

Re: Action SCUFN 27/80, 25/21 & 27/83

Generic Terms Group (Y. Ohara, H-C. Han and V. Stagpoole)

October 1, 2015

1. Introduction

This action item is to cope with the old generic terms that are appeared in the GEBCO gazetteer but never used in modern geoscientific context. These include

- CAP
- CONTINENTAL SLOPE
- DISCORDANCE
- FRACTURE ZONE SYSTEM
- GROUND
- PASS
- SEABIGHT
- SEAMOUNT GROUP
- ZONE

In addition

- RE-ENTRANT

is also considered to cope with the SCUFN action item 25/21.

Furthermore,

- ABYSSAL PLAIN
- PLAIN

are also considered to cope with the SCUFN action item 27/83.

2. Review of old literatures that defined generic terms

We have reviewed old literatures that defined generic terms (Littlehale, 1932; Wiseman and Ovey, 1953; Edvalson, 1967; Matsuzaki Committee, 1971; B-6 1st edition, 1991; B-6 2nd edition, 1993; B-6 3rd edition, 2001; B-6 4th edition, 2008; B-6 4.1th edition, 2013).

Among the 12 generic terms noted above, only CONTINENTAL SLOPE (= SLOPE = ISLAND SLOPE), SEAMOUNT GROUP, PLAIN, ABYSSAL PLAIN are appeared.

1932 Littlehales

- None are defined

1953 Wiseman and Ovey

- CONTINENTAL SLOPE
 - “The declivity from the outer edge of the continental shelf or continental borderland into great depths”

1967 Edvalson

- CONTINENTAL SLOPE (= ISLAND SLOPE)
 - “The declivity seaward from a shelf edge into greater depth”
- SEAMOUNT GROUP
 - “Several closely-spaced seamounts not in a line”
- PALIN (\doteq ABSSAL PLAIN)
 - “A flat, gently sloping or nearly level region of the sea floor (for example, abyssal plain)”

1971 Matsuzaki Committee (GEBCO, International Hydrographic Review, 1971)

- CONTINENTAL SLOPE (= ISLAND SLOPE)
 - “The declivity seaward from a shelf edge into greater depth”
- SEAMOUNT GROUP
 - “Several closely-spaced seamounts not in a line”
- PLAIN (\doteq ABSSAL PLAIN)
 - “A flat, gently sloping or nearly level region of the sea floor (for example, abyssal plain)”

1991 B-6 1st edition

- ABYSSAL PLAIN (= PLAIN)
 - “An extensive, flat, gently sloping or nearly level region at abyssal depths”
- CONTINENTAL SLOPE (= SLOPE = ISLAND 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”

1993 B-6 2nd edition

- ABYSSAL PLAIN (= PLAIN)
 - “An extensive, flat, gently sloping or nearly level region at abyssal depths”
- CONTINENTAL SLOPE (= SLOPE = ISLAND 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”

2001 B-6 3rd edition

- ABYSSAL PLAIN (~~= PLAIN~~)
 - “An extensive, flat, gently sloping or nearly level region at abyssal depths”
- CONTINENTAL SLOPE (~~= SLOPE = ISLAND SLOPE~~)
 - “The deepening sea floor out from the SHELF-EDGE to the upper limit of the COTINENTAL Rise, or the point where there is a general decrease in steepness”

2008 B-6 4th edition

- ABYSSAL PLAIN (~~= PLAIN~~)
 - “An extensive, flat, gently sloping or nearly level region at abyssal depths”
- CONTINENTAL SLOPE (~~= SLOPE = ISLAND SLOPE~~)
 - “The deepening sea floor out from the SHELF-EDGE to the upper limit of the COTINENTAL Rise, or the point where there is a general decrease in steepness”

2013 B-6 4.1th edition

- ~~ABYSSAL PLAIN (=PLAIN)~~
 - “An extensive, flat or gently sloping region, usually found at depth greater than 4000m”
- ~~CONTINENTAL SLOPE (=SLOPE=ISLAND-SLOPE)~~
 - “The sloping region that deepens from a SHELF to the point where there is a general decrease in gradient”

3. The 9 generic terms (Re: SCUFN action 27/80)

The 9 generic terms have been used as full-name for only once in the gazetteer:

- CAP → Flemish CAP
- CONTINENTAL SLOPE → Aktivneset CONTINENTAL SLOPE
- DISCORDANCE → Australian-Antarctic DISCORDANCE
- FRACTURE ZONE SYSTEM → Eltanin FRACTURE ZONE SYSTEM
- GROUND → Fairweather GROUND
- PASS → Flemish PASS
- SEABIGHT → Porcupine SEABIGHT
- SEAMOUNT GROUP → Marcus-Wake SEAMOUNT GROUP
- ZONE → Diamantina ZONE

Among these, only CONTINENTAL SLOPE and SEAMOUNT GROUP had been defined before. The remaining 7 generic terms had never been defined officially.

Our recommendation is these generic terms should be included in B-6 at the GENERIC TERMS USED FOR HARMONIZATION WITH OTHER GAZETTEERS AND DEFINITIONS section with the following possible definitions:

- CAP: “See BANK”
- CONTINENTAL SLOPE: “See SLOPE”
- DISCORDANCE: “An area of seafloor within a MID-OCEANIC RIDGE with rough and disordered morphology”
- FRACTURE ZONE SYSTEM: “A group of closely spaced FRACTURE ZONEs, that can also be called FRACTURE ZONE PROVINCNE.”
- GROUND: “See BANK”
- PASS: “See SADDLE”
- SEABIGHT: “See VALLEY”
- SEAMOUNT GROUP: “Several closely-spaced SEAMOUNTs not in a line, that can also be called SEAMOUNT PROVINCE”
- ZONE: “An area of seafloor with rough morphology, characteristically formed by continental rifting”.

With the definition of CONTINENTAL SLOPE, the following generic terms can be re-defined:

- CONTINENTAL RISE: “A gently sloping region that extends from oceanic depths to the foot of a CONTINENTAL SLOPE”
- PROMONTORY: “A major SPUR-like protrusion of the CONTINENTAL SLOPE extending to the deep seafloor. Characteristically, the crest deepens seaward.”

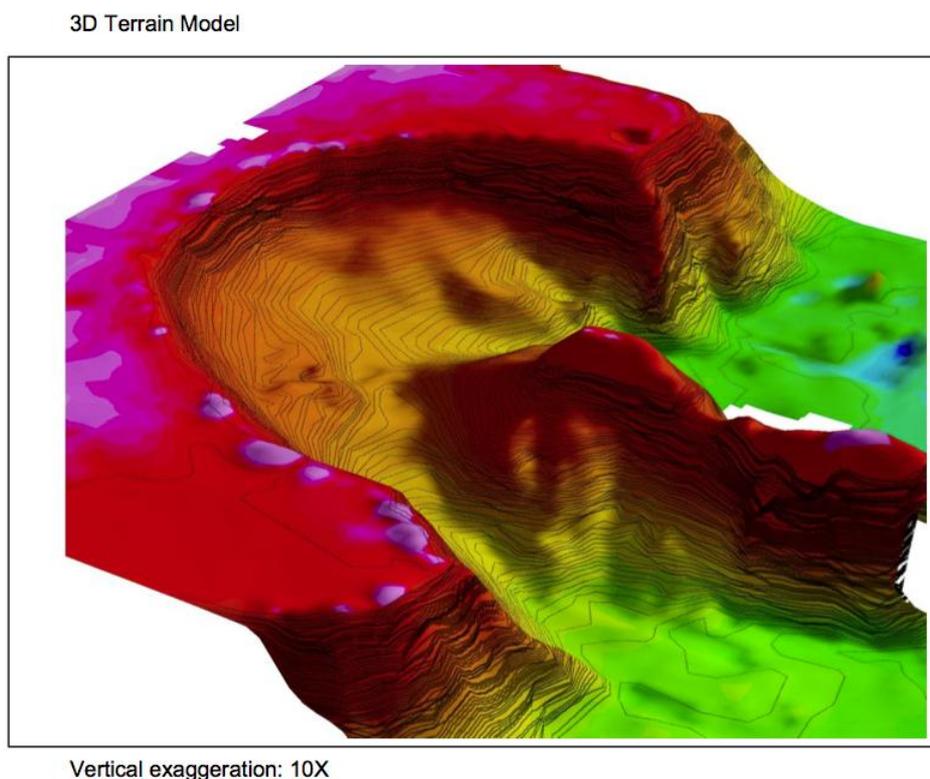
Examination of the GEBCO Gazetteer further suggests that the following generic terms should also be defined:

- SEACHANNEL: “Sea SEA CHANNEL”

4. RE-ENTRANT issue (Re: Action SCUFN 25/21)

This is to reply to Action SCUFN 25/21, which is to discuss suitable generic term for features such as the Bahia Plateau, proposed by A.A. Alberoni.

The proposed Bahia Plateau is actually a curved escarpment, or a curved steep slope bounded by a flat shelf to the west. The problem is that there are not suitable generic terms for such a curved escarpment or a curved steep slope.



In New Zealand, there are several features similar to the proposed Bahia Plateau. These include the *Matakoa Re-entrant* and the *Ruatoria Re-entrant*. These two features are shown on the NIWA East Cape 1:200,000 bathymetry map (Blackmore, 1996) and shown in the images below. They are indentations in the shelf that, in the case of the New Zealand features, result from a massive collapse of the shelf edge. A large debris fan is located on the deep plain below the re-entrant and the features are probably formed by catastrophic failure of the shelf resulting in giant underwater slide.



Matakaoa Re-entrant (Blackmore, 1996)

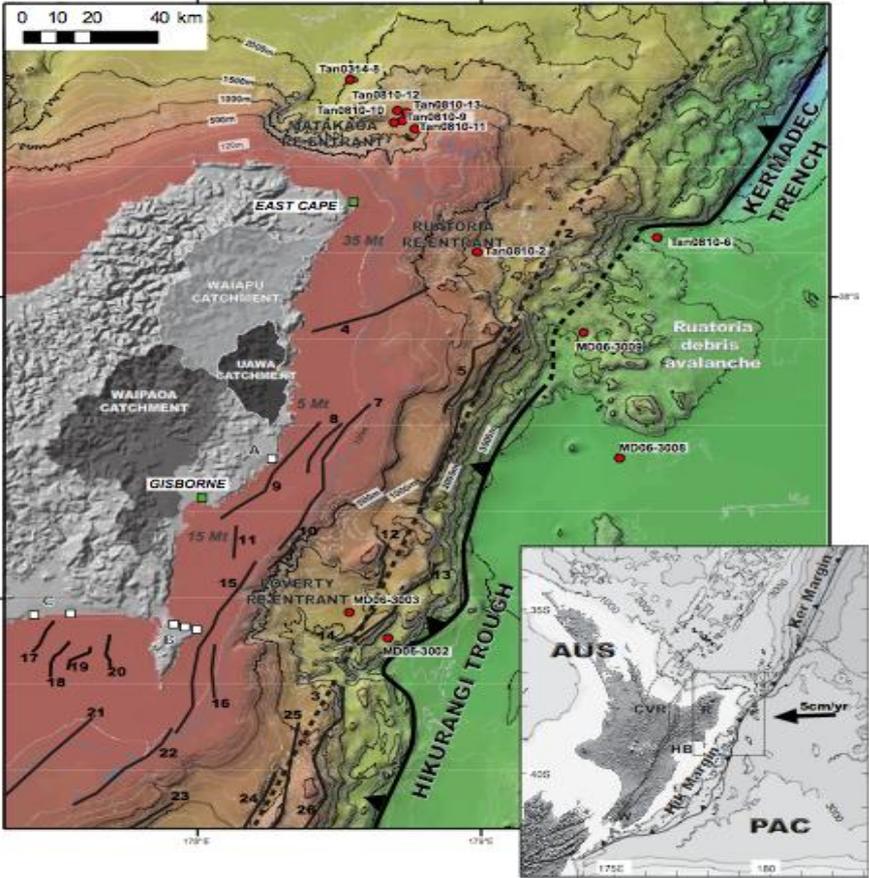


Figure 1

Pouderoux et al. (2014)

According to the glossary of geology from the American Geological Institute (<http://www.agiweb.org/pubs/glossary/>), a re-entrant is “a prominent, generally angular indentation in a landform e.g. an inlet between two promontories along a coastline, or a transverse valley extending into an escarpment.” In Concise Oxford Dictionary of Earth Sciences, a re-entrant is “an embayment or recess in the flank of a main valley, often of sufficient length to form a tributary”. In The Random House Dictionary, a re-entrant is “a prominent indentation in a coastline”, whereas in Oxford Dictionary, “an indentation or depression in terrain”.

Our recommendation is therefore to introduce the definition of RE-ENTRANT, which is “A prominent indentation in a line along which there is marked increase of slope at the seaward margin of a SHELF”. It should be noted that the underlined sentence is the definition of an obsolete term “SHELF-EDGE”. If we use that term, then RE-ENTRANT can simply be defined as “A prominent indentation in a SHELF-EDGE”.

References

- Blackmore N.A. (1996) East Cape bathymetry, 2nd Edition, NZ Oceanographic Institute Chart, Coastal Series, 1, 2000,000.
- Pouderoux, H., Proust, J. N., & Lamarche, G. (2014) Submarine paleoseismology of the northern Hikurangi subduction margin of New Zealand as deduced from turbidite record since 16 ka, Quaternary Science Reviews, 84, 116-131.

5. ABYSSAL PLAIN vs. PLAIN (Re: SCUFN action 27/83)

The review indicates that there were no differences between ABYSSAL PLAIN and PLAIN, back to 1993. However, by 1991, using terminology “abyssal depths”, ABYSSAL PLAIN was defined. By 2001, PLAIN was deleted from B-6. In 2013, ABYSSAL PLAIN is defined using specific figure, 4000m.

The current gazetteer lists 51 ABYSSAL PLAINs, whereas lists only four PLAINs:

- Alaska PLAIN
- Gascoyne PLAIN
- Mascarene PLAIN
- Raukumara PLAIN

We have no idea why SCUFN deleted PLAIN in 2001 (we do need feedbacks from the active SCUFN members at that time: H-W. Schenke and N. Cherkis). However, our recommendation is to define PLAIN in the current B-6 to list in the GENERIC TERMS USED FOR HARMONIZATION WITH OTHER GAZETTEERS AND DEFINITIONS section. The definition shall be “An extensive, flat or gently sloping region, usually found at depths less than 4000m”.

If we define PLAIN, then CONTINENTAL MARGIN may probably be re-defined: “The zone, generally consisting of SHELF, SLOPE and CONTINENTAL RISE, separating the continent from the deep seafloor or ABYSSAL PLAIN or PLAIN. Occasionally a TRENCH may be present in place of a CONTINENTAL RISE”.

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