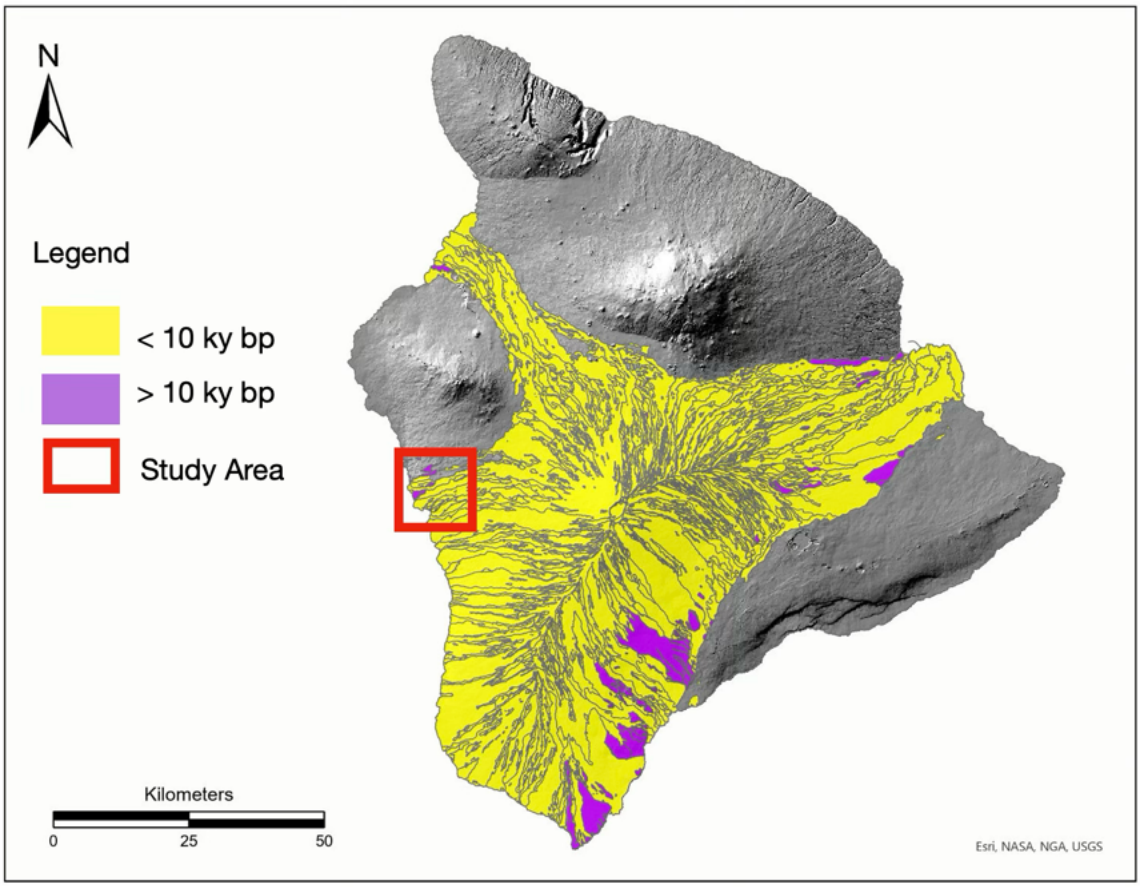
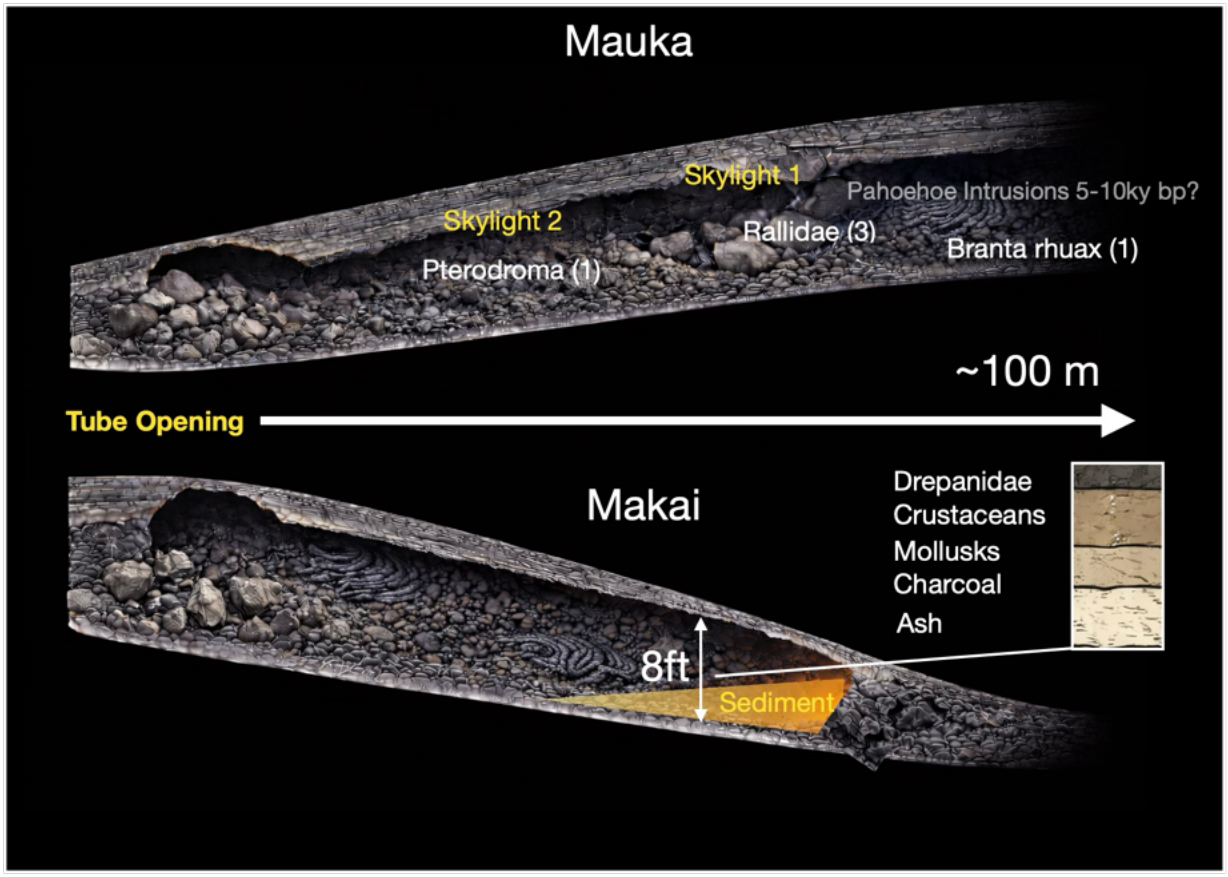
k) **Figure 11.** Limited extent of Mauna Loa lava flows older than 10,000 years BP on Hawai‘i Island



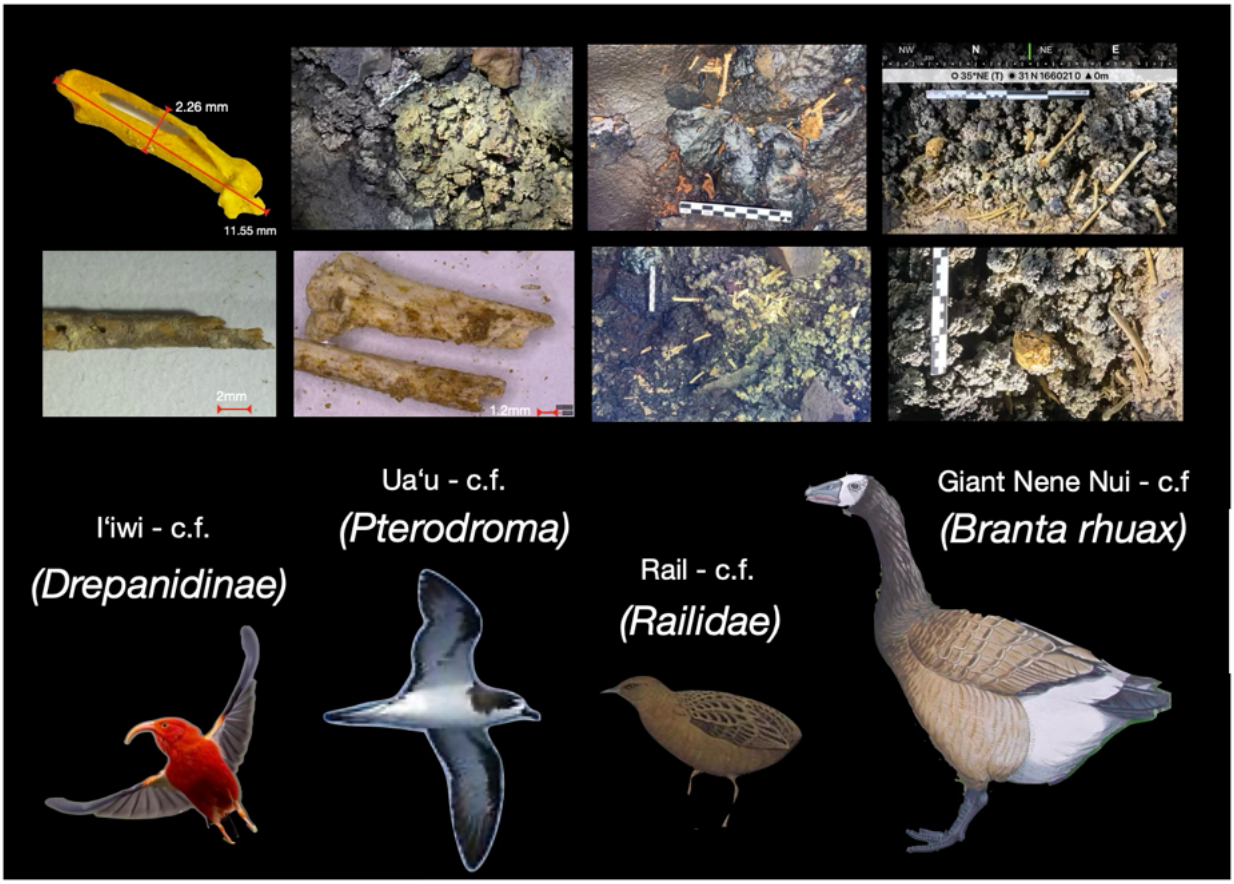
Caption: Map of Hawai‘i Island showing the distribution of Mauna Loa lava flows younger than 10,000 years before present (<10 ky BP; yellow) and older than 10,000 years before present (>10 ky BP; purple), displayed over shaded relief. Lava flows older than 10 ky BP occupy a relatively small proportion of the island, with particularly limited extent on the west side of Hawai‘i Island. The study area (red box) is located within one of these restricted older-flow regions, underscoring the uncommon geologic setting in which the lava tube system and associated deposits occur.

g) **Figure 7.** Schematic longitudinal profile of the lava tube showing mauka–makai extent and distribution of preserved materials



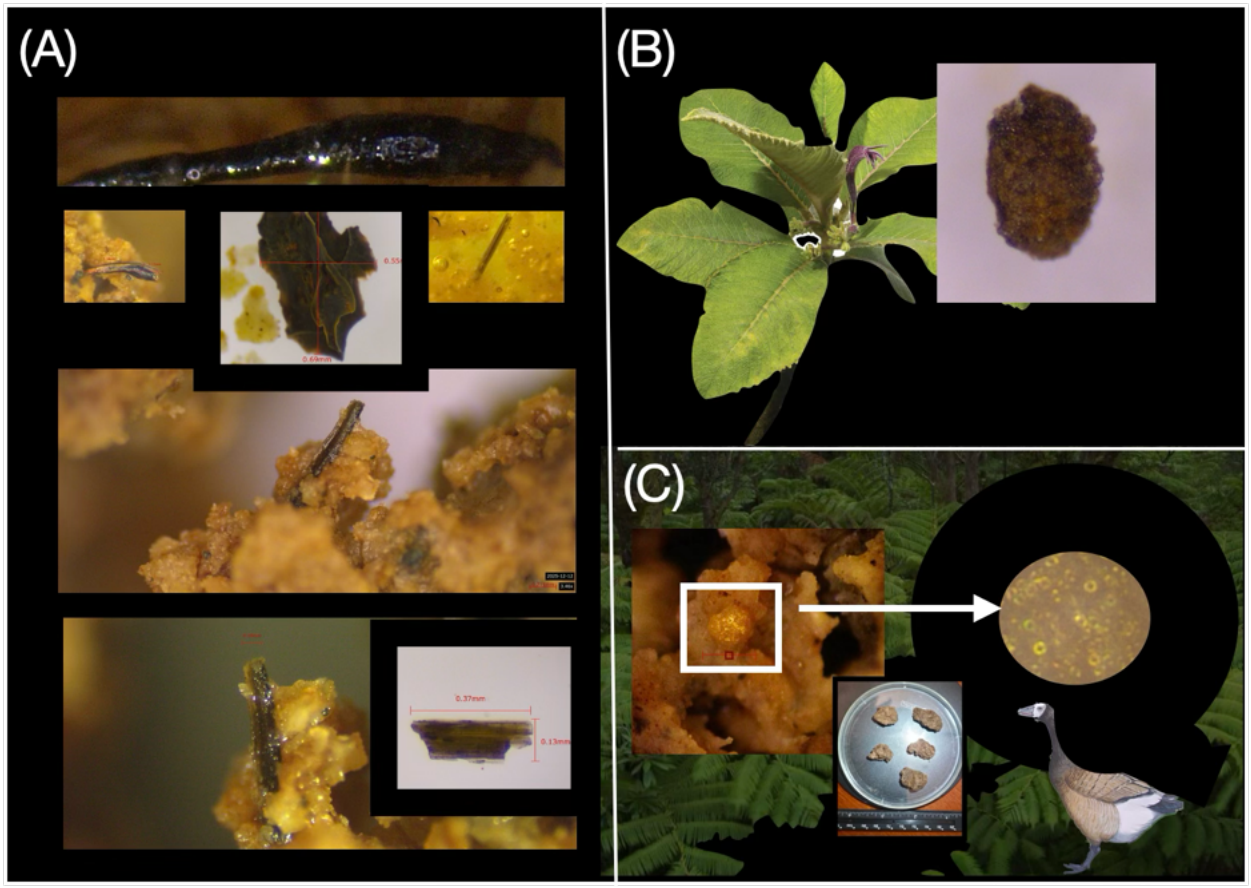
Caption: Schematic longitudinal profile of the lava tube system illustrating the mauka–makai orientation, overall extent (~100 m), and the relative locations of skylights, sediment accumulation, and preserved biological materials. The upper panel shows the mauka-facing portion of the tube, including skylight-derived depositional areas and associated avian remains. The lower panel shows the makai-facing portion of the tube, highlighting a thick interior sediment deposit containing invertebrate remains, charcoal, and ash. Approximate dimensions are shown for scale. This figure summarizes spatial relationships and depositional context rather than exact geometry.

h) **Figure 8.** Representative skeletal material recovered from the lava tube and preliminary taxonomic identifications



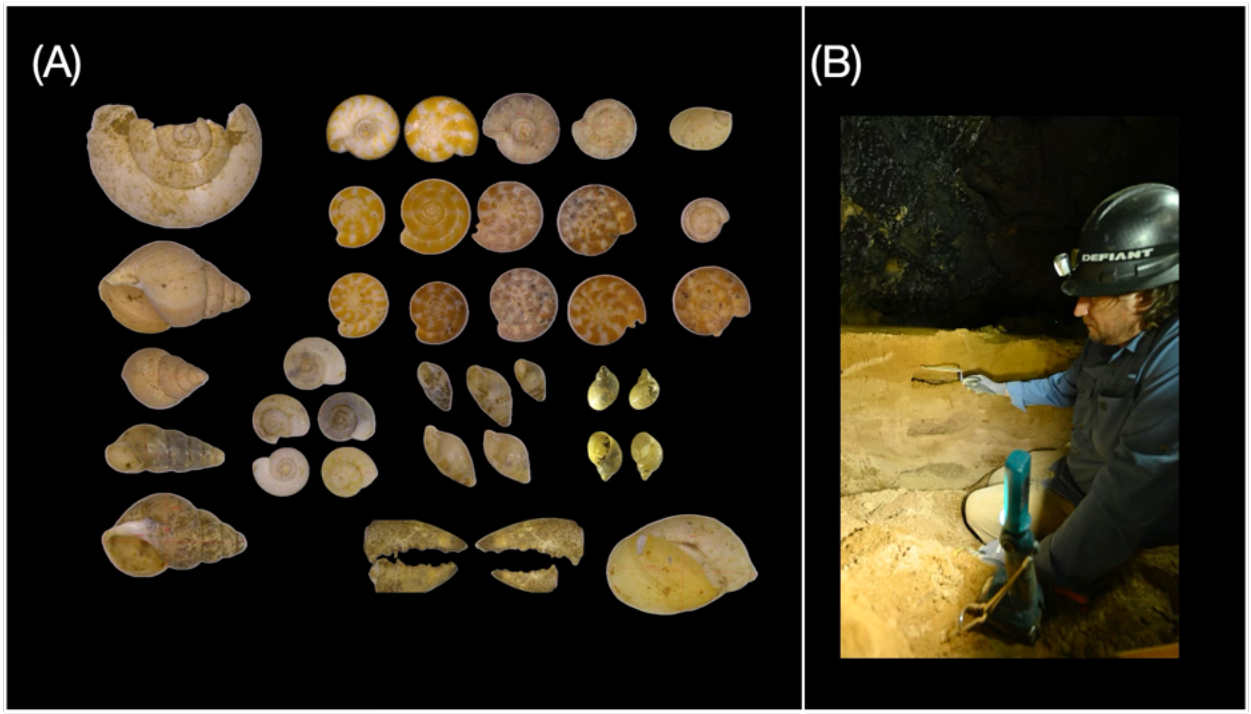
Caption: Representative examples of avian skeletal remains recovered from the lava tube system, illustrating the diversity and preservation of bird bones present at the site. Upper panels show recovered skeletal elements documented during initial inspection. Lower panels present preliminary taxonomic identifications based on comparative morphology, shown for reference (cf.). Identifications include ʻIʻiwi (Drepanidinae), Uaʻu (Pterodroma), a rail (Rallidae), and the Giant Nēnē Nui (Branta rhuax). These materials represent initial observations only; the site has not yet been exhaustively surveyed, and additional taxa are likely present.

i) **Figure 9.** Micro-charcoal from sediment and botanical inclusions recovered from coprolites



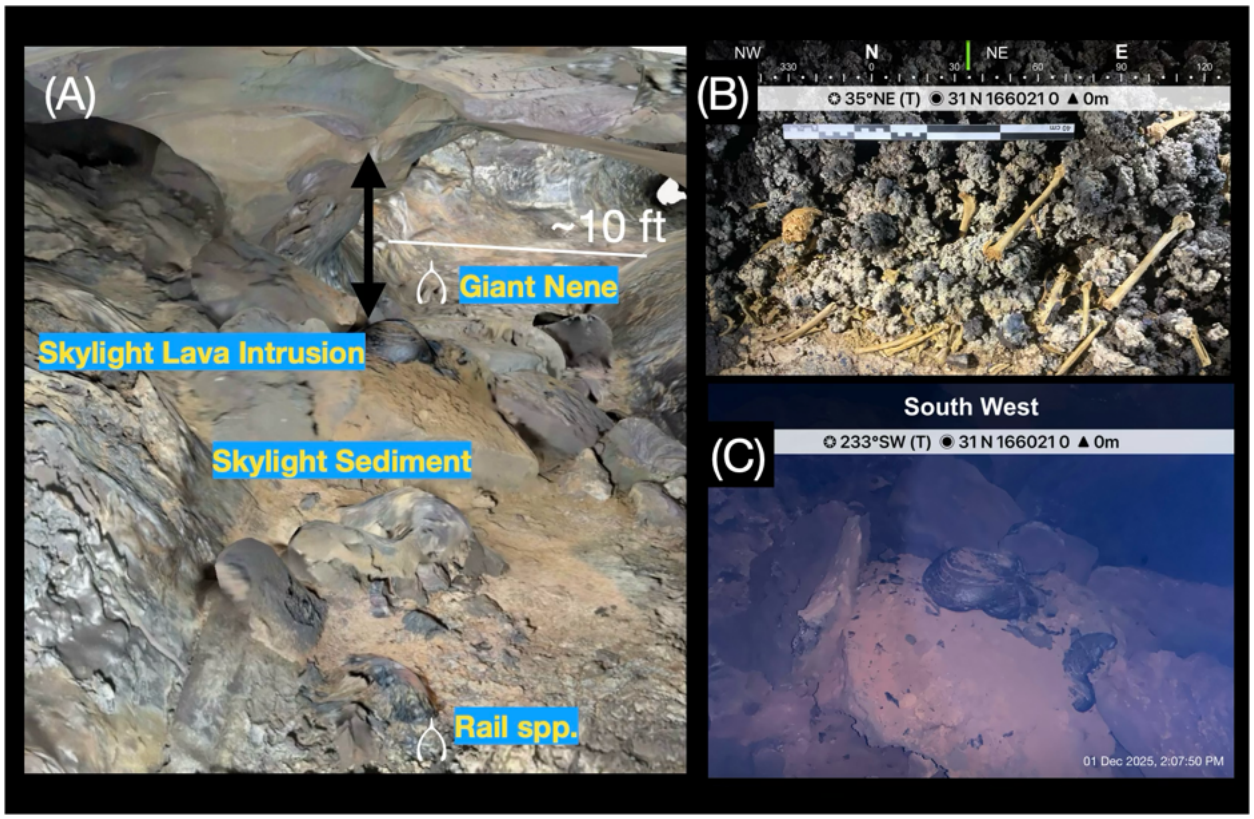
Caption:(A) Representative examples of micro-charcoal fragments extracted from coprolite material, showing a range of fragment sizes and morphologies preserved at fine spatial scales. (B) Botanical inclusions excised from coprolites, including a seed structure with size and overall morphology consistent with Cyanea spp., and (C) a sporangia inclusion of unknown taxonomic affinity; excised from coprolites shown in section and in aggregate, recovered taxonomic identifications are preliminary and based on gross morphology.

j) **Figure 10.** Micromollusk and crustacean remains and stratified sediment context within the lava tube



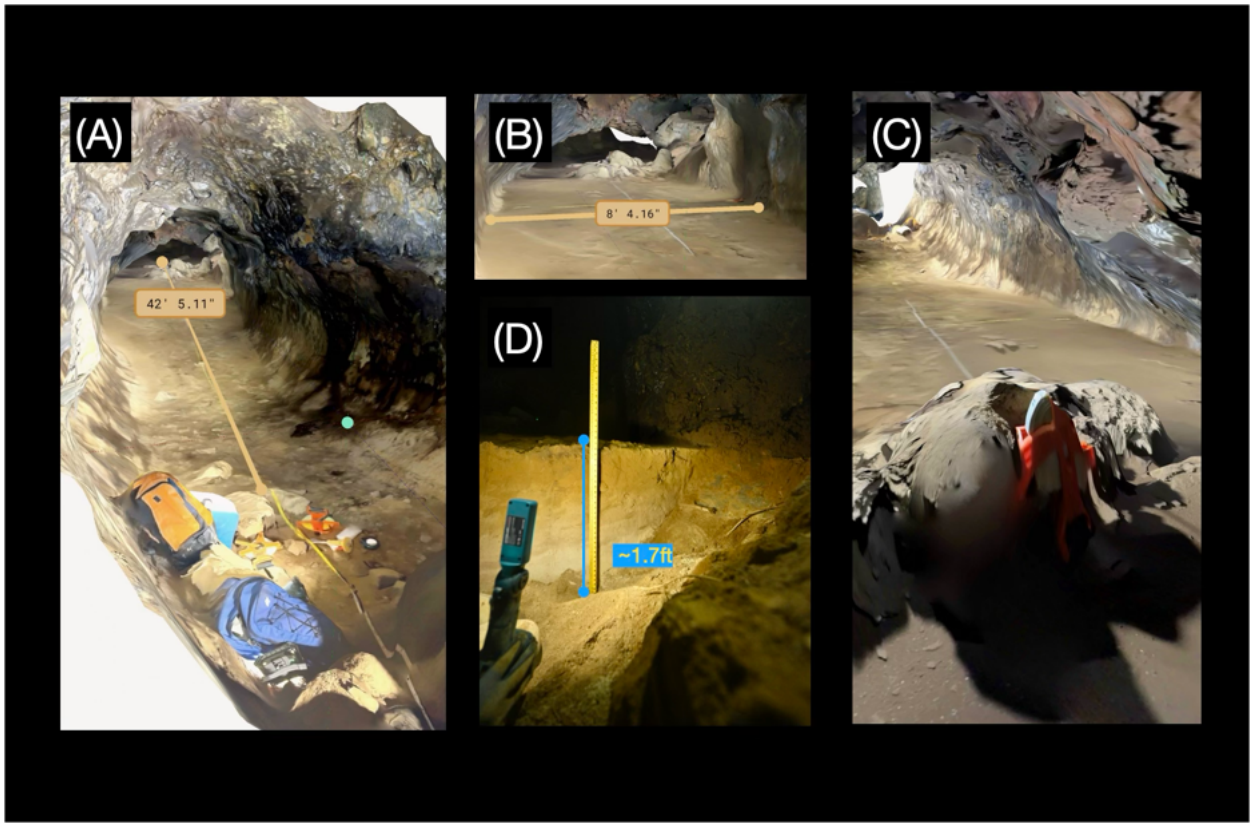
Caption: (A) Representative assemblage of micromollusk shells and crustacean remains recovered from the lava tube, illustrating the diversity and preservation of small-bodied invertebrates present at the site. Specimens shown represent initial observations and do not reflect an exhaustive inventory, (B) Stratified sediment layers exposed in a ~4-ft-deep test pit excavated within the lava tube, showing distinct depositional horizons associated with preserved biological remains and demonstrating intact stratigraphic context.

m) **Figure 13.** Ground-based LiDAR context and associated skeletal remains within a skylight-influenced lava tube deposit



Caption:(A) Ground-based LiDAR scan of the lava tube interior with photographic imagery overlaid, showing the spatial relationship between a skylight-related lava intrusion, skylight-derived sediment, and the locations of avian skeletal remains. Skeletal material attributed to Giant Nēnē Nui (Branta rhuax) is preserved on bare ʻaʻā lava without sediment southwest of the skylight area, while rail (Rallidae) remains occur closer to skylight-associated sediment. The approximate horizontal diameter of the lava tube at this location is ~10 ft.(B) Close-up view of skeletal elements attributed to Branta rhuax preserved directly on ʻaʻā lava clasts, illustrating preservation in the absence of sediment cover. (C) Photograph of the interior sediment deposit adjacent to a lava lobe (clinker-like feature), interpreted as having formed when lava intruded into the skylight opening and later detached during cooling, falling onto the sediment surface below.

n) **Figure 14.** Interior sediment deposit geometry and stratigraphic exposure within the lava tube



Caption: (A) View looking makai toward the interior sediment deposit, showing the extent of sediment accumulation within the lava tube relative to the tube walls and floor.(B) Measurement of the lava tube horizontal diameter at the sediment deposit, illustrating tube width at this location.(C) View looking outward from the back of the sediment deposit, showing the transition from sediment-covered floor to exposed lava tube interior.(D) Stratigraphy exposed in a test pit (~1.5–3.9 ft deep) excavated into the sediment deposit, illustrating distinct sediment layers preserved within the lava tube.

o) **Figure 15.** Surface opening providing access to the lava tube interior, shown in relation to surrounding ground disturbance.

Caption: Aerial photograph showing the surface opening that exposed the lava tube within a disturbed construction zone, compromising the isolation of the cave interior and elevating risk of disturbance, infilling, and environmental exposure.