

# Far Eastern Marine Biosphere Reserve

NATIONAL SCIENTIFIC CENTER OF MARINE BIOLOGY  
FAR EASTERN BRANCH  
OF THE RUSSIAN ACADEMY OF SCIENCES

<http://dvmarine.ru>



# National Scientific Center of Marine Biology FER RAS

Ministry of Science  
and Higher Education



- Institute of Marine Biology (1970–2016)



- Far Eastern Marine Biosphere Reserve (since 1978)



Primorsky Aquarium

- Research and Education  
Centre Primorsky Aquarium  
(since 2016)

# Outline of the Far Eastern Marine Biosphere Reserve

The Far Eastern Marine Reserve was established on March 24, 1978. The reserve is located in the western part of the Sea of Japan and occupies about 10% of the area of Peter the Great Bay, the southernmost and warmest waters of the Far Eastern seas of Russia. The area of the reserve is 64,136.3 hectares, of which 63,000 hectares is water and 1,136.3 hectares is land consisting of islands, kekurs and the island botanical garden on Popov island. This small area of the South Primorye a well-studied region of water area and islands of Peter the Great Bay, by biological diversity area of the Russian seas.





## Совет Министров СССР

### ПОСТАНОВЛЕНИЕ

от 24 марта 1978 г. № 228

МОСКВА, КРЕМЛЬ

#### ОБ ОРГАНИЗАЦИИ ДАЛЬНЕВОСТОЧНОГО ГОСУДАРСТВЕННОГО МОРСКОГО ЗАПОВЕДНИКА

В целях сохранения природной среды наиболее богатого по составу морской и островной фауны и флоры залива Петра Великого Японского моря, и прежде всего генофонда морских организмов, а также проведения научно-исследовательской работы и осуществления просветительской деятельности Совет Министров СССР постановляет:

Организовать в системе Академии наук СССР Дальневосточный государственный морской заповедник в заливе Петра Великого Японского моря.

Поручить Академии наук СССР и Министерству обороны СССР определить по согласованию с Советом Министров РСФСР площадь и границы указанного морского заповедника.

Председатель

Совета Министров СССР А. КОСЫГИН



Уполномоченный Делами

Совета Министров СССР М. СМИРТЮКОВ

уд

In 1974, Director of the Institute of Marine Biology, Far Eastern Scientific Center of Academy of Sciences A.V. Zhirmunsky took the initiative of giving the islands in Peter the Great Bay the status of Marine reserve



The "First Island Forest Range" was established in 1893 from the Muravyev-Amursky peninsula to the mouth of the Tumen River "... for the exclusive control of marine fisheries"



Aim of the Far East Marine Biosphere Reserve: conservation of natural complexes and valuable natural objects.

Almost all landscapes of the South Primorye are accumulated in the Reserve: subtropical forests, bogs and steppes; mountains, warm sandy bays and cold depths of the Sea of Japan, streams, rivers, lakes and saltish lagoons. You cannot find anywhere else such a unique variety of geological structures and soils, concentrated on a small area of the protected islands and coasts.



The first marine reserve in Russia, this area has natural coasts, islands and the shelf of Peter the Great Bay in the Sea of Japan, which is the richest in terms of biological diversity of Russia's coastal waters. It is home to over 5,000 species of plants and animals.

Far Eastern Marine Biosphere Reserve consist of four disjoint clusters (zones) with different function.



# Far Eastern Marine Biosphere Reserve

Eastern marine cluster is situated in Rimsky-Korsakov Islands.

The marine protected area is 45,000 hectares, the area of islands, Stenin Island including, 900 ha. Eastern cluster, including the islands, is a strictly protected area, where the presence of humans is minimized.



Southern marine cluster is situated on the western coast of Possiet Bay and includes Furugelma, Vera and Falshiv islands. The marine protected area is 15,000 ha. The estimated area of the islands is less than 200 ha.

Western marine cluster has the marine protected area is 3,000 ha.

Southern cluster and Western marine cluster is the research zone, where scientific research info conversation and rehabilitation of natural ecosystems is performed, and educational excursions are allowed.



Northern cluster has no marine part. It includes a land plot on Popov island 216,3 ha  
The Northern cluster, like the whole of Popov Island, is located within the city of Vladivostok is open to visitors for environmental education. Here the Museum «Marine nature and its conservation», Botanical Gardens, Ecological Education Center, ancient village and the ecological trails are located, which attract numerous visitors. Center currently works with children, students, and teachers. About 200,000 people have visited the museum and centers.

This territory is a part of Biosphere Reserve Directory of UNESCO Man and Biosphere Program.



Particular attention is paid to protected plant and animal species which reside in the Far Eastern Marine Biosphere Reserve.

The museum includes an archaeological and ethnographic complex under the open sky, which recreates the residential, economic and ritual buildings of the ancient indigenous peoples of Primorye. The design and interior of the Early Iron Age are made in the traditions of the Kronun culture. In the ethnographic zone, the life of hunters and fishermen of the 19th century is presented: a pile barn, a funerary house, figures of spirits-sevan, and attributes of a shaman. The wise attitude of ancient people towards nature is shown.

The Center for Environmental Education of the Population was established in the reserve. Master classes, lectures, seminars for teachers, and excursions on natural routes are organized. The Center for Environmental Education can be visited for several days at a time; the Center includes living accommodations, a dining room, and a study room.





# Protection



- On the territory of the reserve there are 8 cordons of protection, with 38 state inspectors who have access to motorboats. Two of these cordons include video surveillance. Main violations of the protected regime include poaching of valuable sea animals: trepang (*Apostichopus japonicus*), seaside scallop (*Mizuhopecten yessoensis*) and Kamchatka crab (*Paralithodes camtschaticus*).

The main objects of the poaching industry (illegally catch) require special protection measures: the Far Eastern trepang, the giant octopus, the Kamchatka crab and scallop.



Trepang (*Apostichopus japonicus*)



# Fauna

The richness of the underwater world of the reserve is attributed to natural phenomena. The water surface and the deep sea of the reserve are inhabited by more than 1600 species of multicellular plants and animals, made up of boreal, subtropical, and arctic species, including 200 species of fish, 450 species of crustaceans, 30 species of echinoderms and more than 200 species of mollusks. The reserve contains wide representation of mollusks or soft-bodied animals, 7 species of which are listed in the Red Book of Russia.





# LARGA

18 of 19 Larga seal breeding-grounds (90%) of Peter the Great Bay are located in the Reserve.



# Birds

188 species of birds (nesting, colonial, and migratory) can be observed directly in the reserve. The islands are home to the world's largest population of nested black-tailed gulls (*Larus crassirostris*) and Ussuri cormorants (*Phalacrocorax capillatus*). In the lagoon near Cape Ostrovok Falshivi, about 100,000 birds gather each year, including waders, ducks, geese, herons, and storks. In total, the reserve has 28 species of birds included in the Red Book of the International Union for Conservation of Nature and of Russia.



Marine Reserve, its area and the adjacent Khasan natural park, are situated on a crossing of spring-autumn migrations of birds (Siberia-Japan and Arctic-China), that's why about 360 bird species can be observed here, and the rarest species of the world ornithofauna among them. Among these are the deadlock-rhinoceros (*Cerorhinca monocerata*), falcon-peregrine (*Falco peregrinus*), small sturgeon (*Oceanodroma monorhis*), streaked shearwater (*Calonectris leucomelas*), and grasshopper warbler (*Locustella pleskei*). On the island of Furugelma, the rare small spoonbill (*Platalea minor*) and yellow-eared heron (*Egretta eulophotes*) have recently begun nesting.



# FLORA

A total of 880 species of plants have been recorded on the islands, 62 of which are classified as Specially Protected Species and are included in Red Books of various ranks. Among them are *Lilium cernuum* and *Lilium lancifolium*, Japanese orchid (*Pogonia japonica*), *Solanum megacarpum*, fern Straits (*Botrychium strictum*), pyrrhosia (*Pyrrhosia petiolosa*), iron birch (*Betula schmidtii*) and sweet oak (*Quercus dentata*) a



The purpose of the reserve is to preserve for future generations the gene pool of animals and plants of the Peter the Great Bay of the Sea of Japan. The main directions of scientific activity are study and mapping of deep sea and terrestrial communities; inventory of species and landscape diversity, monitoring and assessment of the impact of anthropogenic and natural factors on biota; study of the biology of rare and endangered species. An inventory of the fauna and flora of the reserve has been carried out.



*Foto by Dmitriy Rudas'*

# NSCMB FEB RAS



## Research Laboratories (August 2018):

**Ecosystem Dynamics;**  
**Ecology;**  
**Systematics and Morphology;**  
**Ichthyology;**  
**Embryology;**  
**Physiology;**  
**Comparative Cytology;**  
**Autotrophic Organisms;**  
**Genetics;**

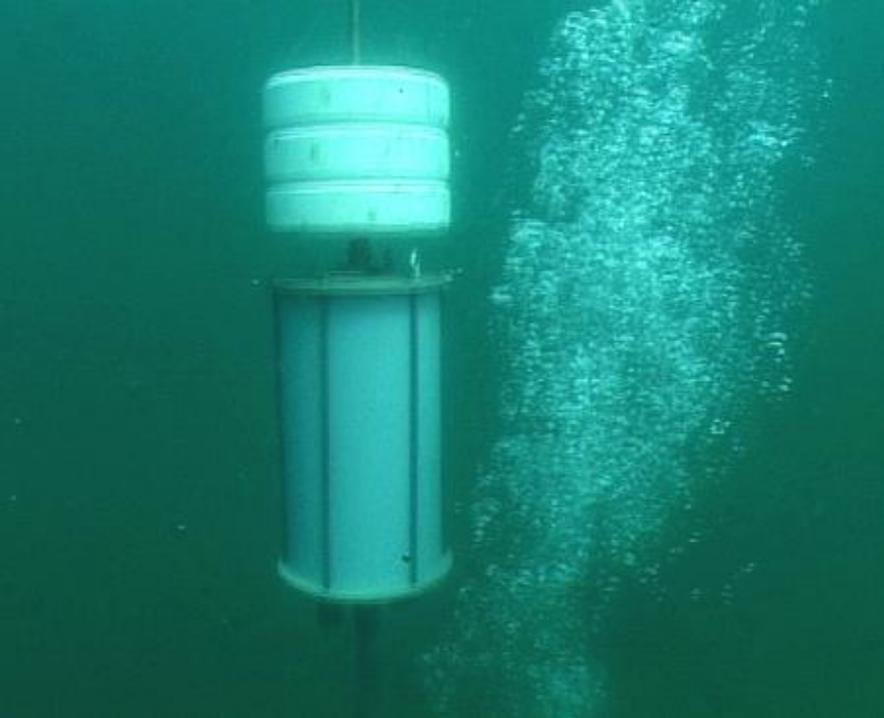
**Molecular Systematics;**  
**Cell Differentiation;**  
**Cell Technology;**  
**Cell Biophysics;**  
**Comparative Biochemistry;**  
**Farmacology**  
**Marine Mammals**  
**Marine Microbiota**

# Monitoring

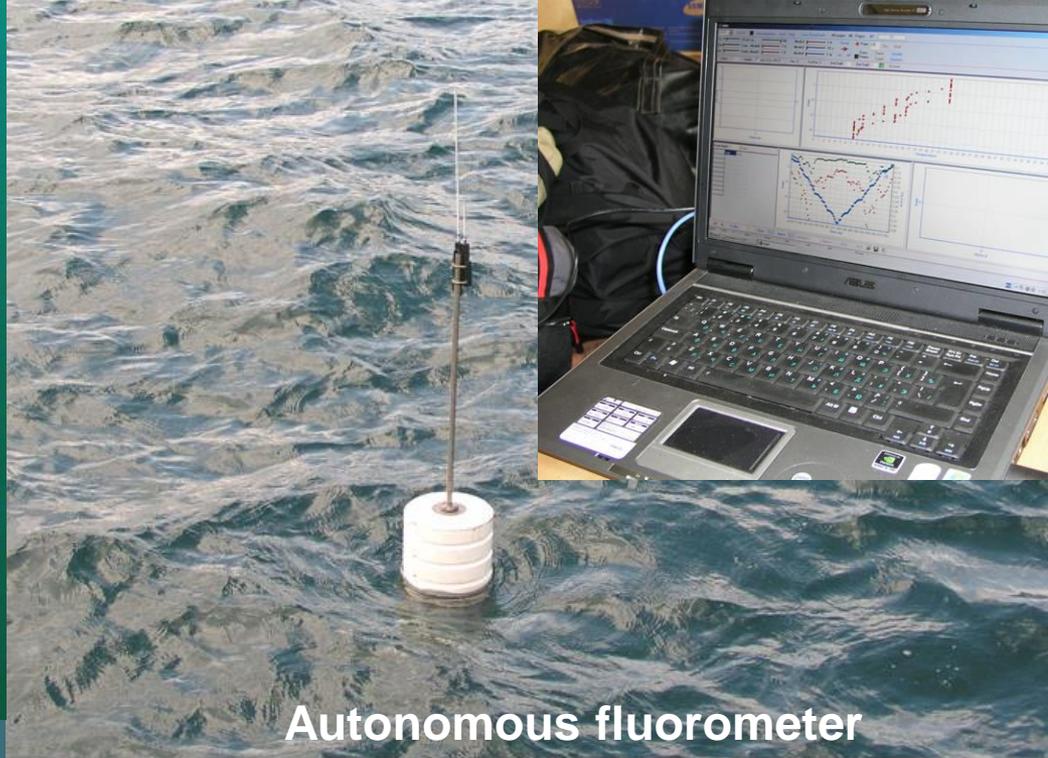
Monitoring of coastal biotope fish in the southern part of the Far Eastern Marine Reserve is being carried out. The study of the distribution of fish and their density records, conducted in 2012 and 2014 in Furugelma Island, as well as in the bays of Sivuchya, Kalevala and Pempzova in 2014, revealed a decrease in species diversity, density and biomass compared to the mid-1990s. The decrease in the species diversity of fish is explained by the partial degradation of biotopes (disappearance of the *Zostera marina*) and a slight increase in the period of high water temperatures, which prevents the approach of some cold-water fish to shallow coastal waters.

Within the framework of the program "Biodiversity of the World Ocean: composition and distribution of biota," monitoring and research of biological diversity of flora and fauna is carried out. Modern technologies which aid in accounting for marine biological resources and monitoring of natural populations of especially valuable commercial hydrobionts are being developed.

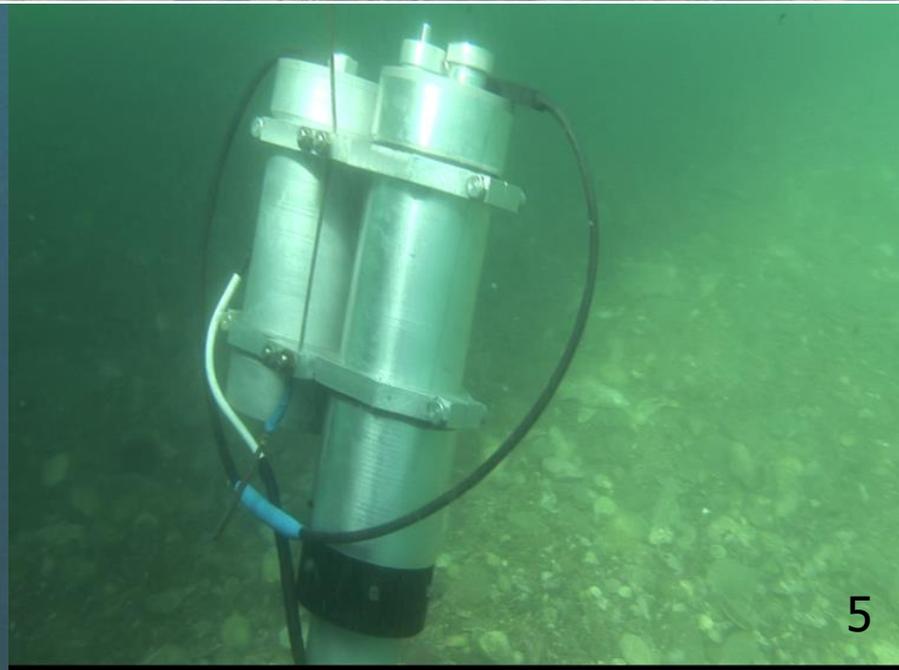
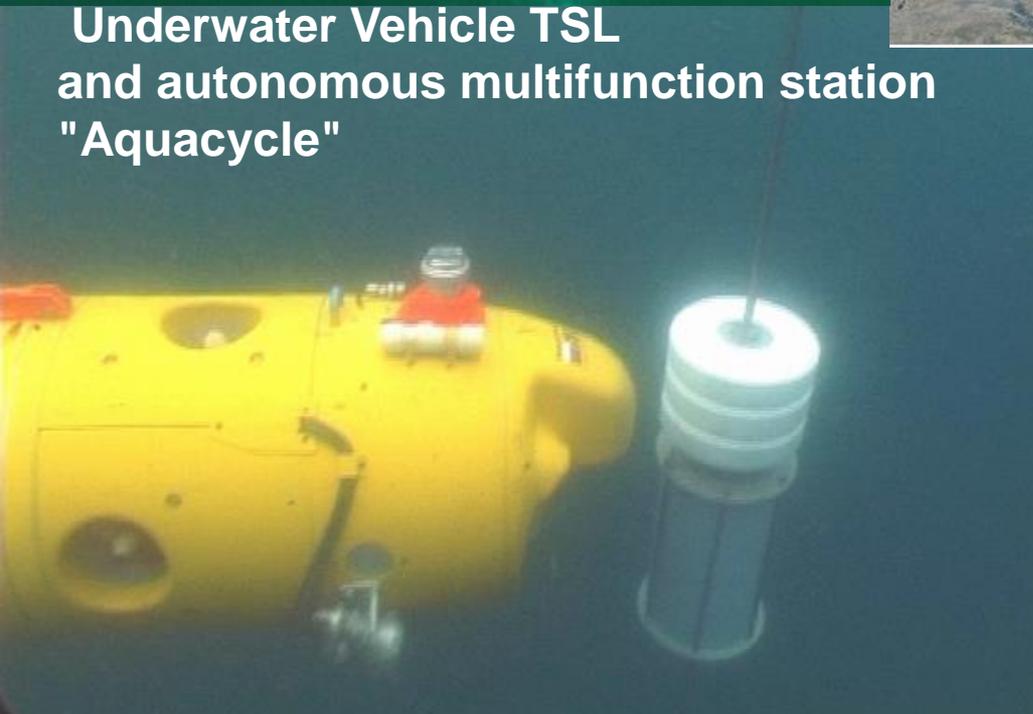
Counts are conducted to ascertain the number of seabirds, migratory, and nesting birds in the Far Eastern Marine Reserve. New data have been obtained on the penetration of alien species of aquatic organisms into the waters of the Reserve.



**Underwater Vehicle TSL  
and autonomous multifunction station  
"Aquacycle"**

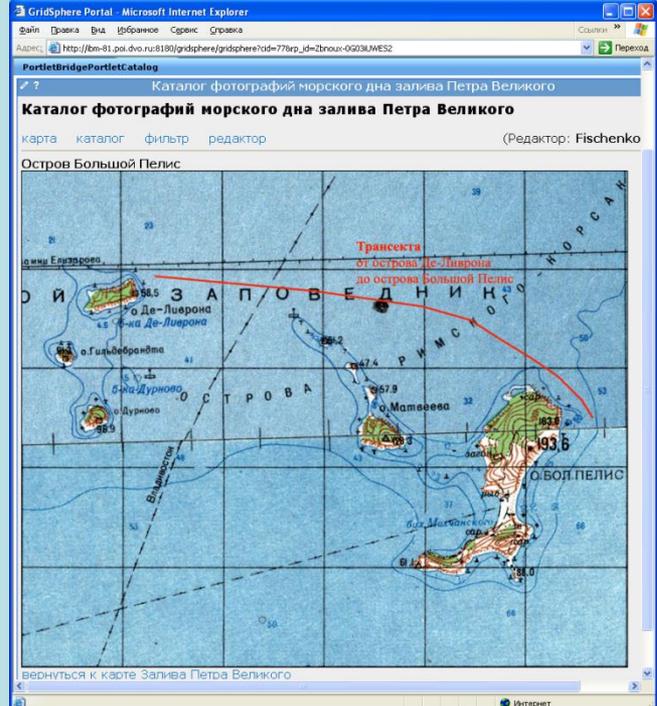
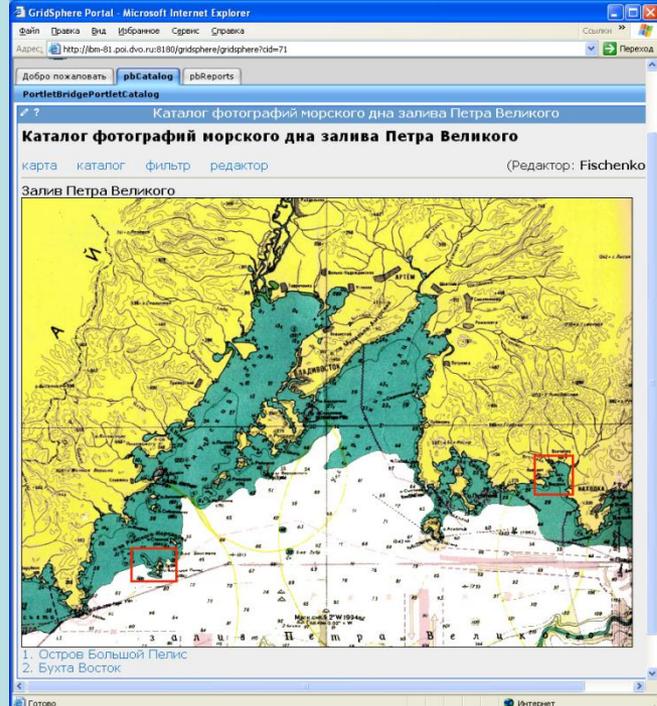
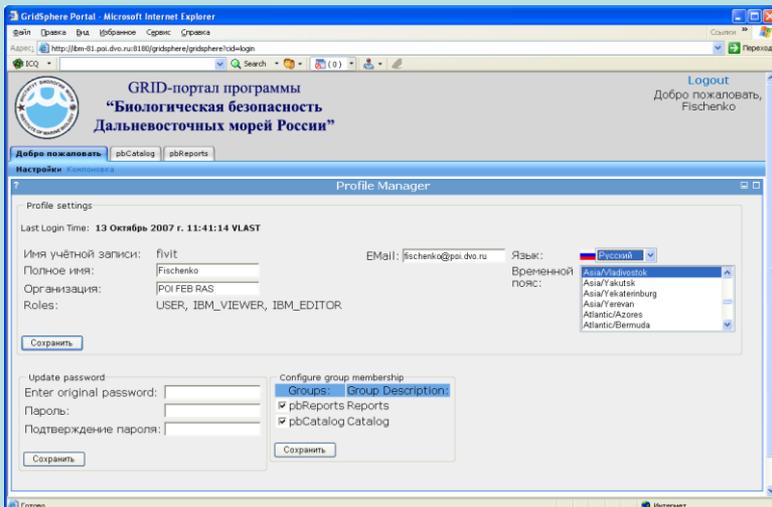
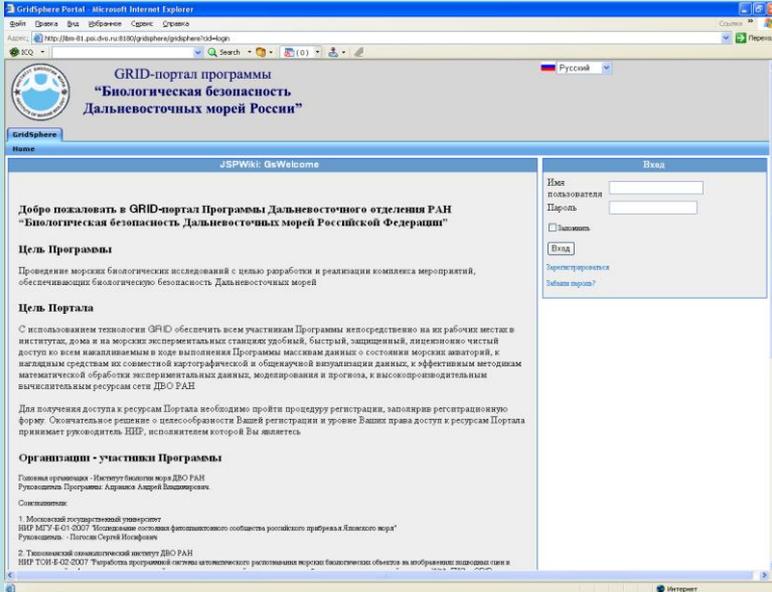


**Autonomous fluorometer**





A software system is developed for automatic recognition of marine biological objects on images of underwater scenes and a distributed information and analytical system for integrated support for marine biological research based on Web, GIS, and GRID technologies.



# System of biological objects Recognition and Accounting

GridSphere Portal - Microsoft Internet Explorer

Адрес: http://bm-81.pol.dvo.ru:8180/gridsphere/gridsphere?cid=778rp\_id=b97hux-0G03zRbJ11

## Каталог фотографий морского дна залива Петра Великого

карта каталог фильтр редактор (Редактор: Fischenko)

ID 6

Полигон: Бухта Восток

Устройство: Подводный аппарат ИПМТ

Год: 0

Дата/время: Формат: YYYY-MM-DD HH:MM:SS

Широта: 42.8918 Долгота: 132.735 Глубина: 0.0 Высота: 0.0 Масштаб: 0.0 Длина полосы: 0.0

Путь: Apparat/IPMT/Vostok/2004/

Имя файла: 0729110832.png

Размер: 0

Температура: 0.0 Соленость: 0.0 Экспозиция: 0.0

Ширина, пикс.: 1020

Высота, пикс.: 1062

Цвет, бит: 24

Описание:



Фотография уменьшена до размера 640 пикселей по высоте, посмотреть оригинал в новом окне

Готово Интернет

GridSphere Portal - Microsoft Internet Explorer

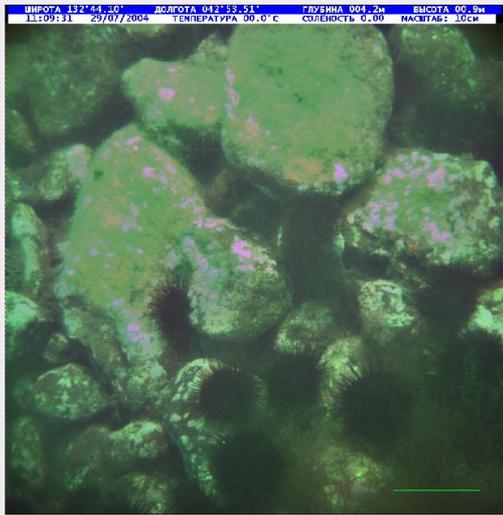
Адрес: http://bm-81.pol.dvo.ru:8180/gridsphere/gridsphere?cid=778rp\_id=b97hux-0G03zRbJ11

## Каталог фотографий морского дна залива Петра Великого

карта каталог фильтр редактор (Редактор: Fischenko)

Список объектов:

Название	Кол-во	Мин. размер	Ср. размер	Макс. размер
Другой	4	48	59	88
Еж черный	9	38	68	89
Синяя звезда	3	34	36	42



Фотография уменьшена до размера 640 пикселей по высоте, посмотреть оригинал в новом окне

Готово Интернет

Transekta Project

Файл Изображение Фильтр Распознавание

Изображение: Широта: 42.8918 Долгота: 132.735 Глубина: 0.0 Высота: 0.0 Масштаб: 10см

Ручное распознавание

Эллипс: Вкл

Рисовать все объекты

Список объектов: 14

Центр x	y
843	872

Главная полуось: 25

Побочная полуось: 30

Направление: 163

Площадь: 2356

Название:

Вид: Еж черный

Комментарий 1:

Комментарий 2:

Для сохранения введенной информации нажимайте Enter!

OK

Transekta Project

Файл Изображение Преобразование Параметры

Изображение: Широта: 42.8918 Долгота: 132.735 Глубина: 0.0 Высота: 0.0 Масштаб: 10см

ЦУП

Просмотр Изменение Добавление Авто

Метод "Корреляция спектра"

Усиление: 0.7

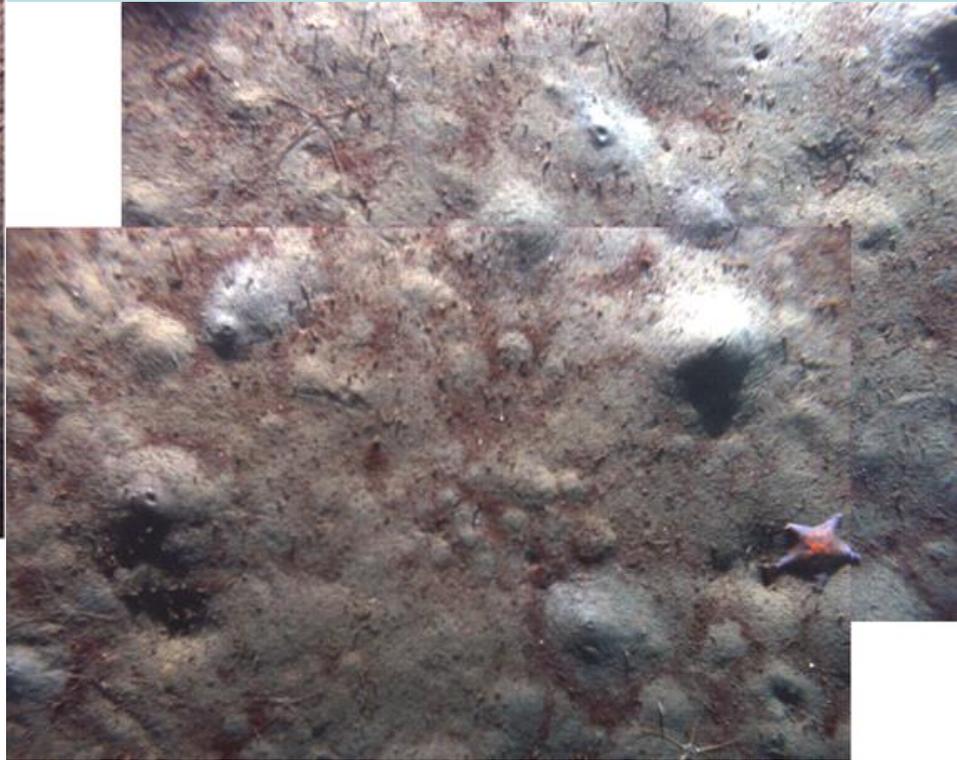
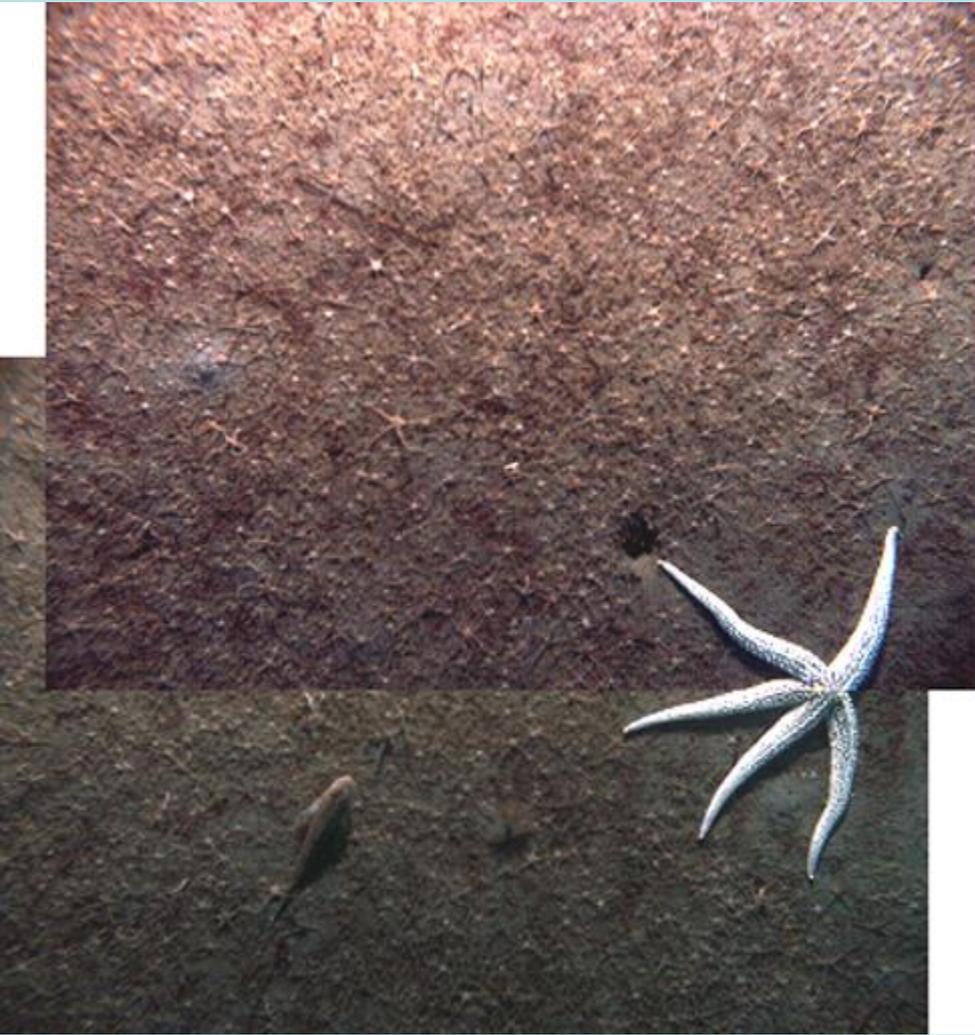
Количество поворотов: 9

Показывать корреляционное поле

ВЧ фильтрация

Образцы: 

11





## **MARINE BIOBANK «MBRU»**

- ❖ *Collecting, investigation, preserving and cataloguing marine organisms from the Far Eastern seas of Russian Federation*
- ❖ *Offers marine samples and services for academia , education and industry searching for novel compounds*

<http://www.ckp-rf.ru/ckp/506171>

<http://marbank.dvo.ru/index.php/ru>



# MBRU – UNIC EQUIPMENT

## LiCONiC STC Compact ULT -80°C

– *Automated biobanking systems designed to store wide range of biological specimens at temperatures -80°C .*



# MBRU -

## THE BIOSAFE - 420

*Cryopreservation (freezing) of various types of biological samples down to low and ultra-low temperatures. Can be used in the creation of biobanks of different types of samples (blood, cells, tissues). The BIOSAFE® container offering maximum safety for samples via the integrated fill-level controller and container monitoring system "BIOSAFE®-Control B", BIOSAFE® Control B guarantees long-term storage via integrated fill-level control and container monitoring with FreezerPro and C+CRYO System*



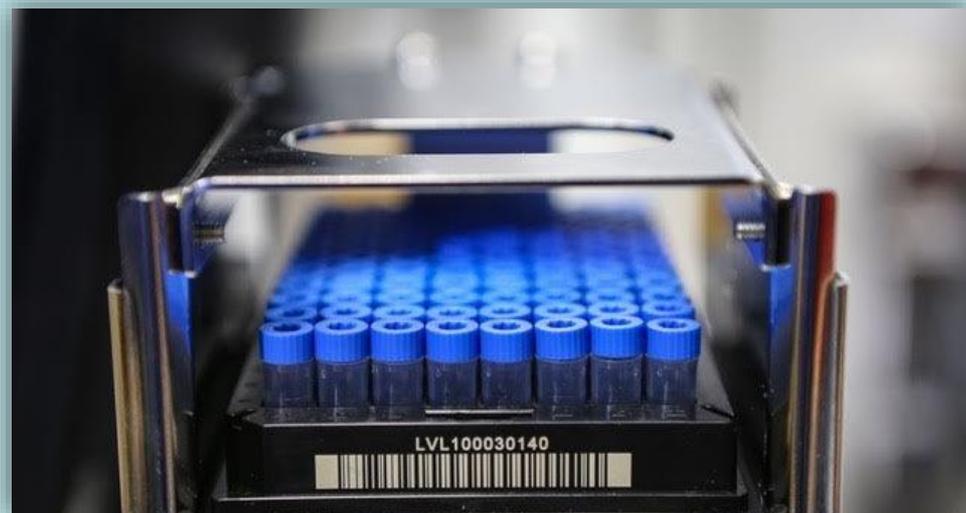
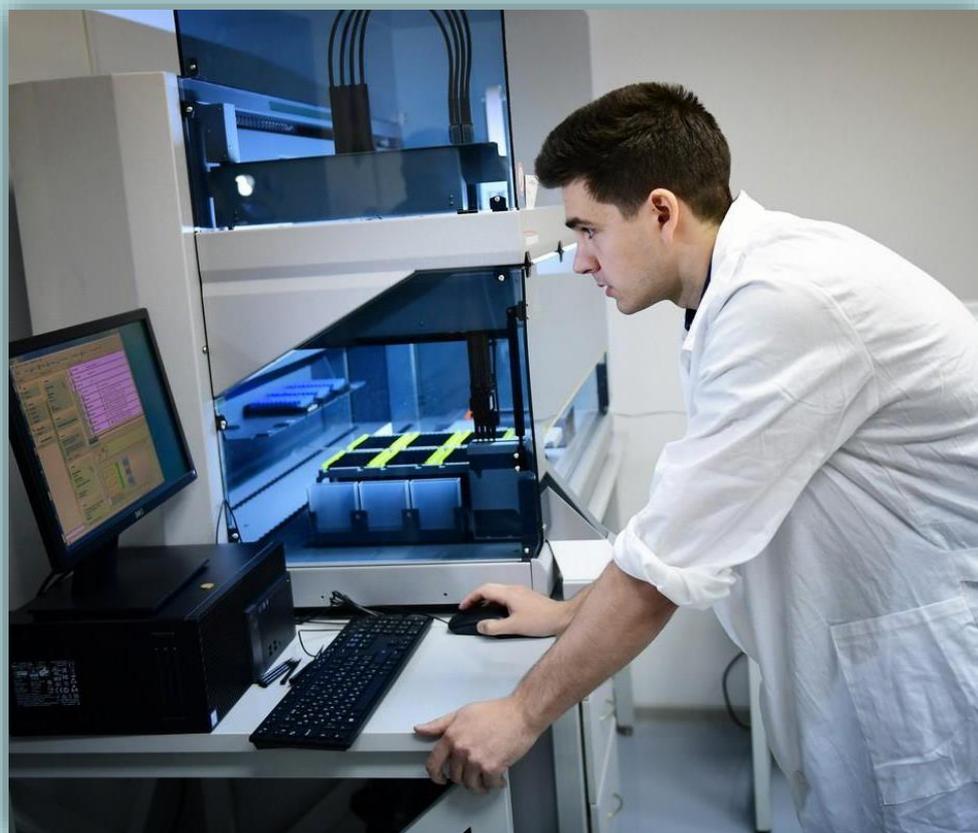


# **MBRU – TECAN Freedom EVO 150/8**

*Fully Robotic automated Station for preparation/storage of different types of samples (blood, cells, tissues).*

*Ten different robotic arms are available and can be easily upgraded or exchanged, ensuring that this workstation meets our laboratory needs both now and in the future.*

*Each liquid handling system offers optimized pipetting parameters for a broad range of liquid types and volumes, with fast liquid level detection, liquid availability check and preferential non-contact dispensing.*



# MBRU –MARINE BIOBANKING

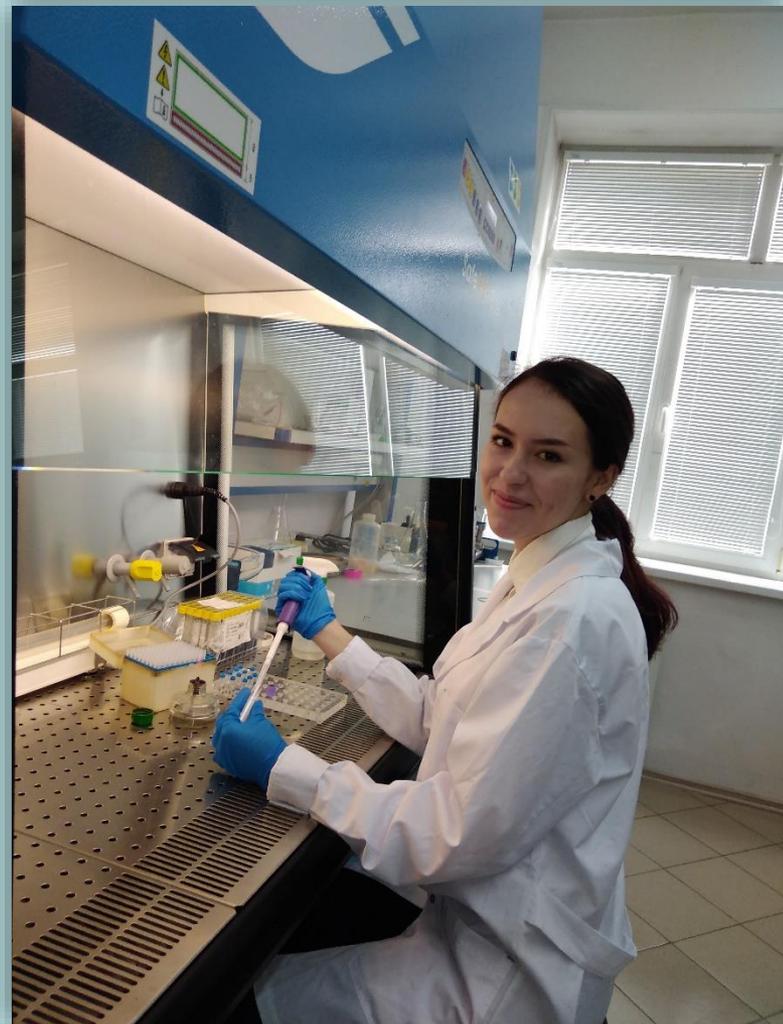
for long-term cryogenic archival of selected marine mammals biomaterials with highest standard (ISBER/GLP)



# Animal passport in the MBRU database



Кличка животного / Animal name	Смоки /Smoky	
Отряд / Squad	<i>Cetacea</i> - Китообразные/Cetaceans	
Вид / Species	<i>Delphinus delphis</i> - Дельфин-белобочка/ White-sided dolphin	
Возраст / Age	> 12	
Пол / Sex	Самец /Male	
Место содержания/ Place of	Приморский океанариум / <i>Primorsky Aquarim</i>	
Период содержания / Retention period	С 2010 / since 2010	
Образцы на хранении / Stored samples	Белые клетки крови (лейкоцитарная пленка) / White blood cells	(ссылка на образец или группу образцов) (ссылка на образец или группу образцов) (ссылка на образец или группу образцов)
	Плазма / Plasma	(ссылка на образец или группу образцов) (ссылка на образец или группу образцов) (ссылка на образец или группу образцов)
	Фекалии / Feces	(ссылка на образец или группу образцов) (ссылка на образец или группу образцов) (ссылка на образец или группу образцов)
	Слизистые/Mucous	(ссылка на образец или группу образцов) (ссылка на образец или группу образцов)



# Animal passport in the MBRU database

[Файл](#) [Правка](#) [Вид](#) [Журнал](#) [Закладки](#) [Инструменты](#) [Справка](#)

[Китообразные](#)

[marbank.dvo.ru/index.php/ru/morskie-mlekopitayushchie-marine-mammals/kitoobraznye](#)

[Часто посещаемые](#) [Начальная страница](#) [Toxins | Special Issue: ...](#)



## Морской биобанк

...ресурсная коллекция, центр коллективного использования








**Содержание**

- [Новости](#)
- [О нас](#)
- [Оборудование](#)
- [Контакты](#)
- [Услуги](#)

[Главная](#) > [Морские млекопитающие](#) > [Китообразные](#)

[Группировать по](#)

Code	Species name	Nickname	stored samples
MBRU_DUler	Delphinapterus leucas	Ler	plasma, white blood cells
MBRU_DLjess	Delphinapterus leucas	Jessica	plasma, white blood cells
MBRU_DDsmoky	Delphinus delphis	Smoky	plasma, white blood cells
MBRU_TTsam	Tursiops truncatus	Sam	plasma, white blood cells
MBRU_TTVasya	Tursiops truncatus	Vasya	plasma, white blood cells
MBRU_TTEmyy	Tursiops truncatus	Emmy	plasma, white blood cells
MBRU_TTyosya	Tursiops truncatus	Yosya	plasma, white blood cells

Отображать по

**Коллекции**

- Коллекции живых микроорганизмов
- Фондовые коллекции Музея
- Экспедиционные коллекции
  - Подводный вулкан Пийпа 2018
    - Документация
    - [План экспедиции](#)
    - Карта
    - Таблица проб
  - Море Лаптевых 2018
  - Коллекция морских генетических ресурсов
  - Морские млекопитающие
    - [Китообразные](#)

**Просмотр**

Китообразные

[Китообразные](#)

**Code**  
MBRU\_DDsmoky

**Order**  
Китообразные

**Species name**  
Delphinus delphis

**Nickname**  
Smoky

**Gender**  
male

**Age**  
12

**Picture**

**Place of retention**  
[Primorsky Aquarium](#)

**Retention period**  
since 2010

**stored samples**  
plasma, white blood cells

**Storage place of samples**  
Bioresource collection  
NSCMB FEB RAS

**Notes**

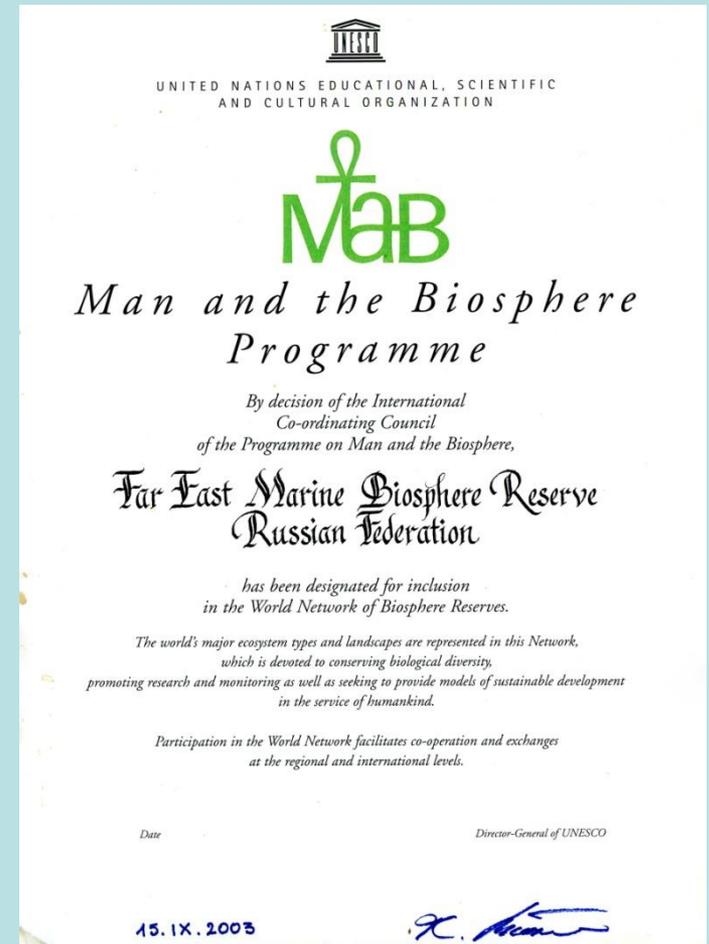
14:54
12.10.2018



# Far Eastern Marine Biosphere Reserve

- 2003 - inclusion in the World Network of Biosphere Reserves of the Programme on Man and the Biosphere MAB UNESCO
- 2018 -membership in International Alliance of Protected Areas (IAPA)

Reports at international conferences and forums, take part in international projects, such as: «Assessment of the effectiveness of management of marine protected areas» by IUCN, WWF, NOAA; «Economic development of the TUMANNA TRED A area» (Tumen River Economic Development Area) by UNDP; «Establishment of a transboundary PA system in the area of the Tumen River and the adjacent water area and territory» by UNDP «Strengthening Marine and Coastal Protected Areas of the Russian



# RESUME

- The reserve has no contradictions to the Lima Action Plan. The reserve has established a stable interaction between science, higher education, government, civil society and private business at the regional level. There are problems in limiting the resources and regulatory framework. An assessment of ecosystem services has not been carried out yet.
- The problem of the expansion of invasive species on protected areas.
- The problem of the spread of marine debris on protected areas.
- Development of proposals for the creation of a biosphere polygon of the far Eastern marine biosphere state nature reserve on the territory of the Khasansky natural Park. Organization of TRANS-regional protected areas for the conservation of migratory and rare bird species, people's Republic of China (Fund Chuan national Park (scenic area)); democratic people's Republic of Korea (Rason migratory bird sanctuary).

A scenic view of a coastline at sunset or sunrise. A large, vibrant rainbow arches across a cloudy sky. The foreground shows the ocean and rocky cliffs on the right side. The text "Thank you for attention!" is overlaid in the center.

*Thank you for attention!*