

添 付 資 料

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添付資料 1 ミニッツ


THE MINUTES OF THE MEETING
BETWEEN THE JAPANESE PRELIMINARY SURVEY TEAM
AND
THE AUTHORITIES CONCERNED
OF THE GOVERNMENT OF THE REPUBLIC OF MAURITIUS
ON
THE JAPANESE TECHNICAL COOPERATION PROJECT
FOR
COASTAL RESOURCES AND ENVIRONMENT CONSERVATION

The Japanese Preliminary Survey Team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") headed by Mr. Taira Matsuoka, Executive Director, Japan Sea-farming Association, visited the Republic of Mauritius from July 30 to August 8, 1994 for the purpose of identifying the outline of the Japanese Technical Cooperation Project for Coastal Resources and Environment Conservation (hereinafter referred to as "the Project") in the Republic of Mauritius.

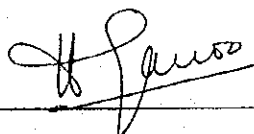
During its stay in Mauritius, the Team exchanged views and had series of discussions with the authorities concerned in the Republic of Mauritius, in respect of the desirable measures to be taken by both governments for the successful implementation of the Project.

As a result of the discussions, both parties agreed to recommend to their respective Governments the Tentative Framework of the Project in the documents attached hereto.

Port Louis, August 5, 1994



Mr. Taira Matsuoka
Leader, Preliminary Survey Team,
Japan International Cooperation Agency,
Japan



Mr. Harry Ganoo
Permanent Secretary
Ministry of Fisheries and Marine Resources
Republic of Mauritius

THE ATTACHED DOCUMENT

I. OVERALL UNDERSTANDING

1. Both sides have agreed upon the relevancy, importance and necessity of the coastal resources and environment conservation through the technical advancement of Albion Fisheries Research Center. Thus, both sides have agreed that the Technical Cooperation Project as proposed should be materialized. The Project should fully utilize the facilities to be constructed by Japanese Grant Aid.
2. Both sides have agreed upon the importance of sustainability and future expansion of the activity initiated by the Project. Both sides have, therefore, agreed that attaining the tangible successes during the implementation of the Project would be the important step to ensure such sustainability and future development.
3. Both sides have agreed that there would be mutual consultation on any major issues in connection with cooperation from other organizations as the needs arise.
4. Both sides have agreed that the directly responsible authority would be the Ministry of Fisheries and Marine Resources in the Republic of Mauritius, and the cooperating agency would be JICA.

II. TENTATIVE FRAMEWORK OF THE PROJECT

Both sides have agreed in principle as follows:

1. OVERALL GOAL OF THE PROJECT

To contribute to the effective and efficient management and use of coastal resources, and to sustaining and preserving the coastal environment in the Republic of Mauritius.

2. PURPOSE OF THE PROJECT

To develop and improve the research and analysis capability of Albion Fisheries Research Center in the field of coastal resources and environment conservation.

3. ORGANIZATION

(1) Executing Institute

Albion Fisheries Research Center,
Ministry of Fisheries and Marine Resources



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- (2) Main Site of Technical Cooperation
Albion Fisheries Research Center

4. EXPECTED OUTPUTS OF THE TECHNICAL COOPERATION

(1) Coastal Environment Research

The capability to research and analyze the marine environment and monitor the coastal environment will be advanced.

(2) Coastal Ecosystem Research

The state of coastal ecosystem is clarified and the technology for research into lagoon ecosystems will be advanced.

(3) Resources Propagation

In order to replenish the fisheries resources, reproduction technology and research capability will be advanced.

(4) Related Matters

Reporting capability of researcher of Albion Fisheries Research Center will be improved. Citizens and fishermen will come to recognize the importance of resources and environmental protection.

5. FIELDS OF THE TECHNICAL COOPERATION

(1) Coastal Environment Research

To research and analyze coastal environmental factors, and the coastal environment monitoring system.

(2) Coastal Ecosystem Research

To investigate and analyze the life distribution of the coastal ecosystem, and its status.

(3) Resources Propagation

To carry out the research on natural resources of commercially important species and seed production of each species.

(4) Related Matters

To draw up various kinds of investigation and analysis manuals. To produce audio-visual

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materials in an effort to heighten public awareness of resources and the need for environment conservation.

6. TERM OF THE TECHNICAL COOPERATION

Five (5) years

7. MEASURES TO BE TAKEN BY THE JAPANESE SIDE

In accordance with the laws and regulations in force in Japan, the Government of Japan will take, at its own expense, the following measures through JICA ;

(1) Assignment of Japanese Experts

- ① Team Leader
- ② Coordinator
- ③ Expert on Coastal Environment Research
- ④ Expert on Coastal Ecosystem Research
- ⑤ Expert on Resources Propagation

Note) Short-term experts are to be dispatched as the need arises.

(2) Provision of Equipment

Machinery, equipment and other material necessary for the technical transfer by Japanese experts are to be provided from within the budget appropriated for the project.

(3) Acceptance of Mauritian counterpart personnel for training in Japan

Approximately two (2) or three (3) persons annually.

8. MEASURES TO BE TAKEN BY THE MAURITIAN SIDE

(1) In accordance with the laws and regulations in force in Mauritius, the Government of Mauritius will take the following necessary measures at its own expense ;

- ① Assignment of the Mauritian counterpart personnel; at least two (2) for each Japanese experts.
- ② Land, buildings and facilities for the implementation of the project
- ③ Supply or replacement of machinery, equipment, instruments, vehicles, tools, spare parts and any other material necessary for the implementation of the project other than those provided through JICA under 7-(2) above.

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- ④ Means of transport and travel allowances for the Japanese expert for the official travel within the Republic of Mauritius.
- ⑤ Suitably furnished accommodation for the Japanese experts and their families.

(2) In accordance with the laws and regulations in force in Mauritius, the Government of Mauritius will take necessary measures to meet ;

- ① Expenses necessary for transportation within Mauritius of the articles referred to in 7-(2) above as well as for the installation, operation and maintenance thereof.
- ② Customs duties, internal taxes and any other charges, imposed in Mauritius on the articles referred to in 7-(2) above, and
- ③ All running expenses necessary for the implementation of the Project.

9. CLAIMS AGAINST JAPANESE EXPERTS

The Government of Mauritius undertakes to bear claims, if any arise, against the Japanese experts engaged in the Project resulting from, occurring in the course of, or otherwise connected with, the discharge of their official functions in Mauritius, except for those arising from the wilful misconduct or gross negligence of the Japanese experts.

10. ESTABLISHMENT OF JOINT COMMITTEE

For the smooth implementation of the project, a Joint Committee shall be established and meetings of the Committee shall be held once a year on a regular basis, and whenever such need arises.

The function of the Committee is as follows:

- (1) Formulation of annual work plan of the Project
- (2) Review of annual activities of the Project
- (3) Review and exchange of views on major issues and problems arising from or in connection with the technical cooperation
- (4) Examination of the local budget-draft necessary for the Project
- (5) Staffing of the Project
- (6) Others

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11. FUTURE PROCEDURE

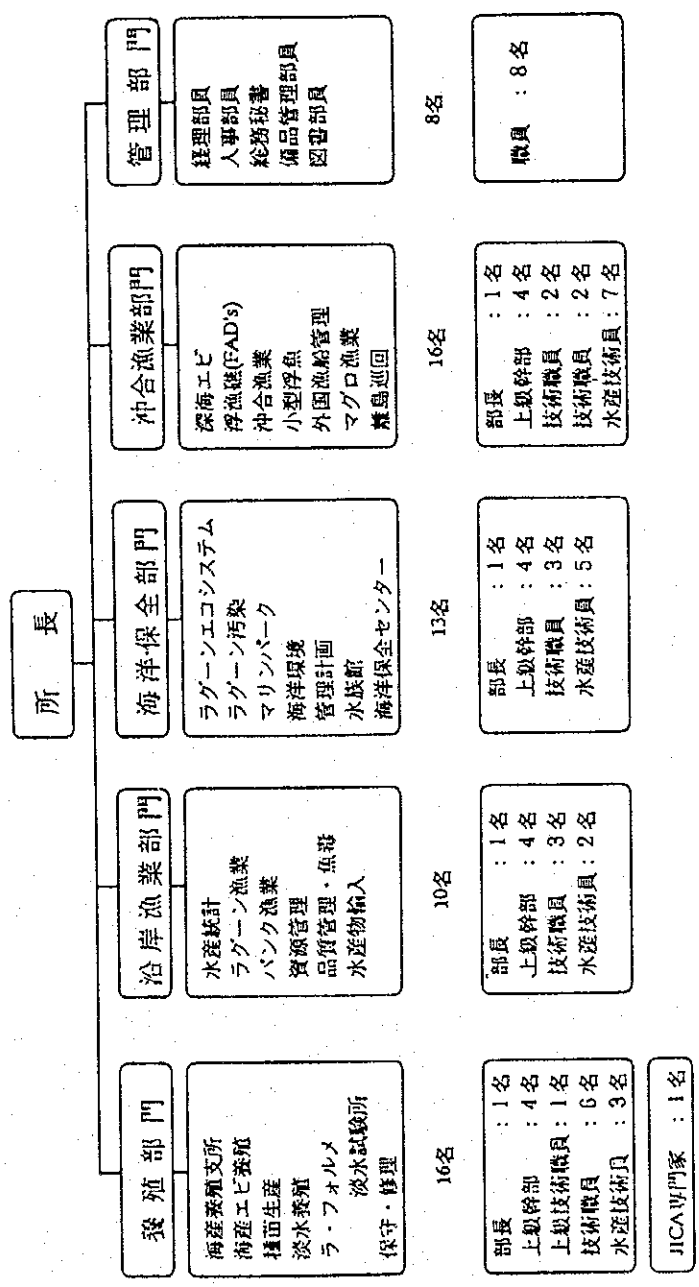
(1) A few experts will be assigned to the Republic of Mauritius by JICA to investigate the details of the Project in line with the recommended Tentative Framework described above in 1. - 10. , and to investigate the necessary machineries and equipment for the Project.

(2) Implementation Discussions Team will be sent to the Republic of Mauritius by JICA to formulate the Project, and to sign and exchange the Record of Discussion (R/D).

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添付資料 2 アルビオン水産研究所組織及び人員配置図



添付資料 3 C I D A 海洋保全プロジェクト

Mauritius Marine Conservation Project

Funded by Canadian International Development Agency (CIDA) as part of the Ocean Development Africa Program (ODAP); Managed and Implemented by LGL Limited

Project Plan Developed in Mauritius, 12-19 April 1994

Final Draft, 19 April

INTRODUCTION

Several concepts that are central to marine conservation and management have become widely recognized in recent years. One is that marine conservation and management are not constraints to fisheries and other human uses of the marine and coastal environment, but necessary co-requisites. Another is that coastal zone management in small island nations should consider that the coastal zone extends from sea to sea, including not only the reefs, lagoons, and beaches, but also the interior and at least a part of offshore waters. Similarly, marine environmental management must extend to and beyond the nation's Exclusive Economic Zone (EEZ), which in Mauritius is enormous. Managers and the public alike must begin to see Mauritius as the archipelago that it is.

The Canadian Government, through the International Centre for Ocean Development (ICOD), began assisting the Government of Mauritius (GOM) in marine environmental management in the 1980s. In 1990, ICOD pledged assistance to Mauritius in conducting several marine conservation projects as a part of the Environmental Investment Program (EIP). When ICOD was dissolved in 1992, the Canadian International Development Agency (CIDA) accepted the responsibility of completing ICOD work in progress, and established the Ocean Development Africa Program (ODAP) to include management of the ex-ICOD programs in West Africa and the Indian Ocean, and implementation of the EIP marine projects in Mauritius. In 1993, CIDA selected LGL Limited as the Canadian Executing Agency for ODAP.

This document outlines a plan to implement the EIP marine conservation projects. The plan has been prepared during 12-18 April 1994 in Mauritius, by William E. Cross (LGL Limited, ODAP Project Director) in consultation with the Marine Conservation Division and with input from other government agencies, NGOs, and individuals involved in marine research in Mauritius (see Mission Programme, Attachment 1). It assumes that the reader is familiar with the ICOD marine conservation projects for which Memoranda of Agreement (MOAs) between ICOD and GOM were signed in 1991-92, subsequent correspondence between Canada and Mauritius, and the World Bank EIP.

The project plan outlined on the following pages is based on (1) the original ICOD MOAs; (2) an attempt to redefine the projects in early 1993 by the interim management agency for ICOD projects, GOM, and CIDA; (3) a proposal to JICA by GOM for technical assistance and equipment in marine conservation; and (4) the equipment requested by GOM

measurable results. Each will be a discrete and significant component of an overall Marine Environment Management Plan (MEMP) or Integrated Coastal Zone Management Program (ICZMP) that should be developed during and subsequent to the 2-year period of CIDA support. Other MEMP/ICZMP program components would include a public education program; a coastal community/interest group involvement program; a plan for sustainable management of coastal and offshore fisheries; effluent control strategies; a contingency plan for spills of oil and hazardous materials; etc. Discussions and recommendations concerning the MEMP/ICZMP will form part of CIDA support to GOM.

SCHEDULE AND PERSONNEL

The project will begin between July and September 1994 and run indefinitely; CIDA support will be for a period of two years. CIDA support will consist mainly of short-term consultancies in Mauritius and on-going support from Canada during the project. *There are a number of requirements of the Government of Mauritius that must be accomplished before some of the project components or sub-components can begin.* These are outlined in the following pages. A preliminary schedule is included as Attachment 2.

Detail will be added to this preliminary plan during the preparation of LGL Limited's Inception Report to CIDA, which will include a detailed plan for the implementation of the project in Mauritius. The Inception Report will be submitted to CIDA in late May 1994 and will be evaluated by CIDA during the following two weeks.

The Mauritian Executing Agency is the Ministry of Fisheries and Marine Resources (MFMR), and the Mauritian Coordinating Agencies are the Ministry of Environment and Quality of Life (MEQOL) and the Ministry of Economic Planning and Development (MEPD). The project will be conducted by existing and new personnel in the Marine Conservation Division (MCD) (see following pages for details). The Canadian Project Manager will be William Cross. Technical assistance will be provided by Mr. Cross (marine ecology, monitoring, and management) and other consultants with expertise in relevant disciplines (oceanography, marine parks, legislation, mapping/Geographical Information Systems). Curricula Vitae of the proposed consultants will be submitted to the Government of Mauritius for approval during May-June 1994.

A Coastal Zone Management Advisory Committee should be established to advise GOM on matters relevant to marine and coastal zone management. It should include representatives from government, NGOs, the University, the private sector, and other organizations using the coastal zone (e.g., the Professional Fishermen's Association, the Federation of Diving Clubs). A smaller Steering Committee should be selected from key GOM ministries (e.g., MANR, MFMR, MEQOL, MHLTCP, MEPD, Finance).

PROJECT COMPONENTS

1. Coastal and Marine Resource and Use Mapping (GIS)

1.1 Results/Outputs: A digital map of Mauritius, with overlays of coastal marine resources, existing coastal land use, inland watersheds, land use plans, political jurisdictions, and existing zonation systems. Uses of the mapping system will include (1) Information

management, (2) Communicating with decision-makers, public, developers (demonstrations of existing conditions, what-if scenarios, cumulative impacts), (3) Delineation of coastal zones of different types of use, and (4) Modelling (e.g., effluent dispersion, sediment transport).

1.2 Project Components (Canadian Contribution): System design, on-site training, supervision of mapping; and assistance with coordination with other studies.

1.3 Government of Mauritius Contribution: One or two counterparts (senior, assistant) with computer aptitude and skills, to be trained in the use of the hardware and software, and to thereafter operate the system. One T.O. with computer skills should be hired. Support from other MCD personnel will be required and a local computer expert, preferably a systems analyst, will be needed to act as a consultant to MCD. The World Bank EIP equipment fund should be used to equip the project at the outset. A limited amount of CIDA project funds can be used for equipment and materials, but those funds should be used for purchases as the project progresses and as needs arise. Guidelines and possibly legislation should be established by the Government of Mauritius to ensure that the Ministry of Fisheries and Marine Resources (MFMR) is consulted by all parties wishing to conduct marine research in Mauritius and that copies of all data collected are provided to MFMR. GOM should ensure compatibility of mapping systems to be used by different ministries and institutions, to allow exchange and integration of data and information. Training should be provided to appropriate MCD personnel in the interpretation of satellite imagery. See also 'Schedule and Personnel' section concerning the establishment of a Coastal Zone Management Advisory Committee and a Steering Committee for the project.

2. Marine Parks/Protected Areas Establishment

2.1 Results/Outputs: Two marine parks will be established initially. Appropriate legislation and park management guidelines will be drafted, and park facilities will be installed. Park managers and wardens will be posted permanently to the Marine Conservation Division and trained for the management of marine parks and reserves.

2.2 Project Components (Canadian Contribution): Assistance with site selection of additional parks/protected areas; assistance in the preparation of draft legislation and management guidelines; training of Park Manager(s) and Wardens; assistance in establishing the two presently proposed parks.

2.3 Government of Mauritius Contribution: Hire or post permanently to MCD under MFMR sufficient full-time staff (Manager(s), Wardens) and make available resources for detailed design and construction of park facilities. The World Bank EIP equipment fund should be used to equip the project at the outset. A limited amount of CIDA project funds can be used for equipment and materials, but those funds should be used for purchases as the project progresses and as needs arise. At the political level, facilitate enactment of legislation and regulations, ensuring that the park staff have the necessary authority to enforce regulations. Allocate land at the two proposed park sites so that purchase of equipment and design of facilities may begin. See also 'Schedule and Personnel' section concerning the establishment of a Steering Committee.

3. Coastal Ecosystems and Pollution Monitoring

3.1 Results/Outputs: A report will be prepared on baseline data collected to date by MCD as a part of the Lagoonal Health Characteristics and Coastal Pollution Project initiated with ICOD assistance in 1991. A plan for continued monitoring of the same variables will be prepared, and will be based on the report and MCD's experience in conducting the baseline studies. The plan will be implemented, and a second report that examines changes in the measured variables over the 5-year period (1991-96) will be prepared.

3.2 Project Components (Canadian Contribution): Assistance with data analysis and report preparation; "on-the-job" training in data analysis and report preparation, "refresher" training as needed, and short-term courses to enhance/up-grade skills now being used; supervision of conduct of the monitoring program.

3.3 Government of Mauritius Contribution: All MCD personnel involved in the Lagoonal Health project should participate in data analysis, report preparation, and preparing and implementing the monitoring plan. The new T.O.s in the Ecology team need to become certified SCUBA divers, and the SFAs should be permanently attached to the MCD. Another two T.O.s should be hired, one to be responsible for seagrass/invertebrates, and one to assist in the physical oceanography component. The World Bank EIP equipment fund should be used to equip the project at the outset. A limited amount of CIDA project funds can be used for equipment and materials, but those funds should be used for purchases as the project progresses and as needs arise. Any relevant training programs, seminars, etc. that become available should be supported by MFMR. See also 'Schedule and Personnel' section concerning the establishment of a Steering Committee.

4. Preparation of Draft Marine and Coastal Resource Legislation

4.1 Results/Outputs: Legislation and regulations for conservation, protection, and management of marine and coastal resources will be drafted. This possibly will be included in the new Fisheries Act, which should be re-titled the Marine and Coastal Resources Act.

4.2 Project Components (Canadian Contribution): A preliminary mission to collect information; and assistance in drafting legislation and regulations for marine resource conservation.

4.3 Government of Mauritius Contribution: Counterparts (to be identified in the preliminary mission). At the political level, facilitate enactment of legislation and regulations. See also 'Schedule and Personnel' section concerning the establishment of a Steering Committee.

Mauritius Marine Conservation Project Plan, Attachment 2
 Tentative Schedule, Prepared 17 April 1994

Single lines show activities in Canada or by counterparts in Mauritius
 Double lines show activities by Canadian consultants in Mauritius

Component Activity	1994			1995							1996							
	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S
Preparation Preliminary Plan																		
Detailed Plan																		
CIDA Evaluation																		
Counterpart Staffing																		
Mapping																		
System Design																		
Training																		
Mapping/Supervision																		
Coordination																		
Parks																		
Site Selection																		
Legislation/Guidelines																		
Training																		
Park Establishment																		
Ecosystems Analysis/Report																		
Training																		
Supervision																		
Legislation Preliminary Mission																		
Draft Legislation																		
Project Management																		

添付資料 4-1 ホテルの排水処理方法

ホテル名	処理方法	ホテル名	処理方法
Ambre Hotel, Belle Mare	T. P.	Le Grand Gaube Hotel, Grand gaube	T. P.
Arc en Ciel Baie du Tombeau	S. T.	Le Mauricia, Grand Baie	T. P.
Belle Mare Plage Golf Hotel & Resort	T. P.	Le Palmar Hotel, Belle Mare	S. T.
Belle Vista Hotel, Grand Baie	S. P.	Le Paradis Hotel, Belle Mare	S. T.
Berjaya Le Morne, Le Morne	T. P.	Le Pearle Beach Hotel, Flic en Flac	S. T.
Blue Lagoon Beach Hotel, Blue Bay	S. T.	Le Plaza Hotel, Curepipe	S. T.
Calamar Hotel, Pointe aux Piments	S. T.	Le Saint Georges Hotel, Port Louis	S. T.
Casa Florida Bungalows, Pereybere	S. T.	Le Saint Geran Sun Hotel, Belle Mare	T. P.
Casuarina Village Hotel, Trou aux Biches	S. T.	Le Sureouf Village Hotel, Palmar	S. T.
Club Med, Pointe aux Canonniers	T. P.	Le Touessrok Sun Hotel, Trou d'eau Douce	T. P.
Coin de Mire Village Hotel	S. T.	Le Tropical Hotel, Trou d'eau Douce	S. T.
Colonial Coconut Hotel, Grand Baie	S. T.	Les Orchidees Hotel (inland), Grand Baie	S. T.
Continental Hotel (inland), Curepipe	S. T.	Mandarin Hotel (inland), Curepipe	S. T.
Corotel, Le Goulet, Baie du Tombeau	S. T.	Manisa Hotel, Flic en Flac	S. T.
Crystal Beach Hotel, Flic en Flac	S. T.	Marina Holiday Village, Anse La Raie	S. T.
Domaine du Chasseur, Vieux Grand Port	S. T.	Maritime Hotel, Balaclava, Terre Rouge	T. P.
El Monaco Hotel (inland), Quatre Bornes	S. T.	Merville Beach Hotel, Grand Baie	T. P.
Emeraude Beach Hotel, Belle Mare	S. T.	Moonlight Bay Hotel	S. T.
Etoile de Mer Hotel, Trou aux Biches	S. T.	Paradise Cove Hotel, Anse La Raie	S. T.
Flic en Flac Hotel (inland), Flic en Flac	S. T.	PLM Azure Hotel, Anse La Raie	S. T.
Gold Crest Hotel (inland), Quatre Bornes	S. T.	Riverside Hotel (inland), Belle Rose	S. T.
Hibiscus Village Vacances, Perybere	S. T.	Royal Palm Hotel, Grand Baie	T. P.
Hotel Club, Riviere Noire	T. P.	Sandy Bay Hotel, Belle Mare	S. T.
Island Sport Club Hotel, Black River	S. T.	Sea Point Beach Bungalows	S. T.
Island View Club Hotel, Grand Gaube	S. T.	Shandrani Hotel, Plaine Magnien	T. P.
Klondike Village Vacances, Flic en Flac	S. T.	Shanghai Hotel (inland), Curepipe	S. T.
La Croix du Sud, Pointe Jerome	T. P.	Silver Beach Hotel, Trou d'eau Douce	T. P.
La Maison, Cap Malheuteux	S. T.	Sofitel Imperial Hotel, Flic en Flac	T. P.
La Pirogue Sun Hotel, Flic en Flac	T. P.	Tamarin Hotel, Tamarin Bay	S. T.
La Reserve Club Hotel, Belle Mare	S. T.	Trou aux Biches Village Hotel	T. P.
Le Brabant Hotel, Le Morne	T. P.	Ventura Hotel, Grand Baie	S. T.
Le Canonnier Hotel,	T. P.	Veranda Bungalow Village, Grand Baie	S. T.
Le Capri Hotel, Baie du Tombeau	S. T.	Villas Caroline Beach Hotel, Flic en Flac	S. T.
Le Flamboyant Hotel, Belle Mare	S. T.	Villas Pointe aux Biches	S. T.
Le Gavnor Hotel (inland), Quatre Bornes	S. T.	Villas Pointe aux Roches, Chemin Grenier	S. T.
Le Grand Bleu Hotel, Trou aux Biches	S. T.	Villas Sand n Dory, Flic en Flac	S. T.

注) T. P. : Treatment Plant

S. T. : Septic Tank

添付資料 4-2 長期モニタリング地点
及び環境的特徴



Scale: 1:2000,000

Sites	Reasons
1. Pointe aux Sables	: Domestic and Industrial Pollution
2. Balaclava	: Proposed Marine Park Site
3. Trou aux Biches	: Tourist Development Zone,
4. Anse La Raie - Grand Gaube	: Low Development Zone
5. Trou D'Eau Douce	: Freshwater Input
6. Bambous Virieux	: GRSE Catchment Area and Siltation
7. Bel Ombre	: Sugar Industry Wastes
8. Ile aux Benitiers	: Control Site

添付資料 4-3 各モニタリング地点での水質分析結果

Site 1 : Ile aux Benitiers

Date	Station	NO3 mg/l	PO4 mg/l	Cr6+ mg/l	BOD5 mg/l	Temp deg C
7/8/91	Fore reef	0.3	0.07		0.7	26
	Sea grass	1	0.05		0.5	24
18/9/91	Fore reef	1.2	0.05		0.8	
	Sea grass	1.2	0.07		0.8	
21/1/92	Fore reef	0.5	0.08	0.03	0.9	30
	Back reef	0.8	0.01	0.05	0.4	30.5
	Shore reef	0.5	0.02	0.04	0.6	31
	Sea grass	0.5	0.02	0.04	0.6	30
6/5/92	Fore reef	0.7	0.01	0	0.6	28
	Back reef	0.7	0.04	0.01	0.7	28
	Shore reef	0.8	0.01	0	1	28
	Sea Grass	0.6	0.02	0	1.3	28.5
27/5/92	Back reef	0.5	0.02		0.4	27
	Shore reef	0.6	0.03		1.1	26.5
	Sea grass	0.5	0.05		1.2	26
9/9/92	Fore reef	0.7	0.02	0	0.8	23.5
	Back reef	0.5	0.01	0	0.6	24.7
	Shore reef	0.6	0.02	0	0.8	24
	Sea grass	0.7	0.03	0.01	0.9	23.7
17/3/93	Fore reef	0.5	0.03		0.4	29
	Back reef	0.5	0.02		0.8	29
	Shore reef	0.5	0.01		1.2	29
	Sea grass	0.4	0.02		0.6	30
18/8/93	Fore reef	0.4	0.02	0.01	1	23.5
	Back reef	0.4	0.06	0	1.2	23.5
	Shore reef	0.5	0.01	0	1.2	23
	Sea grass	0.6	0.01	0.01	0.2	28.5
Average		0.62	0.030	0.013	0.79	27.0

Site 2 : Trou aux Biches

Date	Station	NO3 mg/l	PO4 mg/l	Cr6+ mg/l	BOD5 mg/l	Temp deg C
12/12/91	Fore reef	0.6	0.04	0.02	0.6	26.5
	Back reef	0.5	0.01	0.03	0.4	
	Shore reef	0.4	0.01	0.02	0.6	26.5
	Sea grass	0.6	0.01	0.03	1.4	
1/4/92	Fore reef	0.8	0.08	0	0.2	28.5
	Back reef	1.2	0.05	0.01	0.5	29.5
	Shore reef	0.9	0.02	0	0.8	29
	Sea grass	0.7	0.04	0.1	0.8	30
17/6/92	Fore reef	0.5	0.01	0	0.4	25
	Back reef	0.8	0.01	0	0.3	25
	Shore reef	0.6	0.02	0	0.8	26
	Sea grass	0.7	0.01	0	0.3	24.5
5/8/92	Back reef	0.5	0.02	0	0.1	23.3
	Shore reef	0.8	0.03	0	0.2	23
	Sea grass	0.8	0.05	0.01	0.4	23.7
11/11/92	Fore reef	0.7	0.02	0.01	0.6	22
	Back reef	0.4	0.03	0.01	0.4	26
	Shore reef	0.5	0.08	0.01	0.7	26
	Sea grass	0.3	0.04	0.01	0.5	26.5
14/7/93	Fore reef	0.4	0.06		0.5	25
	Shore reef	0.3	0.04		0.4	25
	Back reef	0.4	0.04		0.3	25
	Sea grass	0.4	0.05		0.6	25.5
Average		0.60	0.033	0.014	0.51	25.8

Site 3 : Anse la Raie

Date	Station	NO3 mg/l	PO4 mg/l	Cr6+ mg/l	BOD5 mg/l	Temp deg C
11/12/91	Back reef	0.8	0.03	0.01	1.6	26.5
	Fore reef	0.7	0.04	0.02	1	26.5
	Sea grass	0.8	0.11	0.02	1.4	28
8/1/92	Fore reef	0.7	0.05	0.04	0.8	28.5
	Back reef	0.6	0.03	0.03	0.5	29.5
	Sea grass	0.7	0.03	0.04	0.6	31
15/4/92	Fore reef	0.8	0.05	0.01	1	27
	Back reef	0.9	0.02	0.02	0.7	27
	Sea grass	0.9	0.04	0.01	1.1	27
24/6/92	Back reef	0.1	0.01	0	0.5	25
	Sea grass	0.2	0.01	0.01	0.8	24.5
12/8/92	Back reef	0.8	0.02	0.01	0.3	24.2
	Sea grass	1	0.02	0.01	0.4	24.5
25/11/92	Fore reef	0.6	0.05	0	0.5	27.5
	Back reef	0.7	0.02	0.01	0.8	28
	Sea grass	0.9	0.01	0	0.8	29.2
5/5/93	Back reef	1	0.03		0.3	27.5
	Sea grass	0.7	0.02		0.4	28
Average		0.72	0.033	0.015	0.75	27.2

Site 4 : Trou d`Eau Douce

Date	Station	NO3 mg/l	PO4 mg/l	Cr6+ mg/l	BOD5 mg/l	Temp deg C
6/11/91	Back reef	0.8	0.01		0.4	22.5
	Shore reef	1	0.04	0.02	1.3	26
	Sea grass	1.1	0.05	0.02	1	26
19/2/92	Back reef	0.8	0.01	0.02	1.1	29
	Shore reef	0.7	0.05	0.02	0.8	29.5
	Sea grass	0.9	0.02	0.03	0.8	30
20/5/92	Back reef	0.6	0.02	0.01	0.2	25
	Shore reef	0.6	0.01	0.01	0.4	25
	Sea Grass	0.7	0.02	0	0.3	25
15/7/92	Shore reef	0.3	0.05	0	0.9	22
	Sea grass	0.4	0.04	0	1.2	22.5
30/9/92	Back reef	0.5	0.04	0	1	24.5
	Shore reef	0.6	0.01	0.01	0.9	24.5
	Sea grass	0.8	0.01	0	0.8	25
1/4/93	Back reef	0.9	0.03		0.8	29
	Shore reef	1.3	0.08		0.7	29
	Sea grass	1	0.05		0.8	29
25/8/93	Shore reef	1.1	0.06		0.6	22.5
	Average	0.78	0.033	0.011	0.78	25.9

Site 5 : Bambous Virieux

Date	Station	NO3 mg/l	PO4 mg/l	Cr6+ mg/l	BOD5 mg/l	Temp deg C
27/11/91	Back reef	0.7	0.1	0.03	0.8	28.5
	Shore reef	0.8	0.03	0.04	0.9	28
	Sea grass	0.6	0.22	0.03	1.2	28.5
11/3/92	Back reef	0.8	0.05	0.01	0.9	29
	Shore reef	0.7	0.03	0.01	0.9	29
	Sea grass	1	0.04	0.01	0.8	29
22/7/92	Back reef	0.6	0.07	0.01	0.5	23
	Shore reef	0.2	0.01	0	0.7	22.5
	Sea Grass	0.4	0.03	0.01	0.3	22.5
4/11/92	Back reef	0.6	0.07	0	0.2	28
	Shore reef	0.7	0.03	0.01	0.4	28
	Sea grass	0.6	0.05	0	0.4	27.5
10/3/93	Back reef	0.6	0.02		0.8	29
	Shore reef	0.9	0.06		0.7	29
	Sea grass	0.7	0.04		0.8	29
13/10/93	Back reef	0.6	0.07		0.3	24
	Shore reef	0.7	0.04		0.9	24
	Sea grass	0.7	0.08		0.6	24.5
	Average	0.66	0.058	0.013	0.67	26.8

Site 6 : Bel Ombre

Date	Station	NO3 mg/l	PO4 mg/l	Cr6+ mg/l	BOD5 mg/l	Temp deg C
13/11/91	Back reef	1.1	0.02	0.02		
	Shore reef	0.5	0.01	0.02		
	Sea grass	1.1	0.01	0.02		
4/3/92	Back reef	0.9	0.06	0.02	0.9	29.5
	Shore reef	0.9	0.08	0.05	0.6	29.5
	Sea grass	0.7	0.08	0.03	0.5	29
29/7/92	Back reef	0.6	0.07	0	0.3	23.5
	Shore reef	0.6	0.05	0.01	0.9	23.5
	Sea Grass	1.1	0.06	0	0.7	23.5
7/10/92	Back reef	0.2	0.03	0	0.2	25
	Shore reef	0.4	0.04	0	0.2	25.5
	Sea grass	0.3	0.01	0	0.2	25.5
7/4/93	Back reef	0.7	0.03		0.5	28
	Shore reef	0.7	0.02		0.2	28
	Sea grass	0.8	0.03		0.4	28
11/8/93	Back reef	0.5	0.07		0.4	24.5
	Shore reef	0.6	0.05		0.9	25
	Sea grass	0.7	0.04		0.5	25
	Average	0.69	0.042	0.014	0.49	26.2

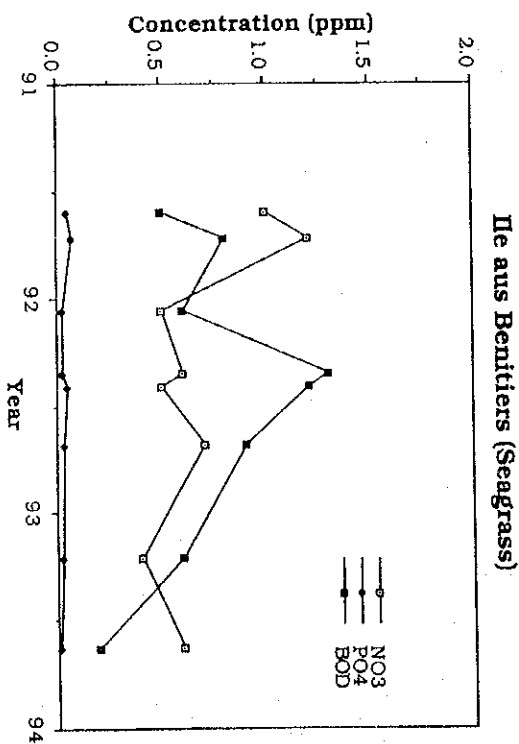
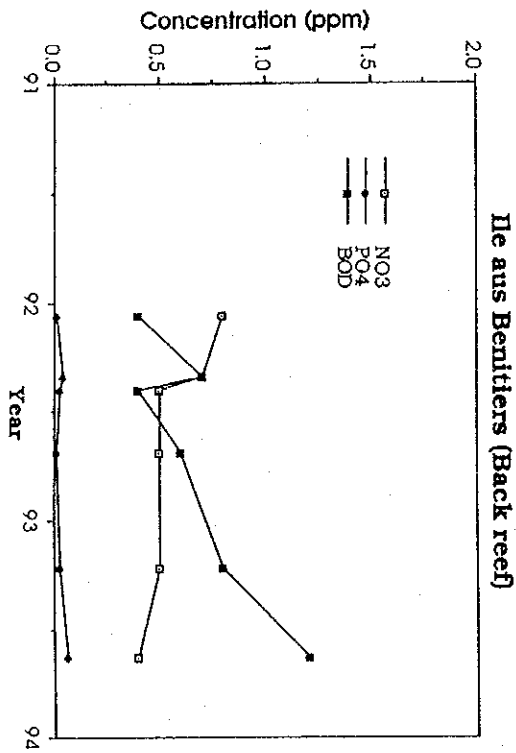
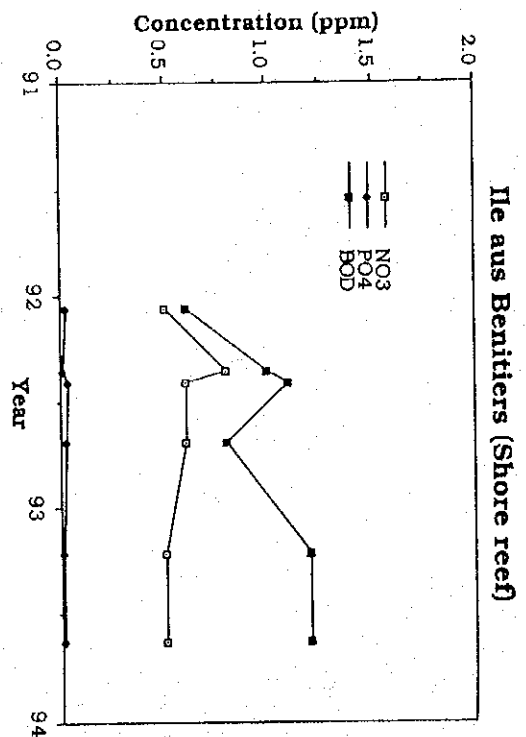
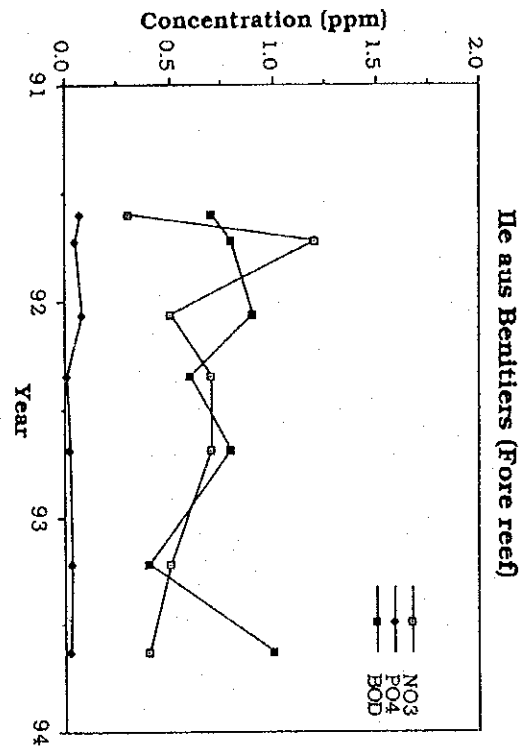
Site 7 : Pte aux Sables

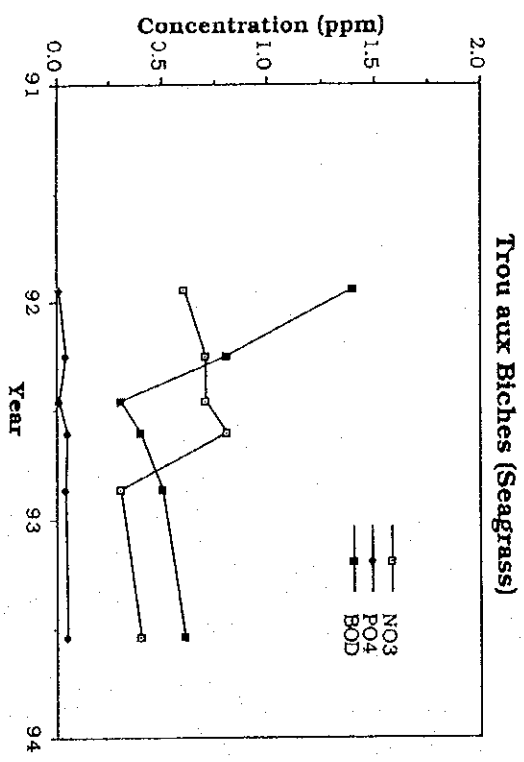
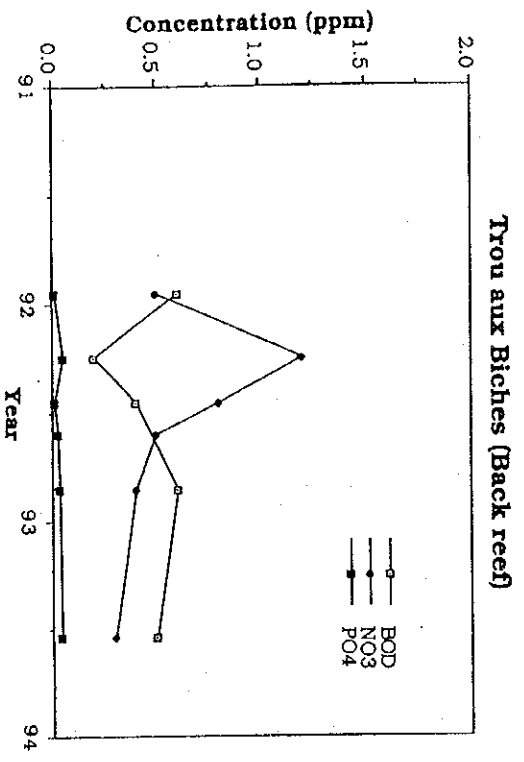
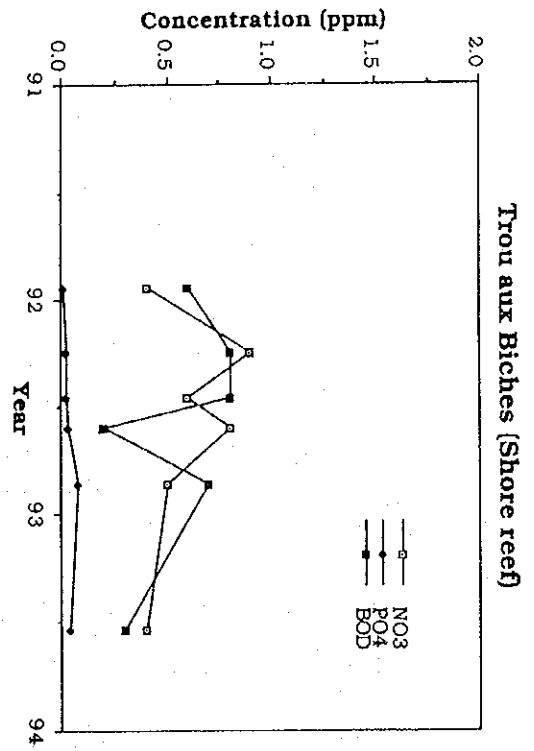
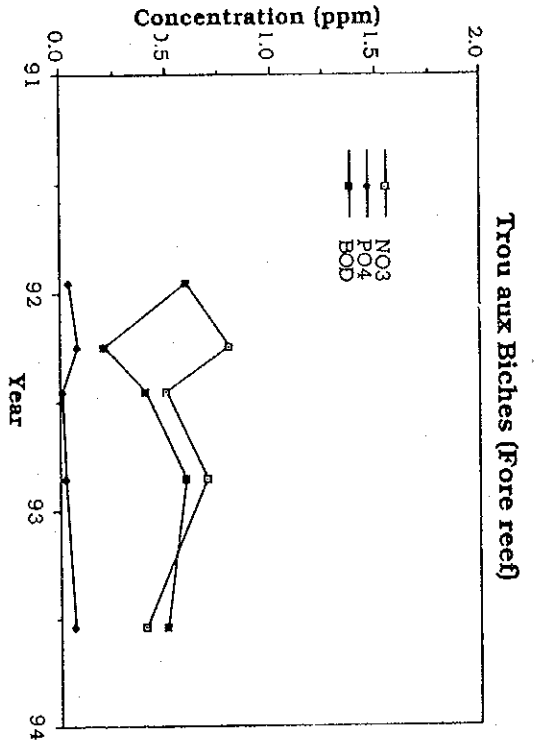
Date	Station	NO3 mg/l	PO4 mg/l	Cr6+ mg/l	BOD5 mg/l	Temp deg C
4/9/91	Fore reef	0.7	0.07	0.02	0.8	23
	Back reef	1	0.04	0.02	1.4	23
	Shore reef	1.1	0.05	0.02	0.7	23
18/12/91	Fore reef	1.1	0.03	0.04	0.8	28
	Back reef	0.9	0.03	0.03	0.6	28.5
	Shore reef	0.7	0.04	0.03	1.1	28.5
22/4/92	Fore reef	0.7	0.05	0.01	0.7	27.5
	Back reef	0.5	0.02	0.01	0.6	28
	Sea Grass	0.8	0.04	0	0.8	28
19/8/92	Fore reef	1	0.03	0.01	0.5	23
	Shore reef	0.9	0.02		0.4	23
	Back reef	0.9	0.02		0.4	23
9/12/92	Fore reef	1.4	0.02	0.01	0.3	27
	Shore reef	1	0.08	0.01	0.8	27.5
	Back reef	1.1	0.04	0.01	0.4	27
21/5/93	Fore reef	0.9	0.09	0.01	0.8	27.5
	Back reef	1	0.04		0.7	26.5
	Sea grass	0.3	0.03		0.8	26.5
	Average	0.89	0.041	0.016	0.70	26.0

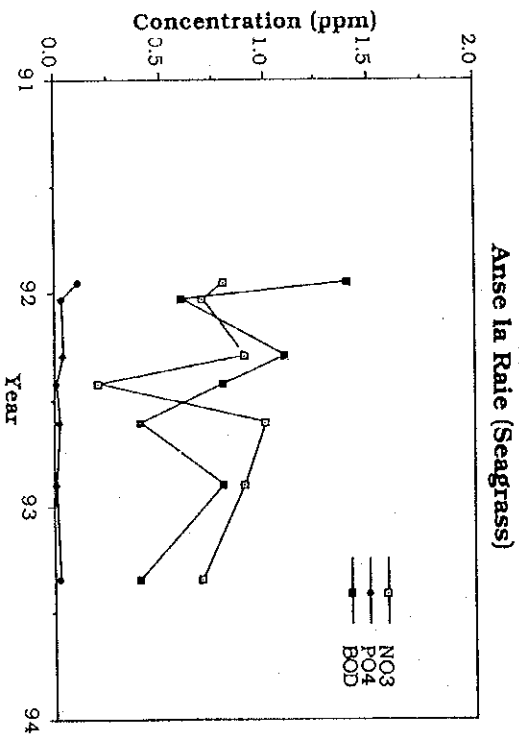
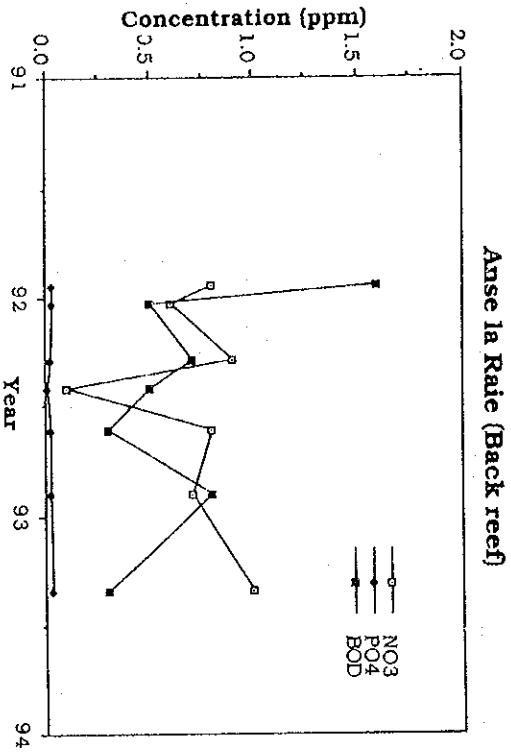
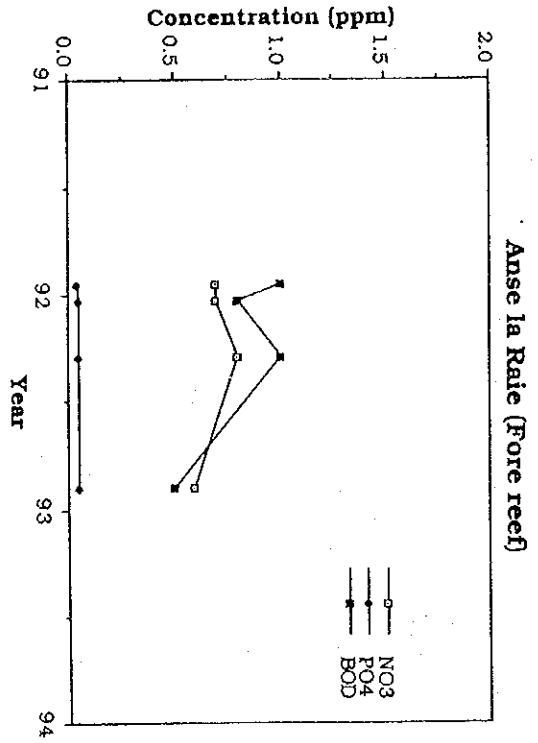
Site 8 : Balaclava

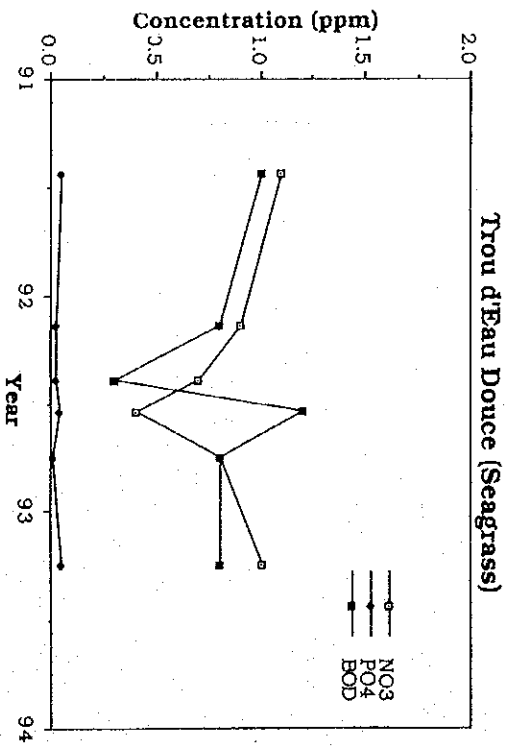
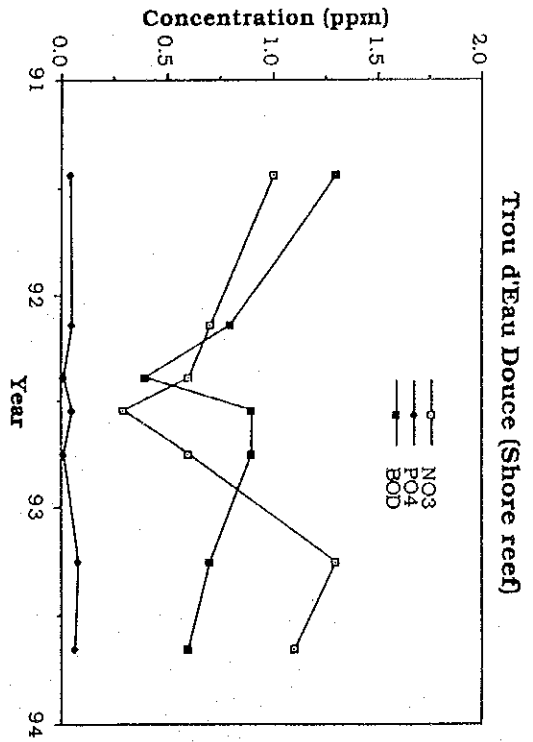
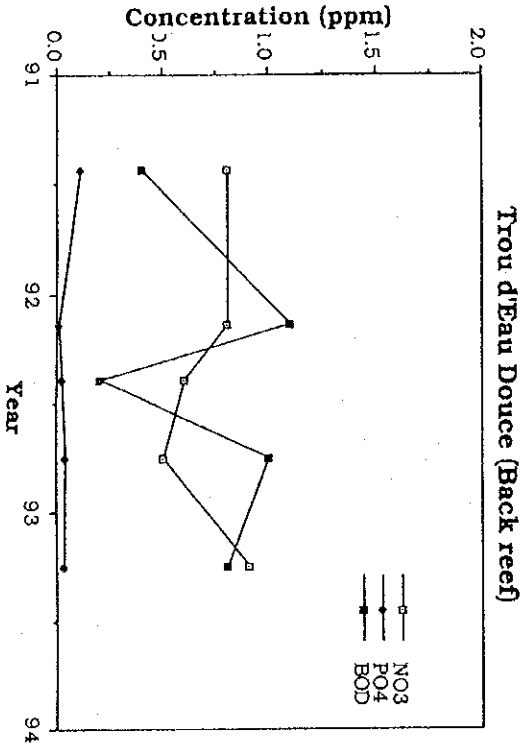
Date	Station	N03 mg/l	PO4 mg/l	Cr6+ mg/l	BOD5 mg/l	Temp deg C
24/7/91	Fore reef	0.2	0.03		0.8	2.8
	Shore reef	0.3	0.04		0.5	23
	Sea grass	0.3	0.04		0.9	2.5
23/10/91	Fore reef	0.6	0.04	0.02	0.9	
	Shore reef	0.3	0.02	0.02	1.5	
	Sea grass	1.2	0.08	0.01	1.3	
12/2/92	Fore reef	0.8	0.04	0.04	1	29.5
	Shore reef	0.5	0.05	0.05	1.1	29.2
	Sea grass	0.7	0.04	0.04	1.3	29.2
13/5/92	Fore reef	0.6	0.06	0.01	0.8	26
	Shore reef	0.7	0.02	0	0.6	26
	Sea grass	0.8	0.05	0	0.4	26
1/7/92	Fore reef	1.1	0.06	0.01	0.6	25
	Shore reef	0.2	0.02	0	1.2	25
	Sea grass	0.3	0.02	0	1.7	25
16/9/92	Fore reef	0.7	0.02	0	0.6	24
	Shore reef	0.5	0.03	0	0.4	24
	Sea grass	0.4	0.04	0	0.3	24
3/2/93	Fore reef	0.9	0.02		0.6	28
	Shore reef	1	0.04	0.01	0.8	28
	Sea grass	0.6	0.05	0.01	0.9	29
21/7/93	Fore reef	0.4	0.06		0.4	24
	Shore reef	0.4	0.02		0.8	24
	Sea grass	0.6	0.06		0.9	24
Average		0.59	0.040	0.013	0.85	23.7

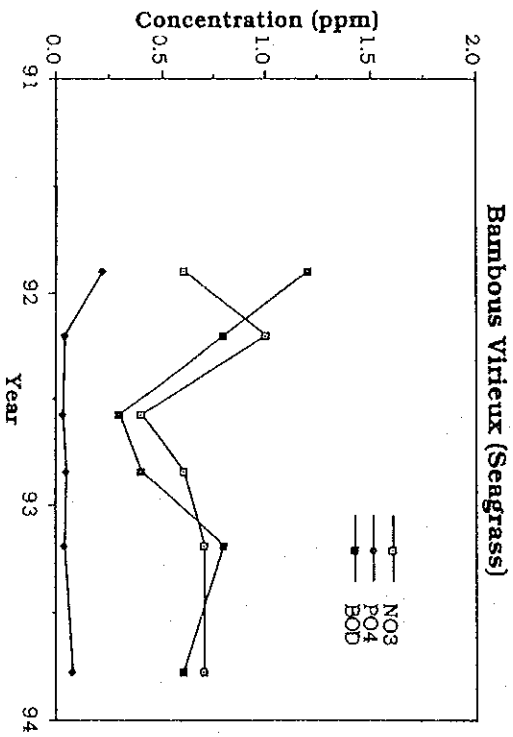
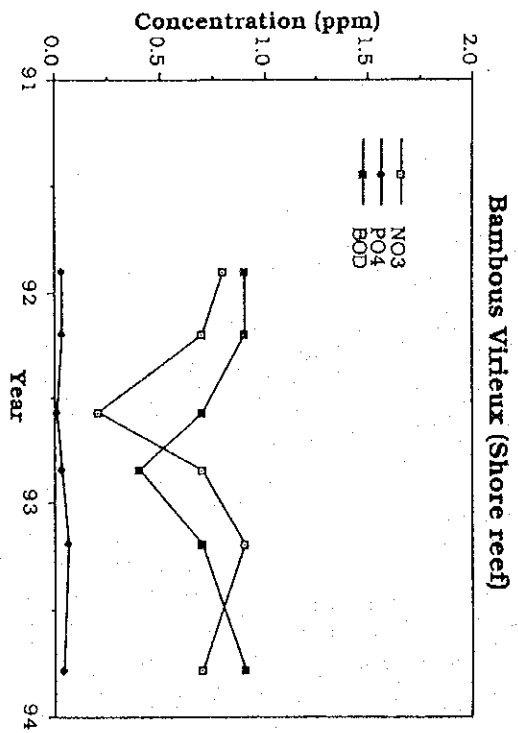
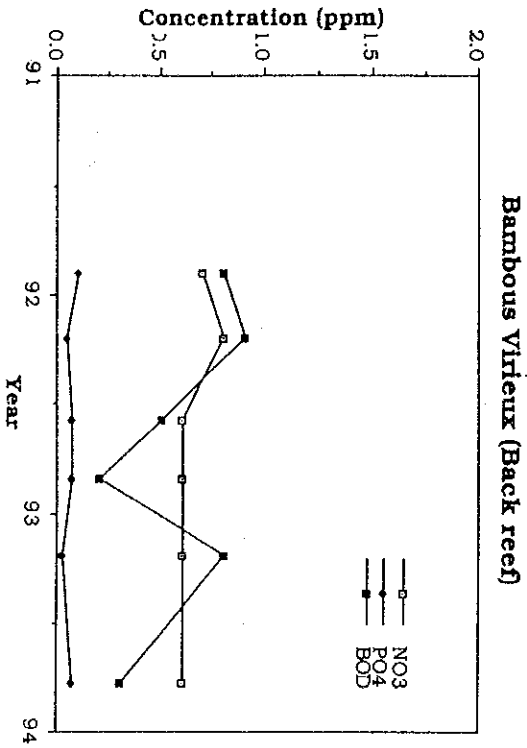
添付資料 4-4 水質の長期変動図及び統計解析結果

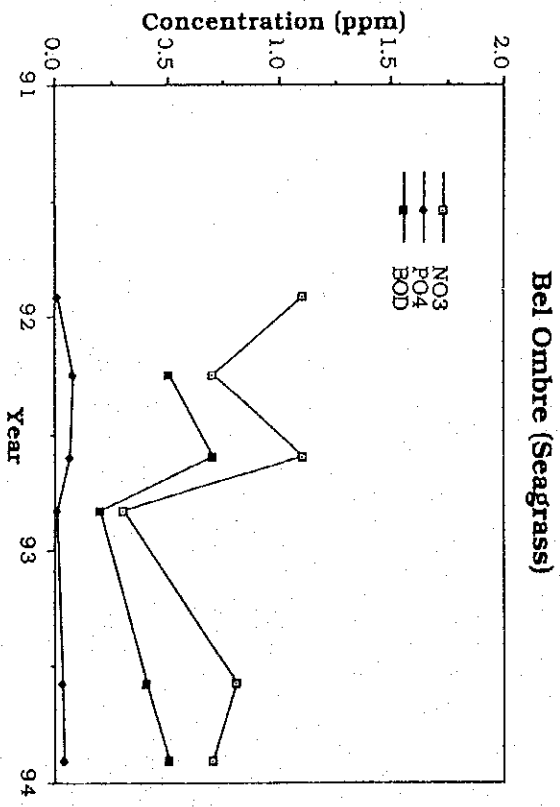
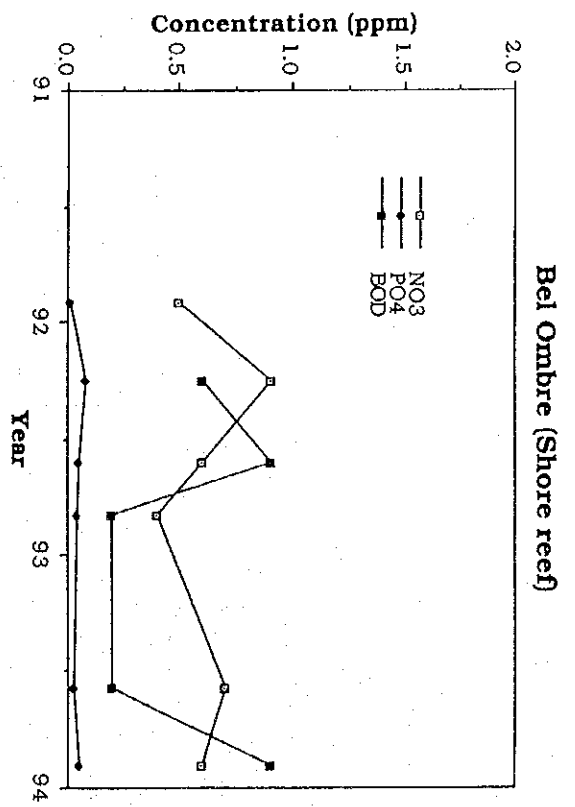
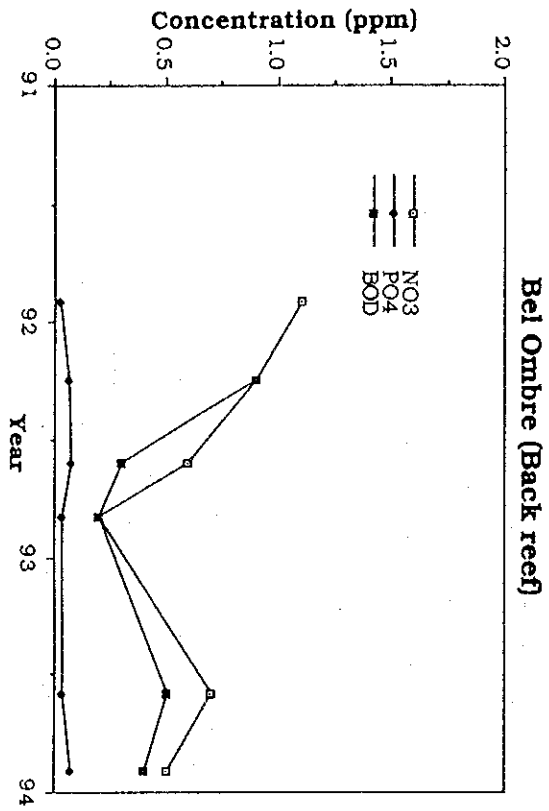


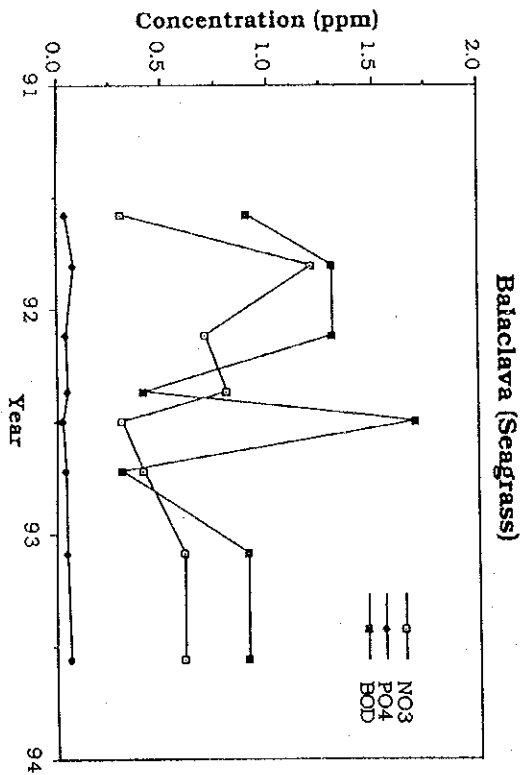
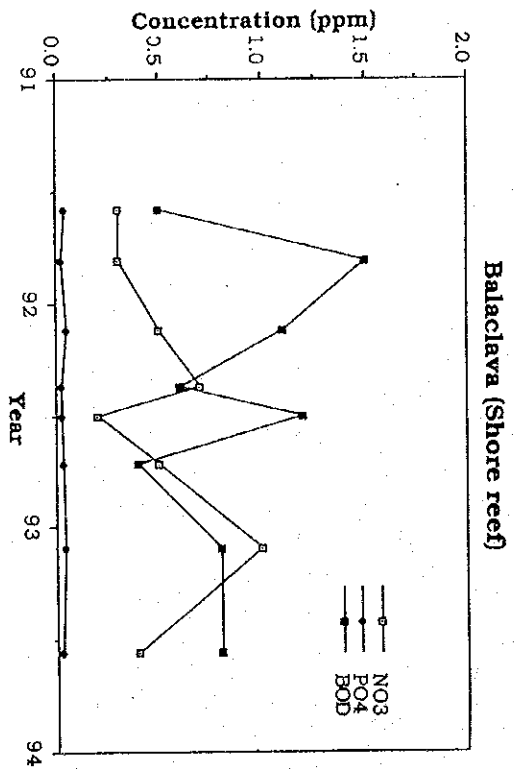
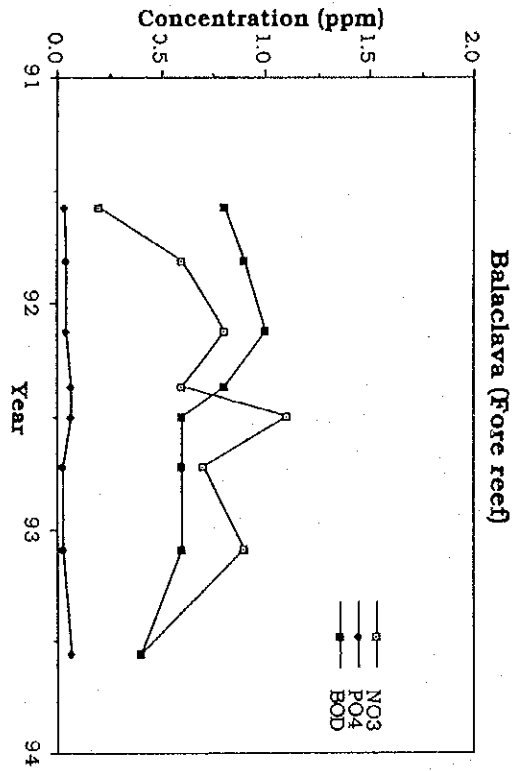


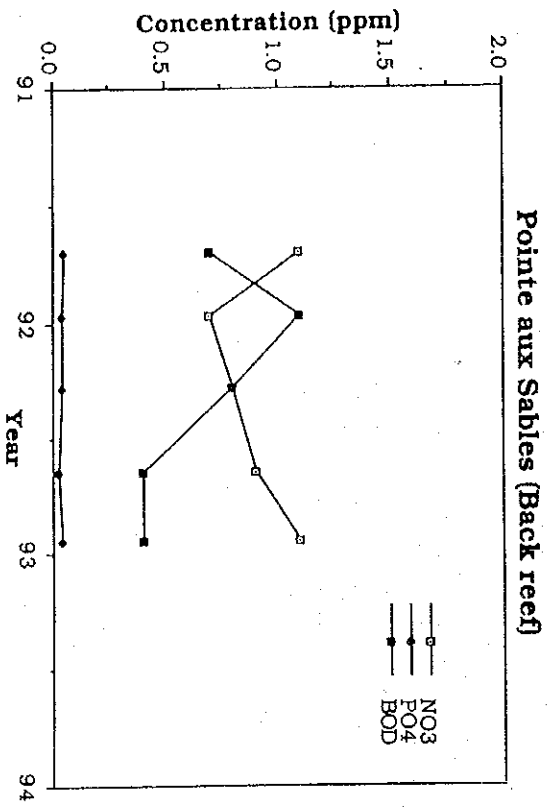
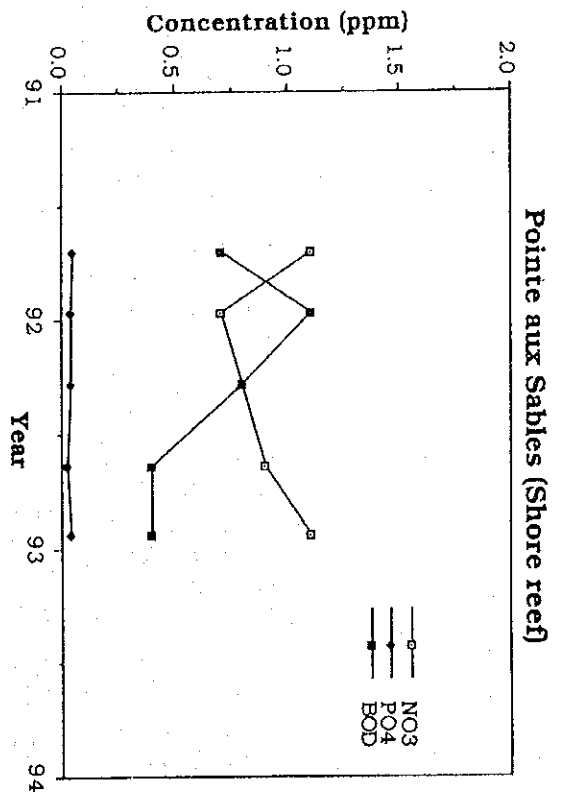
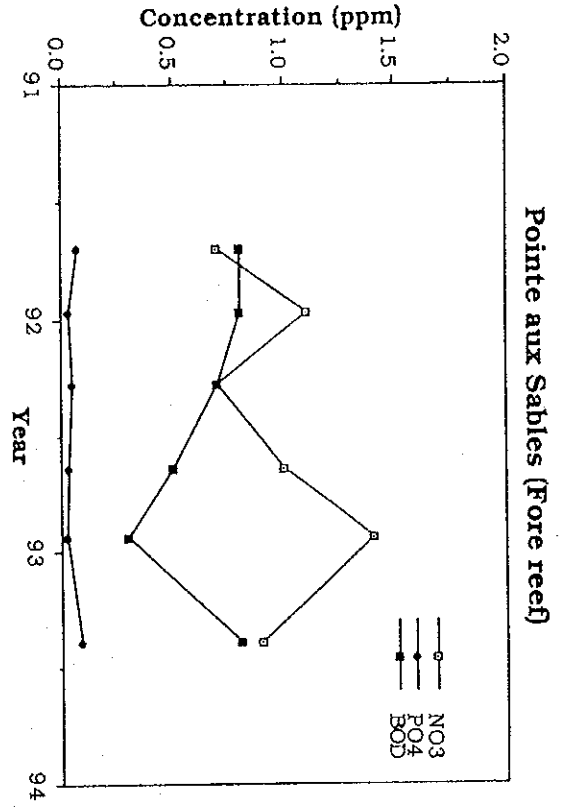












分散分析表 : NO3

	自由度	平方和	平均平方	F値	p値
STATION	7	1.463	.209	3.609	.0012
誤差	156	9.035	.058		

コンポーネント間の分散の推定値 (II型) : 7.402E-3

FisherのPLSD : NO3

効果 : STATION

有意水準 : 5 %

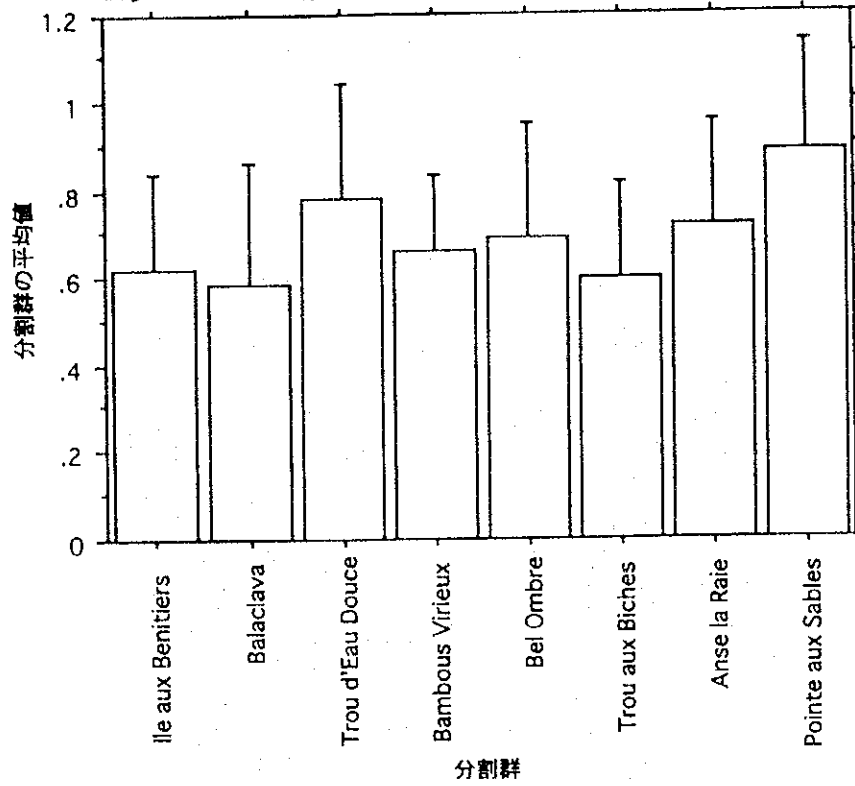
	平均値の差	棄却値	p値	
Ile aux Benitiers, Balaclava	.031	.133	.6466	
Ile aux Benitiers, Trou d'Ea ...	-.165	.145	.0258	S
Ile aux Benitiers, Bambous ...	-.043	.145	.5617	
Ile aux Benitiers, Bel Ombre	-.070	.145	.3381	
Ile aux Benitiers, Trou aux ...	.019	.135	.7866	
Ile aux Benitiers, Anse la R ...	-.098	.145	.1821	
Ile aux Benitiers, Pointe au ...	-.270	.145	.0003	S
Balaclava, Trou d'Eau Douce	-.196	.148	.0099	S
Balaclava, Bambous Virieux	-.074	.148	.3281	
Balaclava, Bel Ombre	-.101	.148	.1786	
Balaclava, Trou aux Biches	-.013	.139	.8590	
Balaclava, Anse la Raie	-.129	.148	.0872	
Balaclava, Pointe aux Sables	-.301	.148	<.0001	S
Trou d'Eau Douce, Bambous ...	.122	.158	.1296	
Trou d'Eau Douce, Bel Ombre	.094	.158	.2409	
Trou d'Eau Douce, Trou aux ...	.183	.150	.0166	S
Trou d'Eau Douce, Anse la R ...	.067	.158	.4072	
Trou d'Eau Douce, Pointe au ...	-.106	.158	.1902	
Bambous Virieux, Bel Ombre	-.028	.158	.7296	
Bambous Virieux, Trou aux ...	.061	.150	.4210	
Bambous Virieux, Anse la R ...	-.056	.158	.4896	
Bambous Virieux, Pointe au ...	-.228	.158	.0051	S
Bel Ombre, Trou aux Biches	.089	.150	.2423	
Bel Ombre, Anse la Raie	-.028	.158	.7296	
Bel Ombre, Pointe aux Sables	-.200	.158	.0137	S
Trou aux Biches, Anse la Raie	-.117	.150	.1255	
Trou aux Biches, Pointe aux ...	-.289	.150	.0002	S
Anse la Raie, Pointe aux Sa ...	-.172	.158	.0334	S

基本統計量 : NO3

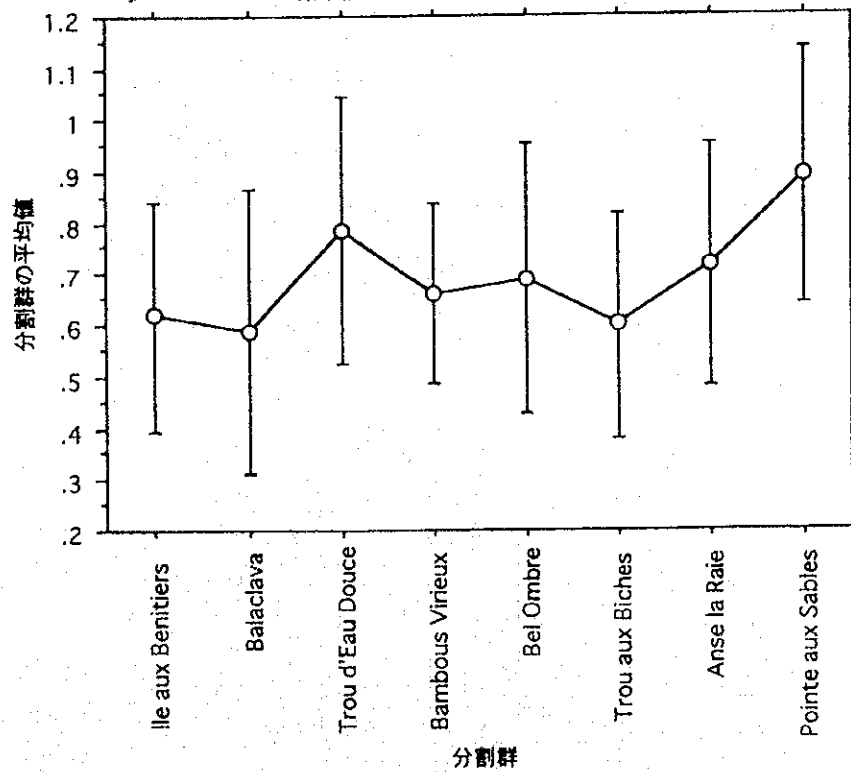
効果 : STATION

	例数	平均値	標準偏差	標準誤差
Ile aux Benitiers	27	.619	.224	.043
Balaclava	24	.587	.279	.057
Trou d'Eau Douce	18	.783	.262	.062
Bambous Virieux	18	.661	.175	.041
Bel Ombre	18	.689	.263	.062
Trou aux Biches	23	.600	.220	.046
Anse la Raie	18	.717	.238	.056
Pointe aux Sables	18	.889	.249	.059

交互作用棒グラフ : N03
 効果 : STATION
 エラーバー : ± 1 標準偏差



交互作用折れ線グラフ : N03
 効果 : STATION
 エラーバー : ± 1 標準偏差



分散分析表 : PO4

	自由度	平方和	平均平方	F値	p値
STATION	7	.011	1.525E-3	2.408	.0229
誤差	156	.099	6.332E-4		

コンポーネント間の分散の推定値 (II型) : 4.366E-5

FisherのPLSD : PO4

効果 : STATION

有意水準 : 5 %

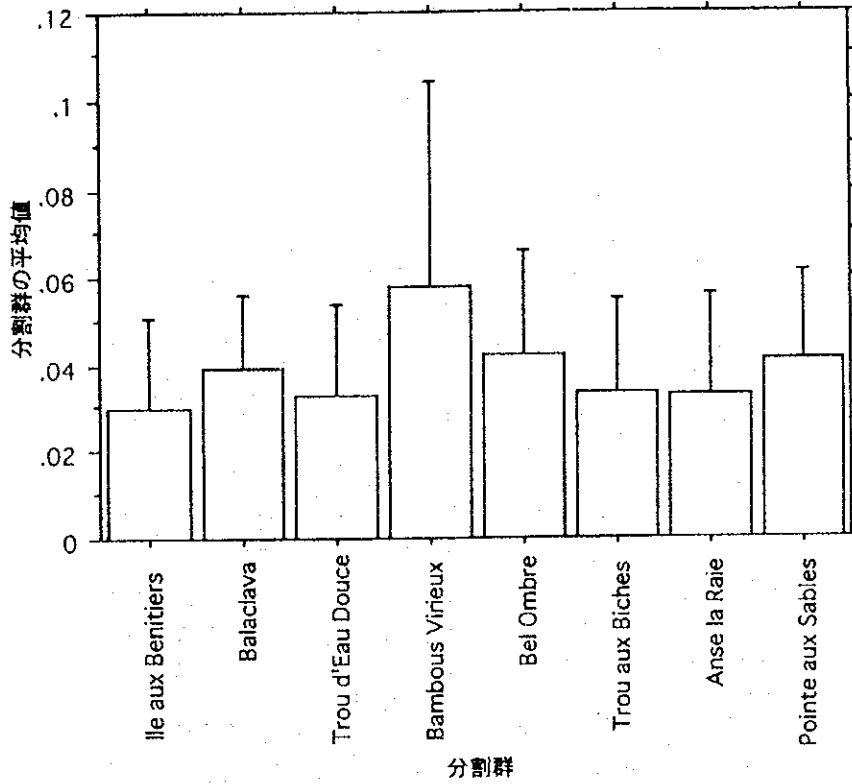
	平均値の差	棄却値	p値	
Ile aux Benitiers, Balaclava	-9.583E-3	.014	.1766	
Ile aux Benitiers, Trou d'Ea ...	-3.333E-3	.015	.6639	
Ile aux Benitiers, Bambous ...	-.028	.015	.0004	S
Ile aux Benitiers, Bel Ombre	-.012	.015	.1125	
Ile aux Benitiers, Trou aux ...	-3.478E-3	.014	.6268	
Ile aux Benitiers, Anse la R ...	-2.778E-3	.015	.7173	
Ile aux Benitiers, Pointe au ...	-.011	.015	.1488	
Balaclava, Trou d'Eau Douce	6.250E-3	.015	.4269	
Balaclava, Bambous Virieux	-.018	.015	.0217	S
Balaclava, Bel Ombre	-2.639E-3	.015	.7371	
Balaclava, Trou aux Biches	6.105E-3	.015	.4070	
Balaclava, Anse la Raie	6.806E-3	.015	.3871	
Balaclava, Pointe aux Sables	-1.528E-3	.015	.8459	
Trou d'Eau Douce, Bambous ...	-.024	.017	.0041	S
Trou d'Eau Douce, Bel Ombre	-8.889E-3	.017	.2909	
Trou d'Eau Douce, Trou aux ...	-1.449E-4	.016	.9854	
Trou d'Eau Douce, Anse la R ...	5.556E-4	.017	.9473	
Trou d'Eau Douce, Pointe au ...	-7.778E-3	.017	.3552	
Bambous Virieux, Bel Ombre	.016	.017	.0655	
Bambous Virieux, Trou aux ...	.024	.016	.0025	S
Bambous Virieux, Anse la R ...	.025	.017	.0033	S
Bambous Virieux, Pointe au ...	.017	.017	.0487	S
Bel Ombre, Trou aux Biches	8.744E-3	.016	.2712	
Bel Ombre, Anse la Raie	9.444E-3	.017	.2619	
Bel Ombre, Pointe aux Sables	1.111E-3	.017	.8948	
Trou aux Biches, Anse la Raie	7.005E-4	.016	.9296	
Trou aux Biches, Pointe aux ...	-7.633E-3	.016	.3366	
Anse la Raie, Pointe aux Sa ...	-8.333E-3	.017	.3220	

基本統計量 : PO4

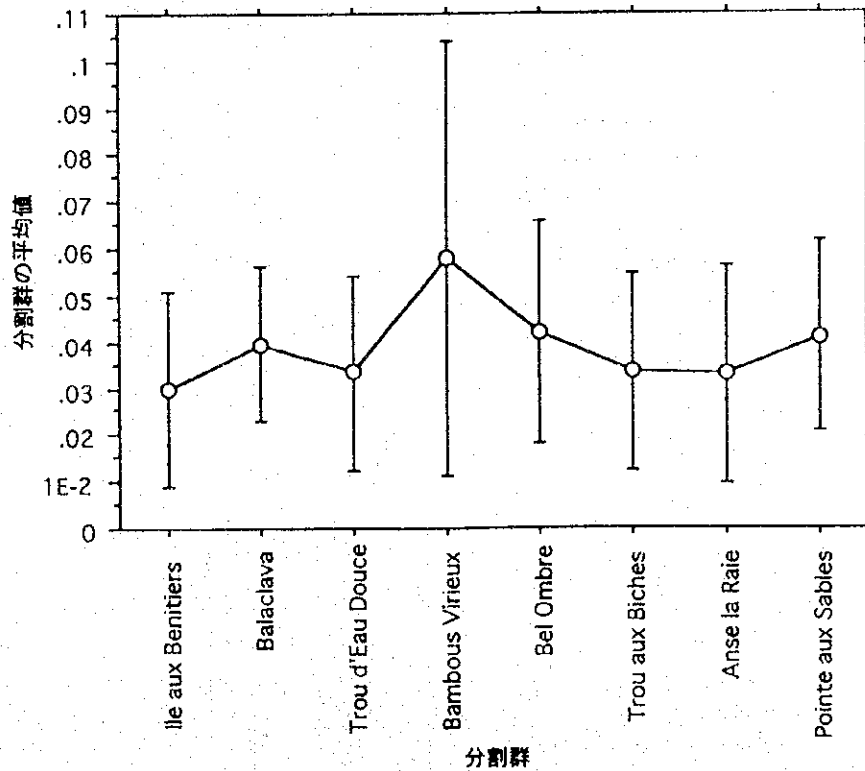
効果 : STATION

	例数	平均値	標準偏差	標準誤差
Ile aux Benitiers	27	.030	.021	4.065E-3
Balaclava	24	.040	.017	3.430E-3
Trou d'Eau Douce	18	.033	.021	4.918E-3
Bambous Virieux	18	.058	.047	.011
Bel Ombre	18	.042	.024	5.633E-3
Trou aux Biches	23	.033	.021	4.473E-3
Anse la Raie	18	.033	.023	5.531E-3
Pointe aux Sables	18	.041	.021	4.843E-3

交互作用棒グラフ : P04
 効果 : STATION
 エラーバー : ± 1 標準偏差



交互作用折れ線グラフ : P04
 効果 : STATION
 エラーバー : ± 1 標準偏差



分散分析表 : BOD

	自由度	平方和	平均平方	F値	p値
STATION	7	2.336	.334	3.602	.0013
誤差	153	14.174	.093		

コンポーネント間の分散の推定値 (II型) : .012

FisherのPLSD : BOD

効果 : STATION

有意水準 : 5 %

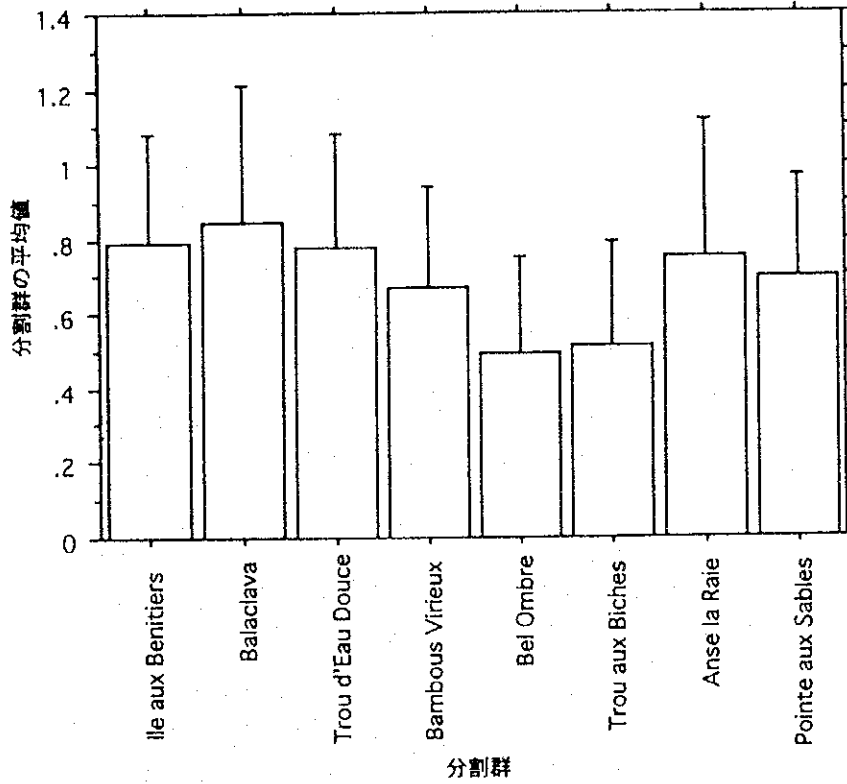
	平均値の差	棄却値	p値	
Ile aux Benitiers, Balaclava	-.057	.169	.5058	
Ile aux Benitiers, Trou d'Ea ...	.011	.183	.9047	
Ile aux Benitiers, Bambous ...	.117	.183	.2097	
Ile aux Benitiers, Bel Ombre	.296	.194	.0030	S
Ile aux Benitiers, Trou aux ...	.276	.171	.0017	S
Ile aux Benitiers, Anse la R ...	.039	.183	.6752	
Ile aux Benitiers, Pointe au ...	.089	.183	.3387	
Balaclava, Trou d'Eau Douce	.068	.187	.4744	
Balaclava, Bambous Virieux	.174	.187	.0693	
Balaclava, Bel Ombre	.352	.198	.0006	S
Balaclava, Trou aux Biches	.333	.175	.0003	S
Balaclava, Anse la Raie	.096	.187	.3142	
Balaclava, Pointe aux Sables	.146	.187	.1264	
Trou d'Eau Douce, Bambous ...	.106	.200	.2998	
Trou d'Eau Douce, Bel Ombre	.284	.210	.0083	S
Trou d'Eau Douce, Trou aux ...	.265	.189	.0064	S
Trou d'Eau Douce, Anse la R ...	.028	.200	.7846	
Trou d'Eau Douce, Pointe au ...	.078	.200	.4445	
Bambous Virieux, Bel Ombre	.179	.210	.0948	
Bambous Virieux, Trou aux ...	.159	.189	.0986	
Bambous Virieux, Anse la R ...	-.078	.200	.4445	
Bambous Virieux, Pointe au ...	-.028	.200	.7846	
Bel Ombre, Trou aux Biches	-.020	.200	.8456	
Bel Ombre, Anse la Raie	-.257	.210	.0170	S
Bel Ombre, Pointe aux Sables	-.207	.210	.0539	
Trou aux Biches, Anse la Raie	-.237	.189	.0145	S
Trou aux Biches, Pointe aux ...	-.187	.189	.0528	
Anse la Raie, Pointe aux Sa ...	.050	.200	.6228	

基本統計量 : BOD

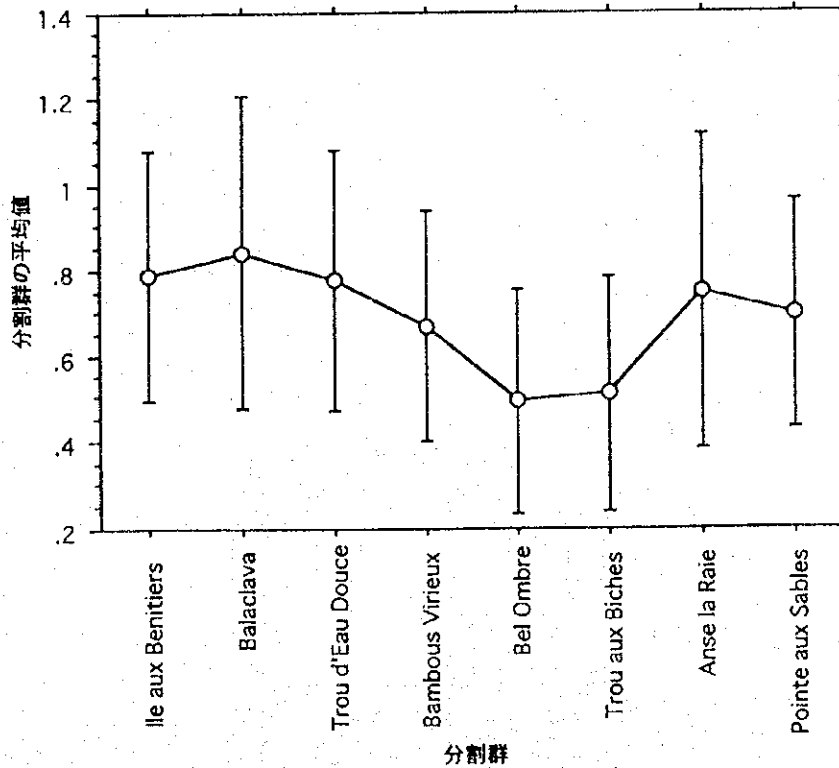
効果 : STATION

	例数	平均値	標準偏差	標準誤差
Ile aux Benitiers	27	.789	.293	.056
Balaclava	24	.846	.365	.074
Trou d'Eau Douce	18	.778	.304	.072
Bambous Virieux	18	.672	.270	.064
Bel Ombre	15	.493	.260	.067
Trou aux Biches	23	.513	.275	.057
Anse la Raie	18	.750	.365	.086
Pointe aux Sables	18	.700	.266	.063

交互作用棒グラフ : BOD
 効果 : STATION
 エラーバー : ± 1 標準偏差



交互作用折れ線グラフ : BOD
 効果 : STATION
 エラーバー : ± 1 標準偏差



分散分析表 : NO3

	自由度	平方和	平均平方	F値	p値
説明	7	1.463	.209	3.609	.0012
誤差	156	9.035	.058		

コンポーネント間の分散の推定値 (II型) : 7.402E-3

FisherのPLSD : NO3

効果 : 説明

有意水準 : 5 %

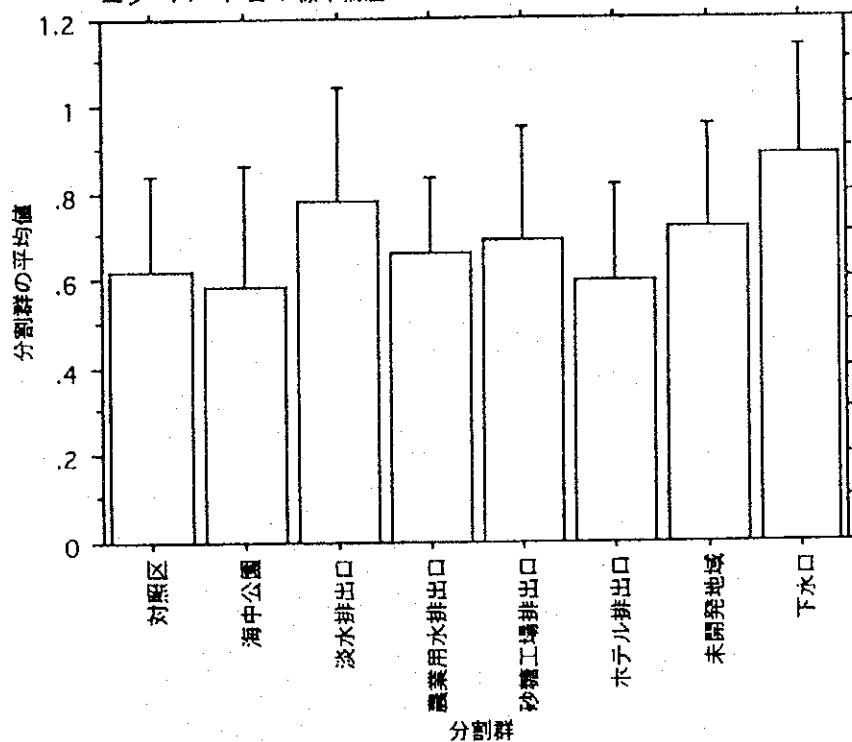
	平均値の差	棄却値	p値	
対照区, 海中公園	.031	.133	.6466	
対照区, 淡水排出口	-.165	.145	.0258	S
対照区, 農業用水排出口	-.043	.145	.5617	
対照区, 砂糖工場排出口	-.070	.145	.3381	
対照区, ホテル排出口	.019	.135	.7866	
対照区, 未開発地域	-.098	.145	.1821	
対照区, 下水口	-.270	.145	.0003	S
海中公園, 淡水排出口	-.196	.148	.0099	S
海中公園, 農業用水排出口	-.074	.148	.3281	
海中公園, 砂糖工場排出口	-.101	.148	.1786	
海中公園, ホテル排出口	-.013	.139	.8590	
海中公園, 未開発地域	-.129	.148	.0872	
海中公園, 下水口	-.301	.148	<.0001	S
淡水排出口, 農業用水排出口	.122	.158	.1296	
淡水排出口, 砂糖工場排出口	.094	.158	.2409	
淡水排出口, ホテル排出口	.183	.150	.0166	S
淡水排出口, 未開発地域	.067	.158	.4072	
淡水排出口, 下水口	-.106	.158	.1902	
農業用水排出口, 砂糖工場排出口	-.028	.158	.7296	
農業用水排出口, ホテル排出口	.061	.150	.4210	
農業用水排出口, 未開発地域	-.056	.158	.4896	
農業用水排出口, 下水口	-.228	.158	.0051	S
砂糖工場排出口, ホテル排出口	.089	.150	.2423	
砂糖工場排出口, 未開発地域	-.028	.158	.7296	
砂糖工場排出口, 下水口	-.200	.158	.0137	S
ホテル排出口, 未開発地域	-.117	.150	.1255	
ホテル排出口, 下水口	-.289	.150	.0002	S
未開発地域, 下水口	-.172	.158	.0334	S

基本統計量 : NO3

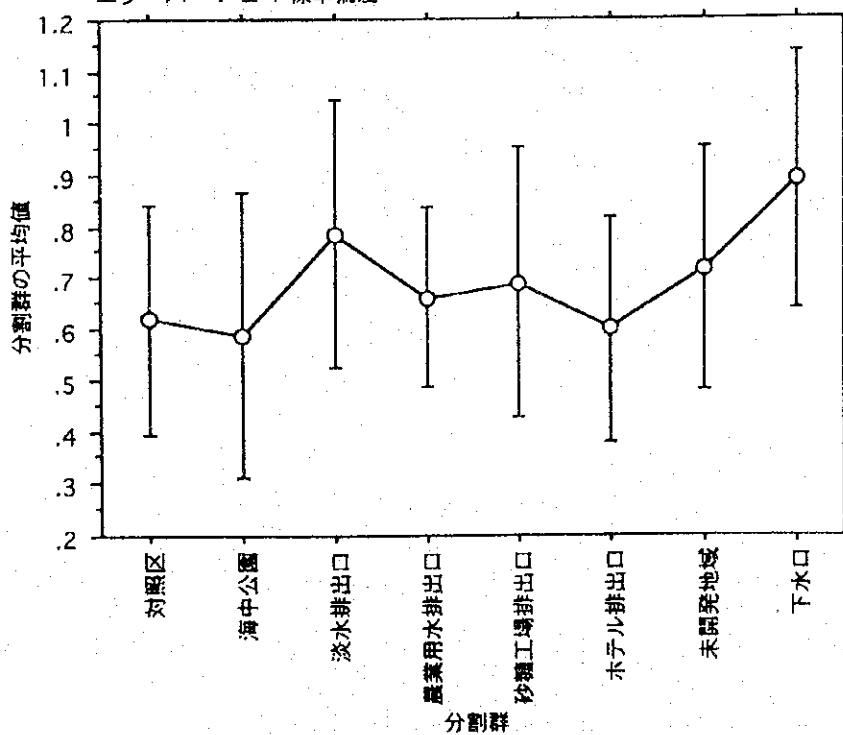
効果 : 説明

	例数	平均値	標準偏差	標準誤差
対照区	27	.619	.224	.043
海中公園	24	.587	.279	.057
淡水排出口	18	.783	.262	.062
農業用水排出口	18	.661	.175	.041
砂糖工場排出口	18	.689	.263	.062
ホテル排出口	23	.600	.220	.046
未開発地域	18	.717	.238	.056
下水口	18	.889	.249	.059

交互作用棒グラフ : N03
 効果 : 説明
 エラーバー : ± 1 標準偏差



交互作用折れ線グラフ : N03
 効果 : 説明
 エラーバー : ± 1 標準偏差



分散分析表 : PO4

	自由度	平方和	平均平方	F値	p値
説明	7	.011	1.525E-3	2.408	.0229
誤差	156	.099	6.332E-4		

コンポーネント間の分散の推定値 (II型) : 4.366E-5

FisherのPLSD : PO4

効果 : 説明

有意水準 : 5%

	平均値の差	棄却値	p値	
対照区, 海中公園	-9.583E-3	.014	.1766	
対照区, 淡水排出口	-3.333E-3	.015	.6639	
対照区, 農業用水排出口	-.028	.015	.0004	S
対照区, 砂糖工場排出口	-.012	.015	.1125	
対照区, ホテル排出口	-3.478E-3	.014	.6268	
対照区, 未開発地域	-2.778E-3	.015	.7173	
対照区, 下水口	-.011	.015	.1488	
海中公園, 淡水排出口	6.250E-3	.015	.4269	
海中公園, 農業用水排出口	-.018	.015	.0217	S
海中公園, 砂糖工場排出口	-2.639E-3	.015	.7371	
海中公園, ホテル排出口	6.105E-3	.015	.4070	
海中公園, 未開発地域	6.806E-3	.015	.3871	
海中公園, 下水口	-1.528E-3	.015	.8459	
淡水排出口, 農業用水排出口	-.024	.017	.0041	S
淡水排出口, 砂糖工場排出口	-8.889E-3	.017	.2909	
淡水排出口, ホテル排出口	-1.449E-4	.016	.9854	
淡水排出口, 未開発地域	5.556E-4	.017	.9473	
淡水排出口, 下水口	-7.778E-3	.017	.3552	
農業用水排出口, 砂糖工場排出口	.016	.017	.0655	
農業用水排出口, ホテル排出口	.024	.016	.0025	S
農業用水排出口, 未開発地域	.025	.017	.0033	S
農業用水排出口, 下水口	.017	.017	.0487	S
砂糖工場排出口, ホテル排出口	8.744E-3	.016	.2712	
砂糖工場排出口, 未開発地域	9.444E-3	.017	.2619	
砂糖工場排出口, 下水口	1.111E-3	.017	.8948	
ホテル排出口, 未開発地域	7.005E-4	.016	.9296	
ホテル排出口, 下水口	-7.633E-3	.016	.3366	
未開発地域, 下水口	-8.333E-3	.017	.3220	

基本統計量 : PO4

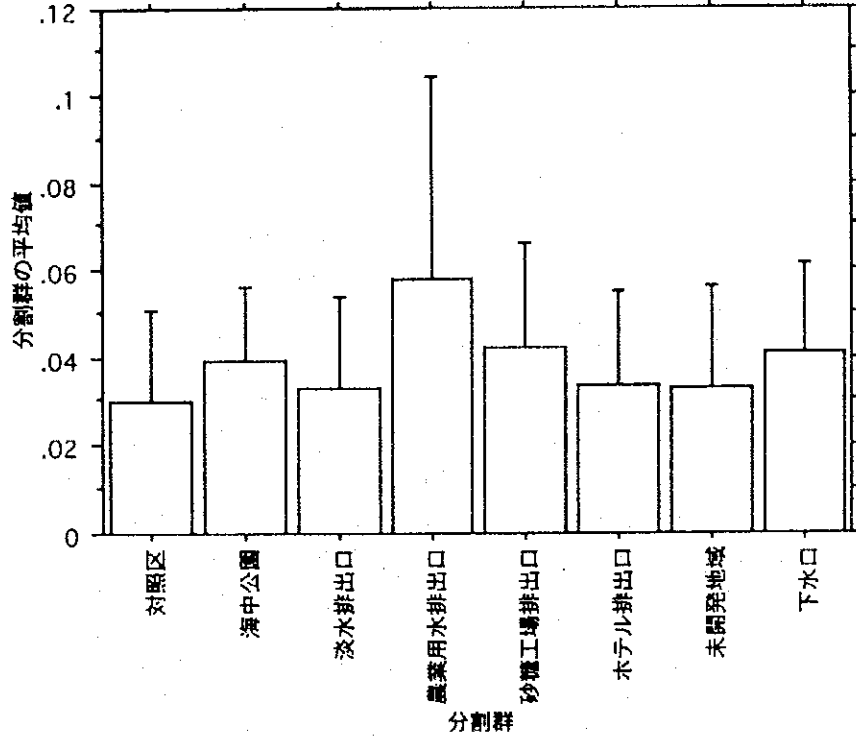
効果 : 説明

	例数	平均値	標準偏差	標準誤差
対照区	27	.030	.021	4.065E-3
海中公園	24	.040	.017	3.430E-3
淡水排出口	18	.033	.021	4.918E-3
農業用水排出口	18	.058	.047	.011
砂糖工場排出口	18	.042	.024	5.633E-3
ホテル排出口	23	.033	.021	4.473E-3
未開発地域	18	.033	.023	5.531E-3
下水口	18	.041	.021	4.843E-3

交互作用棒グラフ : P04

効果 : 説明

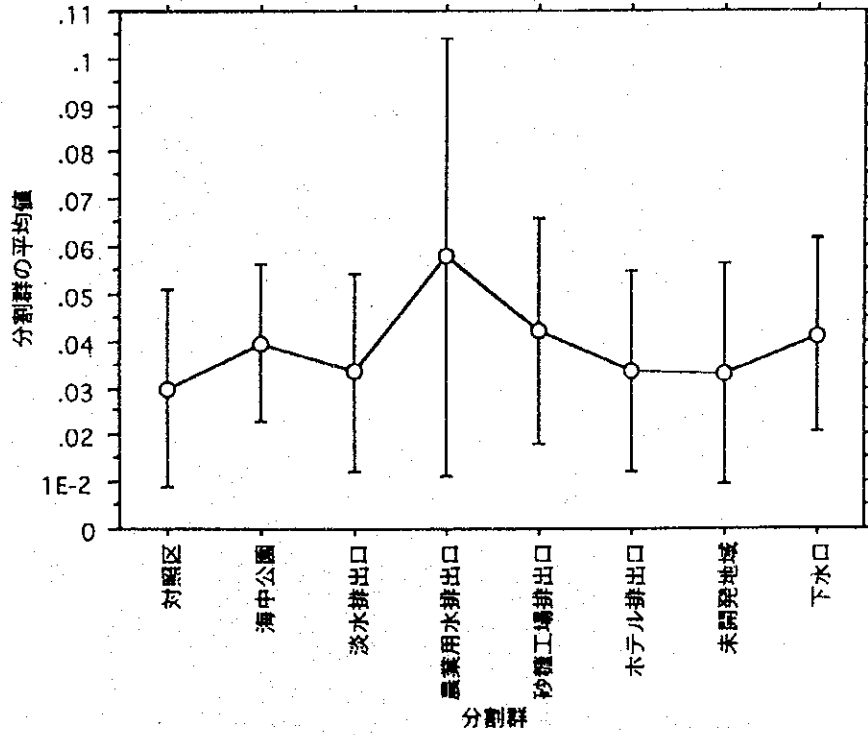
エラーバー : ± 1 標準偏差



交互作用折れ線グラフ : P04

効果 : 説明

エラーバー : ± 1 標準偏差



分散分析表 : BOD

	自由度	平方和	平均平方	F値	p値
説明	7	2.336	.334	3.602	.0013
誤差	153	14.174	.093		

コンポーネント間の分散の推定値 (II型) : .012

FisherのPLSD : BOD

効果 : 説明
有意水準 : 5 %

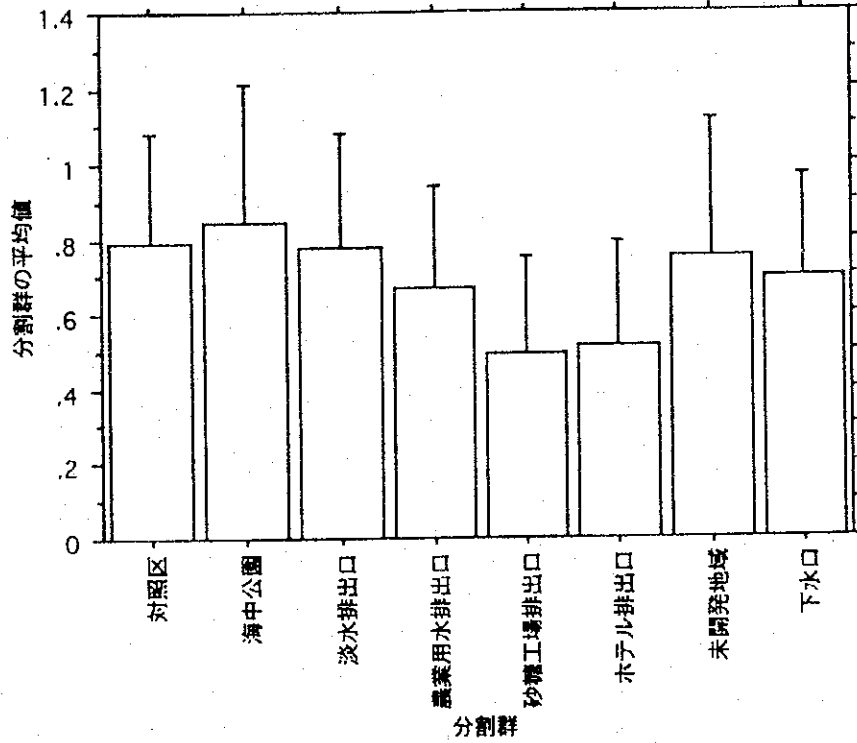
	平均値の差	棄却値	p値	
対照区, 海中公園	-.057	.169	.5058	
対照区, 淡水排出口	.011	.183	.9047	
対照区, 農業用水排出口	.117	.183	.2097	
対照区, 砂糖工場排出口	.296	.194	.0030	S
対照区, ホテル排出口	.276	.171	.0017	S
対照区, 未開発地域	.039	.183	.6752	
対照区, 下水口	.089	.183	.3387	
海中公園, 淡水排出口	.068	.187	.4744	
海中公園, 農業用水排出口	.174	.187	.0693	
海中公園, 砂糖工場排出口	.352	.198	.0006	S
海中公園, ホテル排出口	.333	.175	.0003	S
海中公園, 未開発地域	.096	.187	.3142	
海中公園, 下水口	.146	.187	.1264	
淡水排出口, 農業用水排出口	.106	.200	.2998	
淡水排出口, 砂糖工場排出口	.284	.210	.0083	S
淡水排出口, ホテル排出口	.265	.189	.0064	S
淡水排出口, 未開発地域	.028	.200	.7846	
淡水排出口, 下水口	.078	.200	.4445	
農業用水排出口, 砂糖工場排出口	.179	.210	.0948	
農業用水排出口, ホテル排出口	.159	.189	.0986	
農業用水排出口, 未開発地域	-.078	.200	.4445	
農業用水排出口, 下水口	-.028	.200	.7846	
砂糖工場排出口, ホテル排出口	-.020	.200	.8456	
砂糖工場排出口, 未開発地域	-.257	.210	.0170	S
砂糖工場排出口, 下水口	-.207	.210	.0539	
ホテル排出口, 未開発地域	-.237	.189	.0145	S
ホテル排出口, 下水口	-.187	.189	.0528	
未開発地域, 下水口	.050	.200	.6228	

基本統計量 : BOD

効果 : 説明

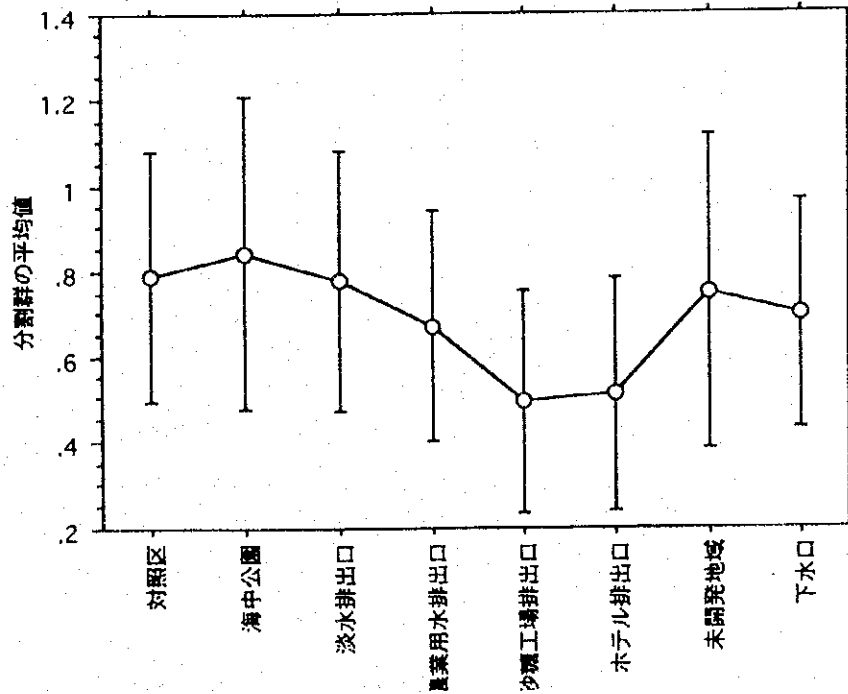
	例数	平均値	標準偏差	標準誤差
対照区	27	.789	.293	.056
海中公園	24	.846	.365	.074
淡水排出口	18	.778	.304	.072
農業用水排出口	18	.672	.270	.064
砂糖工場排出口	15	.493	.260	.067
ホテル排出口	23	.513	.275	.057
未開発地域	18	.750	.365	.086
下水口	18	.700	.266	.063

交互作用棒グラフ : BOD
 効果 : 説明
 エラーバー : ± 1 標準偏差



3. の観測資料は欠測値があるため除外されました。

交互作用折れ線グラフ : BOD
 効果 : 説明
 エラーバー : ± 1 標準偏差



添付資料 4-5 アルビオン水産研究所前の礁湖内の漂流ブイ及び
 流向流速計による潮流解析結果

ICOD LAGOONAL HEALTH AND COASTAL POLLUTION PROJECT
 DROGUE/CTD FIELD SHEET

SITE: Albion	OPERATOR: D. Giangaparsad / M. Nallae	NORTH	EASTING
DATE: 06/09/91	SEA STATE: Calm	LEFT MARK:	
HIGH TIDE: ✓ 11-46	LOW TIDE:	CENTER MARK:	
		RIGHT MARK:	

OBSE NO	DROG NO	TIME	ANGLE L-C	ANGLE C-R	CTD CAST NO	WATER DEPT (m)	OBSE NO	DROG NO	TIME	ANGLE L-C	ANGLE C-R	CTD CAST NO	WATER DEPT (m)
	6	11-20	78-30	51-14				8	13-34	48-44	72-08		
	7	11-23	70-38	43-20				7	13-38	37-42	24-28	✓13	
	8	11-25	61-50	56-12	✓10	1 1/2 m		Current	Depth	36-28	35-16		
	9	11-28	58-20	51-32				9	13-51	35-18	34-26	✓14	
	6	11-30	51-10	35-50				8	13-55	34-46	46-38	✓15	
	7	11-33	45-12	39-48									
	9	11-35	43-16	63-40									
	8	11-36	35-46	54-40									
	2	11-37	35-46	54-40									
	6	11-42	59-40	76-50									
	7	11-44	51-58	63-30									
	8	11-50	30-22	48-58									
	2	11-51	30-14	48-30									
	9	11-53	28-16	49-06									
	6	11-55	26-08	53-30									
	7	11-58	27-10	47-24									
		12-01	33-50	42-54	✓1								
	8	12-04	38-20	30-36	✓2								
	9	12-09	32-20	30-36	✓3								
	9	12-13	40-38	30-48									
	6	12-16	39-38	29-26									
	7	12-18	36-06	28-56									
II	6	12-46	67-12	57-30									
	7	12-47	79-02	54-24									
	6	12-56	34-02	76-18	✓4								
	7	12-58	46-48	77-10	✓5								
	8	13-00	71-08	55-20	✓6								
	9	13-03	83-46	44-40	✓7								
	6	13-07	29-32	49-20	✓8								
	7	13-11	25-08	69-04	✓7								
	6	13-16	35-48	40-18	✓10								
	7	13-19	27-16	49-20	✓11								
	9	13-23	34-02	83-10	✓12								
	8	13-26	56-20	69-04									

ICOD LAGOONAL HEALTH CHARACTERISTICS AND COASTAL POLLUTION
DROGUE STUDY

06/09/91

MAURITIUS GRID FALSE BY 1,000,000 x 1,000,000

	Name	NORTH EASTING			
LEFT M	GREEN SHUTTERED HOUSE	-800	-13000	999200	987000
CENTRE	PUMP HOUSE SHRIMP	-1555	-13150	998445	986850
RIGHT	GARAGE AFRC	-1875	-13250	998125	986750

DROGUE TIME	LEFT ANGLE DEG	MIN	RIGHT ANGLE DEG	MIN	LEFT ANGLE DEG	RIGHT ANGLE DEG	FALSE	FALSE
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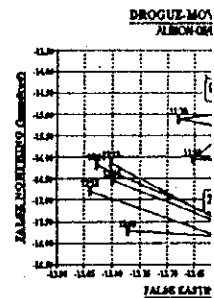
								NORTHING	EASTIN	NORTHIN	EASTING
2	11:37	35	46	54	40	35.77	54.67	-1729	-13515	998271	986485
2	11:51	30	14		30	30.23	0.50	-1790	-13532	998210	986468
2	12:09	32	20	30	36	32.33	30.60	-1774	-13772	998226	986228
6	11:20	78	30	51	14	78.50	51.23	-1470	-13397	998530	986603
6	11:30	51	10	35	50	51.17	35.83	-1510	-13680	998490	986320
6	11:42	59	40	76	50	59.67	76.83	-1577	-13356	998423	986644
6	11:55	26	8	53	30	26.13	53.50	-1817	-13475	998183	986525
6	12:16	39	38	29	26	39.63	29.43	-1617	-13828	998383	986172
6	12:46	67	12	57	30	67.20	57.50	-1521	-13418	998479	986582
6	12:56	34	2	76	18	34.03	76.30	-1717	-13411	998283	986589
6	13:07	29	32	49	20	29.53	49.33	-1797	-13521	998203	986479
6	13:14	35	48	40	48	35.80	40.80	-1735	-13634	998265	986366
7	11:23	70	38	43	20	70.63	43.33	-1448	-13490	998552	986510
7	11:33	45	12	39	48	45.20	39.80	-1607	-13654	998393	986346
7	11:44	51	58	68	30	51.97	68.50	-1605	-13420	998395	986580
7	11:58	27	10	47	24	27.17	47.40	-1822	-13517	998178	986483
7	12:18	36	6	28	56	36.10	28.93	-1680	-13840	998320	986160
7	12:47	79	2	54	24	79.03	54.40	-1482	-13376	998518	986624
7	12:58	46	48	77	10	46.80	77.17	-1636	-13395	998364	986605
7	13:11	25	8	69	4	25.13	69.07	-1794	-13412	998206	986588
7	13:19	27	16	49	20	27.27	49.33	-1817	-13505	998183	986495
7	13:38	37	42	29	28	37.70	29.47	-1658	-13827	998342	986173
8	11:25	61	50	56	12	61.83	56.20	-1540	-13451	998460	986549
8	11:36	35	46	54	40	35.77	54.67	-1729	-13515	998271	986485
8	11:50	30	22	48	58	30.37	48.97	-1789	-13531	998211	986469
8	12:04	38	20	30	56	38.33	30.93	-1654	-13800	998346	986200
8	13:00	71	8	55	20	71.13	55.33	-1502	-13411	998498	986589
8	13:26	56	20	69	4	56.33	69.07	-1584	-13402	998416	986598
8	13:34	48	44	72	8	48.73	72.13	-1625	-13412	998375	986588
8	13:55	34	46	46	38	34.77	46.63	-1746	-13570	998254	986430

9	11:28	58	20	51	32	58.33	51.53	-1543	-13497	998457	986503
9	11:35	43	16	63	40	43.27	63.67	-1660	-13465	998340	986535
9	11:53	28	16	49	6	28.27	49.10	-1808	-13514	998192	986486
9	12:13	40	38	30	48	40.63	30.80	-1612	-13802	998388	986198
9	13:03	89	46	44	40	89.77	44.67	-1425	-13373	998575	986627
9	13:23	34	2	83	10	34.03	83.17	-1709	-13388	998291	986612
9	13:51	35	18	34	26	35.30	34.43	-1730	-13719	998270	986281

DROGUE	TIME	Y	X	DISTAN m	SPEED (m/s)	DIRECTION (deg.true)
2	11:37	-17.29	-13.515	0.61	0.07	182
2	11:51	-17.9	-13.532	0.29	0.03	304
2	12:09	-17.74	-13.772			
6	11:20	-14.7	-13.397	0.49	0.08	215
6	11:30	-15.1	-13.68	0.74	0.10	154
6	11:42	-15.77	-13.356	2.40	0.31	183
6	11:55	-18.17	-13.475	2.03	0.16	
6	12:16	-16.17	-13.828			
7	11:23	-14.48	-13.49	1.60	0.27	186
7	11:33	-16.07	-13.654	0.23	0.04	85
7	11:44	-16.05	-13.42	2.17	0.26	183
7	11:58	-18.22	-13.517	1.46	0.12	347
7	12:18	-16.8	-13.84			
8	11:25	-15.4	-13.451	1.89	0.29	182
8	11:36	-17.29	-13.515	0.60	0.07	182
8	11:50	-17.89	-13.531	1.38	0.16	349
8	12:04	-16.54	-13.8			
9	11:28	-15.43	-13.497	1.17	0.28	178
9	11:35	-16.6	-13.465	1.48	0.14	182
9	11:53	-18.08	-13.514	1.98	0.17	352
9	12:13	-16.12	-13.802			
				Average	<u>0.16</u>	

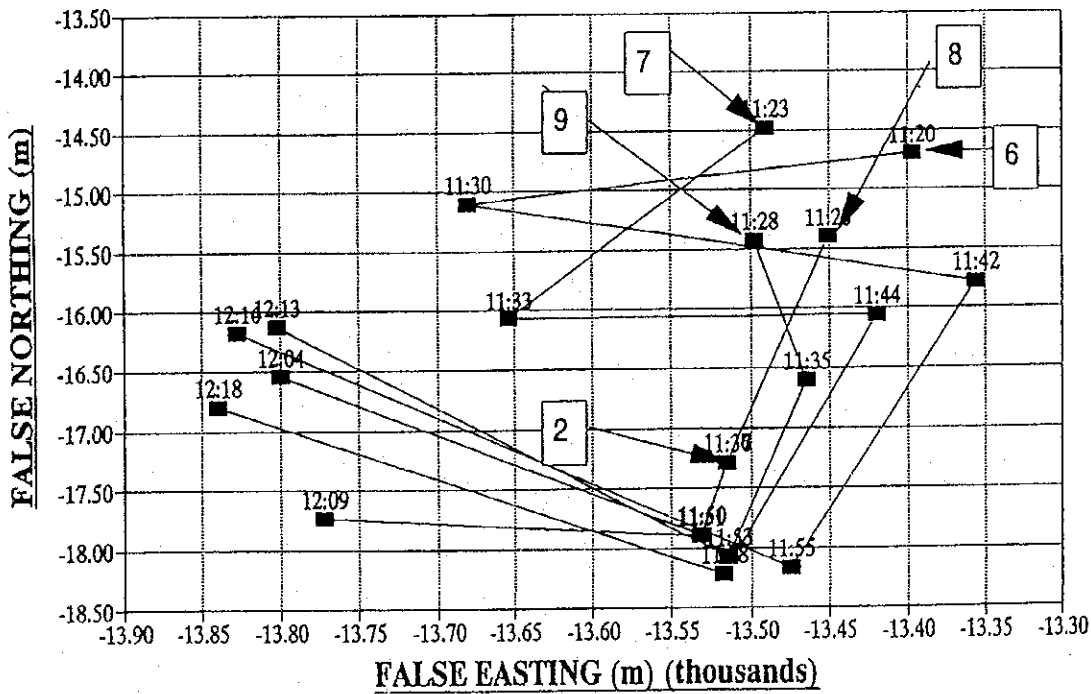
DROGUE	TIME	Y	X	DISTAN m	SPEED (m/s)	DIRECTION (deg.true)
6	12:46	-15.21	-13.418	1.96	0.33	180
6	12:56	-17.17	-13.411	0.81	0.12	188
6	13:07	-17.97	-13.521	0.63	0.15	350
6	13:14	-17.35	-13.634			
7	12:47	-14.82	-13.376	1.54	0.23	181
7	12:58	-16.36	-13.395	1.58	0.20	181
7	13:11	-17.94	-13.412	0.25	0.05	202
7	13:19	-18.17	-13.505	1.62	0.14	349
7	13:38	-16.58	-13.827			
8	13:00	-15.02	-13.411	0.82	0.05	179
8	13:26	-15.84	-13.402	0.41	0.09	181
8	13:34	-16.25	-13.412	1.22	0.10	187
8	13:55	-17.46	-13.57			
9	13:03	-14.25	-13.373	2.84	0.24	180
9	13:23	-17.09	-13.388	0.39	0.02	238
9	13:51	-17.3	-13.719			

Average 0.14



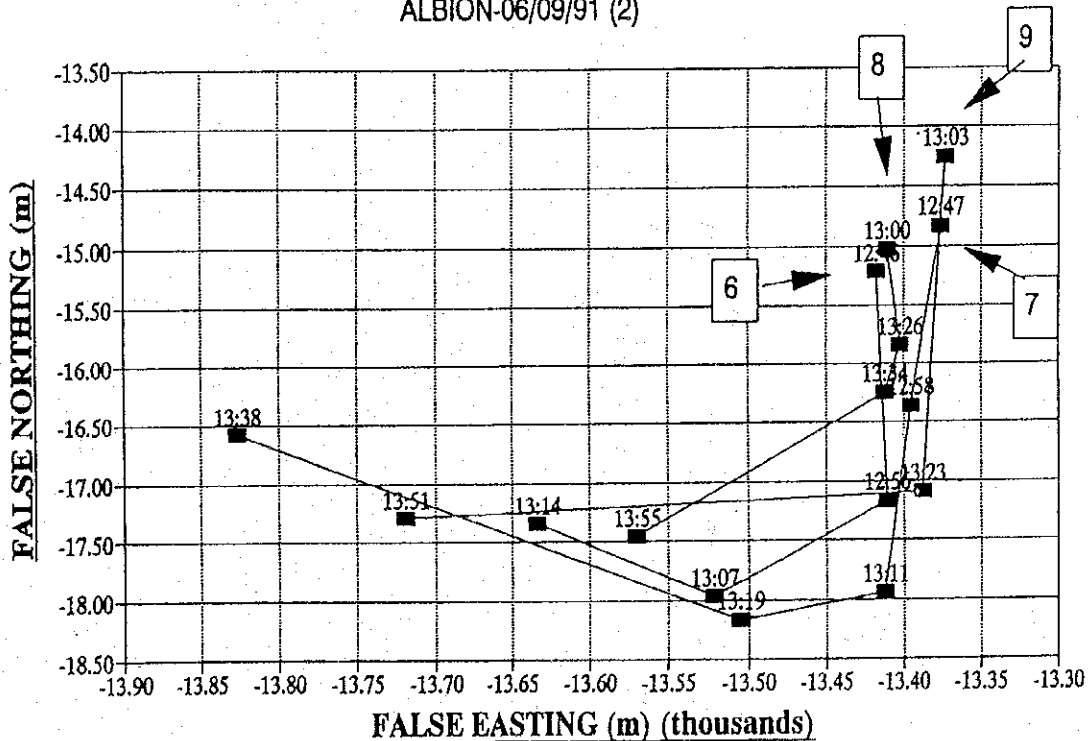
DROGUE-MOVEMENT

ALBION-06/09/91



DROGUE-MOVEMENT

ALBION-06/09/91 (2)



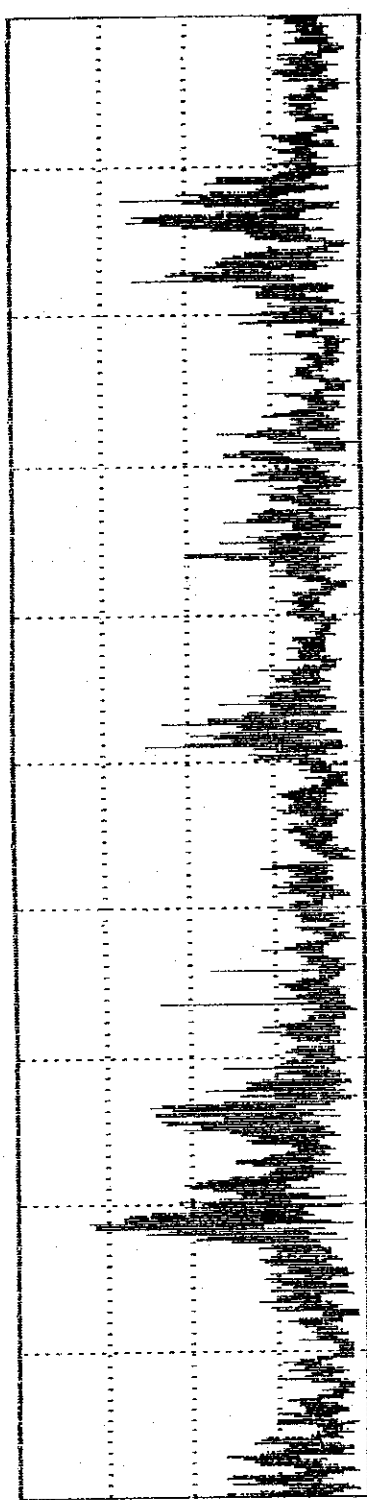
InterOcean Systems, Inc. Model S4 Current Meter #14861532
 a1010692 File : B:2a100792.S4B
 Samples averaged : 1 Mean : 6.40



40.0
cm/s

20.0

0.0

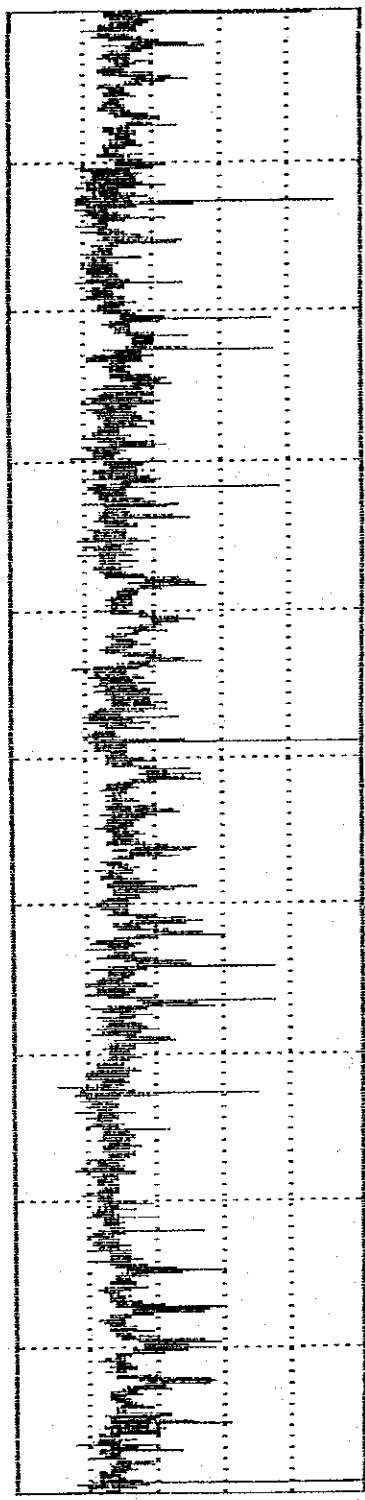


D i p .

360

180

0

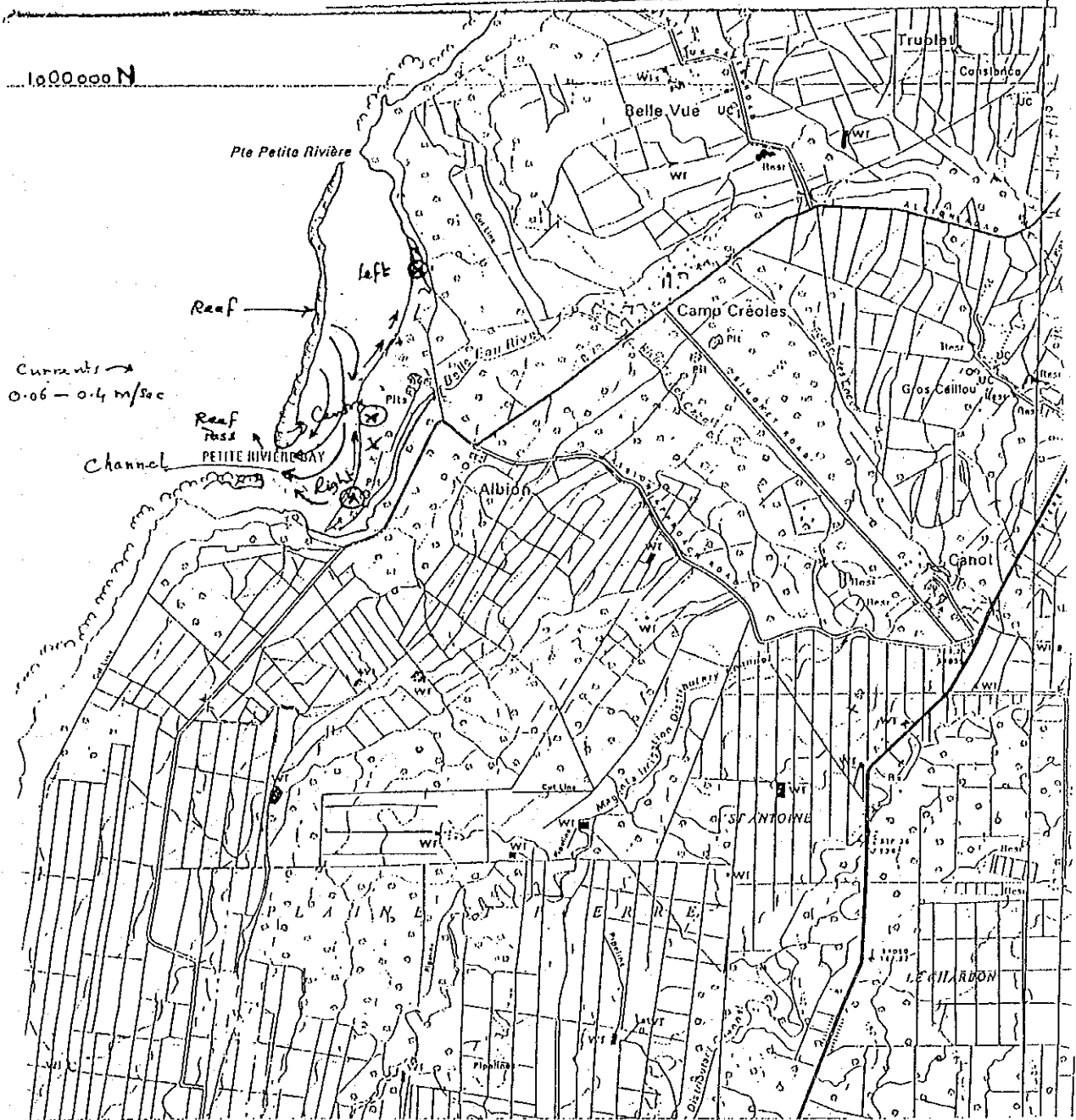


Samples

5582

6/01, 16:00:00

7/10, 10:10:00



添付資料 4-6 モーリシャスのサンゴ礁における造礁サンゴの被度及び出現種数

調査地点	調査域	平均サンゴ被度%	種数	優占種
Trou aux Biches	Fore reef	27.4	33	<i>Porites</i> sp.
	Back reef	60.2	9	<i>Acropora formosa</i> <i>Acropora grandis</i>
	Shore reef	47.5	9	<i>Acropora grandis</i> <i>A. formosa</i>
Balaclava	Fore reef	9.0	29	<i>Favites abdita</i>
	Shore reef	61.6	20	<i>Montipora tuberculosa</i> <i>A. formosa</i>
Anse la Raie	Fore reef	26.6	27	<i>Porites nigres</i>
	Back reef	65.3	14	<i>M. tuberculosa</i> <i>A. formosa</i>
Ile aux Benitiers	Fore reef	16.7	33	<i>Porites</i> sp.
	Back reef	44.5	7	<i>Acropora hyacinthus</i> <i>A. formosa</i>
	Shore reef	49.0	23	<i>A. grandis</i> <i>Pavona cactus</i>
Bel Ombre	Back reef	49.1	5	<i>A. formosa</i> <i>A. gransis</i>
Flic en Flac	?	29.8	?	?

添付資料 4 - 7 Blue Bay Marine Park で確認された造礁サンゴ

1994/08/03 (Wed.) Mauritius - Blue Bay Marine Park

Dep. 6m, Trans. 10m, Temp. 20 degree

List of corals

<i>Pocillopora damicornis</i>	
<i>P. verrucosa</i>	
<i>Seriatopora hystrix</i>	
<i>Montipora turgescens</i>	
<i>M. danae</i>	
<i>M. informis</i> (?)	
<i>M. foliosa</i> (?)	
<i>Montipora</i> sp.1	
<i>Montipora</i> sp.2	lump-like
<i>Acropora cytherea</i>	very abundant
<i>A. hyacinthus</i>	
<i>A. formosa</i>	very abundant
<i>A. macrophthalma</i> (?)	slender than <i>A. formosa</i>
<i>A. tenuis</i>	slightly thicker than normal type
<i>A. elseyi</i> (?)	
<i>Acropora</i> sp.1	collimbose-type
<i>Acropora</i> sp.2 (<i>subglabra</i> ?)	
<i>Porites lutea</i> (?)	
<i>Porites</i> sp.	dendroid-type
<i>Goniopora lobata</i> (?)	
<i>G. tenuidens</i> (?)	
<i>Goniopora</i> sp.1	
<i>Goniopora</i> sp.2	
<i>Alveopora catalai</i> (?)	big collony
<i>Psammocora contigua</i> (?)	
<i>Pavona cactus</i>	big collony
<i>P. decussata</i>	
<i>P. divaricata</i>	
<i>P. varians</i> (?)	
<i>Fungia</i> spp.	abundant
<i>Galaxea fascicularis</i>	
<i>Lobophyllia corymbosa</i> (?)	

底の砂の粒子が非常に細かく、シルト質を多く含む。
 枝状の *Acropora* にミスジリュウキュウスズメ、クロソラスズメダイ多し。
 カイメン、*Salcophyton*, シラヒゲウニの死に殻。
 フタスジナマコ、貝類は非常に少ない。
 シロレイシガイダマシ、
 砂地にアナジャコのマウンド多し。

添付資料 4 - 8 調査地点に出現した造礁サンゴリスト

- | | |
|--|-------------------------------------|
| 1) <i>Pocillopora damicornis</i> | 38) <i>P. varians</i> |
| 2) <i>P. eyedouxi</i> | 39) <i>Gardineroseris planulata</i> |
| 3) <i>P. verrucosa</i> | 40) <i>Fungia</i> sp. |
| 4) <i>P. woodjonesi</i> | 41) <i>Galaxea fascicularis</i> |
| 5) <i>Seriatopora hystrix</i> | 42) <i>Echinophyllia aspera</i> |
| 6) <i>Stylophora pistillata</i> | 43) <i>E. orpheensis</i> |
| 7) <i>Montipora danae</i> | 44) <i>Mycedium elephantotus</i> |
| 8) <i>M. digitata</i> | 45) <i>Acanthastrea echinata</i> |
| 9) <i>M. efflorescens</i> | 46) <i>Lobophyllia corymbosa</i> |
| 10) <i>M. incrassata</i> | 47) <i>L. hemprichii</i> |
| 11) <i>M. tuberculosa</i> | 48) <i>Hydonophora exesa</i> |
| 12) <i>Montipora</i> sp. | 49) <i>Favia laxa</i> |
| 13) <i>Acropora anthoceris</i> | 50) <i>F. matthaii</i> |
| 14) <i>A. auster</i> | 51) <i>F. stelligera</i> |
| 15) <i>A. cuneata</i> | 52) <i>F. pallida</i> |
| 16) <i>A. danai</i> | 53) <i>Favia</i> sp. |
| 17) <i>A. digitifera</i> | 54) <i>Favites abdita</i> |
| 18) <i>A. elseyi</i> | 55) <i>F. complelata</i> |
| 19) <i>A. formosa</i> | 56) <i>F. flexuosa</i> |
| 20) <i>A. gemmifera</i> | 57) <i>F. halicora</i> |
| 21) <i>A. grandis</i> | 58) <i>F. pentagona</i> |
| 22) <i>A. humilis</i> | 59) <i>Favites</i> sp. |
| 23) <i>A. hyacinthus</i> | 60) <i>Goniastrea pectinata</i> |
| 24) <i>A. monticulosa</i> | 61) <i>G. retiformis</i> |
| 25) <i>A. pallida</i> | 62) <i>Goniastrea</i> sp. |
| 26) <i>A. robusta</i> | 63) <i>Platygyra daedalea</i> |
| 27) <i>A. tenuis</i> | 64) <i>P. pini</i> |
| 28) <i>A. secale</i> | 65) <i>Leptoria phrygia</i> |
| 29) <i>Acropora</i> sp. | 66) <i>Oulophyllia crispa</i> |
| 30) <i>Astreopora myriophthalma</i> | 67) <i>Oulophyllia</i> sp. |
| 31) <i>Porites rus</i> | 68) <i>Montastrea curta</i> |
| 32) <i>Porites</i> sp. | 69) <i>Plesiastrea versipora</i> |
| 33) <i>Alveopora moretonesi</i>
(<i>marionensis?</i>) | 70) <i>Diploastrea heliopora</i> |
| 34) <i>Psammocora profundacella</i> | 71) <i>Leptastrea inaequalis</i> |
| 35) <i>Cossinarea</i> sp. | 72) <i>Cypahstrea chalcidicum</i> |
| 36) <i>Pavona cactus</i> | 73) <i>Echinopora gemmacea</i> |
| 37) <i>P. decussata</i> | |

添付資料 5 収集資料リスト

- 1) NATIONAL DEVELOPMENT PLAN 1992-1994, REPUBLIC OF MAURITIUS
- 2) DEVELOPMENT CO-OPERATION MAURITIUS 1990 REPORT
- 3) PROTECT CORAL REEFS, THEY ARE VITAL, ALBION FISHERIES RESEARCH CENTER, June 1994
- 4) BEACH HOTELS TARIFFS, MAURITIUS GOVERNMENT TOURIST OFFICE

JICA