Holocene coversands at Olando Kepure (Dutchman's Cap) on the Lithuanian Baltic Sea Coast

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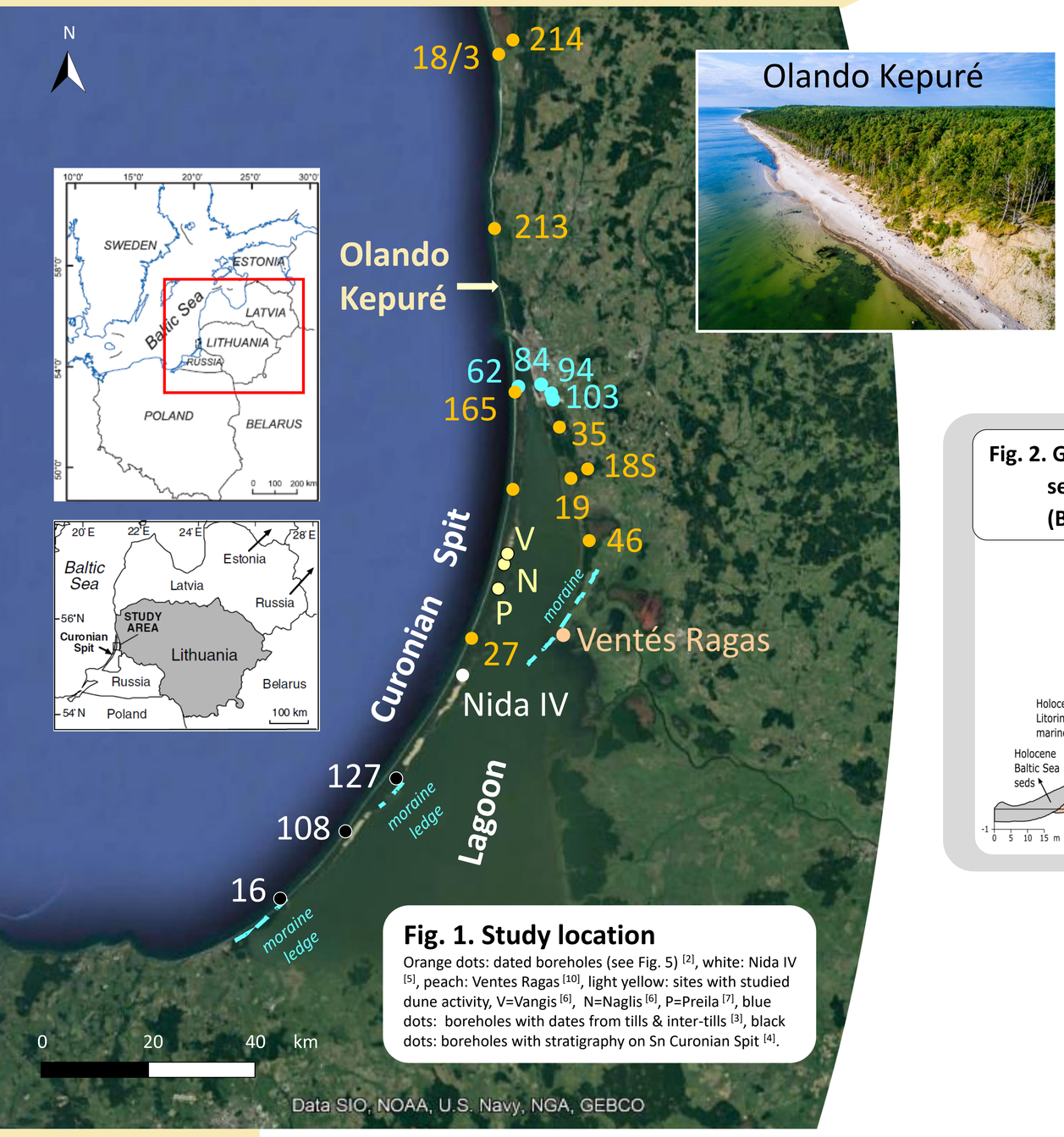
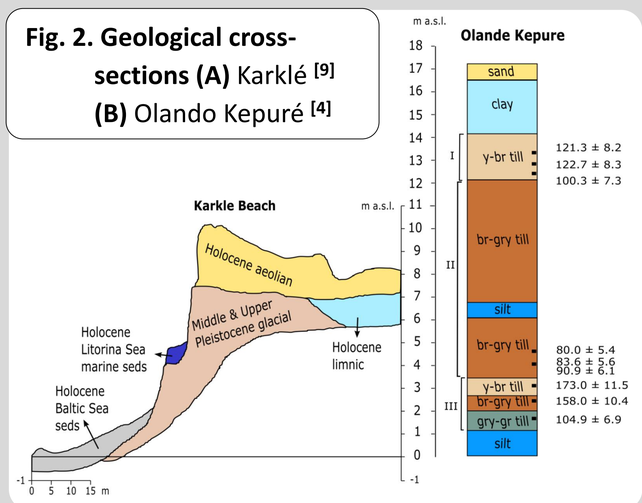


Fig. 1. Study location
Orange dots: dated boreholes (see Fig. 5) [2], white: Nida IV [5], peach: Ventes Ragas [10], light yellow: sites with studied dune activity, V=Vangis [6], N=Naglis [6], P=Preila [7], blue dots: boreholes with dates from tills & inter-tills [3], black dots: boreholes with stratigraphy on Sn Curonian Spit [4].

Context

- The paraglacial Baltic Sea coastline (Fig. 1) includes sand-rich sediments influenced by changes in relative sea-level, sediment supply & windiness.
- Inland there are aeolian deposits of the European Sand Belt [1].
- Whilst the Curonian Spit and Lagoon sediments have geochronological control [5-8], the sands capping the Olando Kepuré (Fig. 2) topographic highpoint have not been studied (just labelled as 'Holocene').

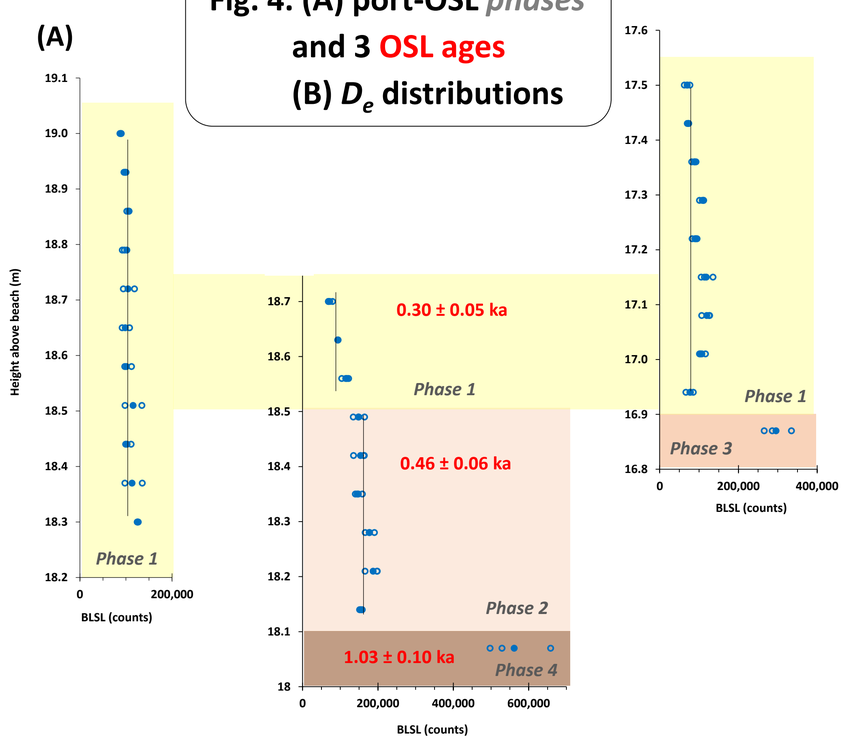
Fig. 2. Geological cross-sections (A) Karklé [9] **(B)** Olando Kepuré [4]



Site & Methods

- Curonian Spit and inland underlain with moraine ledges of variable till thickness (Fig. 1) [3].
- Geological cross-sections for outcrop [4] and nearby Karklé Beach [9] show tills and inter-tills, topped with water-lain clays and aeolian sands (Fig. 2).
- IRSL-dated tills interpreted as older tills moved (and not re-reset) in MIS 4 (till III, II) and MIS 2 (till I) [4].
- Sands sampled every 6 cm (Fig. 3 photos), and analysed using port-OSL reader, particle size and LOI.
- 3 samples were selected for quartz OSL dating.

Fig. 4. (A) port-OSL *phases* and 3 OSL ages (B) D_e distributions



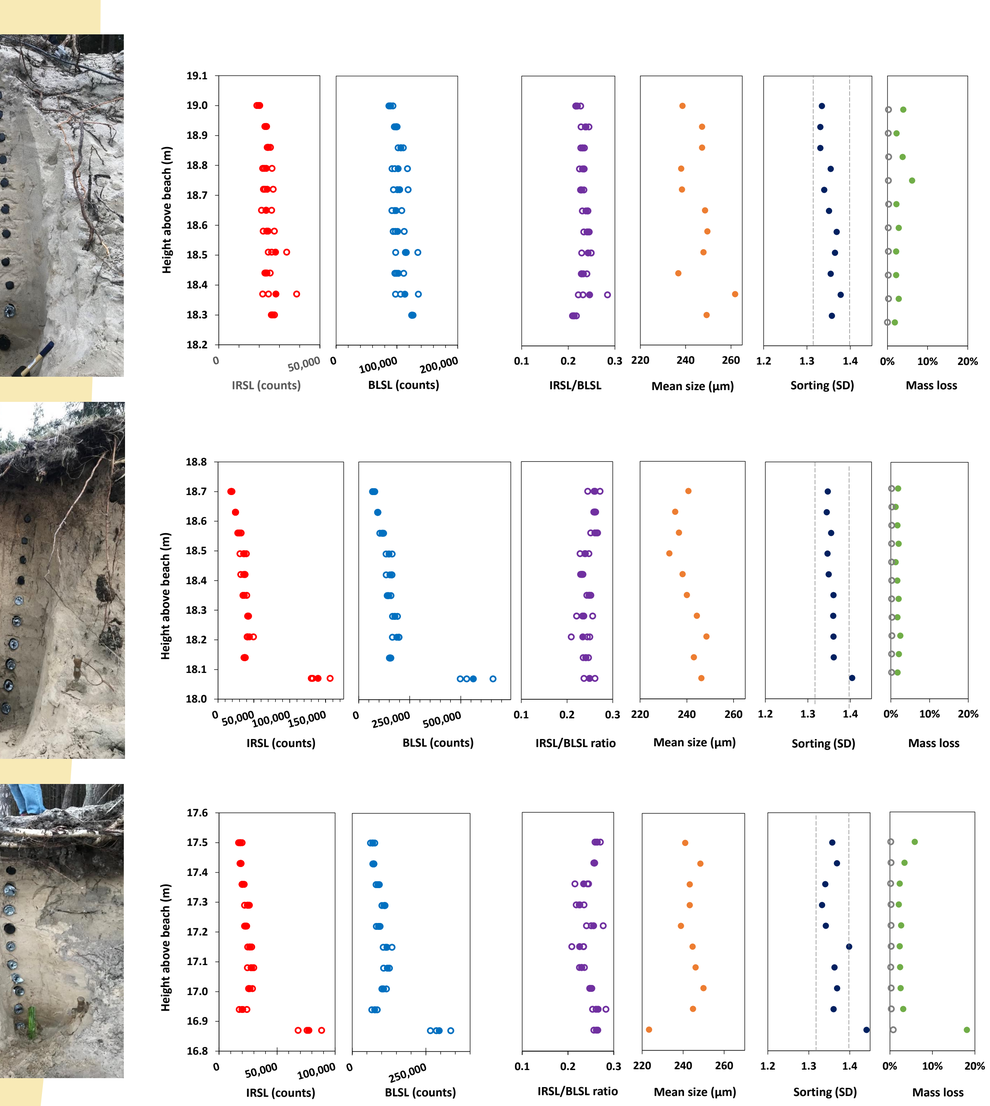


Fig. 3. Sampled profiles, port-OSL signals, and sediment characteristics

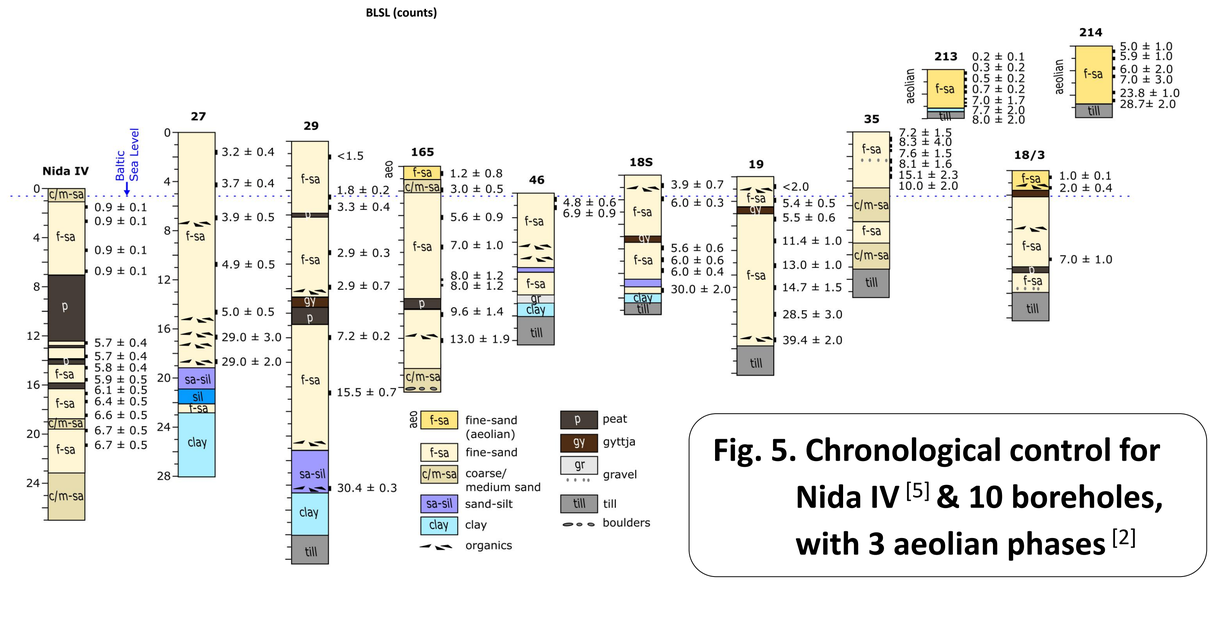


Fig. 5. Chronological control for Nida IV [5] & 10 boreholes, with 3 aeolian phases [2]

Conclusions

- Sand unit at Olando Kepuré has aeolian stratigraphic features and is indeed Holocene (1.03 ± 0.1 to 0.3 ± 0.05 ka).
- This fits with the last part of the regional Holocene aeolian activity.
- Port-OSL has great promise for rapid, low-fidelity, relative age estimation in this region, with 4 phases identified here.

Olando Kepuré aeolian sediment deposition (Fig. 4) fits with:

- Youngest of 3 aeolian phases in bholes: ~30 ka, ~8-5 ka & ~2-0.2 ka [2] (Fig. 5).
- Curonian Spit dune activity: 2.4±0.2 to 2.2±0.2 ka (Vingis) 2.2±0.2 to 1.1±0.1 ka (Naglis) [6], 0.49±0.06 to 0.37±0.05 (Preila) [7].
- Ventés Ragas aeolian deposition [10] .
- Coastal sand deposition across Baltic States (Fig. 6) [1].

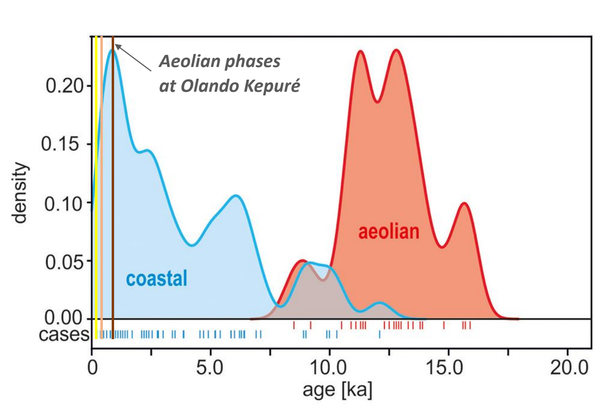


Fig. 6. KDEs of Baltic State luminescence dates [1]

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