

# Intellectual Property Rights: Implications for Deep-Ocean Stewardship

**Intellectual Property (IP) rights have advantages and disadvantages and the various approaches taken by States and innovators can have a significant impact on the future of research, benefit-sharing, capacity building and technology transfer for the deep ocean and its stewardship. A balanced approach is needed to reward innovation and investment and ensure access on appropriate terms.**

IP has emerged as a topic for discussion in the negotiations for the development of a new international legally binding instrument for the conservation and sustainable use of marine biological diversity beyond national jurisdiction under the United Nations Convention on the Law of the Sea. This brief explains IP rights, their intersections with science, and the advantages and disadvantages of different approaches.

## What are IP rights?

IP owners have the right to control the use of an innovation for a limited period. States grant IP rights to innovators and creators if threshold requirements are met, based on state obligations under international treaties. IP rights (**Box 1**) control the reproduction of the results of innovation and creativity– but they do not cover the physical output itself, such as a drug, a book, or equipment. IP rights cover a country or a region and IP owners often have a portfolio of the equivalent rights in different countries. There are different forms of IP, including patents and copyright, with varying duration of rights, thresholds and factors which constitute infringement (**Table 1**). Although IP rights do not apply in areas beyond national jurisdiction (ABNJ), they remain an issue for the scientific community as many activities pertaining to the deep-ocean ecosystem will take place within national borders or indeed on land. Also important are debates regarding disclosure of the origin of genetic resources which can lead to a patent (**Box 2**).

### Examples of IP rights

**BOX 1**

- Patents for drugs building on marine genetic resources (MGR)
- Patents and copyright for machinery and software used in marine scientific research
- Copyright and database rights for the content and structure of information repositories

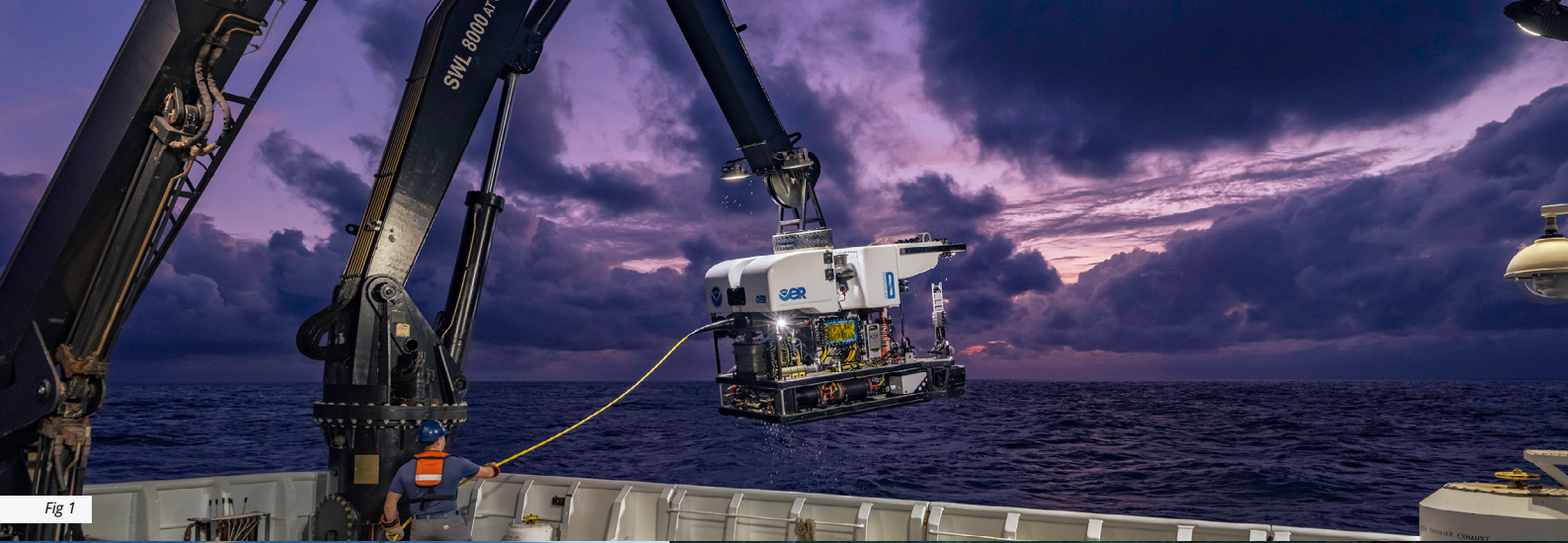


Fig 1

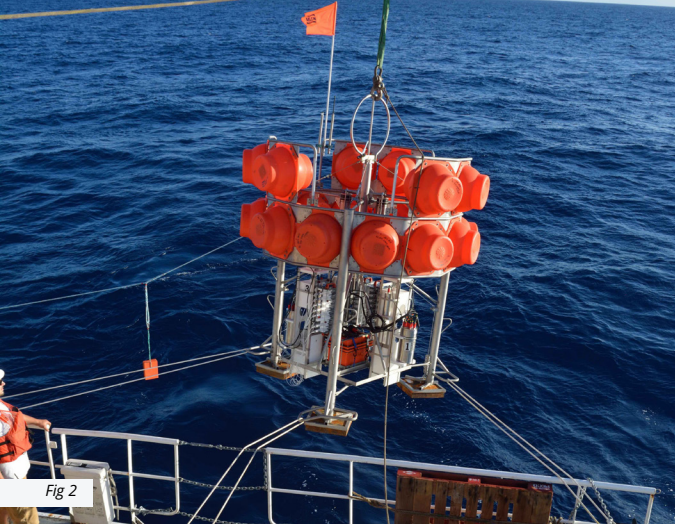


Fig 2

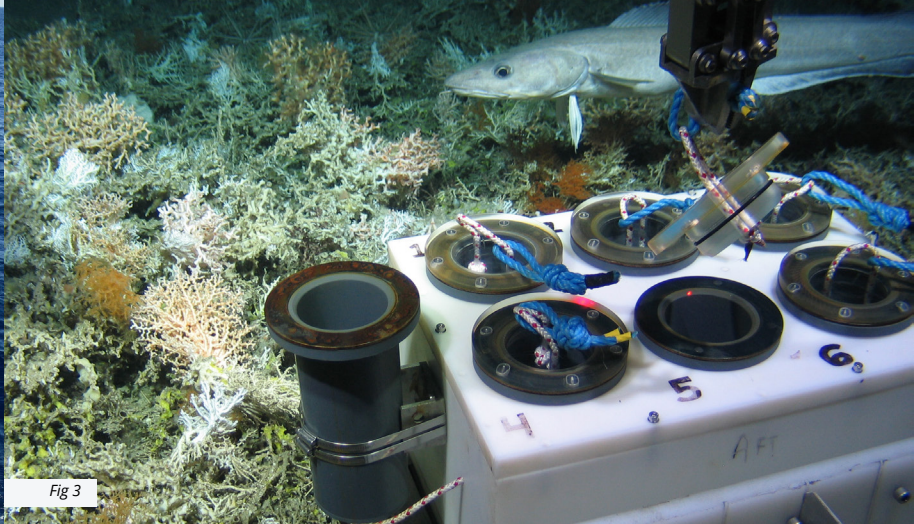


Fig 3

Fig 1 Recovery of ROV Deep Discoverer. Photo credit: ©NOAA OER

Fig 2 Respirometer Lander. Photo credit: ©DeepCCZ Expedition

Fig 3 Changing Oceans Expedition 2012. Photo credit: © JM Roberts

TABLE 1

	TERM OF PROTECTION	THRESHOLD FOR IP RIGHT TO EXIST	WHEN IP RIGHT IS INFRINGED	EXAMPLE
Patent	20 years	Invention is new, inventive, capable of industrial application and full details of it are shared	Use of invention, or something very similar to the invention, even if there was no knowledge of the patent or intention to infringe it	Applications for patents building on lab research, often at request of investors or commercial partners
Copyright	Ranges from 50 years from creation of work, to the life of the author of the work plus 70 years	Work is not copied – and sometimes involves an intellectual creation	Reproduction (direct or indirect) of the work or something very similar (including online) – narrower than patents	IP arises automatically if threshold is met, and could cover academic, peer-reviewed publications and information collections
Database (less widespread, exists e.g in EU)	15 years	Substantial investment in obtaining, verifying or presenting existing information in a collection of materials which is arranged systematically and methodically	Extraction or re-utilisation of whole or substantial part of contents of database	IP arises automatically if threshold is met in respect of information collections

## Debates regarding disclosure of the origin of genetic resources which lead to a patent.

### Common arguments in favour of disclosure:

- Ensures that the local community, or the international community in respect of areas beyond national jurisdiction, can share in the benefit
- Enables others to work the invention.

### Common arguments against disclosure:

- Costly and interferes with the innovation process
- Would bring to light some practices of use of genetic resources without the consent of the community (in breach of the Convention on Biological Diversity) or that what is claimed is, in fact, not new.

If others act in relation to the results of the innovation or creativity without the consent of the IP owner, the owner can raise a court action. They could obtain an order that this activity stop and that a financial payment is made. IP owners may choose to allow others to act. Sometimes this will involve charging a royalty fee but there are also examples of IP owners choosing to share without payment (for some or all purposes) using models such as Creative Commons and CAMBIA BioS.

## How are IP rights obtained?

A patent is acquired through application to a national or regional patent office. Copyright and database are both unregistered rights and arise automatically if thresholds (**Table 1**) are met. It is wise to keep records (hard copy or digital, with dates) showing the development process.

The innovator or creator owns the IP right unless the work is done in the course of employment, in which case the employer will own it. IP rights can be sold, for example to companies or individuals who may have more interest in exploiting them.

## What are the benefits of IP?

Many argue that without IP rights there would be no economic incentive for people to innovate, or for the private sector to invest in innovation, as others could ride freely on the back of the first innovator's work. Arguably this might be bad for the environment and for humankind, as valuable research in the deep ocean and marine biodiscovery, and development of new technologies for conservation and sustainable use of ocean resources, may not occur.



Fig 4 Photo credit: Tingey Law Firm

## What are the disadvantages of IP?

Others argue that as IP owners can limit the use of results of innovation and creativity, they hold too much power to restrict potential applications of this which may benefit humankind. Even if the IP rights will expire, in the short term IP rights can be said to favour private interests over public benefit. Some situations when this could potentially arise are explored in **Box 3**. There is also a view that it is inefficient for innovators to work around the IP rights of others and this could, for example, slow marine technology development progress. Further, regarding MGR, there is concern around the possibility of patents being granted where there has been insufficient innovation from an existing gene, and also, in some countries, for lab replication of genes found in nature.

## Some hypothetical future problems

BOX 3

- Patent owner could charge unaffordable prices for pharmaceutical drugs building on MGR from beyond national jurisdiction and refuse to allow others to make them more cheaply – even in the face of an international crisis
- Patent owner decides not to permit companies in a developing country to use technology to analyse MGR
- The owner of copyright and database rights over established repositories is floated on the stock exchange and decides that it will now charge all users of the repository £1 million per annum so that it can satisfy its new shareholders, thereby precluding significant use.

## Can there be limits on IP rights?

The main IP treaty (known as TRIPS, and part of the World Trade Organization Agreement) provides in essence that States can impose limits if they do not unreasonably conflict with the normal exploitation of the IP and do not unreasonably prejudice the interests of the IP owner. Some countries have exceptions for use in education and in research (sometimes for non-commercial purposes, sometimes commercial work is included).

States can also have compulsory licence regimes where patent owners are forced to share, such as in the case of non-use or to enable use by others (and the State) including to address national emergencies - an established example is responding to a health crisis.

Furthermore, States can choose not to grant patents for plants and animals (excluding microorganisms), for “essentially biological” processes for the production of plants or animals, or for inventions where the prevention of commercial exploitation is necessary to protect “ordre public” or morality, including to protect human, animal or plant life or health and to avoid serious damage to the environment. Note that if more use of a particular innovation (say of pharmaceutical drugs) is sought, rather than less, this last provision is unlikely to help deliver that goal.

There have also been instances of trade and investment agreements requiring that States do not limit IP rights; and if Investor-State dispute settlement proceedings are available in the agreement, this could lead to IP owners making complaints directly against States.

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There are other IP rights (such as trademarks and design rights) and also trade secrets. Trade secrets can last forever, as long as the information remains secret, but most countries have exceptions if a following disclosure was made in the public interest. This could include details of the impact of an activity on the environment and the ocean.



Fig 5 Photo credit: Tingey Law Firm

## Future directions

Some in the IP community argue for a stewardship approach to IP. For the deep ocean, this could involve more decisions made at national and regional level to adopt a more sharing, holistic, ocean- and environment-focused based approach to IP rights which are relevant to - and build on - ocean resources. This could draw together relevant international agreements (not just those relating to IP) and avoid the hypothetical problems suggested above.

A stewardship approach to IP could provide some reward for innovation and creativity and investment in them. It could also enable, in some cases for a reasonable fee, other scientists to use information sets, analysis and drilling technology, and to work and move beyond the inventions of others. This could contribute to research and capacity building. It could inform benefit sharing regimes, such as in the negotiations for an international legally binding instrument for the conservation and sustainable use of marine biological diversity beyond national jurisdiction, as well as processes relating to climate change. It could enable wider use of the resulting innovation, particularly in the case of new medicines.

This stewardship approach would complement some decisions already made by IP owning scientists, in some cases at the request of funders and publishers, to share their technology and information. It would also be supported by calls for openness from advocacy groups, shareholders, consumers and scientists.

It is timely for the scientific community to stress its needs in terms of access to information, including in relation to MGR in its various forms, and to technology. Understanding these needs could inform discussions and decision-making to bring about effective and sustainable contributions to the future of the oceans and to the benefits for humankind which can derive from them.

## Further reading

- [WTO TRIPS](#)
- [WIPO](#)
- Disclosure of origin [link](#) and [link](#)
- [UK Intellectual Property Office](#)
- Agreements requiring high levels of IP protection [link](#) and [link](#)
- [Creative Commons](#)
- [CAMBIA BioS](#)
- [EU-Start Ups on IP and investment](#)
- [Commission on IP rights](#)
- [Wellcome Trust](#)
- [Link](#) to University of Aberdeen videos on IP and Song of the Oceans
- [More](#) on IP and Stewardship

## ABOUT DOSI

The Deep-Ocean Stewardship Initiative seeks to integrate science, technology, law and economics to advise on ecosystem-based management of resource use in the deep ocean and strategies to maintain the integrity of deep-ocean ecosystems within and beyond national jurisdiction.

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Fig 6 WIPO Headquarters, Geneva.