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Changes to the Pacific Section AAPG Constitution and By-laws
Upcoming re-vote on the proposed changes (Page 7)

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And more

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Fossil Type Specimens and Species Named from National Park Service Areas in Alaska

Justin S. Tweet[1], Vincent L. Santucci[2], and Robert B. Blodgett[3]

[1]National Park Service, 9149 79th Street S., Cottage Grove, MN 55016
justin_tweet@nps.gov

[2]National Park Service, Geologic Resources Division, 1849 C Street, NW Washington, D.C., 20240
vincent_santucci@nps.gov

[3]Blodgett & Associates, Consulting Geologists, 2821 Kingfisher Drive, Anchorage, AK 99502
RobertBBlodgett@gmail.com

Eighteen national parks, monuments, and other National Park Service areas and affiliated sites are located within Alaska. These include some of the largest and most geologically diverse parks in the National Park System. Several of these are among the most significant in the NPS for paleontological resources, such as Denali National Park and Preserve (NP&PRES), Lake Clark NP&PRES, Wrangell-St. Elias NP&PRES, and Yukon-Charley Rivers National Preserve (NPRES). Together these NPS units preserve evidence of the complex geologic history of Alaska, assembled from disparate fragments of crust over hundreds of millions of years. The fossils in these rocks help to document this process by illustrating biogeographic connections with other places.

An important part of the study of fossils is describing and naming new species. Every fossil species is based on one or more specimens that are known as “type specimens”, intended to serve as a typical example of that species for comparison with other species. Because detailed locality information was not always published or even possible to determine in the early days of paleontology, the exact number of fossil species that have been named from fossils found in NPS lands is not certain. To date (August 2023), the type specimens for 2,361 fossil species have been confirmed to originate from localities within an NPS unit. Of that total, almost exactly 10% (236) were discovered in and collected from Alaska’s NPS areas. These 236 fossil species, plus two more potentially based on material from what is now Katmai NP&PRES, serve as a microcosm of NPS fossil species and the history of life in general. Of course, not all of these species are necessarily considered valid today, but this represents an impressive number.

Alaska’s NPS fossil type specimens come from nine park units (Table 1). These units are distributed throughout the state, from the Brooks Range to the Alaska Peninsula to the Panhandle. Most of the parks have fewer than two dozen, but Wrangell-St. Elias NP&PRES has 35, and Yukon-Charley Rivers NPRES has 129, which puts it at sixth place in the entire NPS for confirmed type specimens within an individual park.

Park	Confirmed	Potential
Aniakchak NM & PRES	2	0
Denali NM & PRES	6	0
Gates of the Arctic NM & PRES	13	0
Glacier Bay NM & PRES	9	0
Katmai NM & PRES	20	2
Lake Clark NM & PRES	21	0
Noatak NM & PRES	1	0
Wrangell-Str. Elias NM & PRES	35	0
Yukon-Charley Rivers NM & PRES	129	0
Total	**236**	**2**

Table 1. Distribution of fossil species named from Alaska’s NPS units.

Taxonomically, this record is dominated by fossil invertebrate taxa, followed distantly by plants, microorganisms, and trace fossils, in that order (Table 2). Notably, to date no fossil vertebrates have been named from body fossils found in Alaska's NPS units. Within these broad categories numerous groups are represented (Table 3). Trilobites, ammonoids, angiosperms, ostracodes, brachiopods, and bivalves are particularly well-represented.

Group	Confirmed	Potential
Invertebrates	186	2
Plants	38	0
Microorganism	10	0
Trace Fossils	2	0

Table 2. Broad taxonomic distribution of fossil species named from Alaska's NPS units.

Invertebrates	Plants	Microorganism	Trace Fossils
64 trilobites	34 angiosperms	9 radiolarians	2 bird tracks
43 ammonoids (+2 potential)	2 ferns	1 foram	
22 ostracodes	1 conifer		
19 brachiopods	1 ginkgo		
16 bivalves			
8 gastropods			
4 tentaculitids			
3 echinoids			
2 belemnites			
2 nautiloids			
1 coral			
1 lobster			
1 sponge			

Table 3. Taxonomic diversity of fossil species named from Alaska's NPS units.

The temporal distribution of the fossil species named from Alaska's NPS areas is quite extensive, from a questionably Proterozoic occurrence representing one of the more unusual examples (*Brabbinthes churkini* from Yukon-Charley Rivers NPRES; see below) to the Pliocene (Figure 1). Almost every Phanerozoic period or sub-period is represented, most by more than a dozen taxa.

The history of this paleontological work in Alaska extends back more than 150 years (Figure 2). The oldest named fossils identified to date are from Eichwald (1871), with several fossil bivalves named from coastal areas now part of Lake Clark NP&PRES. Following this are several quiet decades, then a brief spurt in the 1920s and 1930s, a lull in the 1940s, then small numbers of taxa each decade except for the 1960s and 1970s. Most of the descriptions from the 1920s through the 1970s come from the work of the U.S. Geological Survey, and are frequently batches of names.

Within the peaks and valleys of the various charts are various works by particular authors. Some of the significant publications include:

- Berdan and Copeland (1973; Devonian ostracodes from Yukon-Charley Rivers NPRES)
- Hollick (1930; Cretaceous plants from Yukon-Charley Rivers NPRES)
- Hollick (1936; Cenozoic plants from several parks)

- Imlay (1960; Cretaceous ammonoids from Wrangell-St. Elias NP&PRES)
- Imlay (1964, Jurassic ammonoids from Lake Clark NP&PRES)
- Knowlton (1904; Oligocene plants from Katmai NP&PRES)
- Kobayashi (1934; Cambrian trilobites and brachiopods from Yukon-Charley Rivers NPRES)
- Palmer (1968; Cambrian trilobites from Yukon-Charley Rivers NPRES)
- Smith (1927; Triassic invertebrates from Wrangell-St. Elias NP&PRES and Yukon-Charley Rivers NPRES)
- Won et al (2002; Silurian radiolarians from Yukon-Charley Rivers NPRES)

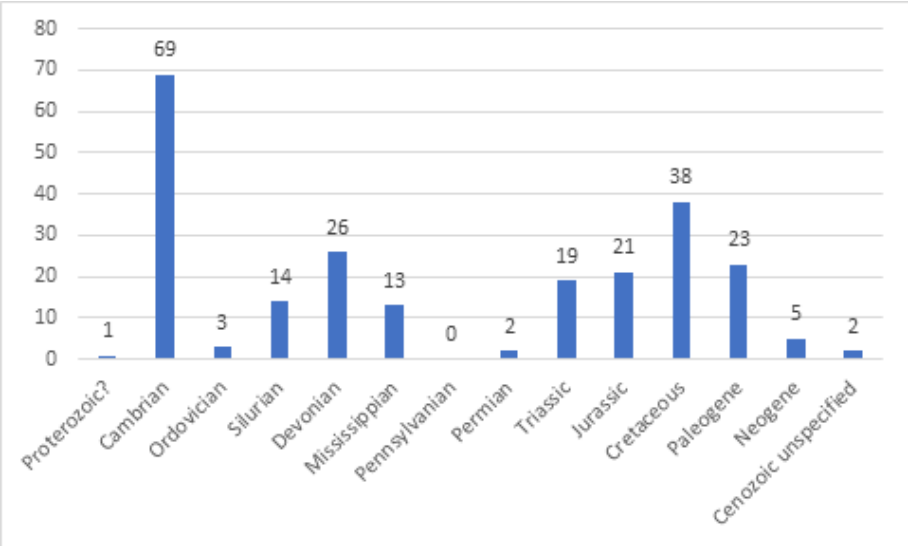

Figure 1. Temporal distribution of fossil species named from Alaska's NPS units (two unconfirmed Jurassic occurrences omitted).

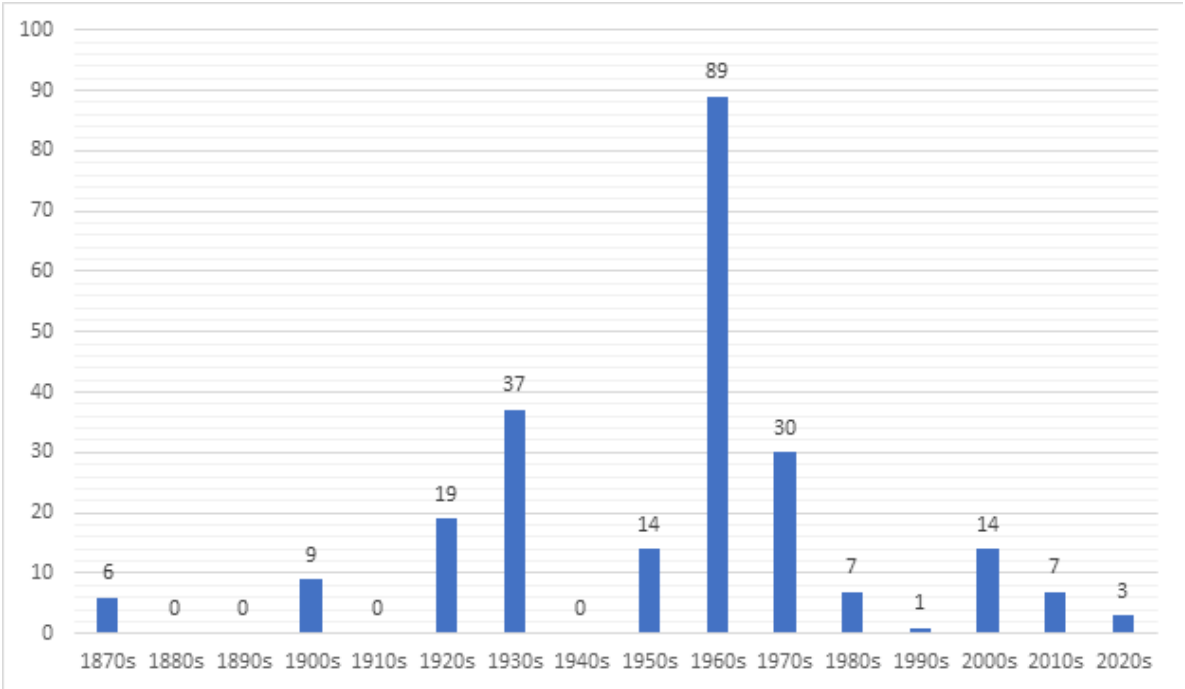

Figure 2. Chronology of fossil species named from Alaska's NPS units (two unconfirmed names from the 1900s omitted).

Each of the 238 taxa represent a piece of the mosaic that is the history of life on Earth. Some of the more unusual species include:

Brabbinthes churkini Allison (1975): This species was first described as a silicified Neoproterozoic flatworm from the "basalt and red beds" unit of the Tindir Group in Yukon-Charley Rivers NPRES (Allison 1975). Its identification and stratigraphic provenance were challenged by Cloud in Cloud et al. (1976), who proposed that the holotype was actually a section of a sponge spicule and found the correlation of the type locality to be questionable. Allison (1988) did not attempt to resurrect a flatworm identification but did not commit to any other identification, either, finding some structural differences from sponge spicules.

Magnoavipes denaliensis Fiorillo et al. (2011): One of many different ichnospecies found in the Upper Cretaceous Cantwell Formation of Denali NP&PRES, *Magnoavipes denaliensis* represents tracks left by a large crane-like bird that reached human heights.

Pycinodesma giganteum (Kirk 1927a): At roughly hand-sized, this is the largest known Silurian bivalve, and is only found in rocks of the Alexander Terrane. The type specimen comes from an islet off Willoughby Island in Glacier Bay NP&PRES. The genus was originally *Pycnodesma* (Kirk 1927a), but that name proved to be in use and *Pycinodesma* was substituted (Kirk 1927b).

Although many fossil species have already been named from the rocks of Alaska's national parks, we can be sure that many more are yet to be described. In just the past three years three new species of brachiopods were described from the Devonian Shellabarger Limestone of Denali NP&PRES: *Carinagypa robecki* Blodgett et al. (2021) and *Clorinda cappsi* and *Ivdelinia (Ivdelinia) tweeti* Blodgett et al. (2022). Brachiopods have become an especially studied group in the past few decades, and other newly established species include *Myriospirifer breasei* Garcia-Alcalde and Blodgett (2001), also from the Shellabarger Limestone of Denali NP&PRES; *Alaskothyris frosti* Blodgett et al. (2015) from Devonian strata in Noatak NPRES; and *Sapelnikoviella santuccii* Blodgett et al. (2013) from late Silurian strata of the Willoughby Limestone, Glacier Bay NP&PRES. A gallery of some of these species follows the text (Figures 3–9). The complex and varied rocks exposed in the state's NPS areas should continue to be fertile grounds for new discoveries.

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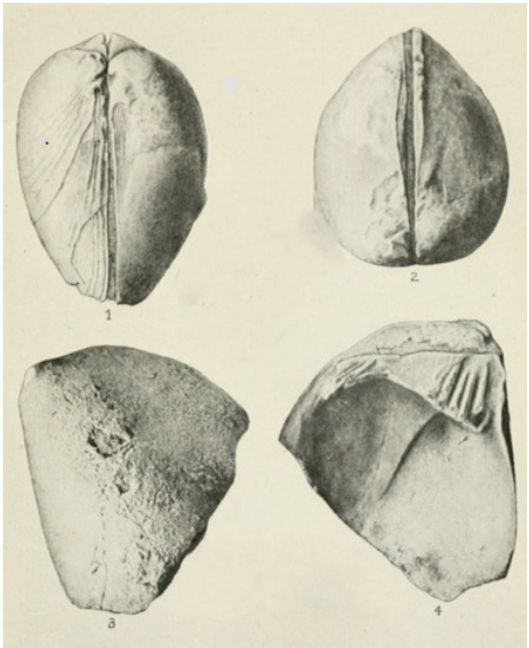

Figure 3. *Pycinodesma giganteum* (Kirk 1927a) from upper Silurian strata of the Willoughby Limestone, Glacier Bay NP&PRES. Articulated specimen, USNM 71275. Reposited at the United States National Museum (USNM), Washington, D.C.

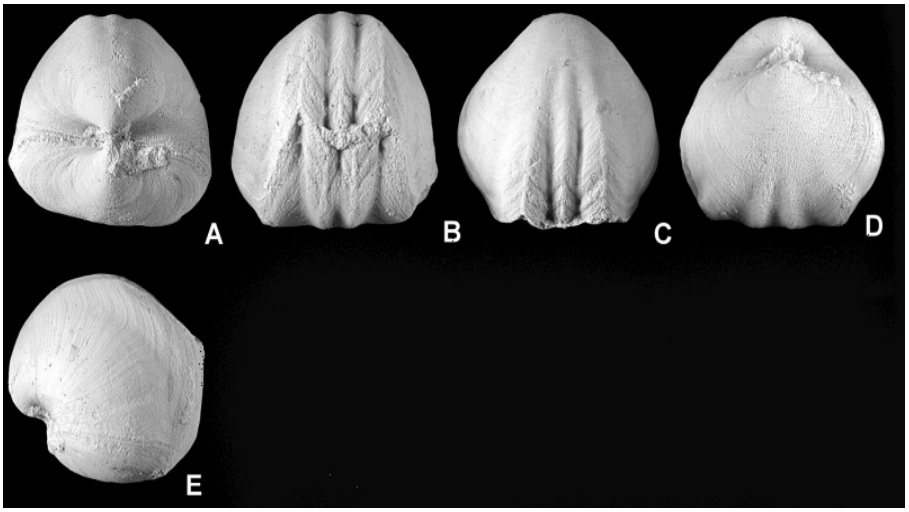

Figure 4. *Sapelnikoviella santuccii* Blodgett et al. (2013) from upper Silurian strata of the Willoughby Limestone, Glacier Bay NP&PRES. Articulated shell, UAMES 23259. Shell measures 9.4 mm in thickness. Reposited at the University of Alaska Museum of Earth Sciences collection (UAMES), Fairbanks, Alaska.

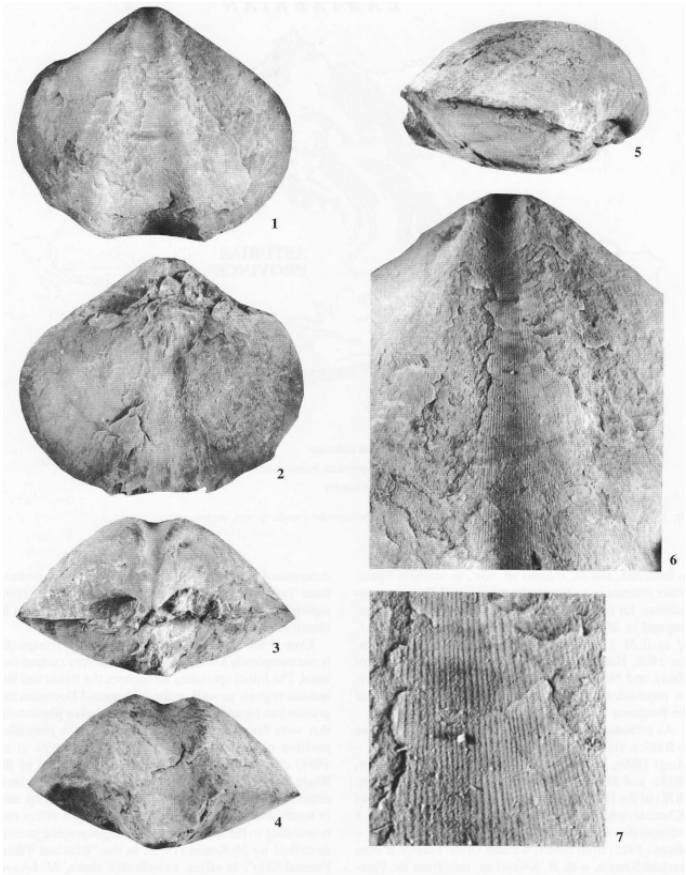

Figure 5. *Myriospirifer breasei* Garcia-Alcalde and Blodgett (2001) from the Devonian Shellabarger Limestone of Denali NP&PRES. Articulated specimen, UAM 2569. Shell measures 50 mm in thickness. Reposited at the University of Alaska Museum of Earth Sciences collection (UAMES), Fairbanks, Alaska.

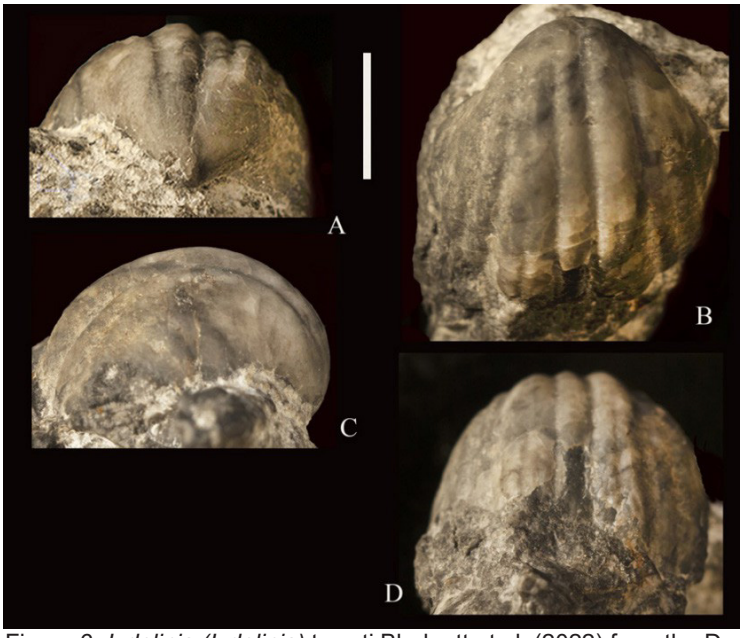

Figure 6. *Ivdelinia (Ivdelinia)* tweeti Blodgett et al. (2022) from the Devonian Shellabarger Limestone of Denali NP&PRES. Ventral valve, AKGMC-54. Scale bar = 1 cm. Specimen reposited at the Alaska Geological Materials Center (GMC), Anchorage, Alaska.

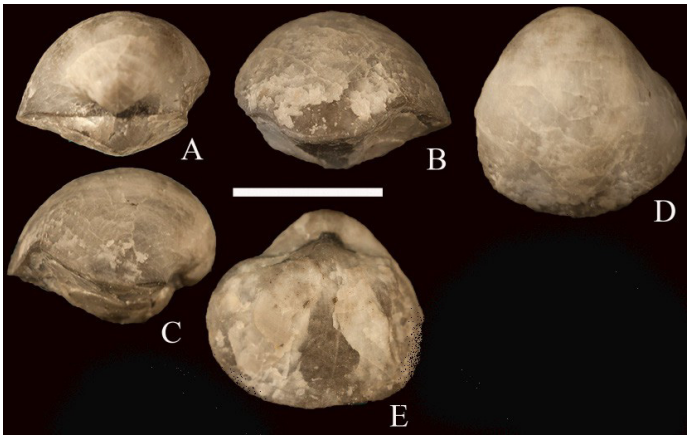

Figure 7. *Clorinda cappsi* Blodgett et al. (2022) from the Devonian Shellabarger Limestone of Denali NP&PRES. Articulated shell, AKGMC-56. Scale bar = 1 cm. Specimen reposited at the Alaska Geological Materials Center (GMC), Anchorage, Alaska.

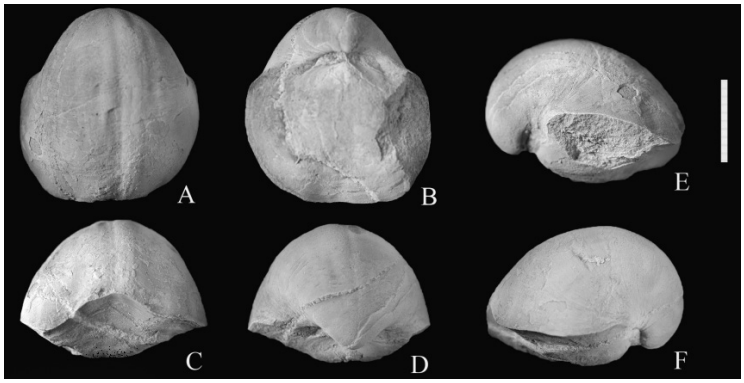

Figure 8. *Carinagypa robecki* Blodgett et al. (2021) from the Devonian Shellabarger Limestone of Denali NP&PRES. Articulated shell, AKGMC=4. Scale bar = 1 cm. Specimen reposited at the Alaska Geological Materials Center (GMC), Anchorage, Alaska.

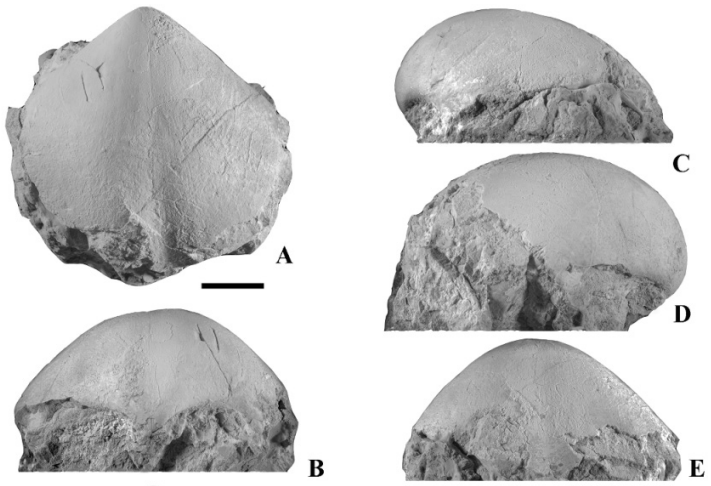

Figure 9. *Alaskothyris frosti* Blodgett et al. (2015) from the Devonian strata in the Noatak National Preserve. Ventral valve, USNM 604946. Scale bar = 1 cm. Specimen deposited at the United States National Museum (USNM), Washington, D.C.