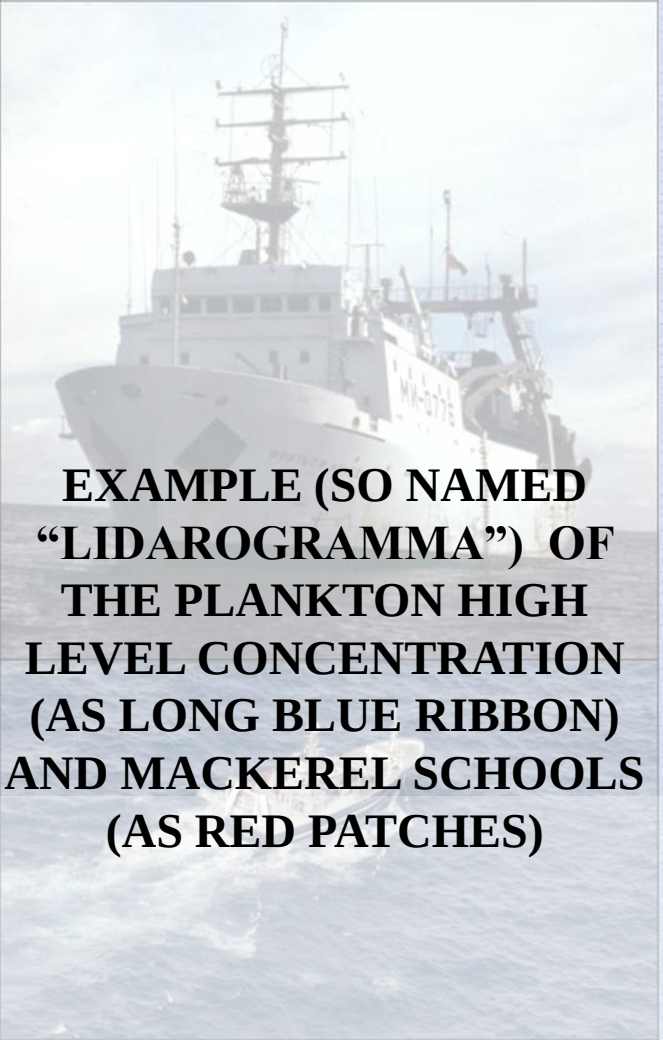
EXAMPLE OF LIDAR SIGNAL FROM MACKEREL SCHOOL



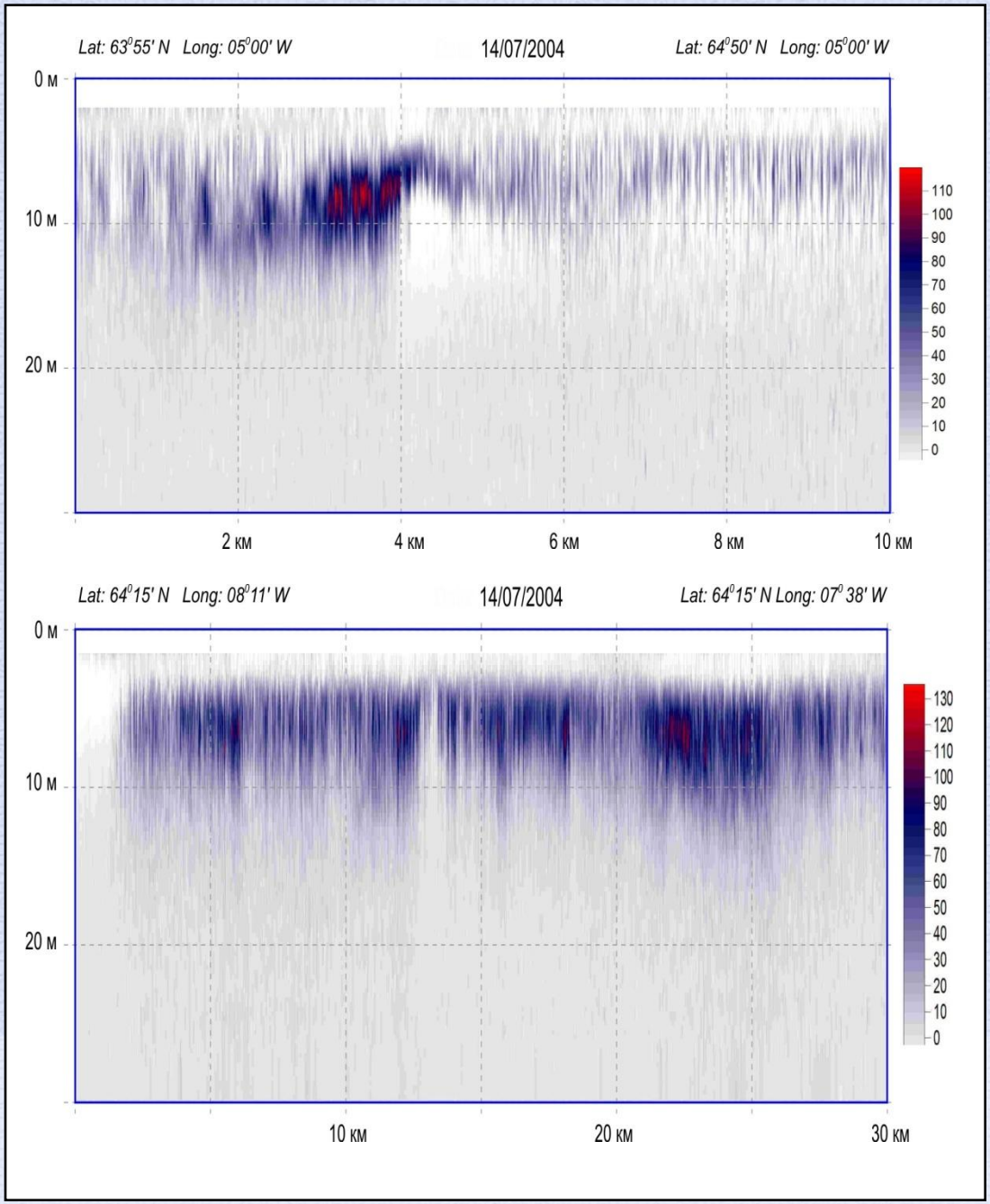
DEPTH OF SCHOOL BEDDING IS BETWEEN 10 - 18 METERS

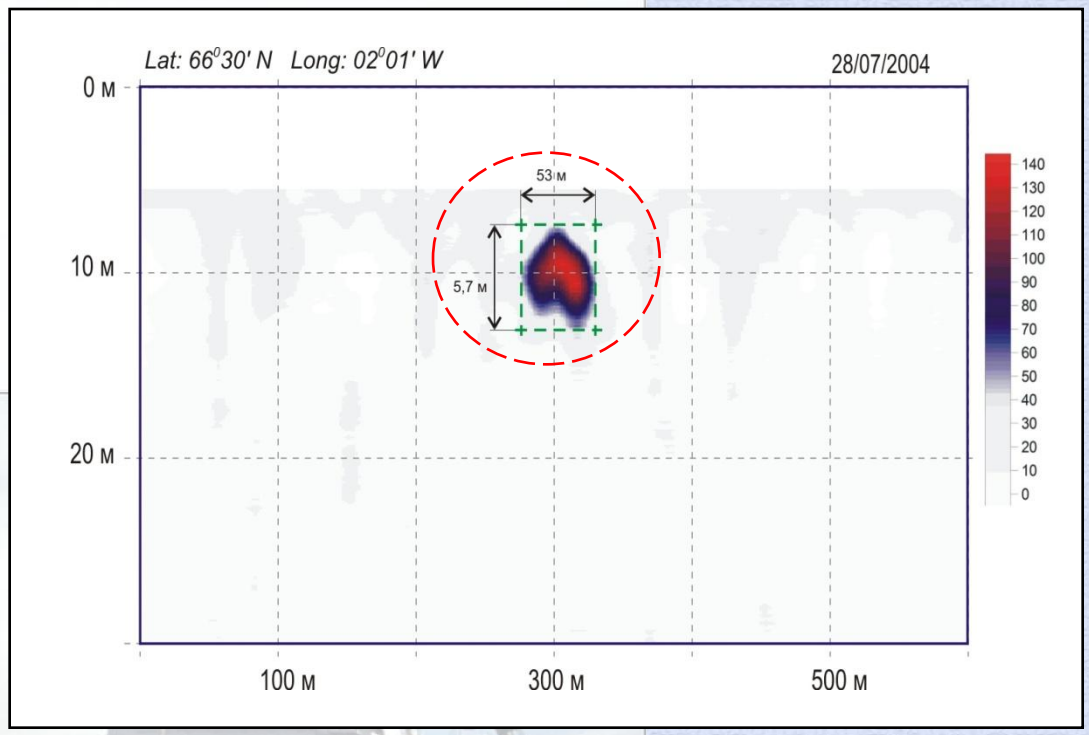
EXAMPLEA OF ACOUSTIC ECHOGRAM



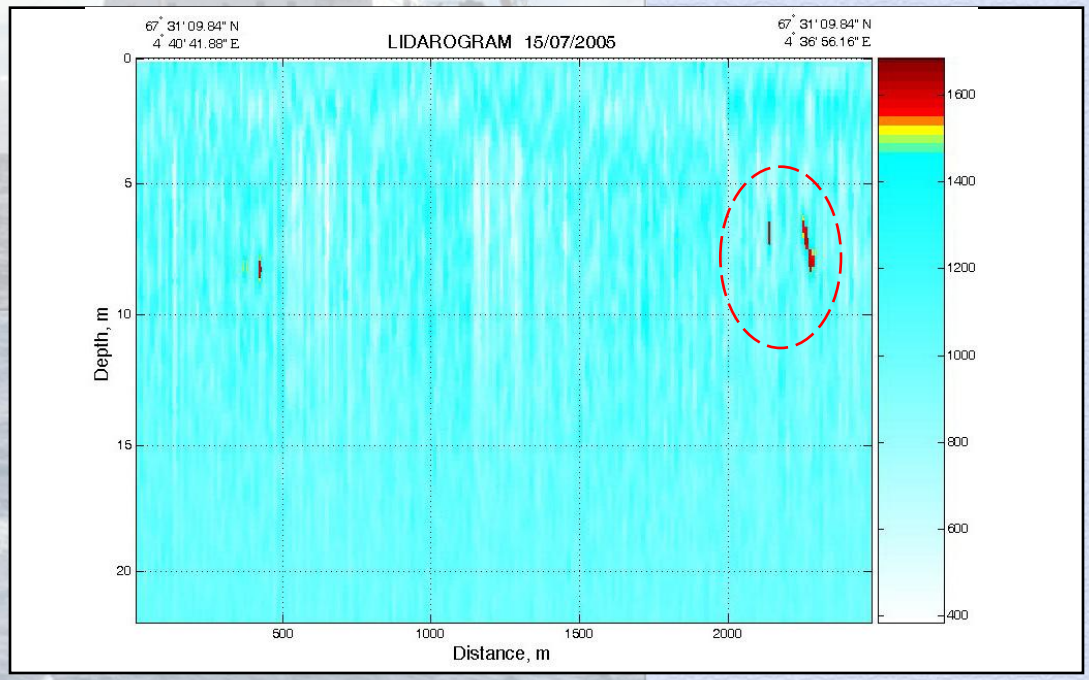


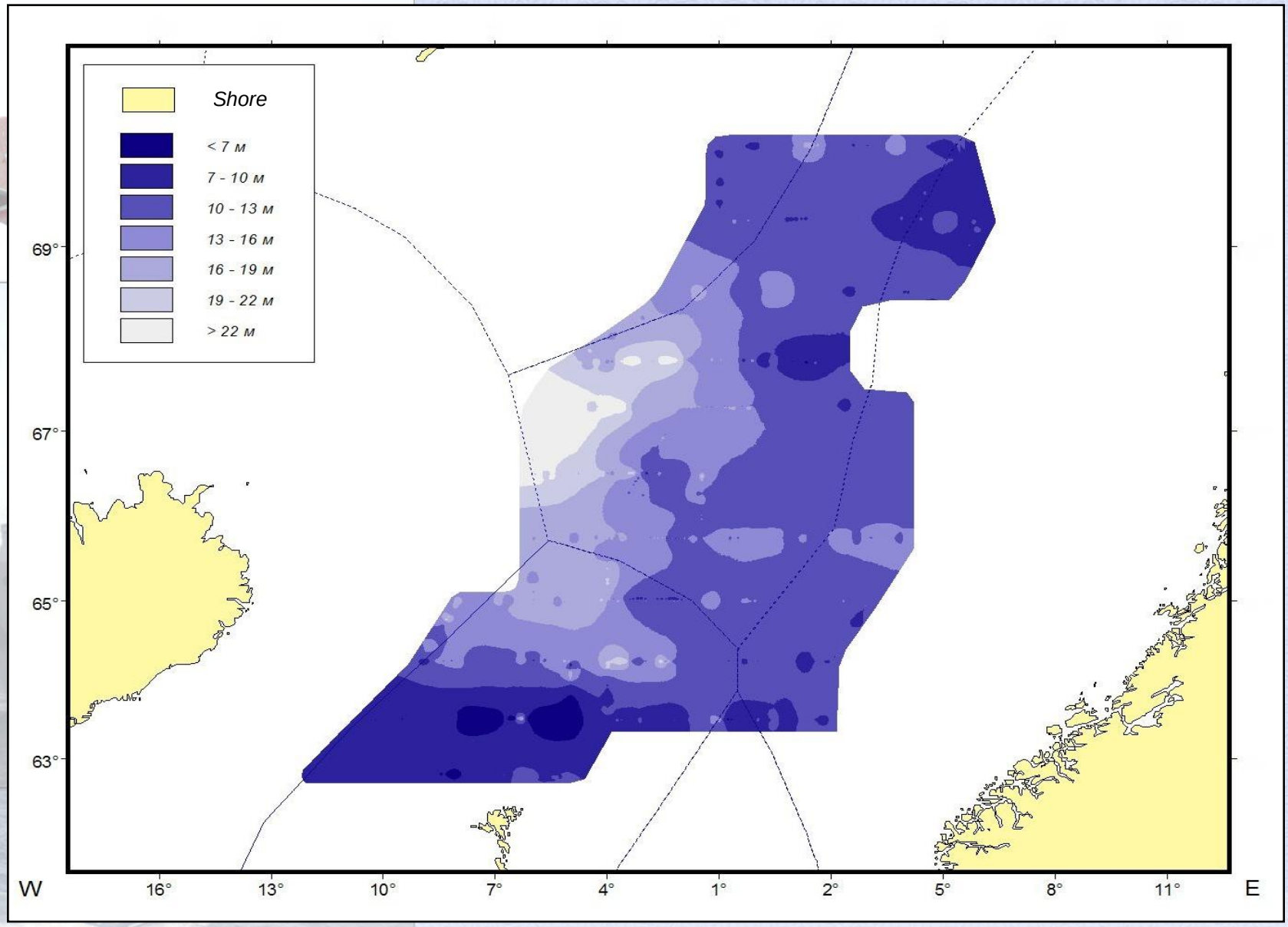
EXAMPLE (SO NAMED "LIDAROGRAMMA") OF THE PLANKTON HIGH LEVEL CONCENTRATION (AS LONG BLUE RIBBON) AND MACKEREL SCHOOLS (AS RED PATCHES)



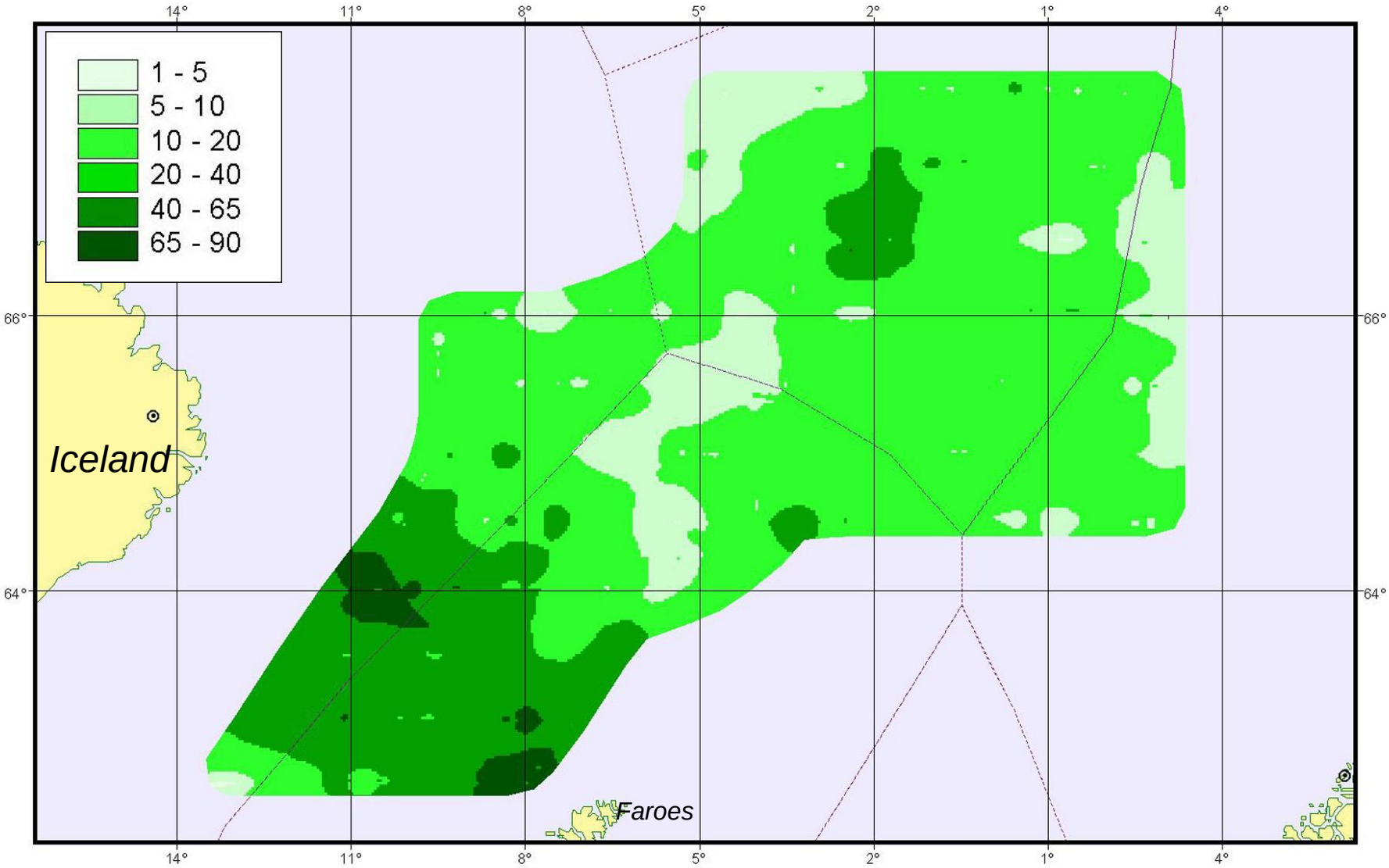


SOME EXAMPLES OF MACKEREL SCHOOLS ON "LIDAROGRAMMA " (LEFT SIDE) AND BY VISUAL OBSERVATIONS FOR THE SAME SCHOOLS (RIGHT SIDE)

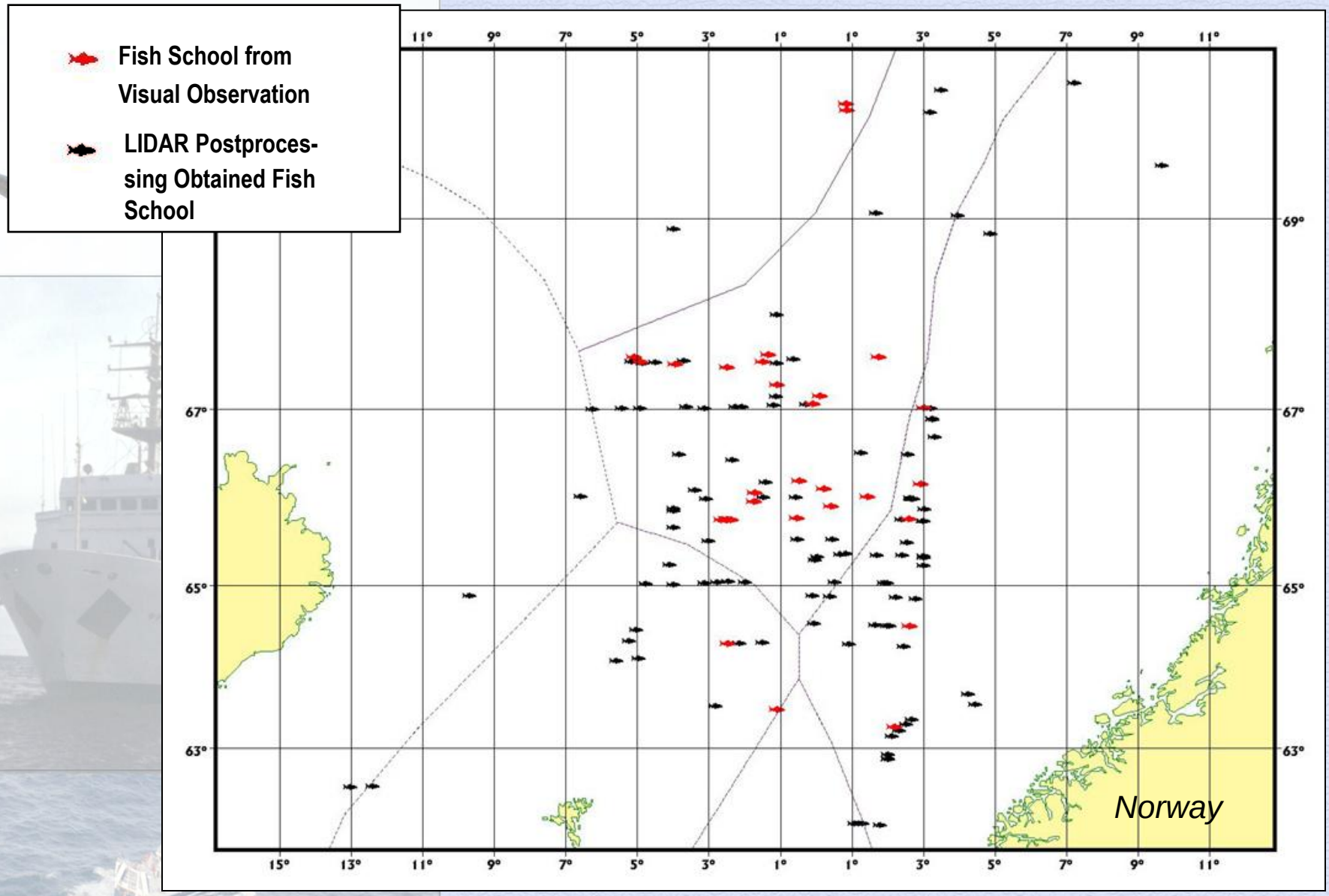




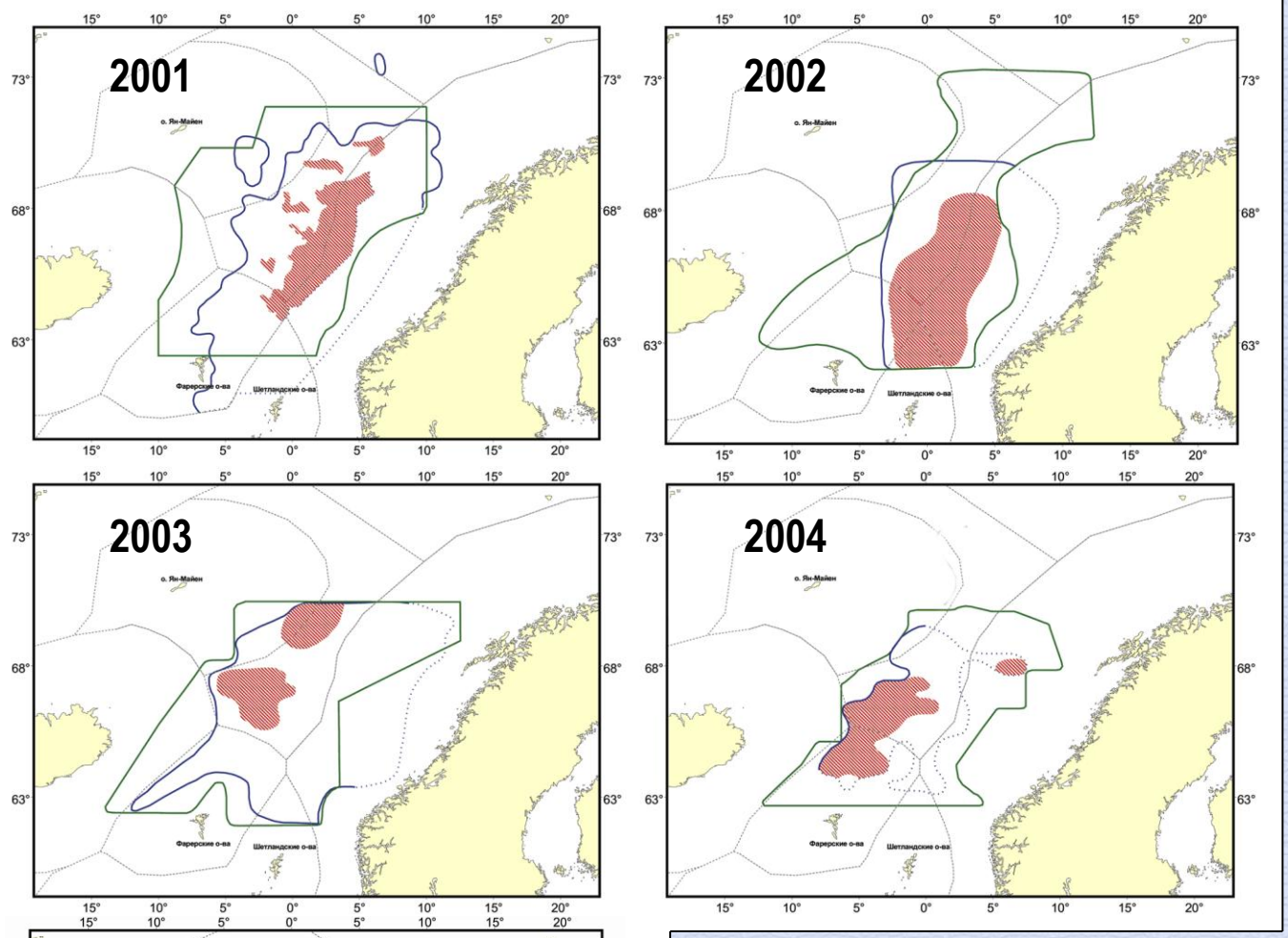
EXAMPLE OF SUMMARIZED TRANSPARENCY SPATIAL DISTRIBUTION MAP IN THE NORWEGIAN SEA

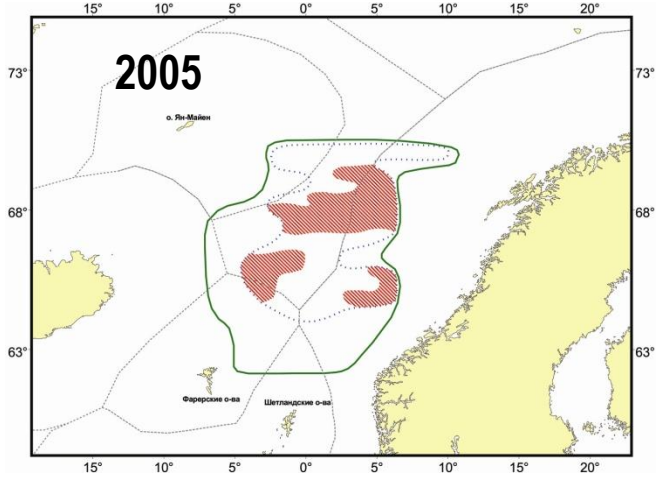


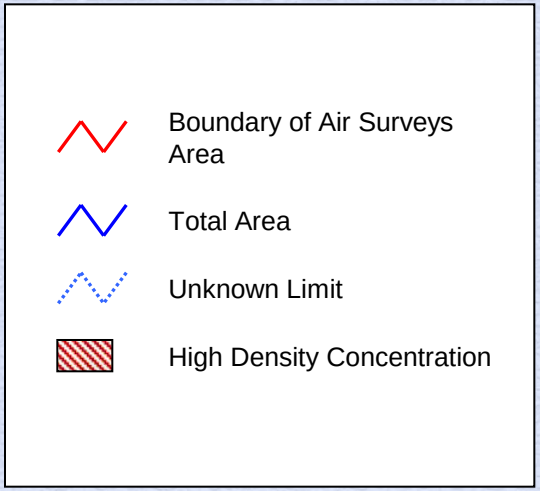
EXAMPLE OF SUMMARIZED CHLOROPHILL "A" FLUORESCENCE SPATIAL DISTRIBUTION MAP IN THE NORWEGIAN SEA



EXAMPLE OF SUMMARIZED GIS-MAP DISTRIBUTION FOR VISUAL MACKEREL SCHOOLS OBSERVED AND LIDAR DATA POSTPROCESSING







MACKEREL SPATIAL DISTRIBUTION IN THE NORWEGIAN SEA (AS AN EXAMPLE FOR 2001-2005)

AS AN EXAMPLE SOME RUSSIAN AND NORWEGIAN RESEARCH VESSELS WHICH PARTICIPA-TED IN CALIBRATI-ONS ACTIVITY

THANKS A LOT FOR YOUR ATTENTION!