New Arctic islands and straits: origin and distribution, 1960–2020

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At least 44 new islands, each taking from 0.4 km^2 to above 200 km^2, appeared due to glaciers' recession under climate warming in the Arctic since the 1960s. Comprehensive information on a way and time of their origin, and spatial distribution of them is the objective of the statement.

Comparative analysis of maps and satellite data of all the Arctic coasts from different years or periods was our main research method, completed with literature (including internet) studies and fieldwork (in Spitsbergen only). The literature consists mostly of three kinds of sources: (1) original scientific notes or papers, first of all by Pelto (2009–2019, 2017) and Sharov (2005, 2014), (2) notes in Wikipedia and other Internet pages without authors' names (e.g., World Climate Reports 2008), and (3) news from press agencies.

35 new islands which appeared by 2017 were localized and described by Ziaja and Ostafin (2019, 2019b). 9 new islands which appeared from 1997 and 2021 (including 6 from 2018–2021) were localized and described by W. Haska.

The new islands were separated from a mainland by new straits, formed after sea transgression in bedrock depressions (below sea level) abandoned by coastal glaciers (which had before filled these depressions). Of course, such depressions had to be opened for inundation by sea water from at least two sides.

The new islands appeared in:
- Greenland (33), majority (more than 20) of them in the northwest, but 3 newest islands from 2018 and 2021 (including the biggest of the new Arctic islands) in the northeastern Greenland
- Novaya Zemlya (4), all the islands appeared in the western coast of the Northern Island in the period 1993–2014
- Franz Josef Land (3), in the coasts of Eva-Liv Island, Northbrook Island and Hall Island, two of them in the 20th century and the third one in 2016
- Svalbard (2), first one at the beginning of the 1990s in the NW Spitsbergen (Kongsfjorden) and the second one in the southern coast of Nordaustlandet, recognized by Anders Skoglund in 2019 (Kolberg 2019)
- Severnaya Zemlya (2), both islands, being the first new islands out of Greenland and the European Arctic, were separated from the Komsomolets and Szmidt Islands in the northern part of the archipelago in 2018.

The rate of the new islands' appearance has been quickly increasing: 7 in the 1960s–1970s, 14 in the 1980s–1990s, 23 in 2000s–2010s (i.e., twice each twenty years). The last new island appeared in 2021. This process continues and numerous new islands are in the stage of formation.

The biggest of the potential islands is Sørkapp Land—the southern Spitsbergen peninsula (ca. 1300 km^2). It may be quickly transformed into a new island after the connection of two opposite fjords due to the recession of the glacial isthmus between them (Ziaja and Ostafin, 2015, 2019; Grabiec et al., 2018).

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