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Elements of Oceanographic Terminology in English and Romanian

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Abstract. Oceanography is a vast domain dealing with various aspects of marine life, physical and chemical aspects of the seas and oceans of the world. Searching available oceanographic documents of the 19th, 20th and 21st century, the aim of the paper is to emphasize the specific terminology of at least one of the branches of oceanography. The branches of oceanography deal with marine biology, ocean chemistry, marine geology and marine physics. The differences between the Romanian and English terminology according to the etymology are brought into discussion and conclusions drawn according to the similarities and differences.

1. Introduction

Oceanography is a science with a type of terminology that has not been studied in depth from the linguistic point of view. Some general aspects about this science related closely to meteorology but dedicated to the seas and oceans of the world are taken into consideration in this introductory chapter. Oceanography is the study of all aspects of the ocean covering a wide range of topics, from ecosystems and marine life, to waves and currents, or from the movement of sediments, to seafloor geology. According to specialty literature, there are four sub-disciplines generally accepted by scientists within this broader subject: Biological Oceanography, Physical Oceanography, Geological Oceanography and Chemical Oceanography. Each particular narrow field is important for people who travel across the seas and oceans, but, the most important one for the seafarers, in our opinion, is the physical oceanography.

Physical oceanography deals with the properties of seawater (temperature, density, pressure, and so on), its movement (waves, currents, and tides), and the interactions between the ocean waters and the atmosphere. (Britannica, Oceanography)

However, it is difficult to make a strict separation among the terminology of sub-disciplines, so that in our study terms from bordering vocabulary might be linguistically analyzed.

Oceanography is also connected to seafaring and the first seafarers are also the pioneers of physical oceanography by drawing rudimentary maps and pointing on them the islands, currents and great waves. Polynesians are considered the first seafarers who navigated the ocean 25,000 years ago. Since then, data about open waters have started to be gathered by means of trade, war, colonization, exploration and eventually by scientific discovery. In 1912 the book, *Science of the Sea*, was claimed to be the milestone of the modern oceanography. The study of the oceans has been facilitated by military technology that used submarines and sonars in the last century and more sophisticated technology lately.

2. Method of study

The sub-discipline we wanted to base our linguistic study upon has connections, as we mentioned above, with seafaring, being of real interest for the specialists in the maritime field. But, at the same time, the main terminology is new and somehow different, so that we need to search for the terminology in several scientific books and articles, and to compare the terms obtained to the terms existing in glossaries on oceanography. We classified the terms into categories according to different formal criteria, such as if they are single words or phrases, abbreviations or short forms. Most words defining a scientific or technical terminology are nouns, as demonstrated by linguists, and consequently the oceanographic we have selected are nouns, sometimes accompanied by adjectives, or followed by other structures.

The English terminology selected and the English Glossaries are analyzed from the linguistic point of view and then a parallel is made between the English and Romanian terms and holistically. The selected words are given the etymology both in English and Romanian in order to make a comparison between the specific terminologies of Physical Oceanography of these two languages that belong to different linguistic families. The comparison is also made between English and Romanian general structure of the specific vocabulary and conclusions will be drawn leading us eventually to some general conclusions about specific elements of language found out in the terminology.

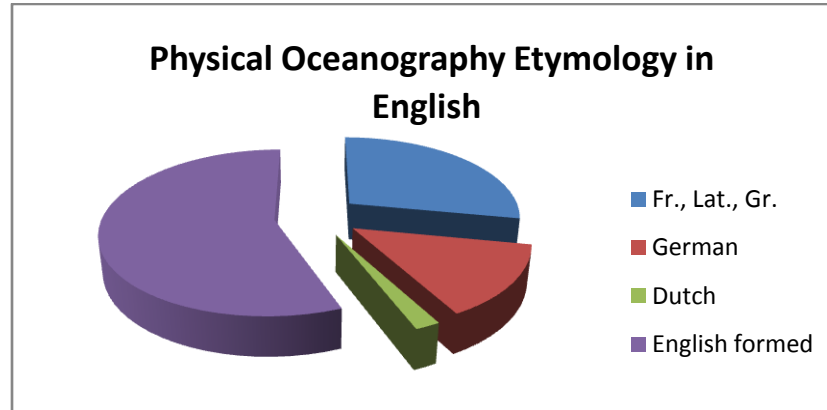
3. The core of Physical Oceanography terminology in English and Romanian

The oceanographers from the Department of Oceanography, College of Geosciences, Texas, (USA) selected about 100 specific words that form a *Glossary*. The *Glossary on Oceanography* made by Sazzadur Rahamanu from Chittagong University, Chittagong, Bangladesh, is formed of 460 specialty words from all the sub-disciplines of the field. The *Glossary of Oceanographic Terms* (1966) Washington DC, USA comprises a number of approximately 5,000 technical terms used in oceanography and connected marine sciences. We have found about 290 English words and phrases from the texts analyzed, which seem to be characteristic for the sub-discipline of Physical Oceanography. For the Romanian terminology we have found out a Glossary (*Glosar de termeni oceanografici*) of 150 words as part of the book *The Black Sea Geography* by Vespeanu (2005).

Out of 290 terms and phrases selected from the specialty bibliography 162 were also found in the Oceanographic Glossaries. We have also tried to observe the frequency of the words selected in the specialty texts and the result was that about 50 terms were the most frequent. These may be considered to be the core of the Physical Oceanographic terminology, or at least a great part of it, in our opinion, and the terms are: *abyss, buoyancy, chart, chlorinity, coastal current, compressibility, continental shelf, current, deep water, density, depth, edge wave, electrical conductivity, equatorial, estuary, evaporite, flow, friction, gravitation, high latitude, internal wave, light air, low latitude, marginal seas, oceanography, optical length, phytoplankton, planetary vorticity, potential, relative density, ridge, salinity, sea surface, shallow seas, shallow-water, shore, sill, strong breeze, submarine, surface, temperature, thermal expansion, thermocline, tide, trench, tropical, turbidity, undersea, wind stress, upper layer, wave amplitude, wave length, underwater.*

If we analyze the English words morphologically we can see that about 15% of them are either adjectives or compounds or phrases made with an adjective and a noun, while 85% of the terms are nouns. Out of 50 terms, more than half are compounds. From the etymological point of view, 14 words are from Greek, Latin or French origin, 7 words are from Germanic origin and 1 from Dutch origin, while the other 28 are formed mainly with prefixes or are compounds or phrases created in English either

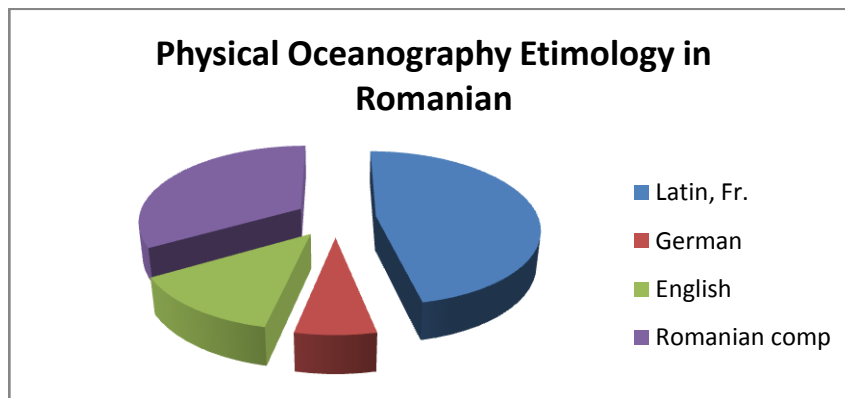
Middle English like *depth* or *shallow*, or the modern times like *evaporite* that is an alternation for *evaporate* which was first recorded in 1920. Taking into consideration the minimum possible terms, that in our opinion may form the core of the Physical Oceanography, the etymologic chart would be as follows:



We have analyzed the Romanian terminology of Physical Oceanography, according to the Glossary mentioned above containing about 150 terms, from which we have tried to extract the same 50 terms (words with the same meaning as the English ones), and we have drawn the following conclusions.

We have found out 16 terms that are identical translations of the English terms, and these are: *fitoplancton, clorinitate, coastă, curenți, continental, crustă continentală, densitate, litoral, margine continentală, salinitate, termoclină, șant, șelf, termic, strat, submarin*. Due to the fact that there are not enough terms to make a concise analysis, we added some other usual terms from the Glossary: *ocean, apă de mare, scurgere, câmpie (lagunară/ nisipoasă/ deltaică/ abisală), mare, faleză, front, glaciș, strat, swash, termohalină, țărnișă, upwelling, versant*.

From a total of 30 terms, only 3 are made of two or more words, meaning 6%, while the rest are single words but this might be the result of the fact that most terms are taken from a glossary and not from the specialty books. Most of the terms are nouns. The etymological analysis demonstrates the following influences: 14 words are from Latin or French, 2 words have German origin, 4 words have English origin, while the rest are formed into Romanian language following French or English models.



4. Other elements of Physical Oceanography terminology in English and Romanian

As Oceanography is the study of oceans and seas by means of sciences as biology, chemistry, geology, and physics by making use of mathematics, the Physical Oceanography studies the physical processes making use mainly of physics and geography.

The elements from **geography** of Physical Oceanographic terminology both in English and Romanian are proper nouns denoting especially seas, oceans, straits, channels etc.: *Antarctic Circumpolar Current, Inter-tropical Convergence Zone (ITCZ), Mindanao Trench, North Equatorial Current (NEC), the American Mediterranean (the Caribbean Sea), the Arabian Sea, the Arctic Sea, the Atlantic, the Atlantic Ocean, the Bering Strait, the European Mediterranean, the Indian Ocean, the Pacific, the Persian Gulf, the Red Sea, the South China Sea.*

Elements from **physics** are also present in great number in English as single words or compounds: *absorption, acceleration, breaking wave, cavitation, Celsius scale, cooling, conductivity, Coriolis force, density, dynamical, force, gravity, frictionless, freezing point, irradiance, isobaric surface, isopycnal surfaces, kinematic viscosity, layer depth, melting point, optical oceanography, potential density, pressure, radiance, reflectance, reflectivity, refractive index, refractivity, relative vorticity, scale depth, specific volume, stability, speed expansion, thermal radiation, temperature, transparency, transmittance, velocity shear, vorticity, warmth, wave energy, wave height, wave velocity.*

The specific physical vocabulary selected from the Romanian glossary is given below, though most of the terms from physics given above are also used, many being similar in form with the English ones, although they were borrowed mainly from French: *surgere baroclină, surgere barotropă, convecție, efectul Coriolis, densitate, eufotică, izobară, masă de apă, picnoclină, sverdrup, termoclină, gradient termic.*

As it could be noticed in the paragraph of geography terms, there are also abbreviations, which are a characteristic of the scientific vocabulary: Inter-tropical Convergence Zone (**ITCZ**), North Equatorial Current (**NEC**). There are abbreviations which could be frequently found out in physics: Insolation **QSW**, Net Infrared Radiation **QLW**, Advection **QV**, Latent Heat Flux **QL**, Sensible Heat Flux **QS**, sea surface temperature (**SST**).

Searching for terminology we have found out in English one term that is not used very frequently; it might be known by specialists: *gelbstoffe* meaning “yellow stuff/ muddy waters”, with an unusual etymology given by Wiktionary:

Borrowed from German Gelbstoff (literally “yellow substance”), from German gelb (“amber, yellow”) (ultimately from Proto-Indo-European*ǵʰelh₃wós (“yellow”), from *ǵʰelh₃- (“to shine”) + *-wós (“suffix forming adjectives from verb stems”)) + German Stoff (“matter, stuff, substance”) (from Proto-Germanic*stuppōną (“to close; to fill, stop up”), possibly ultimately from Proto-Indo-European*(s)tew- (“to hit; to push”)).

Another unusual term that appears in oceanographic books is **hump**, used for the graphics illustrating currents and it is also connected to “Gaussian hump”, however the term is generally used in zoology and to describe land protuberances in Geography.

A phrase that sounds intriguing for a non-specialist in oceanography is **stemming a current** meaning “to oppose a current”, especially when we speak about a tidal current. For a linguist the noun *stem* means “the main part of a word”, while **stemming** may have the meaning of removing the affixes

and suffixes of a word, until it is brought to the stem form. This is a case of polysemy of a noun that has different meanings according to the domain it is used.

Another characteristic of the Physical Oceanography terminology, both in English and Romanian, is the great number of adjectives used in compounds or phrases, the most frequent being: *black, deep, dilute, dynamic, enhanced, fresh, gentle, global, high, light, low, meridional, mixed, moderate, permanent, shallow, short, specific, strong*, and *weak*.

The Romanian terminology studied has also some characteristic among which we could mention common Romanian words with the meaning changed: *bare* “sand crests that are submersed” in comparison to the common meaning “solid cylindrical object”; *conuri de rever* “places made of sand where the water is accumulated behind the beach” in comparison to the common term *rever* “lapel”; *portiță* means “disconnection in the shore barriers that permit communication between the sea and the lagoon” in comparison to the common meaning “diminutive of gate”.

The existence of long compounds, or words formed by double affixation seems to be another characteristic of the Romanian terminology: *bacterioplancton, mediolitoral, circalitoral, clorinitate, thalassochimic, geostrofic, mezoscală, troposferă*.

Another characteristic is the combination between a foreign word, English and a Romanian one: *upwelling costier, muchia shelf, curent rip*, or French/Latin and a Romanian one *glacis continental, câmpii estuariene*, forming unusual compounds. Other combinations have as result repetitive terms: *etajul supralitoral*.

5. Conclusion

The Physical Oceanographic terminology is a rich field of investigation for linguists and an important specialty vocabulary for seafarers. The characteristics found can be divided in two categories: common elements for English and Romanian and different elements.

Common elements:

- Words from Geography and Physics are predominant.
- Abbreviations.
- Core terminology has about the same components, although the percentages are different.
- Proper nouns, either geographic or phenomena named after the person that discovered or found them.
- Compound words and words formed by affixation are predominant.
- Great number of adjectives.

Different elements:

- For the main part of the terminology selected and analyzed, the words with Latin or French origins are about twice more numerous in Romanian than in English.
- For the main part of the terminology selected and analyzed, the words with German origins are about twice more numerous in English than in Romanian.
- More compounds are formed within English than within Romanian.

As final conclusion, according to the materials selected and analyzed, the Physical Oceanographic terminology in English is more developed than the one in Romanian. While for English terminology the words are gathered and classified in numerous glossaries, in Romanian, there is only one available glossary for all the sub-specialties of Oceanography.

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