

Palynology and micropaleontological evaluation of core samples (102.6'-1,142.5') from the U.S. Navy Sentinel Hill Core Test No. 1.



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# Palynological and Micropaleontological Evaluation of Core Samples from the Sentinel Hill Core Test #1, Central North Slope, Alaska

June 2006

## Summary

Ten conventional core samples (102.6-1142.5 ft) from the Sentinel Hill Core Test No. 1, Central North Slope, Alaska, were examined for organic-walled palynomorphs, and two samples (699.6 ft, 1145.5 ft) were examined for foraminifera.

The sample at 102.6 ft is early Maastrichtian in age. The interval between 364.3 ft and 941.3 ft is late Campanian, and the lowermost sample at 1142.5 ft is early Campanian.

## Palynology

Ten conventional core samples occupy an interval ranging in age from early Campanian to early Maastrichtian (see Figure 1 for sample information and observed distribution of taxa). The uppermost sample (102.6 ft) contains a relatively low-diversity terrestrial assemblage with few age-diagnostic taxa. The next sample down (364.3 ft), however, contains a rich and characteristically late Campanian assemblage including in particular numerous specimens of the important late Campanian indicator pollen species *Aquilapollenites trialatus*. Given the absence of typical late Maastrichtian taxa from the uppermost sample, we regard it as being early Maastrichtian in age.

The late Campanian assemblage persists throughout most of the rest of the core, down to 941.3 ft, and is characteristically non-marine in nature. The lowermost sample (1142.5 ft), however, contains a population of marine dinoflagellate cysts typical of early Campanian strata, including the major marker species *Spongodinium delitiense* and *Chatangiella ditissima*.

Overall, recovery and preservation of palynomorphs was excellent throughout, and more detailed sampling, if desired, would permit clearer resolution of the chronostratigraphy in this core.

## Foraminifera

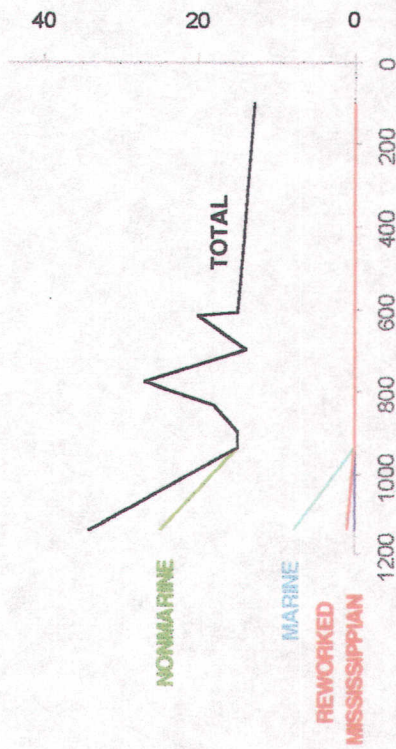
### 699.6'C

<u>Age.</u>	Indeterminate
<u>Environment.</u>	Indeterminate
<u>Fauna.</u>	Barren of Foraminifera
<u>Washed Lithology.</u>	Dark gray silty micaceous mudstone or shale.

### 1142.5'C

<u>Age.</u>	Late Cretaceous Probable Campanian
<u>Zone.</u>	Probable F-5
<u>Environment.</u>	Inner to Middle (Inner to Middle)
<u>Fauna.</u>	<i>Ammobaculites wenonahae</i> (X) <i>Bathysiphon</i> sp. (R) <i>Eoeponidella strombodes</i> (X) <i>Haplophragmoides bonanzaensis</i> (R) <i>Haplophragmoides rota</i> (R) <i>Quinqueloculina</i> sp. (X) <i>Trochammina ribstonensis</i> (F) <i>Trochammina whittingtoni</i> (F) <i>Verneuilinoides fischeri</i> (F) <i>Cenosphaera</i> spp. (pyritized) (F) <i>Spongodiscus</i> sp. (R) Diatoms (pyritized) (F) Pyrite (C) Tar (F) LCM (F)
<u>Washed Lithology.</u>	Dark gray to black slightly silty pyritic shale.

**TAXA DIVERSITY**  
no. of taxa per sample



early MAASTRICHTIAN  
late CAMPANIAN  
early CAMPANIAN

CORE DEPTH  
(feet)

# Sentinel Hill Core Test 1

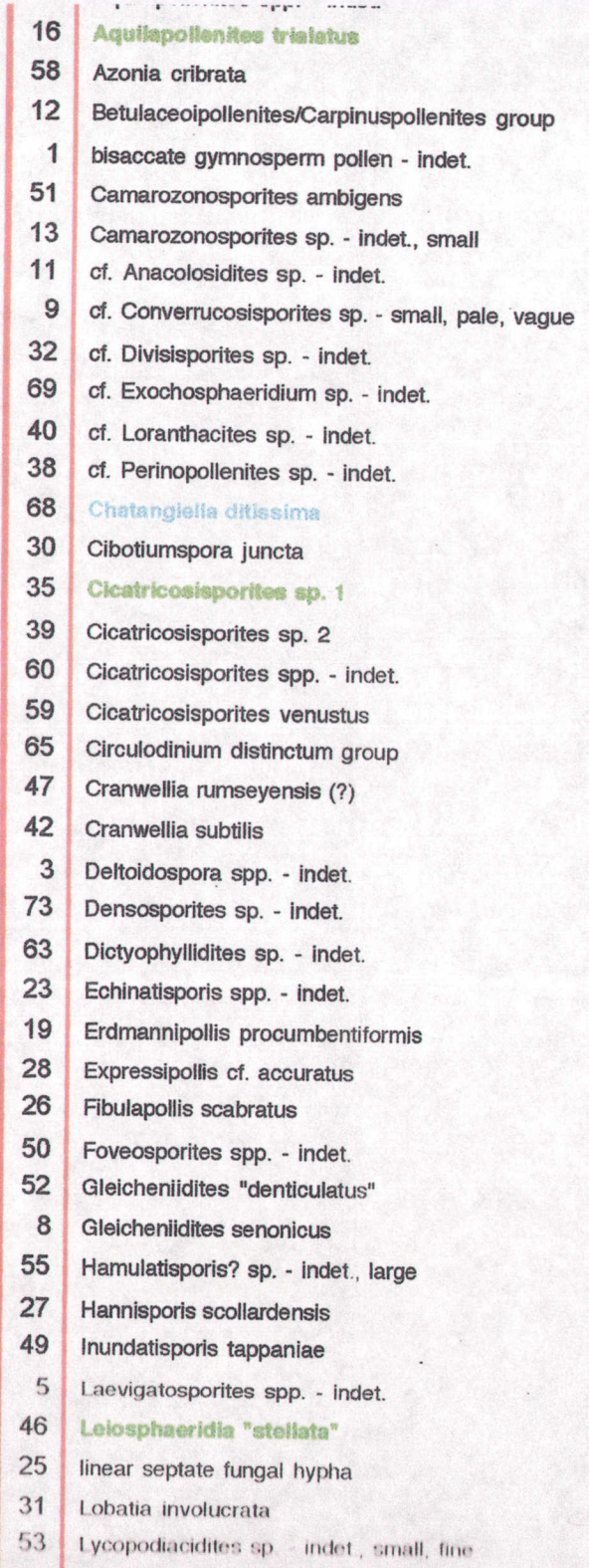
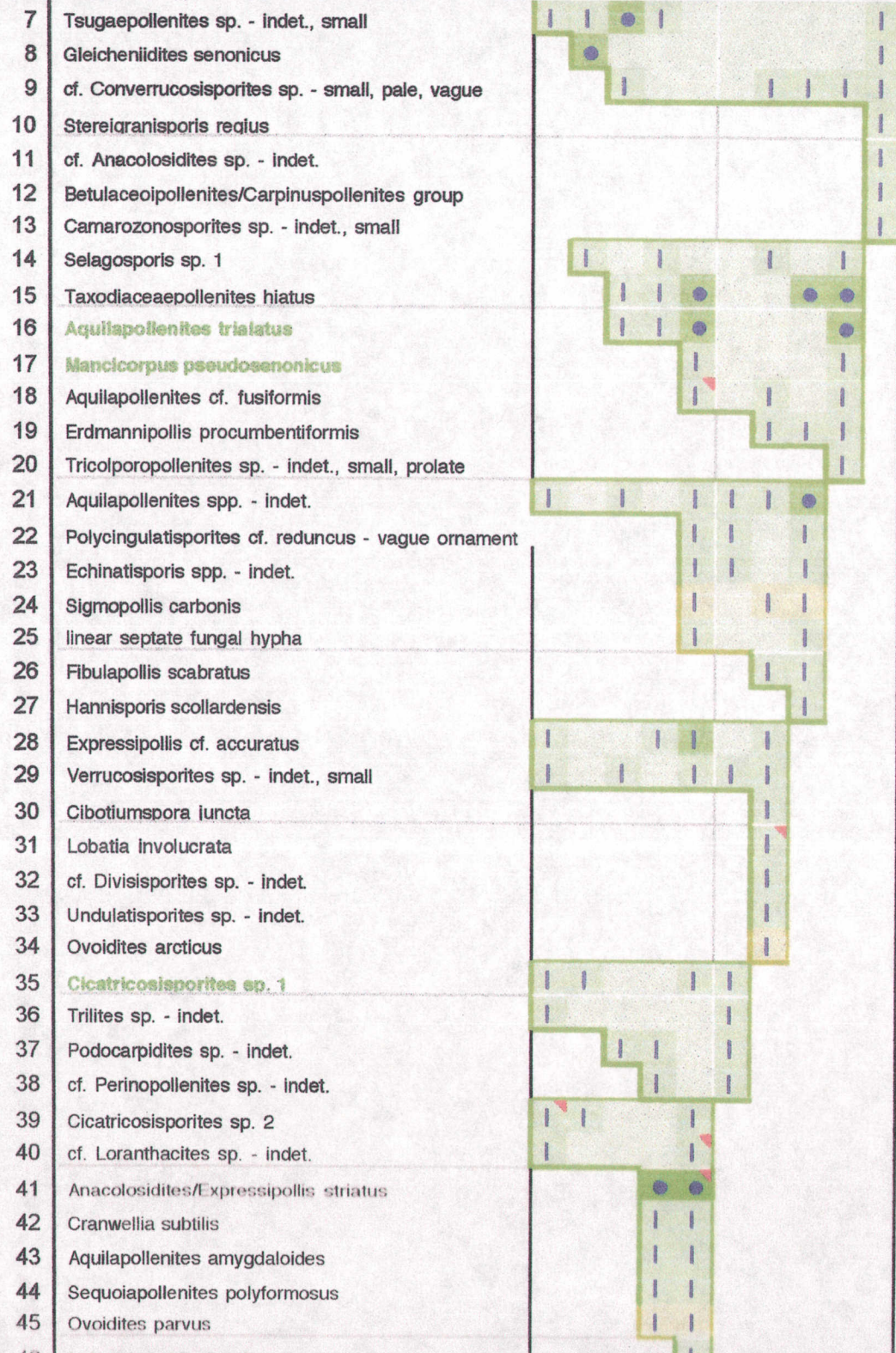
TAXON

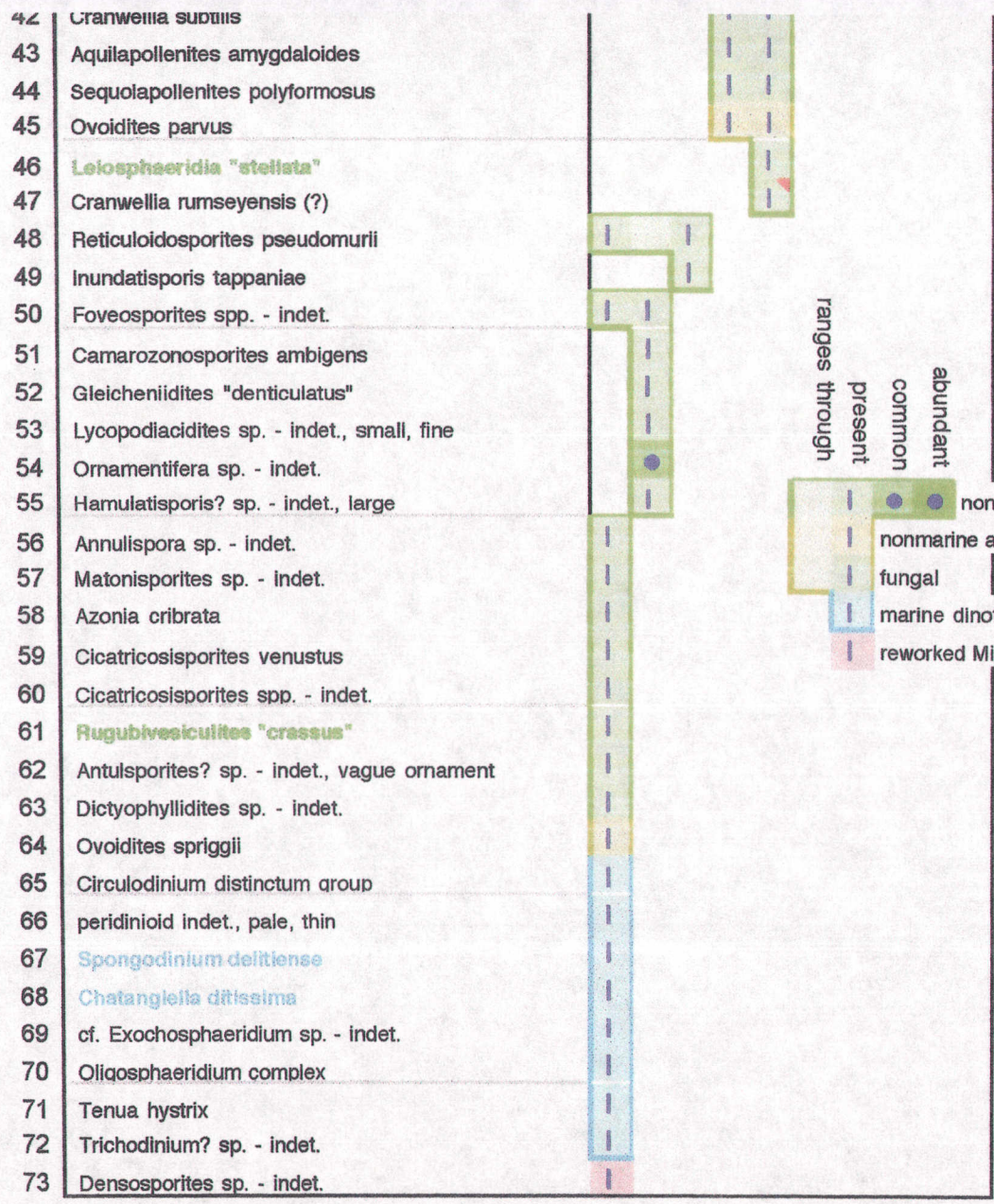
- 1 bisaccate gymnosperm pollen - indet.
- 2 Stereisporites spp. - indet.
- 3 Deltoidospora spp. - indet.
- 4 Osmundacidites wellmanii
- 5 Laevigatosporites spp. - indet.
- 6 Retitriletes spp. - indet.
- 7 Tsugaepollenites sp. - indet., small
- 8 Gleicheniidites senonicus
- 9 cf. Converrucosporites sp. - small, pale, vague
- 10 Stereigranisporites regius

TAXA INDEX

41	Anacolosidites/Expressipollis striatus
56	Annullispora sp. - indet.
62	Antulisporites? sp. - indet., vague ornament
43	Aquilapollenites amygdaloides
18	Aquilapollenites cf. fusiformis
21	Aquilapollenites spp. - indet.
16	<b>Aquiapollenites triolatus</b>
58	Azonia cribrata
12	Betulaceipollenites/Carpinuspollenites group
1	bisaccate gymnosperm pollen - indet.

Figure 1. Stratigraphic distribution of organic-walled microfossils, Sentinel Hill Core Test No. 1.





- 40 *Leiosphaeridia "stenata"*
- 25 linear septate fungal hypha
- 31 *Lobatlia involucreta*
- 53 *Lycopodiacidites* sp. - indet., small, fine
- 17 *Mancicorpus pseudosenonicus*
- 57 *Matonisporites* sp. - indet.
- 70 *Oligosphaeridium* complex
- 54 *Ornamentifera* sp. - indet.
- 4 *Osmundacidites wellmanii*
- 34 *Ovoidites arcticus*
- 45 *Ovoidites parvus*
- 64 *Ovoidites spriggii*
- 66 peridinioid indet., pale, thin
- 37 *Podocarpidites* sp. - indet.
- 22 *Polycingulatisporites* cf. *reduncus* - vague ornament
- 48 *Reticuloidosporites pseudomurii*
- 6 *Retitriletes* spp. - indet.
- 61 *Rugubivesiculites "crassus"*
- 14 *Selagosporis* sp. 1
- 44 *Sequoiapollenites polyformosus*
- 24 *Sigmopollis carbonis*
- 67 *Spongodinium delitiense*
- 10 *Stereigranisporis regius*
- 2 *Stereisporites* spp. - indet.
- 15 *Taxodiaceapollenites hiatus*
- 71 *Tenua hystrix*
- 72 *Trichodinium?* sp. - indet.
- 20 *Tricolporopollenites* sp. - indet., small, prolate
- 36 *Trilites* sp. - indet.
- 7 *Tsugaepollenites* sp. - indet., small
- 33 *Undulatisporites* sp. - indet.
- 29 *Verrucosisporites* sp. - indet., small

TAXA DIVERSITY (see graph at left):

Nonmarine	25	8	1	34
Marine	15	0	0	15
Reworked Mississippian	15	0	0	15
Tota.	13	0	0	13
	14	0	0	14
	15	0	0	15
	20	0	0	20
	14	0	0	14
	27	0	0	27
	18	0	0	18
	15	0	0	15
	15	0	0	15
	25	8	1	34