

January 2, 1961

Dear Dr. Humphrey,

I have received your "Circular Memorandum"

mailed on December 8th, 1960.

It is very encouraging and pleasing to know that a great number of Soviet oceanographers are enlisted in the body of SCOR and the Indian Ocean Expedition Working Group.

I wish to express my considerations on two points:

1) It seems to me that it would be most appropriate to arrange the coming SCOR Session in Honolulu and thus avoid the extra distant travelling in the Autumn of 1961. I believe that most of the SCOR members as well as the members of the International Indian Ocean Expedition Working Group will be at the Xth Pacific Congress in Honolulu.

2) At the meeting of the Indian Ocean Working Group in Copenhagen I emphasized the urgent necessity of organizing a temporary Biological Station at some small remote island away from the coastal area (for example, Chagos Arch.) which would carry out year-round observations throughout the period of the International Indian Ocean Expedition fulfilling and covering the points of the biological program. This station should devote itself mainly to the study of biological productivity and quantitative distribution of marine life forms. The present day concept dealing with the quantitative distribution of living marine forms lacks indices on productivity in relation to various plant and animal organisms. For instance, our knowledge on plankton (its age, size, growth rate, fertility, number of generations, seasonal shifts etc.) is incomplete. If this proposal would be welcomed and favorably met, I would be happy to submit

a draft program for investigations to be carried out at a Biological
tation of this type.

I am very eager to know your opinion on the matter in question.

I also want to know your views on the following: as you recall the Intergovernmental Conference held in Copenhagen had adapted a recommendation according to which a permanent International Oceanographic Committee is to function under the supervision of UNESCO. This International Oceanographic Committee (IOC) will cope with very responsible problems and bear high authority. Recently the UNESCO Session has approved the recommendations of the Copenhagen Conference. I wish to know and comprehend the interrelations between the IOC and SCOR bodies? I personally believe that SCOR should prolong its existence and go on with its work for some time. Possibly, there are some other views on the matter.

I ~~should~~ be most thankful if you would kindly reply to my questions which preoccupy my mind for some time.

It seems to me that our views and opinions on these most important problems should ^{be} worked out on mutual basis.

At present "Vitjaz" is carrying out its second Indian Ocean expedition cruise most successfully and has made several new most important discoveries.

Wishing you a most fortunate and happy New Year,

Most sincerely and friendly yours,

L. Zenkevitch

Professor L. Zenkevitch,
Institut Okeanologii,
Akademiya Nauk,
Lujnikovskaya 8,
MOSCOW 127
U.S.S.R.

Dear Professor Zenkevitch,

I was very glad to receive your letter of January 2.

I remember that in Copenhagen and Helsinki we did discuss the possibility of holding the next SCOR meeting in Honolulu, but most members thought we should meet in India to show our interest in that area and to try to encourage India to provide a biological centre. I think that some members must go to India but it is not absolutely necessary to have a full meeting there. It was also felt that if we met in Honolulu we would not give our full attention to SCOR business. We cannot decide about meetings until we know how much money we have; we shall not know this until we learn our relation to UNESCO and IOC. If most of our members are in Honolulu, we could have a meeting there. About April I shall write to our members asking how many will be in Honolulu.

Your suggestion about a biological station on an Indian Ocean island could be very important for the biologists who are interested in making observations in one place over a long period in an oceanic environment. I think it would be good if you made a detailed proposal including information such as:-

- (a) Scientific importance.
- (b) Type of building and facilities (e.g. launch, meteorological instruments etc.).
- (c) Staff requirements (e.g. each country to provide one person for several months).

I would be glad to distribute such a document to SCOR members for their opinion and to arrange further action.

The UNESCO proposal for the Intergovernmental Oceanographic Commission will be discussed by the UNESCO Executive Board before action is taken and therefore the details of the relation between IOC and SCOR are not yet known. I have written to UNESCO asking what the relation will be and I shall tell you their answer as soon as it comes. Certainly IOC will not replace SCOR. I think it may be necessary for the Executive Committee of SCOR to go to Paris in February or March to discuss all these details with UNESCO.

As soon as I have information from UNESCO I shall write to all our members asking their ideas for an Executive meeting.

Yours sincerely,



(G.F. HUMPHREY)
President of SCOR

March 6, 1961

Dear Dr. Humphrey,

I have received your kindly letter dated February 14th.

In accordance with your request and your wish I am sending you a more detailed project touching upon the substantiation and the grounds for the establishment of the Experimental Tropical Oceanic Station (ETOS).

I hope to believe that this document will serve the purpose as an initial basis for the establishment of this station.

If a meeting concerned with the interrelations between IOC and SCOR is to take place in Paris in April or May I hope to participate in person. I would like to report on my project which seems to be of equal interest for both parties i.e. UNESCO and SCOR.

Yours very sincerely, *L. Zenkevitch*

P.S. I would like to share one more idea which came to my mind and was approved by my colleagues. We find it appropriate and timely to establish a special working group "OCEANOGRAPHIC ESTIMATION OF THE SIZE AND DISTRIBUTION OF THE OCEANS LIVING RESOURCES" besides the ones mentioned under SCOR.

If you approve our initiative and our proposal is to be accepted I am ready to name Prof. T. S. Rass or myself as representatives of the Soviet Union.

Once again your truly,

L. Zenkevitch

EXPERIMENTAL TROPICAL OCEANIC STATION

(ETOS)

At present one of the leading ideas in oceanography is the concept of the ocean as a single unity in which all phenomena and processes (biological, chemical, physical, meteorological, and geological) are interrelated and mutually predetermined. The biological aspect of the problem is revealed in the concept of the ocean's biological structure.

The many-sided nature of events developing in the ocean follows the general law of geographical zonation and recurrence of phenomena in both latitudinal and meridional directions.

At the present stage of its development, oceanography for scientific and practical purposes on a world-wide basis in regard to the study of the World ocean requires a synthetic approach, incorporating a great variety of facts, ideas, and concepts.

The general characteristic of our present-day level of knowledge concerned with oceans reveals a remarkable discrepancy between the rate of investigated areas and the vast areas covered by various latitudinal zones of the ocean.

If the ocean is subdivided into three zones, i.e., 60 latitudinal degrees in each

1. From 90° n.l. to 30° n.l.

2. From 30° n.l. to 30° s.l.

3. From 30° s.l. to 90° s.l. the surface of the World ocean covered by these zones may be respectively expressed in the following percentages : 15%, 60%, and 25%. The cold and

moderate zones of the Northern hemisphere comprise only 15% of the oceans' total area.

If we give an approximate evaluation of our present-day knowledge in regard to the abovementioned three zones, we believe that our departure from the true state of affairs will be not too great if their distribution according to the three cited zones is estimated as follows : 90%, 5%, and 5%.

If we combine the equatorial zone with the equally poorly investigated moderate and cold zones of the Southern hemisphere, their area will amount to 85% of the ocean's total area, whereas the scope of our knowledge about these facts will barely exceed 10% of the general knowledge concerned with the ocean, i.e., their area is 6 times greater than that of the cold and moderate zones of the oceans, whereas our knowledge is 9 times less.

It is quite natural that man involuntarily applies knowledge of the northern moderate zone to the entire World ocean; if this is done many erroneous deductions may be made.

If some phenomena (especially of biological nature) may be to some extent extrapolated onto the southern moderate zone, this cannot be practised in relation to the tropical zone. It is worthy of notice that the enormous variety of species of plant and animal populations in the equatorial zone is many times greater than that of the moderate zones.

However, temperature and its seasonal variation should be acknowledged as the capital factor in these differences. The rate of all the biological and chemical processes differs greatly; the annual fluctuations of high temperatures is ((20-30°)), whereas at low temperature with severe seasonal varia-

The quantitative approach to the biological processes developing in the ocean requires the knowledge of several indices of vegetable, animal and bacterial population of the tropical zone; the latter may be obtained only by means of all-year-round stationary observations and cannot be produced by expeditionary methods of work. These indices are : the total quantitative distribution of plankton and benthos (including vertical indices); the size, growth rate, age, fertility, nutrition and some morphological, physiological, biochemical indices for mass forms of flora and fauna.

The coral reefs represent a very important object of investigation in the equatorial zone; they cover many million km^2 of the ocean floor, but have been studied far too little. At any rate we lack reliable indices regarding the quantitative distribution of the plant and animal organisms within the area of the coral reefs; little is known about their growth rate and the rate of CaCO_3 accumulation. One may assume that the annual rate of accumulated CaCO_3 deposited in the tropical belt amounts to the order of 10^{10} - 10^{11} tons. It is very important to clarify this index and to obtain an adequate idea of the ocean's chemical balance, particularly the CO_2 balance.

At present comprehension of the ocean's biochemical structure is of first rate importance for understanding the cycle of organic matter. Not having grasped the details of these processes developing throughout the vast spaces of the equatorial belt, one cannot obtain a clear idea of the ocean's biochemistry as a whole; this is true not only of the biological processes, but also of many processes involved in the shaping of mineral formations at the ocean floor and bottom sediments.

It is necessary to seek for gross quantitative indices reflecting the chemical processes developing in the ocean; these indices would help us to understand the chemical history of the ocean, the chemical exchange between the lithosphere and the atmosphere and the relations between the chemical and biological processes.

There is no doubt that the urgent problems linked with the interests of physical and geological oceanography may be solved in the tropical zone of the ocean, when the latter is viewed as an entire whole.

To promote the further development of oceanologic appraisal of the World ocean it is necessary to concentrate upon and to stimulate oceanographic investigations in the above mentioned directions of the Indian Ocean, in the equatorial and southern regions of the Pacific and Atlantic oceans.

For this purpose it is necessary to establish experimental stations, but not next to the continental coasts or near island masses; it is more appropriate to organize them in the mid parts of the ocean, far away from the mainland.

It is worth noting that at present there are no less than 200 marine stations in the northern hemisphere (including laboratories and institutes), whereas south of 30° n.l. there are not more than ten.

It would be preferable to organize an experimental laboratory in the Indian Ocean; this enterprise would be most timely in connection with the wide range of international expeditionary works being carried out in this area.

From the geographical view-point the most suitable place for the establishment of a similar station would be the Chagos Islands (the Diego Garsia atoll).

A similar ETOS could serve as a research and investigatory centre and might be used as a place for training younger specialists as high skilled personnel in oceanography; auxillary buildings and tent settlements could provide possibility for the organization of courses in specialized professional aspects of oceanography.

The primary stage for the establishment of ETOS would require the building of six light houses of local type :

1. The laboratory building with four laboratories about $25-30 \text{ m}^2$ each.
2. An aquarium with an area of about 30 m^2 .
3. A technical service station; it should include a pump house, a mechanical workshop and an electric power station.
4. Living quarters for the scientific personnel, consisting of 12 separate rooms with a total living space of 170 m^2 .
5. Living quarters for the personnel, made up of four rooms with a total living space of 60 m^2 .
6. A storage house.

The technical personnel of the station should not exceed 4 men : the director, the caretaker, the attendant and the mechanic.

The station should be provided with a small vessel which could take to sea. It would be most appropriate to agree that the country-partners participating in this enterprise should in turn assign a small vessel and a crew for a year's

time. The country-partners should provide their research institutions with apparatus and investigation equipment for this purpose.

The funds for paying the technical personnel of the station and the building of the six houses should be furnished by SCOR.

L. Zenkevitch
7/III 1961

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? (Squ) L. ZENKEVITCH
7/III/1961

Ref. 033.4251
GFH/CV

Professor L. Zenkevich,
Institute Okeanologii,
U.S.S.R. Akademia Nauk,
Lujnikovskaya 8,
MOSCOW 127,
U.S.S.R.

Dear Professor Zenkevich,

I have received your letter of March 6 with the detailed statement on ETOS. You know already from Dr Bohnecke that our meeting with UNESCO will be either April 10-12 or 24-26. I am very pleased to see that you will be available.

I shall put ETOS on the agenda and as promised in my letter of January 24 I shall distribute your statement to SCOR members, asking that they give Dr Bohnecke their opinions.

I shall also place your suggestion for the new working group on the agenda, together with the other suggestions for new working groups. I think your subject may affect F.A.O. and perhaps they should have a representative. This would be a good liaison with them.

Looking forward to seeing you in Paris,

Yours sincerely,

18

(G.F. HUMPHREY)
President of SCOR

*on the group if we
set it up.*

C/- C.S.I.R.O.,
Marine Laboratory,
Box 21, Cronulla, Sydney,
Australia

March 16, 1961

Memorandum to SCOR Members and Participants
in Discussions on Indian Ocean Biological Programme

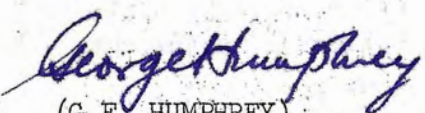
The SCOR executive will meet in Paris in April,
either 10-12 or 24-26.

Professor Zenkevitch has made a proposal for an
Experimental Tropical Oceanic Station to be included as
part of the Indian Ocean Investigation.

I would be glad if you would send any comments you
have on this proposal to

The Secretary of SCOR
Bernhard-Nocht-Strasse 78
HAMBURG 4 GERMANY

to reach him before April 9 so that we shall have the
benefit of your advice in Paris.


(G.F. HUMPHREY)
President of SCOR

EXPERIMENTAL TROPICAL OCEANIC STATION

(ETOS)

At present one of the leading ideas in oceanography is the concept of the ocean as a single unity in which all phenomena and processes (biological, chemical, physical, meteorological, and geological) are interrelated and mutually predetermined. The biological aspect of the problem is revealed in the concept of the ocean's biological structure.

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However, temperature and its seasonal variation should be acknowledged as the capital factor in these differences. The rate of all the biological and chemical processes differs greatly; The annual fluctuations of high temperatures is $20-30^{\circ}$, whereas at low temperature with severe seasonal variations the indices are from below zero to $10-16-20^{\circ}$.

The quantitative approach to the biological processes developing in the ocean requires the knowledge of several indices of vegetable, animal, and bacterial population of the tropical zone; the latter may be obtained only by means of all-year-round stationary observations and cannot be produced by expeditionary methods of work. These indices are: the total quantitative distribution of plankton and benthos (including vertical indices); the size, growth rate, age, fertility, nutrition and some morphological, physiological, biochemical indices for mass forms of flora and fauna.

The coral reefs represent a very important object of investigation in the equatorial zone; they cover many million km^2 of the ocean floor, but have been studied far too little. At any rate we lack reliable indices regarding the quantitative distribution of the plant and animal organisms within the area of the coral reefs; little is known about their growth rate and the rate of CaCO_3 accumulation. One may assume that the annual rate of accumulated CaCO_3 deposited in the tropical belt amounts to the order of $10^{10}-10^{11}$ tons. It is very important to clarify this index and to obtain an adequate idea of the ocean's chemical balance, particularly the CO_2 balance.

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It would be preferable to organize an experimental laboratory in the Indian Ocean; this enterprise would be most timely in connection with the wide range of international expeditionary works being carried out in this area.

From the geographical view-point the most suitable place for the establishment of a similar station would be the Chagos Islands (the Diego Garsia atoll).

A similar ETOS could serve as a research and investigatory centre and might be used as a place for training younger specialists as highly-skilled personnel in oceanography; auxiliary buildings and tent settlements could provide possibility for the organization of courses in specialized professional aspects of oceanography.

The primary stage for the establishment of ETOS would require six buildings of local type:

1. The laboratory building with four laboratories about 25-30 m² each.
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The station should be provided with a small vessel which could take to sea. It would be most appropriate to agree that the country-partners participating in this enterprise should in turn assign a small vessel and a crew for a year's time. The country-partners should provide their research institutions with apparatus and investigation equipment for this purpose.

The funds for paying the technical personnel of the station and for the six buildings should be furnished by SCOR.

(Sgd) L. ZENKEVITCH

7/iii/1961

The International Agency for ^{14}C Determination
Measurements of Primary Production in the Sea

CHARLOTTENLUND SLOT
CH. ENLUND
DANMARK

Charlottenlund, March 21st, 1961.

Your ref. 033./425 GFH/MM

FILE	033-425/
2	MAR 1961
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Clark	

The President of SCOR
Mr. G.F. Humphrey,
C/- C.S.I.R.O.
Marine Laboratory,
Box 21, Cronulla, Sydney,
Australia.

Dear Mr. G.F. Humphrey:

Thank you for your memorandum of March 16th, to the SCOR member,
Mr. Vagn Kr. Hansen, Danmarks Fiskeri-og Havundersøgelser, Charlottenlund
Slot, Charlottenlund, Denmark.

We regret to inform you that Mr. Vagn Hansen at the moment is on a
journey in South Africa and will not be back until the middle of
April this year, so it is impossible for him to send any comments
on this proposal before April 9th.

The memorandum will be presented to Mr. Vagn Hansen as soon as he
is back again.

Yours sincerely
for

C-14 laboratoriet,

Danmarks Fiskeri- og Havundersøgelser
Charlottenlund Slot.
Charlottenlund.

Ann-Mari Thorsen

0334251

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WOODS HOLE OCEANOGRAPHIC INSTITUTION
WOODS HOLE, MASSACHUSETTS

April 5, 1961

The Secretary
SCOR
Bernhard-Nacht-Strasse 78
Hamburg 4, Germany

Dear Sir:

I have recently received and read with interest the proposal by Professor L. Zenkevitch for an experimental tropical-oceanic station as a part of the Indian Ocean Expedition. At the suggestion of Dr. G. W. Humphrey, I am sending the following comments which I hope will reach you in time for discussion at the Paris meeting.

I do feel strongly that a centralized international land base should be established as a part of IOE. This, I feel, should go beyond the proposed International Taxonomic Center, the purpose of which is not entirely clear to me. If the objective of this taxonomic center is the preliminary sorting by Indian technicians of all biological collections from all expeditions, I am very much afraid that such an approach is overly-optimistic and somewhat naive. No systematic biologist of my acquaintance will be willing to turn over his carefully collected material to a group of strangers for processing, sorting or treatment of any kind until he has been over it himself and removed what he wants from his collections.

What is needed, I feel, is an international laboratory where individuals from the various countries may work over their own collections. Coupled with this is the need for an experimental laboratory where biologists may work with living organisms collected on oceanographic cruises or nearby coastal areas, performing experiments which could not be carried out easily on shipboard.

A land based laboratory of the type described above could, if suitably located, also function as a staging area, supply center, and general headquarters for both oceanographic cruises and island and shore-based operations.

In order to serve these various functions, such a land base should provide (1) a deep-water harbor with fueling facilities for large oceanographic vessels, (2) easy access by air and rail for transportation of people and supplies, (3) existing or easily provided living and working facilities, and (4) a centralized location with respect to accessibility by large ships to the major oceanic regions and accessibility by small boat to island groups, coral reefs and shore regions of special interest.

It is my understanding that Cochín has been suggested as a location for the proposed Taxonomic Center. In my opinion Cochín represents nearly the ideal

April 5, 1961

location for a shore base with the additional functions I have suggested above, and I wish to urge the choice of this location most strongly.

With respect to Professor Zenkevitch's proposal for an experimental laboratory in the Chagos Islands, I feel (admittedly with insufficient knowledge of the area) that the difficulties of building laboratories, maintaining a staff and transporting people and goods to such an isolated location would be excessive. On the other hand, expeditions could be manned from a base in Cochin in relatively small ships and for short periods of time to such diverse areas of interest as the Arabian Sea, the Bay of Bengal, the equatorial oceanic region and the Chagos, Maldive and Laccadive Island groups.

Sincerely yours,

John H. Ryther
Scientific Director

ael

cc: Humphrey
Snider

Ref. 033.425
GFH/CV

5 DEC 1964

The Secretary,
National Committee on Oceanic Research,
Pr-T Lomonosova 14, Kv. 492,
MOSCOW U.S.S.R.

Dear Professor Zenkevich,

EXPERIMENTAL TROPICAL OCEANIC STATION


I do not know what we should do in order to commence the ETOS project. There are some scientists interested: yourself, Dr D.H. Davies, South Africa; Dr A. Bruun, Denmark; Professor J. Krey, Germany, and Dr J.H. Ryther, U.S.A.

We need a stimulus to give some action. I do not see how SCOR can provide the stimulus. If several laboratories promise action and assistance in the project, I think SCOR should arrange and perhaps provide money for a meeting of representatives of these laboratories.

The problem is to stimulate the interest of the laboratories. Perhaps you should write to the scientists who have already said that they are interested.

It is possible that the best course of action is to make a proposal at the next IOC meeting.

Yours sincerely,


(G.F. HUMPHREY)
President of SCOR

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18 December 1961

cc Dr. Humphrey, Cronulla, NSW,
Australia

22 DEC 1961

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DEC 20 1961

Dear Dr. Böhncke,

Enclosed please find a preliminary list of marine research institutions in the tropics as requested at the last SCOR meeting. As you will see from this list the number of existing tropical institutions was badly underestimated by most people, including myself, during this meeting. The enclosed list is incomplete, especially where information on the field of activity and facilities are concerned. However, as you know, a new international directory of marine biological institutions is being compiled and as soon as this appears in print, additions can be made to this list.

It seems that in the tropics there is no great lack of institutions, but the problems are of another kind:

1. Most of the laboratories are badly equipped.
2. The laboratories have too small a staff and the work in the tropics requires at least three times more manpower than comparable work would require in higher latitudes.
3. Further difficulties in the tropics are the relatively great isolation of the small institutions and lack of funds for bigger projects and co-operation.
4. The results of the studies are very often published in local publications which have limited circulation and therefore the work done in the tropics is not properly brought to the attention of all the people concerned in higher latitudes. (It seems that the establishment of an international tropical marine journal would be of value).
5. Sometimes people with lower qualifications and abilities are recruited in tropical laboratories, whereas the best people are attracted to the more advanced laboratories in the higher latitudes.

With best seasonal greetings,

Yours sincerely,

Dr. G. Böhncke
Neuer Wall 34
Secretary of Special Committee
on Oceanic Research
Hamburg 36.
Germany

T. Laevastu

PRELIMINARY LIST OF MARINE RESEARCH INSTITUTIONS IN THE TROPICS (30°N to 30°S)

- (3) Type: University institution - U
 Fisheries research institution - F
 (Governmental)
 Others - A
- (4) Field of activity: Marine biology (general) - B
 Fisheries research, biological and
 technological - Fb, Ft
 Oceanography - O
- (6) Facilities: Boats, small - Vs
 research vessels - Vr
 Gear - fisheries - Gf
 biol. collection gear - Gb
 oceanographic equipment - Go
 Library - L
 Reference collection - R
 Aquarium - Q

*See also
enclosed map.*

1 No.	2 Country, name and address of the institution	3 Type	4 Main field of activity	5 No of technical staff	6 Facilities	7 Remarks
<u>USA</u>						
<u>Hawaii</u>						
1	Pacific Oceanic Fisheries Investigations P.O.Box 3830 Honolulu.	F	Fb; O		Vr; Gf, b, o L; R; Q	
2	Hawaii University Marine Laboratory Honolulu.	U	B		Vs; Gf, b, o L; R	
<u>Mexico</u>						
3	Instituto de Pesca del Pacifico Guaymas, Sonora.	F				

1 No.	2 Country, name and address of the institution	3 Type	4 Main field of activity	5 No. of technical staff	6 Facilities	7 Remarks
	<u>Costa Rica</u>					
4	Comisión Interamericana del Atún Tropical Puntarenas.	F				
	<u>Panama</u>					
5	Inter-American Tropical Tuna Commission P.O.Box 3665 Balboa, Canal Zone.	F				
6	Laboratorio Nacional de Pesca Edificio Miramar Apartado 3318 Panamá.	F	Fb			
	<u>Peru</u>					
7	Comisión Interamericana del Atún Tropical Paita.	F				
8	Consejo de Investigaciones Hidrobiológicas Apartado 3734 Lima.	A	B; O			
	<u>Brazil</u>					
9	Instituto Oceanográfico da Universidade de São Paulo Caixa Postal 9075 São Paulo.	U	O; B		Vs, (r); Gb, o; L; R; Q	
10	Instituto de Biologia Marítima e Oceanografia Praia da Piedade Caixa Postal 1075 Recife, Pernambuco.	U				

1 No.	2 Country, name and address of the institution	3 Type	4 Main field of activity	5 No. of technical staff	6 Facilities	7 Remarks
	<u>French Guiana</u>					
11	Institut Français d'Amérique Tropicale Cayenne.					
	<u>Venezuela</u>					
12	Laboratorio Marina de Isla Margarita Fundación LaSalle Ciencias Naturales Caracas.					
13	Instituto de Oceanografía Universidad de Oriente Edificio Sucre Cumaná.	U	O; B		Vr; Gb, o	
	<u>U.S.A.</u> <u>Puerto Rico</u>					
14	Institute of Marine Biology University of Puerto Rico College Station Mayaguez.	U	B			
	<u>Cuba</u>					
15	Laboratorio de Biología Marina Universidad Católica de Santo Tomás de Villanueva Apartado 6, Mariano Habana.	U	B			
	<u>Mexico</u>					
16	Estación de Biología Marina Instituto Tecnológico de Veracruz Tres Carabelas 73 Fracc. Reforma. Veracruz.	U	B			

1 No.	2 Country, name and address of the institution	3 Type	4 Main field of activity	5 No. of technical staff	6 Facilities	7 Remarks
<u>U.S.A.</u>						
17	Institute of Marine Sciences University of Texas Port Aransas, Texas.	U	B			
18	Department of Oceanography and Meteorology Texas A. and M. College Station Texas.	U	O; B		Vs, r; Gf, b, o; L; R	(See 20)
19	Gulf of Mexico Fishery Investigation Galveston, Texas.	F	Fb; C			
20	Galveston Marine Laboratory Texas A. and M. Building 311, Fort Crockett Galveston, Texas.	U	O; B		(see 18)	
21	Louisiana State University Marine Laboratory Grand Isle, Louisiana.	U	B			
22	Marine Biological Laboratory of Florida State University Alligator Harbor, Florida.	U	B			
23	The Marine Laboratory University of Miami 1 Rickenbacker Causeway Miami 49, Florida.	U	O; B		Vs, r; Gf, b, o; L; R; C	
<u>Bahamas, British West Indies</u>						
24	Lerner Marine Laboratory Bimini, Bahamas. (Dupont Building, Miami, Florida)	A	B			

1 No.	2 Country, name and address of the institution	3 Type	4 Main field of activity	5 No. of technical staff	6 Facilities	7 Remarks
25	University College of the West Indies Kona, Jamaica. <u>Senegal</u>	U	B			
26	Station Océanographique Pointe Noire Dakar. <u>Guinea</u>	A	O			
27	Centre d'Etude des Pêches Conakry. <u>Sierra Leone</u>	F	Fb, t;			
28	Fisheries Research Institute <u>Ivory Coast</u>	F	Fb			
29	Service Océanographique Abidjan. <u>Ghana</u>	A	O			
30	University College of Ghana Accra. <u>Republic of South Africa</u>	U	B			
31	Marine Biological Association P.O.Box 736 Durban, Natal. <u>Madagascar</u>	A	B			
32	Station Océanographique de I.R.S.M. Nossi-Bé.	A	O; Fb		Vr; L; Q	

1 No.	2 Country, name and address of the institution	3 Type	4 Main field of activity	5 No. of technical staff	6 Facilities	7 Remarks
	<u>British East Africa</u>					
33	East African Marine Fisheries Research Organization Zanzibar.	F	Fb; O		Vr	
	<u>India</u>					
34	Taraporevala Aquarium and Marine Biological Station Bombay.	A	B		Q	
35	Central Marine Fisheries Research Station Mandapam Camp. Ramanad District. South India	F	Fb, t; B		Vs; Gf, b; L	Several sub- stations
36	Department of Zoology Andhra University Waltair.	U	B			
	<u>Ceylon</u>					
37	Fisheries Research Station P.O. Box 531 Galle Face Colombo 3.	F	Fb, t		Vs, r; L	Several field stations
	<u>Indonesia</u>					
38	Laboratorium Penjilidikan Laut Djalan Kerapu 12 Pasar Skan Djakarta.	A	O; B		Vr; Gb, o; L	

1 No.	2 Country, name and address of the institution	3 Type	4 Main field of activity	5 No. of technical staff	6 Facilities	7 Remarks
<u>Federation of Malaya and Singapore</u>						
39	The Singapore Regional Fisheries Research Station Singapore.	F	Fb		Vs, r; Gb, f; L	
<u>Thailand</u>						
40	The Ban Phae Marine Fisheries Station Ban Phae, Rayonj.	F	Fb		Vs	
<u>Viet Nam</u>						
41	Institut Océanographique de Nha Trang Nha Trang.	A	B		Vs; Gb; L; R	
<u>Philippines</u>						
42	The Philippines Institute of Fisheries and Technology Boston and 23rd Streets Port Area. Manila.	F	Fb, t; O		Vs, r; Gf, b, o; L	
<u>Hong Kong</u>						
43	Hong Kong University Fisheries Research Unit Hong Kong.	U	Fb		Vr; Gf, b; L	
<u>Taiwan</u>						
44	Taiwan Fisheries Research Institute 125 Hou-1 Road Chilung.	F	Fb; O		Vs, r; Gf, b; L	

1 No.	2 Country, name and address of the institution	3 Type	4 Main field of activity	5 No. of technical staff	6 Facilities	7 Remarks
45	Research Laboratory of Fisheries Rehabilitation Administration 51, Chung Ching Road Section III Keelung. <u>Mariana Islands</u>	F	Fb, t; 0		Vr.	
46	Aquarium Agana, Guam. <u>Netherlands New Guinea</u>	A	B		Q	
47	Tuna Fishing Station Sorong, c/o Fisheries Division Hollandia. <u>Australia</u>	F	Fb.		Vr.	
48	Heron Island Marine Biological Station Heron Island Via Gladstone Queensland. <u>New Caledonia</u>	A	Reef research		Field station Limited library	
49	Laboratoire d'Océanographie de l'Institut Français d'Océanie P.O.Box 4 Noumea.	A	O; B		Vr; Gb, o; L	



Marine Research Institutions in the Tropics (30°N to 30°S)