

The terrestrial and freshwater invertebrate biodiversity of the archipelagoes of the Barents Sea; Svalbard, Franz Josef Land and Novaya Zemlya.



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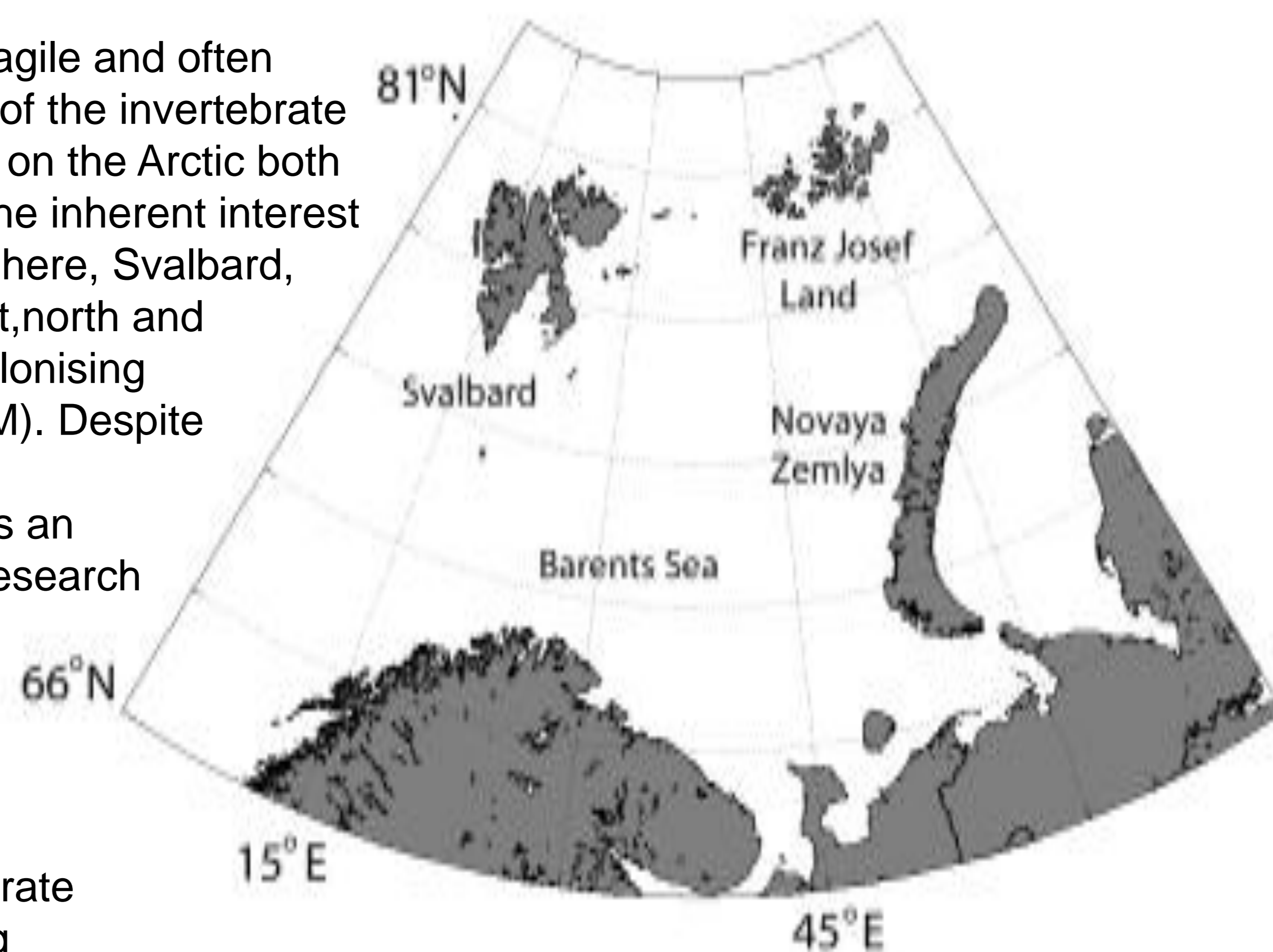
In this article (Coulson *et al.* 2015 *Soil Biology and Biochemistry* **68**; 440-470) we provide a baseline synthesis of the terrestrial and freshwater invertebrate fauna of the Barents Sea archipelagoes, highlight the taxa present, the characteristic elements of fauna, and the complexity of their biogeography. In doing so, we provide a background from which to assess responses to environmental change for a region under increasing international attention

Arctic terrestrial ecosystems are generally considered to be species poor, fragile and often isolated. Nonetheless, their diversity and intricate complexity, especially that of the invertebrate component (Table 1), is beginning to emerge. Attention has become focused on the Arctic both due to the importance of this rapidly changing region for the Earth and also the inherent interest of an extreme and unique environment. The three archipelagoes considered here, Svalbard, Franz Josef Land and Novaya Zemlya, delineate the Barents Sea to the west, north and east. This is a region of convergence for Palearctic and Nearctic faunas recolonising the Arctic following the retreat of the ice after the Last Glacial Maximum (LGM). Despite the harsh Arctic environment and the short period since deglaciation, these archipelagoes are inhabited by diverse invertebrate communities. But there is an obvious imbalance in our knowledge of many taxa from each archipelago. Research in Svalbard is increasing rapidly but there are still few reports, particularly in

the western literature, from Franz Josef Land and Novaya Zemlya. Nevertheless, there appears to be a surprising degree of dissimilarity between the invertebrate faunas (Table 2), possibly reflecting colonization histories.

Table 1. The number of terrestrial and freshwater invertebrate species names listed from Svalbard. Inventory source:- updated database maintained by Coulson and available at Coulson staff homepage www.unis.no and www.svalbardinsects.net

Taxon	number of species
Insecta	257
Collembola	71
Araneae	18
Acari	164
Tardigrada	91
Annelida	41
Platyhelminthes	27
Nematoda	113
Rotifera	173
Crustacea	33



Group		Novaya Zemlya to Svalbard	Franz Josef Land to Svalbard	Franz Josef Land to Novaya Zemlya
Rotifera	Bdelloidae	1 (2 : 67)	3 (3 : 67)	0 (0 : 2)
	Monogonta	45 (71 : 134)	16 (20 : 134)	15 (20 : 71)
Gastrotricha		0 (0 : 1)	-	-
Nematoda	Freeliving	24 (81 : 95)	-	-
Annelida	Lumbricidae	0 (1 : 2)	-	-
Tardigrada		40 (68 : 92)	17 (19 : 92)	12 (19 : 68)
Acari	Mesostigmata	11 (27 : 29)	3 (6 : 29)	4 (6 : 27)
	Oribatida	39 (64 : 87)	5 (15 : 87)	8 (15 : 64)
Araneae		8 (20 : 14)	2 (2 : 14)	2 (2 : 20)
Collembola		20 (53 : 68)	12 (14 : 68)	8 (14 : 53)
Insecta	Phthiraptera	4 (7 : 37)	-	-
	Hemiptera	0 (1 : 3)	-	-
	Coleoptera	1 (28 : 14)	-	-
	Diptera	30 (150 : 122)	1 (4 : 122)	0 (4 : 150)
	Chironomidae	19 (73 : 66)	1 (1 : 66)	0 (1 : 73)
	Other Diptera	10 (77 : 56)	0 (3 : 56)	0 (3 : 77)
	Siphonaptera	1 (1 : 2)	-	-
	Lepidoptera	0 (14 : 3)	-	-
Crustacea	Cladocera	5 (8 : 17)	-	-
	Copepoda	1 (16 : 6)	-	-
	Anostraca	0 (4 : 0)	-	-
	Ostracoda	0 (5 : 2)	-	-
	Notostraca	1 (1 : 1)	-	-
	Malacostraca	0 (3 : 1)	-	-

Megaphorura arctica, Collembola.



The oribatid mite *Diapterobates notatus*.



One of the two moth species resident in Svalbard, *Apamea exulis*, photographed in Adventdalen.



The Svalbard endemic aphid, *Acyrtosiphon svalbardicum*, on the host plant, *Dryas octopetala* (reinrosa, mountain avens). Blomstrandhalvøya, Kongsfjord.



Participants at the terrestrial invertebrate workshop held at UNIS in March 2011. From left to right: Peter Convey, Elise Biersma, Arne Fjellberg, Torstein Solhøy, Maria Luisa Ávila-Jiménez, Elisabeth Stur, Willem De Smet, Natalia Lebedeva, Olga Makarova, Nastasia Taskaeva, Anatoly Babenko, Elena Melekhina, Dariusz Gwiazdowicz, Hanne Eik Pilskog, Anja Carlsson, Kirsten Christoffersen, Katarzyna Zmudczyńska, Leopold Füreder, Kristine Maraldo, John Brittain, Sigmund Hågvar, Hanna-Laisa Lakka, Steve Coulson, Geir Søli and Jean-Christophe Simon. Workshop funded by the Research Council of Norway

Table 2. Similarities between the invertebrate faunas of the archipelagoes. Figures indicate: total number of species in common (total number of species in first archipelago; total number of species in second archipelago). Dashes indicate comparisons not possible, usually as no species of the group concerned have been recorded from Franz Josef Land.

Poster can be downloaded from Coulson homepage at www.unis.no or www.svalbardinsects.net (Research in Svalbard pages)

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