

Toponymy and Undersea Topographic Features

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The practice of naming terrestrial topographic features (toponymy) goes back to earliest human history. Descriptive placenames were applied to distant and nearby hills, valleys and rivers, and probably were meant to guide indigenous peoples to and from their villages. The practice of naming UNDERSEA features, however, is a relatively young practice, because the morphology of the floors of the oceans and seas was relatively unknown until the last 120 years or so. Most of those names were given to large features that were discovered by scientific and/or fishing expeditions or commercial cable-laying operations.

ACUF

Until 1975, there was only one group of seafloor experts that was *actively* naming and compiling a list of named undersea features: The Advisory Committee on Undersea features (ACUF), which is a part of the United States Board on Geographic Names (USBGN).

The USBGN was established by an Act of Congress of the United States of America in 1898. Members of the Board were and continue to be chosen by their member-organizations, and are changed or reinstated periodically as established in the USBGN Bylaws. The sole mission of the Board is to STANDARDIZE geographic names for use in United States government publications and maps. The Board is the official naming authority for the United States government, and does not impose spelling or Romanization systems (for non-Roman alphabets) on any state, nation, organization or individual. For example, the state of Hawaii is written one way on Federal Government and another way, Hawai'i, by the state government. By law, the Federal Government does not interfere in these types of state matters. The USBGN has guidelines for names,

including a rejection of trivial names, improper or pejorative names, and generally, names of living persons. Those types of names are generally excluded from US Government publications. Further, the USBGN. has guidelines for naming undersea features, and asks that discoverers of newly-discovered submarine features use those guidelines in naming those features. A list of the feature types and definitions is appended to this paper.

Presently, the USBGN consists of an Executive Committee (the voting membership), a Domestic Names Committee and a Foreign Names Committee. The latter has two Advisory Committees: one on Antarctic Names (ACAN) which collects and disseminates the names of land and sea topographic features south of 60° S latitude, and one on Undersea Feature names (ACUF), which collects and disseminates names of topographic features on the seafloor *seaward of national baselines*, that is, more than 12 nautical miles from those baselines. Both of the Advisory Committees generally follow the guidelines of the USBGN, but both of the Advisory Committees allow use of names of living individuals as a general practice. Those names commemorate living persons *who have made significant contributions to Antarctic or ocean sciences*. Nominations and/or proposals for toponyms are received by the Board, assigned to an appropriate Advisory Committee for research and action, and finally, if and when accepted by the Advisory Committee, it is presented to the USBGN for a final vote of approval by the Board membership. Normally, these decisions take no longer than three to five months from the time the proposal was initially receive.

Beginning in the late 19th Century and continuing into the mid 20th Century, scientific research cruises and commercial fishing and cable-laying operations located a significant number of seafloor features, and these were sometimes given names, e.g., *Cortes Bank* (off the western coast of the US), *Stocks Seamount* (in the South Atlantic Ocean off eastern Brazil), *Emden Deep* (Pacific Ocean off eastern Russia) and others. Seafloor features were often named for the ships of discovery, famous scientists (both living and dead), project sponsors and adjacent land features, something that was not strictly adhered to in the case of terrestrial features, where sometimes comical or inappropriate names described certain features.

In 1954, an ad hoc committee was formed by the USBGN to examine and compile a list of all known undersea features, and these would be printed on US Navy Hydrographic Office nautical charts of the era. That committee was short-

lived and disbanded in 1956. In 1960, however, a second ad hoc committee on undersea features was established at the US Navy Hydrographic Office, and three years later, in January, 1963, the Advisory Committee on Undersea Features (ACUF) was formally established as a committee of the USBGN.

The Naval Oceanographic Office (Navoceano), formed in late 1960, assumed the responsibilities of the Hydrographic Office. Navoceano realized that a catalogue of these features was required, established a gazetteer of these features, whether named or not, to disseminate the information on nautical charts and to the scientific community. The group of experts that began to compile this catalogue became the modern, the Advisory Committee on Undersea Features (ACUF) in January, 1963 as an Advisory Committee of the USBGN. The Committee dealt *exclusively* with topographic features that were totally and permanently submerged in the oceans and seas of the world. Other entities in the chart-compilation division dealt with naming larger features, such as, oceans, seas, gulfs, bays, straits and passages, etc.

The first Chairman of the modern ACUF was Dr. Harris B. Stewart of the US Coast and Geodetic Survey. Members came from the US Naval Oceanographic Office, US Department of the Interior, US Geological Survey, the Smithsonian Institution, Scripps Institution of Oceanography, Woods Hole Institution of Oceanography and consulting individuals at other academic institutions. In the beginning years, they met every second week, to examine sounding tracks and to provide guidance for establishing names for some of these features. In 1964, ACUF began to convert typewritten lists of names into computerized lists by placing those names onto Hollerith (IBM) punch cards, which were updated after each meeting. Fifty meetings were held between January 1963 and December 1965 by which time, many hundreds of features were given names. Guidelines for naming features had been established in 1953, prior to the meetings of the first ad hoc committee meeting in 1954, and revised in 1966, revised again (and amended) in 1970, 1978 and 2005. At this writing, ACUF has five members (including the Chairman) of which four are from US Government activities and one, a former government employee, is presently representing private industry. ACUF (again, at the time of this report) has had 322 meetings, which are presently held approximately 6-8 times each year. ACUF considers proposed names by researchers and the public at-large, however proposals for names from within the Committee are few and seldom occur.

ACUF published its undersea feature names list in a series of gazetteers, beginning in 1969 (as a computer printout), with revisions in 1972, 1981 and finally, 1990. After 1990, it was determined that a computer-accessible data file significantly eliminated the need for costly, printed gazetteers and the USBGN ceased publishing paper copies of not only the ACUF gazetteer, but also all other national and international gazetteers. Presently, the US domestic topographic names database is maintained by the National Mapping Division of the US Geological Survey, and all other toponyms, worldwide, and exclusive of US domestic names, are provided to the public via the US National Geospatial-Intelligence Agency (NGA-formerly NIMA [National Imagery and Mapping Agency] and earlier, DMA [Defense Mapping Agency]). The NGA database is Internet-accessible at:

<http://earth-info.nga.mil/gns/html/index.html>

ACUF information is located on the left side of the page, under the heading, "Undersea Features." When using the GEONet Names Server (GNS), one MUST use the search file for undersea features, which is listed in the country file, UF, for obvious reasons.

Features above the sea surface are always deemed to be under the aegis of the nation that claims the feature, or in the case of multiple or disputed claims, the nations involved in those claims, and are not relevant to the work of ACUF. Some disputed subaerial feature-names, however, discovered prior to present international conventions, have been retained, but held without prejudice until the disputes have been resolved. For example, the name, Liancourt Rocks, a feature named over two centuries ago by French navigators transiting in the East Sea (or Sea of Japan) continues to be called as such by the US Government, until South Korea (calling it *Dok Do*) and Japan (calling it *Takeshima*) can diplomatically resolve the issue of sovereignty. The United States government will not intervene in the sovereignty issue and will to use the name, Liancourt Rocks on all their official charts and publications until the issue of sovereignty is resolved.

Providing names and "Limits of the Oceans and Seas" (Publication S-23), are the responsibility of the International Hydrographic Organization (IHO). First issued in 1928 and revised in 1937 and last in 1953, over 50 years ago. The

publication, has long been in need of revision. An attempt began in 2002 to effect this revision, but issues between nations over the certain toponyms has stopped the work after only a few chapters were completed. Until the nations involved in the disputes can be resolved, the IHO is unable to complete the work. Further, the United States Board on Geographic Names will not address completed parts of the new edition, but wishes to wait until the completed 4th edition is published.

It must be again stressed that the United States Board on Geographic Names and its standing committees exist for only one purpose: to STANDARDIZE geographic nomenclature for use in US Governmental publications, maps, reports and other documents. Its extended value, of course, is to provide the information to users around the world for reference purposes. The USBGN and its committees make no demands of any private citizens to adhere to its gazetteers or principles other than for using the published terms of reference and guidelines when making formal submissions to the Board.

GEBCO-SCUFN

General Bathymetric Chart of the Oceans–SubCommittee on Undersea Feature Names:

As early as 1900, an international committee was being formed for the sole purpose of putting names on newly discovered undersea features, in advance of several conferences for producing a General Bathymetric Chart of the Oceans (GEBCO). The “Commission on Sub-oceanic Nomenclature” was the very first committee of the forthcoming GEBCO, which considered the names of the features to be of paramount importance. The Commission was comprised of an international group of experts: Sir John Murray, Hugh Robert Mill, Professors Julian Thoulet, Otto Irminger Otto Krümmel, Alexander Supan, and Josef Luksch, and the primary driving force behind GEBCO, Prince Albert I of Monaco. These and other expert individuals of the period, selflessly volunteered their time and efforts for the purpose of compiling a map of the seafloor for use by the general public, as well as by scientific organizations. It had no mandate from any *governmental* body, and continues to serve the international community in that manner to the present day.

The modern-day Sub-Committee on Undersea Feature Names (SCUFN) evolved

out of meetings in 1974, when it was realized that a new, 5th edition of GEBCO would begin compilation by esteemed, volunteering ocean scientists before 1976, under joint oversight of the International Hydrographic Organization (IHO) and the Intergovernmental Oceanographic Commission (IOC). The first chairman of the 5th Edition group, named the “Sub-Committee on Geographic Nomenclature” (SCGN–SCUFN’s original name) was Gerald Ewing of Canada, with representatives from France and the United States and an ex-officio Secretary, Rear Admiral D.C. Kapoor, director of the IHO. At their first meeting in 1975, a list of seafloor features definitions was established, based upon the similarity of form, gradient, relative size and other physical characteristics of seafloor features, without examining the genesis of these features. The morphology was all-important, whereas the manner in which the feature was formed was not taken into account. These practices continue to the present day.

SCUFN had also been charged by IHO and IOC to acquire and maintain the names included in the IOC International Bathymetric Chart series. This series included the International Chart of the Mediterranean Sea (IBCM), the International Bathymetric Chart of the Arctic Ocean (IBCAO), both of which appear in published form, and for the International Bathymetric Chart of the Caribbean Area (IBCCA), the International Chart of the Central Eastern Atlantic (IBCCEA), both of which are presently in various stages of compilation. Future projects, also under compilation, are the International Bathymetric Chart of the Western Pacific (IBCWP), the International Bathymetric Chart of the Southern Ocean (IBCSO) and the International Bathymetric Chart of the Southeastern Pacific (IBCSEP).

As the ACUF gazetteer is an online reference document within a much larger geographical database and due to formatting constraints, has room for only a single geographic position at the present time. This is likely to change in the near future, but at present, only a single point can be shown.

SCUFN maintains an online version of their gazetteer for approved feature names: IHO IOC Joint Publication, B8, entitled, “GEBCO Gazetteer of Undersea Feature Names,” which can be found online at:

<http://www.ngdc.noaa.gov/mgg/gebco/underseafeatures.html>

Dr. Robert L. Fisher replaced the late Dr. Bruce Heezen as the US member of the subcommittee and he assumed leadership of SCUFN from Mr. Gerald Ewing in the early 1980s. SCUFN then retained an active membership of only four experts, but enlisted the expert assistance of other marine geoscientists whenever necessary. Under Fisher's leadership, the gazetteer grew by orders of magnitude, the naming procedures became more standardized and the printed version of the gazetteer, IHO / IOC Joint Publication B-8, and the electronic version of the "GEBCO Gazetteer of Undersea Feature Names became a reality." Fisher retired as Chairman in 2003, during the GEBCO Centenary Celebration, and the new Chairman, Dr Hans Werner Schenke, a member of the GEBCO Guiding Committee, became SCUFN's official representative to the international ocean-mapping community. Under Dr. Schenke's leadership, SCUFN held meetings 17 in St Petersburg, Russia, 18 in Monaco, and the last, SCUFN 19, in his home city of Bremerhaven, Germany.

SCUFN and ACUF continue to enjoy parallel, often simultaneous and cooperative paths to the present time. ACUF exists solely for the benefit of the United States Government. SCUFN, however, enjoys the freedom to maintain its volunteer existence for the benefit of the international ocean science community, albeit without a mandate of the IHO or IOC. It is a SUBCOMMITTEE of GEBCO. Also, it must be noted, that one only other major difference between the two committees is that ACUF often allows features to be named in commemorative fashion for LIVING individuals who have made significant contributions to studies of the oceans and atmosphere, whereas SCUFN allows such names to be applied only on rare occasions.

SCUFN employs most of the same criteria as does ACUF, in that the feature-type descriptions are nearly identical and the rules and guidelines for submissions are nearly identical. For example, both committees employ the national boundary limit as being 12 nautical miles from the established hydrographic baselines for each country. Features within those boundary limits are the exclusive domain of the host nation. All features seaward of the 12 mile limit enjoy the freedom of being named initially by the discovering vessel or institution, no matter what nation that vessel represents.

It must be stressed, however, that recognizing national claims under the United Nations Convention on the Law of the Sea – 1982, the nation that has a claim

accepted by the United Nations has often been granted the initial opportunity to name features in these ocean regions as a courtesy by the discovering vessel or institution. As stated, this is only a courtesy, and in a number of cases, features were named in current EEZ-claimed areas without such courtesy being advanced. However, in the case of names presented in disputed areas by neighboring nations, both SCUFN and ACUF decline to accept names proposals from either nation into their respective undersea feature names databases. Instead, the proposed names in these areas are held in deferred or “reserve” files until the dispute is resolved by the interested parties.

SCUFN’s membership has grown since its original meeting, from four, to the present 12 members, six each appointed by IHO and IOC. The names approved at last year’s meeting in Bremerhaven are expected to be published in the online GEBCO gazetteer in the very near future. The next meeting, SCUFN 20, is expected to take place in mid-2007 at IHO headquarters in Monaco.

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**APPENDIX:
UNDERSEA FEATURE TYPES AND DEFINITIONS,
ACCORDING TO ACUF GUIDELINES**

Feature Designation Name	Definition	Feature Designation Code
apron	a gentle slope, with a generally smooth surface, particularly found around groups of islands and seamounts	APNU
bank	an elevation, typically located on a shelf, over which the depth of water is relatively shallow but sufficient for safe surface navigation	BNKU
banks	elevations, typically located on a shelf, over which the depth of water is relatively shallow but sufficient for safe surface navigation	BKSU
basin	a depression more or less equidimensional in plan and of variable extent	BSNU
bench	a small terrace	BNCU
borderland	a region adjacent to a continent, normally occupied by or bordering a shelf, that is highly irregular with depths well in excess of those typical of a shelf	BDLU
canyon	a relatively narrow, deep depression with steep sides, the bottom of which generally has a continuous slope	CNYU
canyons	relatively narrow, deep depressions with steep sides, the bottom of which generally has a continuous slope	CNSU
continental rise	a gentle slope rising from oceanic depths towards the foot of a continental slope	CRSU
cordillera	an entire mountain system including the subordinate ranges, interior plateaus, and basins	CDAU
deep	a localized deep area within the confines of a larger feature, such as a trough, basin or trench	DEPU
escarpment (or scarp)	an elongated and comparatively steep slope separating flat or gently sloping areas	ESCU
fan	a relatively smooth feature normally sloping away from the lower termination of a canyon or canyon system	FANU
flat	a small level or nearly level area	FLTU
fork	a branch of a canyon or valley	FRKU
forks	branches of a canyon or valley	FRSU
fracture zone	an extensive linear zone of irregular topography of the sea floor, characterized by steep-sided or asymmetrical ridges, troughs, or escarpments	FRZU
furrow	a closed, linear, narrow, shallow depression	FURU
gap	a narrow break in a ridge or rise	GAPU
gully	a small valley-like feature	GLYU
hill	an elevation rising generally less than 500 meters	HLLU
hills	elevations rising generally less than 500 meters	HLSU
hole	a small depression of the sea floor	HOLU

knoll	an elevation rising generally more than 500 meters and less than 1,000 meters and of limited extent across the summit	KNLU
knolls	elevations rising generally more than 500 meters and less than 1,000 meters and of limited extent across the summits	KNSU
ledge	a rocky projection or outcrop, commonly linear and near shore	LDGU
levee	an embankment bordering a canyon, valley, or seachannel	LEVU
median valley	the axial depression of the mid-oceanic ridge system	MDVU
mesa	an isolated, extensive, flat-topped elevation on the shelf, with relatively steep sides	MESU
moat	an annular depression that may not be continuous, located at the base of many seamounts, islands, an other isolated elevations	MOTU
mound	a low, isolated, rounded hill	MNDU
mountain	a well-delineated subdivision of a large and complex positive feature	MTU
mountains	well-delineated subdivisions of a large and complex positive feature	MTSU
peak	a prominent elevation, part of a larger feature, either pointed or of very limited extent across the summit	PKU
peaks	prominent elevations, part of a larger feature, either pointed or of very limited extent across the summit	PKSU
pinnacle	a high tower or spire-shaped pillar of rock or coral, alone or cresting a summit	PNLU
plain	a flat, gently sloping or nearly level region	PLNU
plateau	a comparatively flat-topped feature of considerable extent, dropping off abruptly on one or more sides	PLTU
platform	a flat or gently sloping underwater surface extending seaward from the shore	PLFU
province	a region identifiable by a group of similar physiographic features whose characteristics are markedly in contrast with surrounding areas	PRVU
ramp	a gentle slope connecting areas of different elevations	RMPU
range	a series of associated ridges or seamounts	RNGU
ravine	a small canyon	RAVU
reef	a surface-navigation hazard composed of consolidated material	RFU
reefs	surface-navigation hazards composed of consolidated material	RFSU
ridge	a long narrow elevation with steep sides	RDGU
ridges	long narrow elevations with steep sides	RDSU
rise	a broad elevation that rises gently, and generally smoothly, from the sea floor	RISU
saddle	a low part, resembling in shape a saddle, in a ridge or between contiguous seamounts	SDLU

seachannel	a continuously sloping, elongated depression commonly found in fans or plains and customarily bordered by levees on one or two sides	SCNU
seachannels	continuously sloping, elongated depressions commonly found in fans or plains and customarily bordered by levees on one or two sides	SCSU
seamount	an elevation rising generally more than 1,000 meters and of limited extent across the summit	SMU
seamounts	elevations rising generally more than 1,000 meters and of limited extent across the summit	SMSU
shelf	a zone adjacent to a continent (or around an island) that extends from the low water line to a depth at which there is usually a marked increase of slope towards oceanic depths	SHFU
shelf edge	a line along which there is a marked increase of slope at the outer margin of a continental shelf or island shelf	EDGU
shelf valley	a valley on the shelf, generally the shoreward extension of a canyon	SHVU
shoal	a surface-navigation hazard composed of unconsolidated material	SHLU
shoals	hazards to surface navigation composed of unconsolidated material	SHSU
sill	the low part of a gap or saddle separating basins	SILU
slope	the slope seaward from the shelf edge to the beginning of a continental rise or the point where there is a general reduction in slope	SLPU
spur	a subordinate elevation, ridge, or rise projecting outward from a larger feature	SPRU
tablemount (or guyot)	a seamount having a comparatively smooth, flat top	TMTU
tablemounts (or guyots)	seamounts having a comparatively smooth, flat top	TMSU
terrace	a relatively flat horizontal or gently inclined surface, sometimes long and narrow, which is bounded by a steeper ascending slope on one side and by a steep descending slope on the opposite side	TERU
tongue	an elongate (tongue-like) extension of a flat sea floor into an adjacent higher feature	TNGU
trench	a long, narrow, characteristically very deep and asymmetrical depression of the sea floor, with relatively steep sides	TRNU
trough	a long depression of the sea floor characteristically flat bottomed and steep sided, and normally shallower than a trench	TRGU
valley	a relatively shallow, wide depression, the bottom of which usually has a continuous gradient	VALU
valleys	relatively shallow, wide depressions, the bottom of which usually has a continuous gradient	VLSU

"EAST SEA" (Sea of Japan) / "KOREA STRAIT" (Tsushima Strait):

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Korean placenames are in **bold characters**
All non-Korean authors are underlined

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