INTERNATIONAL HYDROGRAPHIC ORGANIZATION

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (of UNESCO)

IHO/IOC Form No. 1

UNDERSEA FEATURE NAME PROPOSAL

(See NOTE overleaf)

Ocean or Sea **North Pacific Ocean** Name proposed **Suruga Seamount**

Coordinates : **A** - of midpoint or summit : Lat. **14-14 N** , Long. **142-53 E**

_____ kilometres in _____ direction from _____

and/or **B** - extremities (if linear feature) :

Lat. _____ } to { Lat. _____
Long. _____ } to { Long. _____

Description (kind of feature) : **seamount**

Identifying or categorizing characteristics (shape, dimensions, total relief, least depth, steepness, etc.):
This is a seamount located at the southern end of the West Mariana Ridge, Philippine Sea. The seamount is almost conical-shaped, which is arguably defined by 1600 m contour line. The shallowest depth is only 40 m.

Associated features : **The seamount has a smaller peak on its southern flank.**

Chart reference :

Shown with name on chart No. _____

Shown but not named on chart No. **INT 510**

Not shown but within area covered by chart No. _____

Reason for choice of name (if a person, state how associated with the feature to be named) : _____
As part of spawning ground investigation for Eel *Anguilla japonica*, full-scale investigation was conducted for the first time by a fisheries research ship "Suruga Maru" in 1997. Detailed geological/geophysical mapping were then performed by R/V Yokosuka in 2001. The latest study confirmed that Eel *Anguilla japonica* spawns at this seamount (Tsukamoto, 2006, Nature).

Discovery facts :

Date **August 2001** by (individuals or ship) **Research Vessel "Yokosuka" of JAMSTEC**

By means of (equipment) : **Multibeam Echo Sounder SEABEAM2112.004**

Navigation used : **D-GPS**

Estimated positional accuracy in nautical miles : **0.0054 mile (10 m)**

Description of survey (track spacing, line crossing, grid network, etc.) : **The following four survey lines were employed for mapping this seamount: (12°33'84N,140°42'7E) – (13°59'58N,142°53'90E), (13°59'84N,142°54'31E) – (14°46'43N, 142°53'98E), (14°46'98N, 142°53'69E) – (14°30'02N, 142°45'00E), (14°30'2N, 142°45'0E) – (14°25'24N, 142°45'0E). Deep-sea camera survey was also conducted along the 300-m contour of the seamount.**

Nature and repository of other survey activities (dredge samples, cores, magnetics, gravity, photographs, etc.) : _____

_____

Supporting material : enclose, if possible, a sketch map of the survey area, profiles of the features, etc.,

with reference to prior publication, if any : _____

The name of "Suruga seamount" has already appeared in several scientific journals for fisheries. A Nature paper has just been published in 2006.

Tsukamoto, K., 2006, Spawning of eels near a seamount, Nature, doi: 10.1038/439929a

_____

Submitted by : **Japanese Committee on Undersea Feature Names**

Date : **5 June 2006**

Address : **5-3-1 Tsukiji, Chuo-ku, Tokyo 104-0045, Japan**

_____

Concurred in by (if applicable) : _____

Address : _____

_____

National Authority (if any) : **Japanese Committee on Undersea Feature Names**

Address : **5-3-1 Tsukiji, Chuo-ku, Tokyo 104-0045, Japan**

_____

NOTE : This form should be forwarded, when completed :

a) **If the undersea feature is located in territorial waters** :-
to your "National Authority for Approval of Undersea Feature Names" or, if this does not exist or is not known, either to the International Hydrographic Bureau or to the Intergovernmental Oceanographic Commission (see addresses below);

b) **If the undersea feature is located in international waters** :-
to the International Hydrographic Bureau or to the Intergovernmental Oceanographic Commission, at the following addresses :

International Hydrographic Bureau
4, quai Antoine 1er
B.P. 445
MC 98011 MONACO CEDEX
Principality of MONACO
Fax: +377 93 10 81 40
E-mail: info@ihb.mc

Intergovernmental Oceanographic Commission
UNESCO
Place de Fontenoy
75700 PARIS
FRANCE
Fax: +33 1 45 68 58 12
E-mail : info@unesco.org

BRIEF COMMUNICATIONS

Spawning of eels near a seamount

Tiny transparent larvae of the Japanese eel collected in the open ocean reveal a strategic spawning site.

Discoveries of the larvae of the European and American eels, *Anguilla anguilla* and *A. rostrata*, in the Sargasso Sea[1,2] and of the Japanese eel, *A. japonica*, in the Philippine Sea[3] indicate that these freshwater eels migrate thousands of kilometres into the open ocean to spawn. Here we pinpoint a spawning location for Japanese eels after genetically identifying newly hatched larvae that we collected from the site. The restricted size of this spawning area ensures that the eel larvae enter a particular current that transports them to the freshwater areas in east Asia where they mature, and it also prevents them from being carried southwards away from their species range by a different local current.

It has been suggested that changes in oceanic conditions[4] are contributing to the recent drastic decline of anguillid eels worldwide[5], by disrupting their spawning areas and the transport of their larvae (leptocephali)[4]. But little is known about such spawning areas. On the basis of data collected on leptocephali over almost 50 years and analysis of their hatching dates, we have proposed that the Japanese eel spawns near seamounts west of the Mariana Islands (14–17° N, 142–143° E), close to the time of the new moon[6]. We have now verified the location and timing of spawning by Japanese eels after collection and analysis of the newly hatched pre-leptocephali.

During research cruise KH-05-1 aboard *RV Hakuho Maru*, we collected and genetically identified 130 pre-leptocephali (size, 4.2–6.5 mm) and 60 leptocephali (11.7–18.4 mm) of the Japanese eel in the region of the North Equatorial Current in June 2005. The pre-leptocephali were collected around 14° N, 142° E, to the west of the Suruga Seamount in the southern part of the West Mariana Ridge (Fig. 1).

Some pre-leptocephali were identified as *A. japonica* on board by real-time polymerase chain reactions[7]; this identification was later confirmed by DNA sequencing of additional specimens[8]. (For details, see supplementary information.) The larvae were collected on the day of the new moon and for two days afterwards. They were at various stages of development: some had unpigmented eyes and no teeth, others had pigmented eyes, early teeth and jaws (Fig. 2). Daily growth rings of calcium mineralization in 'ear stones' known as otoliths showed that the eels had hatched 2 to 5 days previously, indicating that spawning had occurred about 4 days before the new moon.

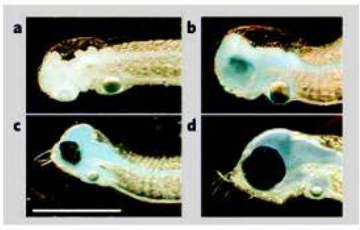

Figure 2 | Japanese eel pre-leptocephali at different stages of development. **a**, Head regions of early-stage larvae with no teeth, jaws or eye pigmentation; **b**, some larvae show early eye pigmentation; **c**, some have early teeth but no jaws; **d**, others have teeth that are more developed and early jaws. Larva lengths in **a**–**d** are 5.0, 4.7, 5.2 and 4.2 mm, respectively. Scale bar, 1 mm.

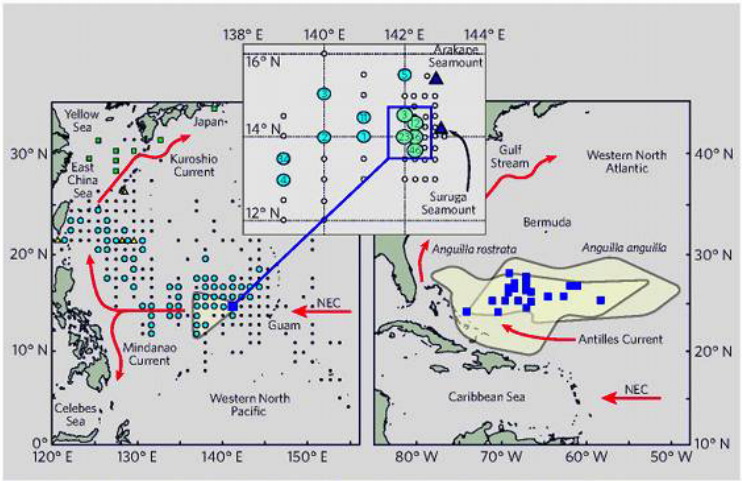

Figure 1 | Collection sites of small eel larvae. Left, catches of the Japanese eel, *Anguilla japonica*, in the western North Pacific Ocean between 1961 and 2002 ($n = 2,418$; ref. 6); yellow circles, sites where leptocephali larger than 7 mm were collected. Metamorphosing leptocephali (blue triangles) and oceanic glass eels (green squares) were also found. Black dots, sites where no larvae were found. Right, eel catches in the western North Atlantic Ocean (1913–85; ref. 2). Shaded areas, sites where leptocephali (≤10 mm in size) of each species were collected[2]. Red squares mark collection sites of pre-leptocephali (≤7 mm) of the Japanese eel (left) or of both Atlantic eel species[2] (right). NEC, North Equatorial Current. Inset, distribution and number of Japanese eel pre-leptocephali (≤7 mm; green circles) and leptocephali (>7 mm; yellow circles) collected during the time of the new moon in June 2005. Red triangles, seamounts. White circles, stations where no Japanese eel leptocephali were found.

We have identified a precise spawning location by collecting newly hatched pre-leptocephali. The area seems to be much smaller than the spawning area estimated for the Atlantic eels (Fig. 1). It is located at an optimum latitude for the leptocephali to enter the Kuroshio Current that flows north towards the eels' habitat areas in east Asia. It seems that spawning occurs in a narrow range of latitudes because otherwise leptocephali would not find the northward flow and might instead enter the Mindanao Current, which flows southwards to places where there are no Japanese eels[4,6].

Katsumi Tsukamoto
Ocean Research Institute, University of Tokyo, Nakano, Tokyo 164-8639, Japan
e-mail: ktpc@ori.u-tokyo.ac.jp

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Supplementary information accompanies this communication on *Nature*'s website.
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doi:10.1038/439929a

Tsukamoto, K., 2006, Spawning of eels near a seamount, Nature, doi: 10.1038/439929a

3D image of the Suruga Seamount-1

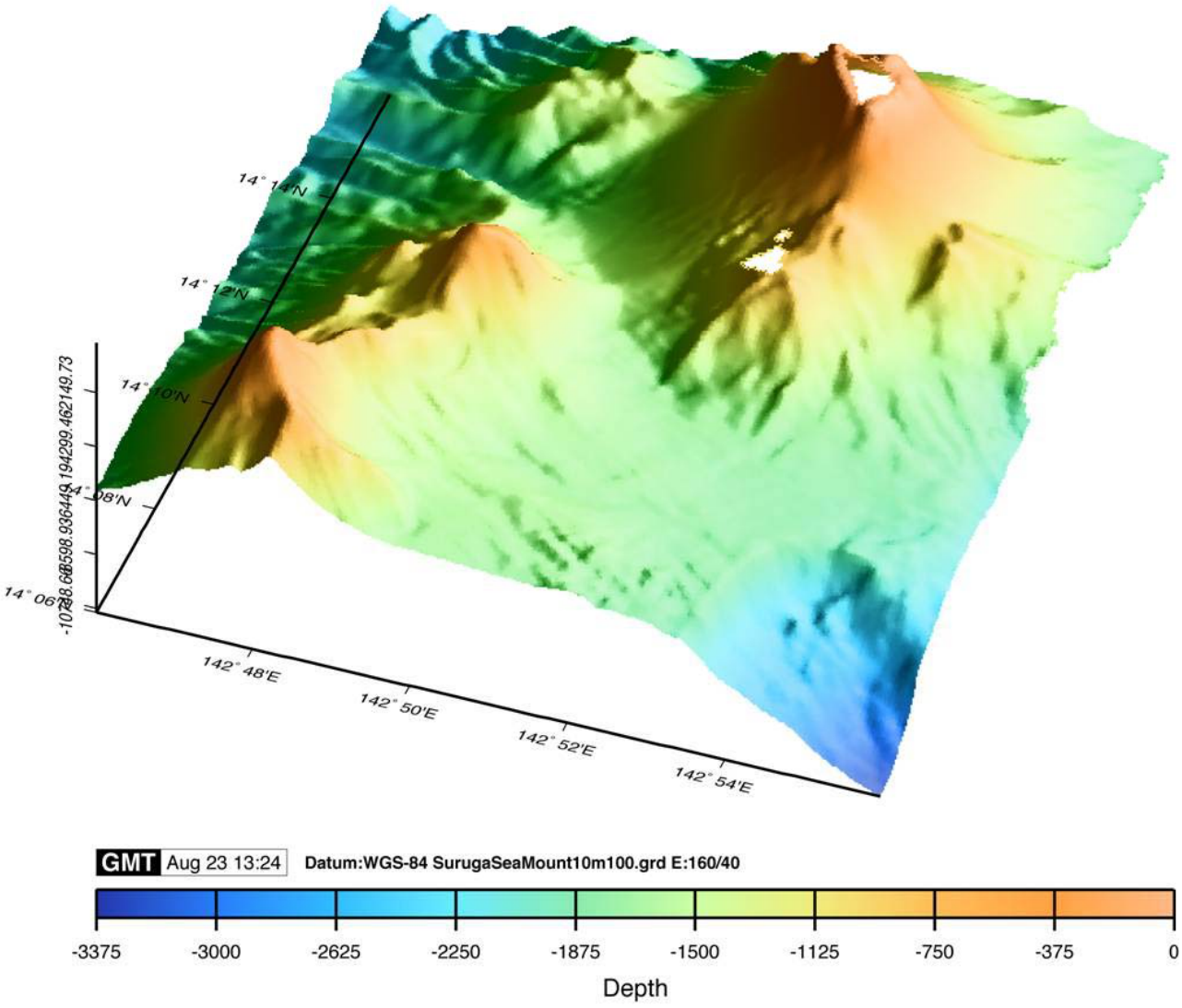

Fig. 1. 3D image of Suruga Smt., looked from southwest.

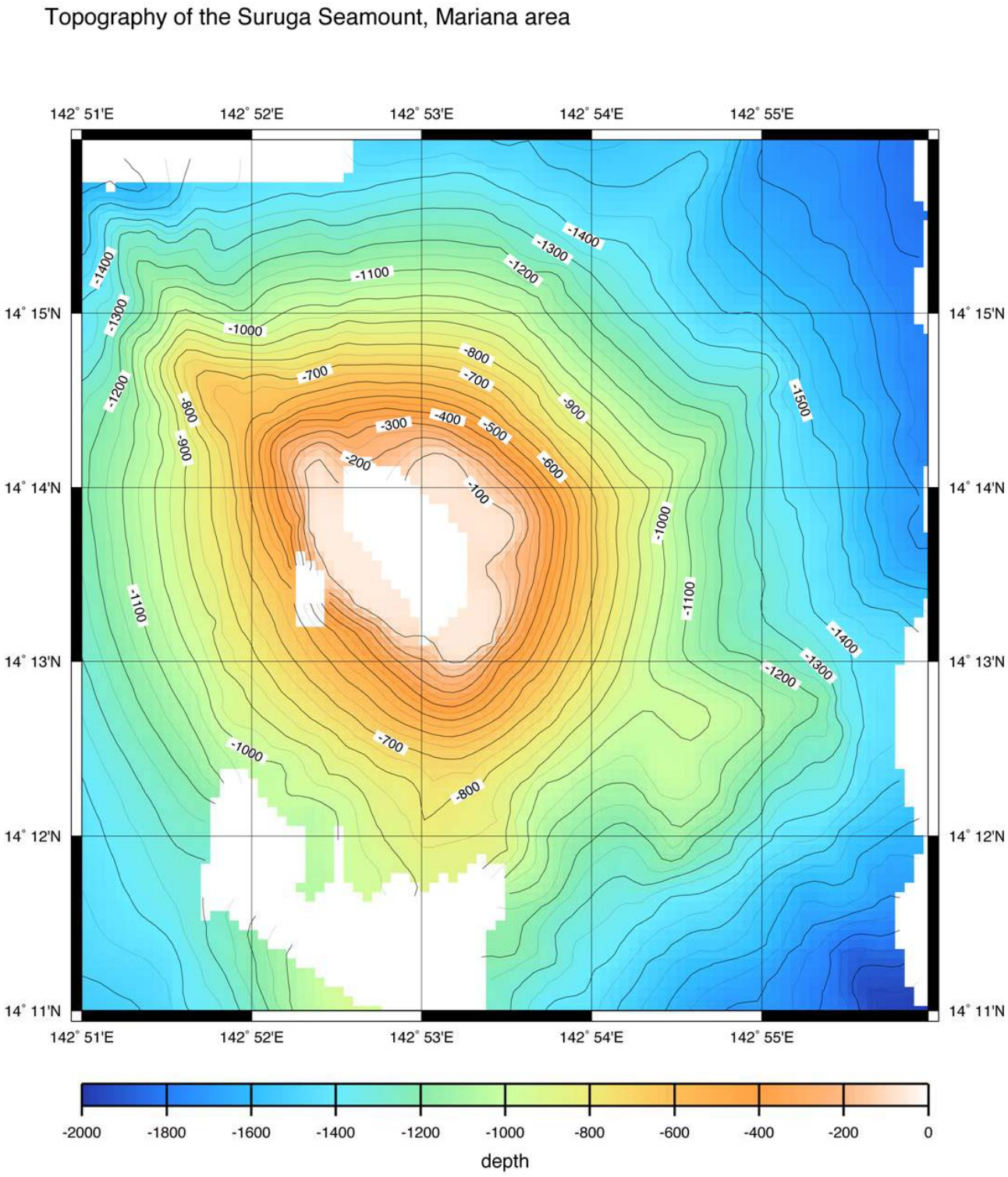

Fig. 2. Color bathymetric map of Suruga Smt. Contours in 100 m.