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Claudius Ptolemy's East Africa Georeferenced and Visualized

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Summary: In this paper, we present the product of the most recent continuation of our multi-year project that has involved georeferencing and visualization of data from Claudius Ptolemy's classical 'Geography'. The previously developed set of more than 2,200 translations of the ancient coordinates of Ptolemaic objects to the modern coordinates that can be visualized in modern GIS instruments, such as ArcGIS and Cesium, is extended to East Africa. The provinces of Cyrenaica, Aethiopia below Egypt, Marmarica, the Libyan nome, and all of Egypt together contribute 400+ new points to the expanding body of georeferenced coordinates to close the gap between West Africa and Arabia.

Introduction

Claudius Ptolemy earned himself a special place in the history of science as one of the most prolific early founders of two major modern disciplines — geography and astronomy. Ptolemy is widely believed to have lived and worked in Alexandria, Egypt, in the 2nd century AD. His *Geography* (*Geōgraphikē Yfēgēsis*) represents an amazing feat of ancient Hellenic science. The *magnum opus* has provided a set of coordinates (latitudes and longitudes) of 6300+ objects, such as ancient cities, villages, markets, altars, temples, harbors, anchorages, mountains, capes, bays, lakes, river sources and mouths, etc. More than four hundred of these objects belong to the East African provinces of Ptolemy's *oikouménē* (the 'known world') — Cyrenaica, Aethiopia below Egypt, Marmarica, the Libyan nome, and all of Egypt — along with few of the objects placed in the vast Aethiopia Interior, which was largely unknown at the time. Understandably, the researchers of Ptolemy's Africa have encountered significant difficulties. Smith (2003) complained that Claudius Ptolemy provided "an enormous mass of mostly indigestible data in the form of names and locations of peoples and places, severalfold more than all other ancient authors combined... But Ptolemy was essentially a mathematician, and his interest was in map-making rather than history, ethnography, or culture. His goal was to complete his map, which he seems to have done much better for East than West Africa. On the eastern coast his accuracy extends to below the equator; in the west, however, it begins wearing thin in southern Morocco. He has been accused of repeating and inverting names sometimes alternating between their Greek and Latin forms when he ran out of data to fill in the blank spaces." Livieratos (2006) established the need for "a rigorous revisiting of Ptolemy's representations, especially the regional tabulae, in terms of georeferencing." This paper presents the results of the most recent continuation of our multi-year "Universe of Ptolemy" project founded by the late Lyudmila Filatova. The scope of our research has been extended to complete the second iteration of our study of Ptolemy's Africa (Libya) and complement our prior work on his

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West Africa (Filatova et al. 2019) by georeferencing and visualizing his East Africa in popular GIS tools (ArcGIS and Google Earth) using modern projections. The information on the authors' other publications documenting the "Universe of Ptolemy" project will be provided in the next section of this paper as part of the essential literature review.

The third section of the manuscript describes our hybrid human-machine methodology that combines traditional research techniques with modern digital analysis approaches. Our resulting reconstruction map of Ptolemy's East Africa is presented in the fourth section of the paper, along with some noteworthy identifications of ancient objects. In the final section of the paper, we draw conclusions and share our plans for the future research.

Literature Review

Stückelberger and Grasshoff (2006) produced the best complete translation of Ptolemy's *Geography* into a modern European language. Their multi-volume work includes an authoritative version of the original Greek manuscript printed side by side with its German translation. The book comes with an electronic database of coordinates based upon a well-developed object ID system. We have found this ID system convenient to use and adopted it for the purposes of our research. Stückelberger and Grasshoff suggest modern names for many of the Ptolemy objects listed in the database. We observed that many of their identifications had originated from the classical Latin translation by Müller (1883-1901). Müller's monograph contains many informative comments and provides useful lists of different spellings of Ptolemaic object names, but it is dated to the extent that some of the modern names have changed since its publication and a few important archaeological finds were made, influencing some of the object identifications.

Stevenson provided the only complete English translation of Ptolemy's *Geography* (Ptolemy 1991), which happens to be of poor quality (Diller 1935). Despite its deficiencies, we have used this translation to come up with suitable English counterparts for the German object names and supplement some of the object characteristics omitted in the electronic database, e.g., the name "Outlet of Sirbonis lake" was substituted for the German "Sirbonis-See (Durchbruch)." Stevenson's translation is heavily latinized, while the East African provinces of Cyrenaica, Marmarica, the Libyan nome, and all of Egypt were largely Hellenized by Ptolemy's time. We have adopted Hellenic-style names for most Ptolemy objects, with few exceptions made for famous toponyms, such as *Cyrene* and *Pelusium* (as opposed to naming them *Kyrene* and *Pelousion*, or *Pelusion*). No name assignment can be perfect, given that many toponyms in East Africa have originated from local languages. McCrindle (1927) translated and commented the part of *Geography* that covered India and several adjacent provinces. Berggren and Jones (2000) produced an annotated English translation of the theoretical chapters of *Geography*, which contains a nearly complete reconstruction of Ptolemy's Gallia (Celtogalatia). Diller (2009) translated Book 8 of *Geography*.

The authors' prior publications covered GIS analysis, georeferencing and mapping of Ptolemy's Taprobane and India before the Ganges (Abshire et al. 2016), Arabia (Abshire et al. 2020), the Fertile Crescent — Judaea Palestina, Syria, Mesopotamia, and Babylonia (Abshire et al. 2017, 152–167), Britain and Ireland (Abshire et al. 2017), India beyond the Ganges, Serike and Sinae (Gusev and Stafeyev 2018), and West Africa (Filatova et al. 2019). Most recently, we have framed the prior results of our project in the context of other important ancient and medieval cartographic sources, such as Tabula

Rogeriana, Tabula Peutingeriana, Hellenic Ptolemaic maps, and the Alfonsine tables (Gusev and Stafeyev 2021).

Lacroix (1998) applied linguistic and toponymic analysis of Ptolemaic maps to the task of reconstructing Ptolemy's Africa. Barrington Atlas of the Greek and Roman World (Talbert 2000) is a major authoritative source of information on ancient object sites. The "GeoPtolemy-0" catalog by Tsorlini (2011) covered Ptolemy's Mediterranean and Black Sea region. Representative coordinates of most East African objects from Ptolemy's *Geography* can be found in the online Digital Atlas of the Roman Empire (DARE) by Åhlfeldt (2020) and/or Pleiades, a community-built gazetteer and graph of ancient places edited by Bagnall and Talbert (2022). Other valuable online sources of information on ancient objects include such sites as Trismegistos (2022) and Mapping Past Societies (2022), the latter of which was formerly known as the Digital Atlas of Roman and Medieval Civilizations (DARMC), and that's how it is still referenced in Pleiades.

Tobler (1966) pioneered application of modern numerical methods to georeferencing of old maps by deriving equations to relate the medieval Hereford map to an oblique Mercator projection by means of regression analysis. Strang (1998) classified Ptolemy's points for Britain into groups according to two longitudinal scales and several spatially non-intersecting rotation groups in order to account for the turning of Scotland and other distortions. He then warped modern map contours so as to superimpose them over Ptolemy's points.

Manoledakis and Livieratos (2007) developed the azimuth method, a technique for approximate localization of Ptolemy objects based on transplanting Ptolemy's azimuths into the modern coordinate system and adjusting them. Darcy and Flynn (2008) and Gibson (2013) used relatively primitive mathematical methods to come up with digital reconstructions of Ptolemy's Hibernia (Ireland) and Arabia Felix, respectively. Both reconstructions ended up containing significant errors. Tsorlini (2011) and Kleineberg et al. (2012) published other original methodologies for derivation of modern coordinates of Ptolemy objects. Marx (2016) extended and adapted the methodology of Kleineberg et al. to study the Western coast of Ptolemy's Africa and localize Ptolemy's prime meridian at the Canary Islands. Shcheglov (2018) compared the length of coastlines in Ptolemy's *Geography* and in ancient *periploi*. The literature reviews included in our earlier papers referenced above contain many other references related to GIS analysis and georeferencing of ancient maps.

Methodology

In our prior publications referenced above, we have demonstrated that there was more to gain by processing the coordinate data directly, as opposed to merely performing visual comparisons between old and modern maps in search of similar toponyms. The known objects mentioned in Ptolemy's *Geography* can serve as reference points that can help us place and identify some of the previously unknown objects. We also take advantage of the object descriptions and tribe names provided by Ptolemy. The negative influences on our ability to pinpoint the correct locations come from the source distortions, data compilation errors responsible for the numerous duplicates encountered in the Ptolemy database, and discrepancies between different editions of *Geography*. The latter were previously shown to be a separate noise factor difficult to quantify in relation to Ptolemy's own errors (Dilke 1987). Abshire et al. (2016) addressed the challenge of how to establish correspondence between the set of unknown points and the sets of points representing their respective surrounding spherical triangles. A Delaunay

triangulation of the known points was computed in their ancient coordinates, and the surrounding point triangles were searched for a point to be predicted. In the same article, Abshire et al. introduced a numerical method that helped us handle the prediction task for unknown points that were not surrounded by spherical triangles of known points — flocking with Bayesian correction. That second method was further refined by Abshire et al. (2020). In that paper, the authors separated the Ptolemy points into four categories: *known* points, *tentatively identified* points, *unknown* points (placed approximately), and *duplicates*. We continue to use this approach to point classification in this work and provide a table of known and likely duplicates in Appendix A at the end of the paper.

The natural first step is to identify and georeference as many Ptolemy objects as possible. In East Africa, our hybrid human-machine method (Filatova et al. 2019) incorporated the traditional interpolation by tracing the shorelines of the Mediterranean, the Red Sea and the Indian Ocean, while looking for harbors and river mouths. Furthermore, we traced the course of the Nile River in a manner similar to that, in which we handled the Euphrates (Abshire et al. 2017, 152–167). This special task required us to pay close attention to which bank of the Nile each given city is reported to be located on and where the city is placed relative to the Greater (Second) and the Lesser (First) Cataracts of the river.

The second step is to place the objects that could not be directly identified and georeferenced on the first step. The third step involves tentative or certain identification of some of the Ptolemy objects that were placed approximately on the previous step. If any new objects are identified with certainty, then the second step may have to be repeated if there are any objects left to be placed approximately, or if the precision of their prior placement can be improved.

Given that Claudius Ptolemy is believed to have lived in Egypt, it comes to us as no surprise that the bulk of his objects in East Africa are placed by reconciliation of the identifications from Stückelberger and Grasshoff (2006) with the identifications and coordinates from Åhlfeldt (2020) and Pleiades (Bagnall and Talbert 2022). The objects placed approximately are mostly mountains and long shores (beaches). We will present the resulting reconstruction maps, along with some interesting identifications of Ptolemy objects in East Africa in the next section of the paper.

The Reconstruction Maps and Identifications

Figure 1 shows our map of Ptolemy’s East Africa produced using ESRI’s ArcGIS. Figure 2 demonstrates the same area visualized in Google Earth. Figures 3-8 provide more detailed maps developed in ArcGIS. The tables of modern coordinates for known and tentatively identified locations in Ptolemy’s East Africa can be found in Appendix B at the end of the article. The tentative identifications are accompanied by question marks.

Our most exciting new find in this region is Ptolemy’s *Alabastrinos mountain* in Egypt. In Stevenson’s translation (Ptolemy 1991), the object’s name is given as “Alabastrites mountains”, somewhat confusingly. You can see this mountain of alabaster (a hill named Tilā’ Nūfal) next to the known ancient city of *Alabastronpolis* in Figure 9 and easily imagine how alabaster was quarried there and shipped along the Nile River for hundreds of years.

The second noteworthy identification is that of Ptolemy’s *Cape Prason* in Aethiopia Interior, the southernmost point of the *oikouménē* that the ancient geographer knew about. It is said to be located where the shallow sea ends. In Google Earth, we can literally see the shallow sea and find two adjacent capes, Ras Matuso (also known as Cape Kilwa) and Ras Mso, at the sea’s south end (see Figure 10). We are

inclined to derive the name *Prason* from one of the two similarly sounding local names, instead of the Greek πράσο ('leek') or Latin *praesum* ('to be in front', 'precede'). We further hypothesize that Ptolemy's *Cape Rhapton* in Aethiopia below Egypt — the "Rhaptum promontory" of (Ptolemy 1991) — is located where the shallow sea begins, and that's where we find two suitable adjacent capes — Ras Pembamnasi and Ras Mwambamku.

We would also like to tell the readers about our identifications of the cities called *Naki* (Stevenson's "Nacis", ID 4.07.17.03) and *Tathis* (ID 4.07.17.04). Once the former was recognized by us to be the ruined Kushite city presently known as Naqa or Naga'a and famous for its temple of Amun, we were able to conjecture that the latter's name in Ptolemy's *Geography* is a corruption of *Tabis* (a θ took place of a β). The modern name of the corresponding Kushite archaeological site in Nubia, Sudan, is Tabo, or Tebo, and this city features a well-preserved Amun temple, by a not-so-random coincidence. We are convinced that the known archaeological site in Jikharra, Libya, corresponds to Ptolemy's *Dioskoron*, by virtue of its name and positioning relative to the known *Augila* (Awjilah). Meanwhile, we have concluded that Ptolemy's coordinates of *Thanuthis* and *Skope* were badly misplaced, and the known Egyptian sites (Terenouthis and Perseos Skope) "moved" spuriously to the middle of the Sahara Desert, in a sharp contrast to Ptolemy's overall good knowledge of the region.

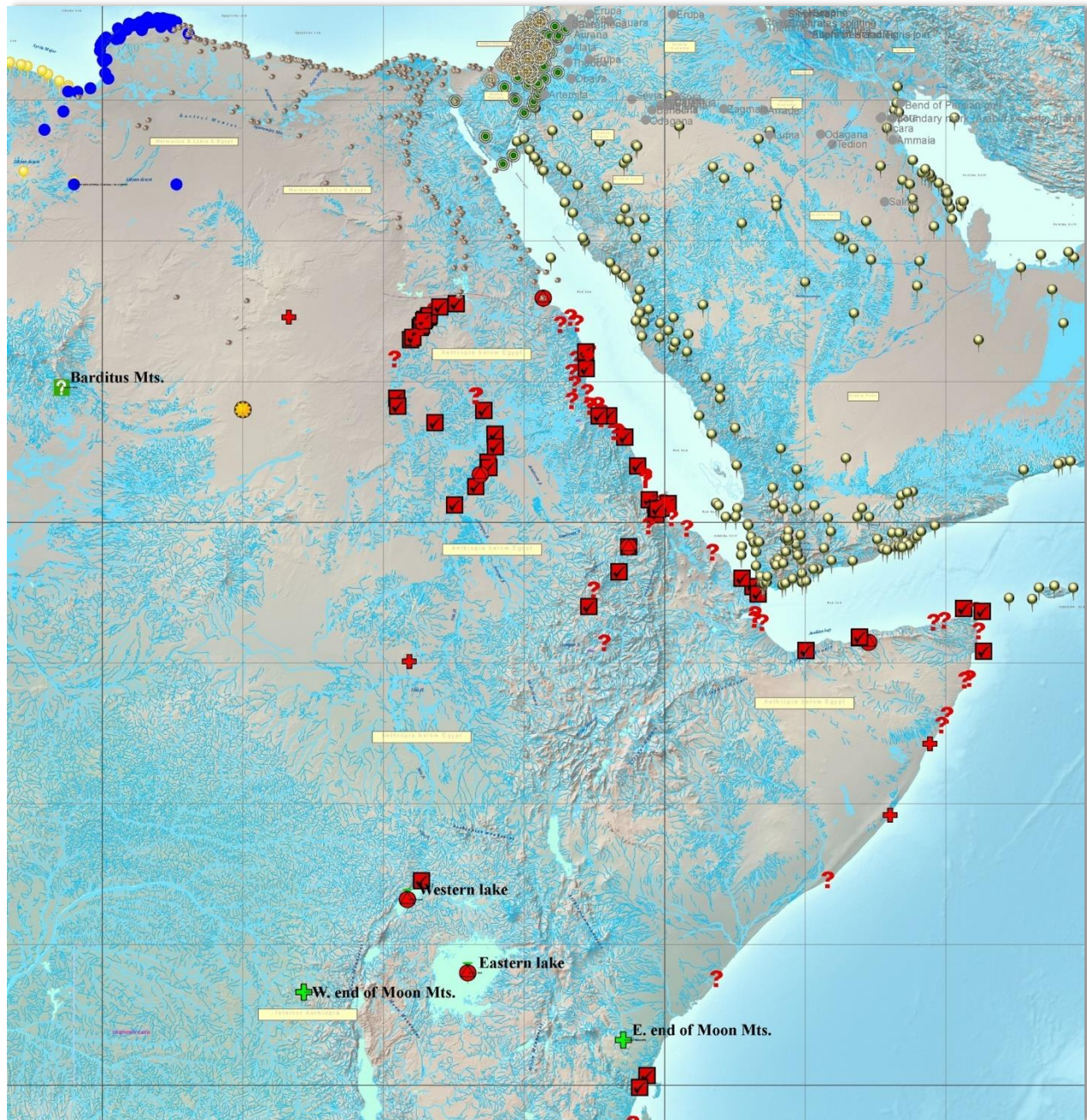


Figure 1: Ptolemy's East Africa visualized in ArcGIS. Blue dots – Cyrenaica; small grey spheres – Marmarica, the Lybian nome, and all of Egypt; red symbols – Aethiopia below Egypt (checkmarks – known points, question marks – tentatively identified, crosses – unknown points placed approximately, circles with triangles in them – duplicates); green symbols – Aethiopia Interior; orange circle – border mark of Aethiopia below Egypt, Libya Interior, Marmarica; yellow pins – the province of Africa; pins in the Arabian Peninsula – Arabia Felix; olive green “pause buttons” – Arabia Petraea; light gray dots – Arabia Deserta; the cluster of closely placed gray symbols – Judaea Palestina.



Figure 2: Ptolemy's East Africa visualized in Google Earth.

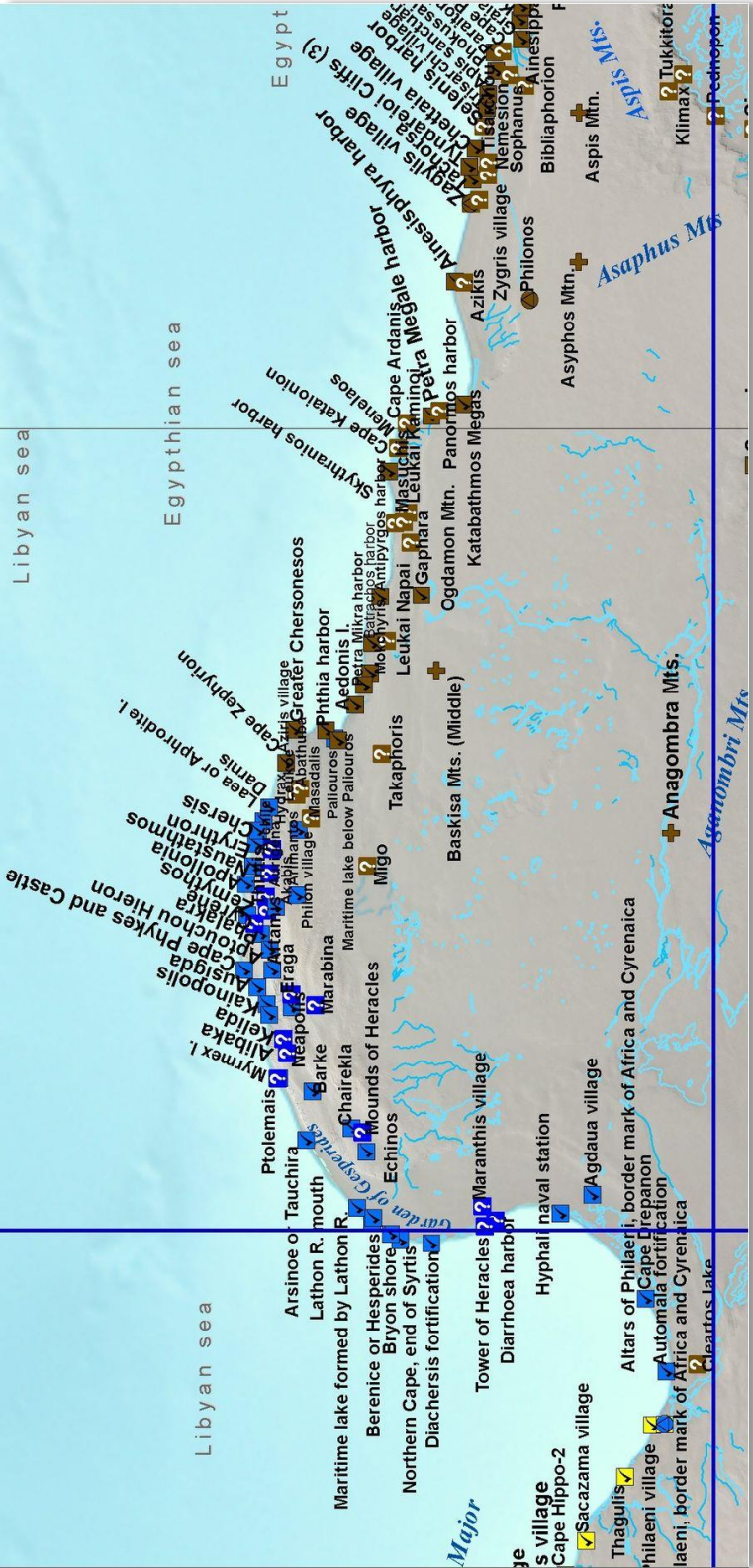


Figure 3: Ptolemy's Cyrenaica visualized in ArcGIS.

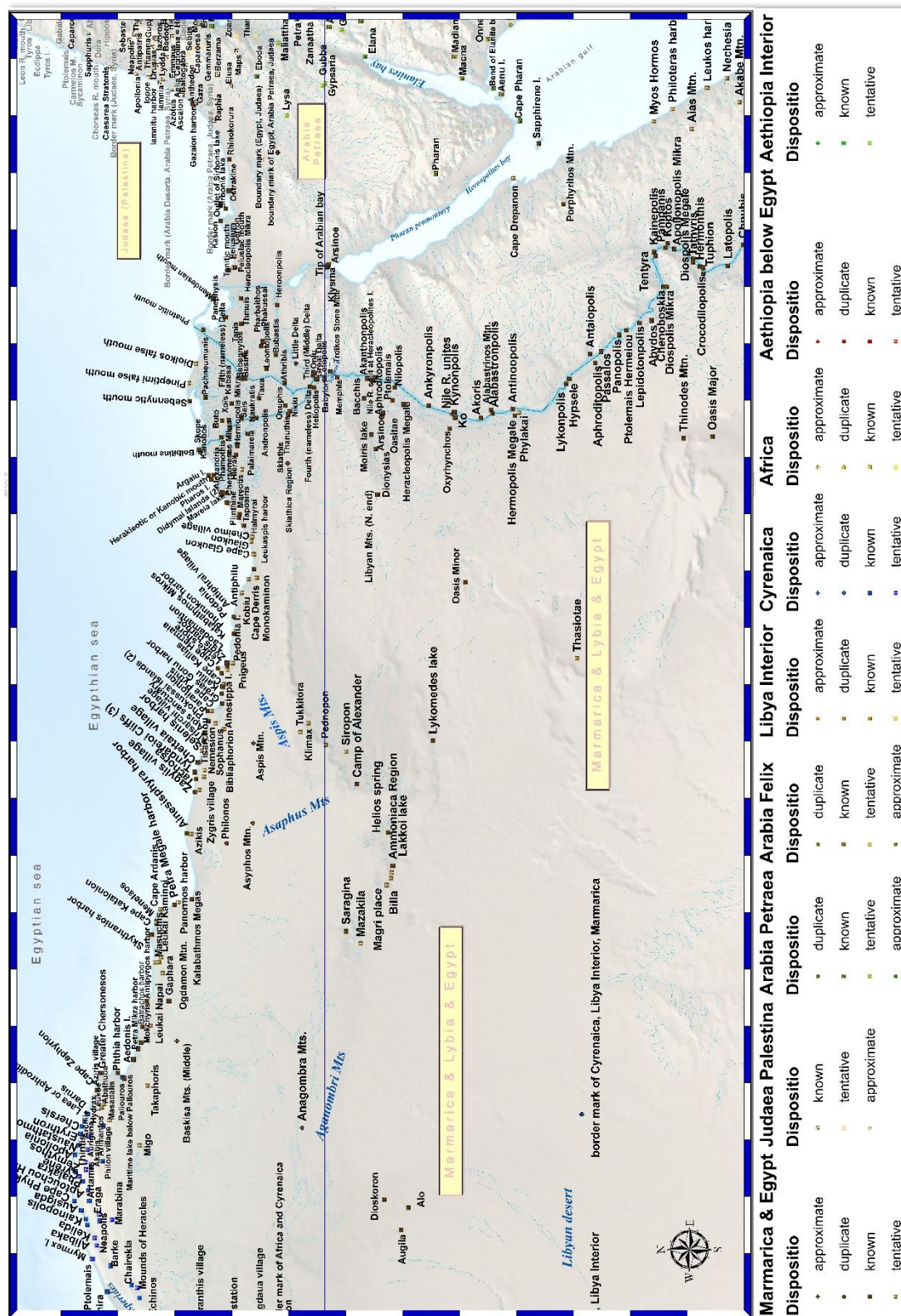


Figure 4: Ptolemy's Marmarica, Libyan nome, and Egypt visualized in ArcGIS.

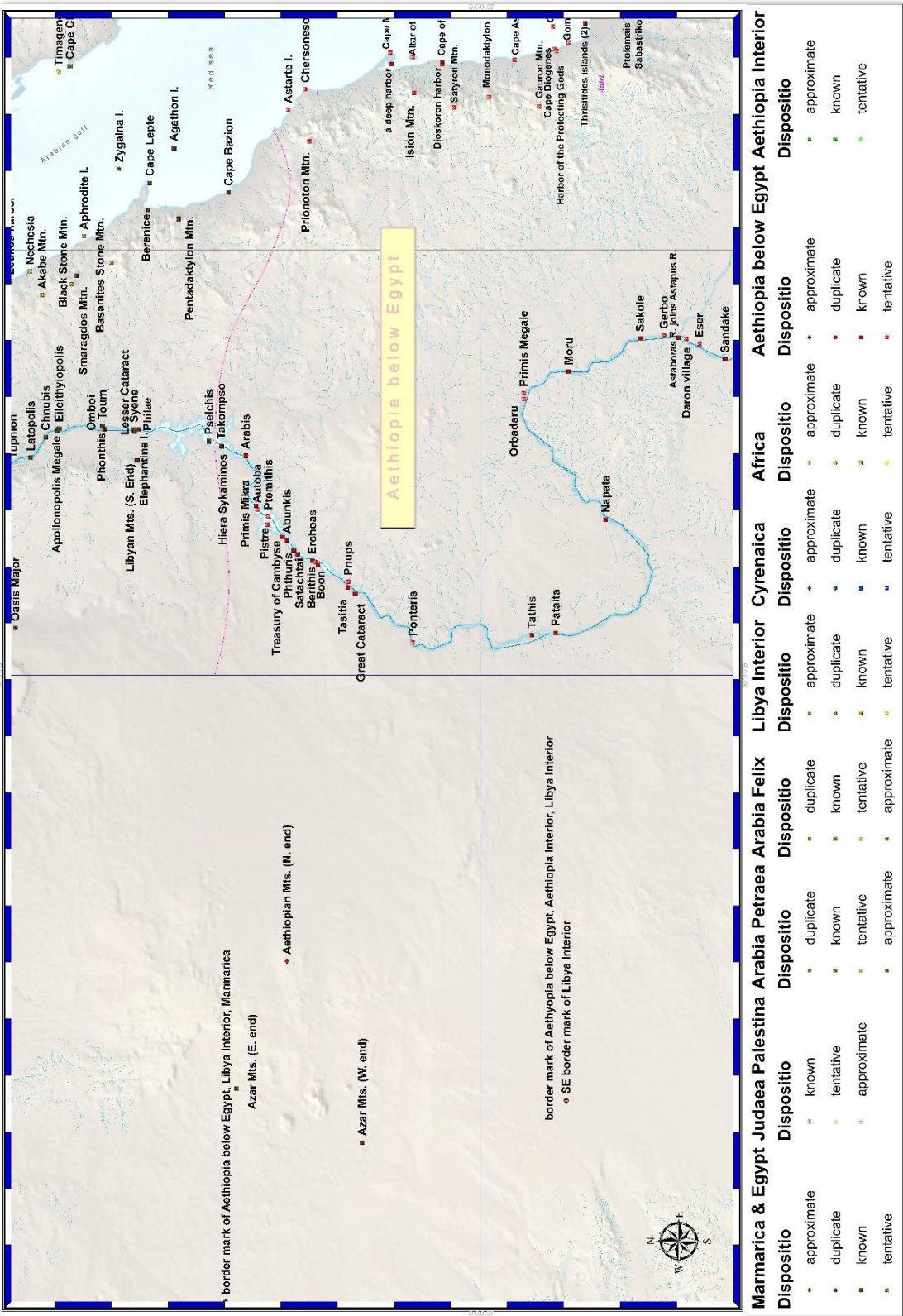


Figure 5: The northern part of Ptolemy’s Aethiopia below Egypt visualized in ArcGIS.

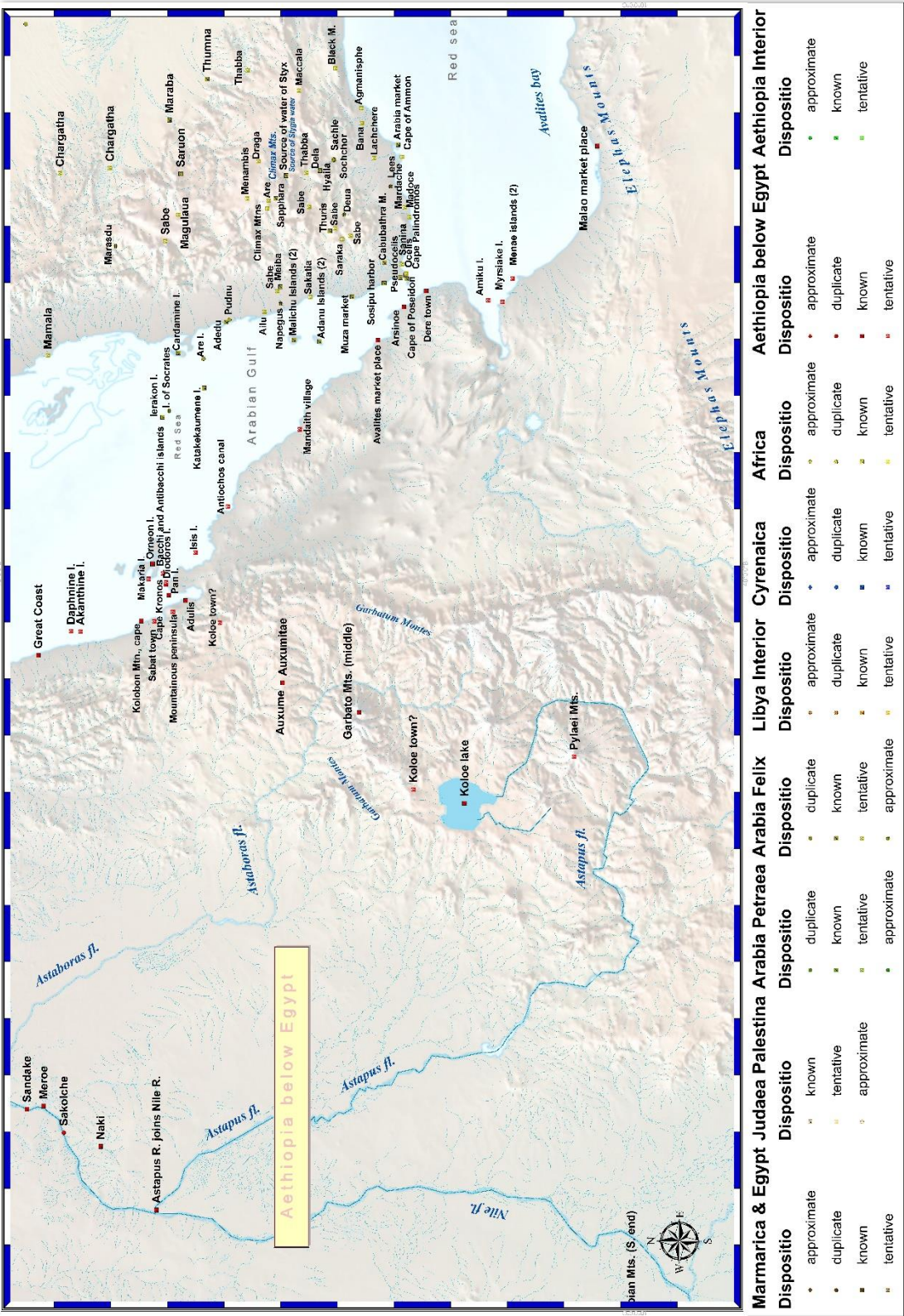


Figure 6: The southern part of Ptolemy’s Aethiopia below Egypt visualized in ArcGIS.

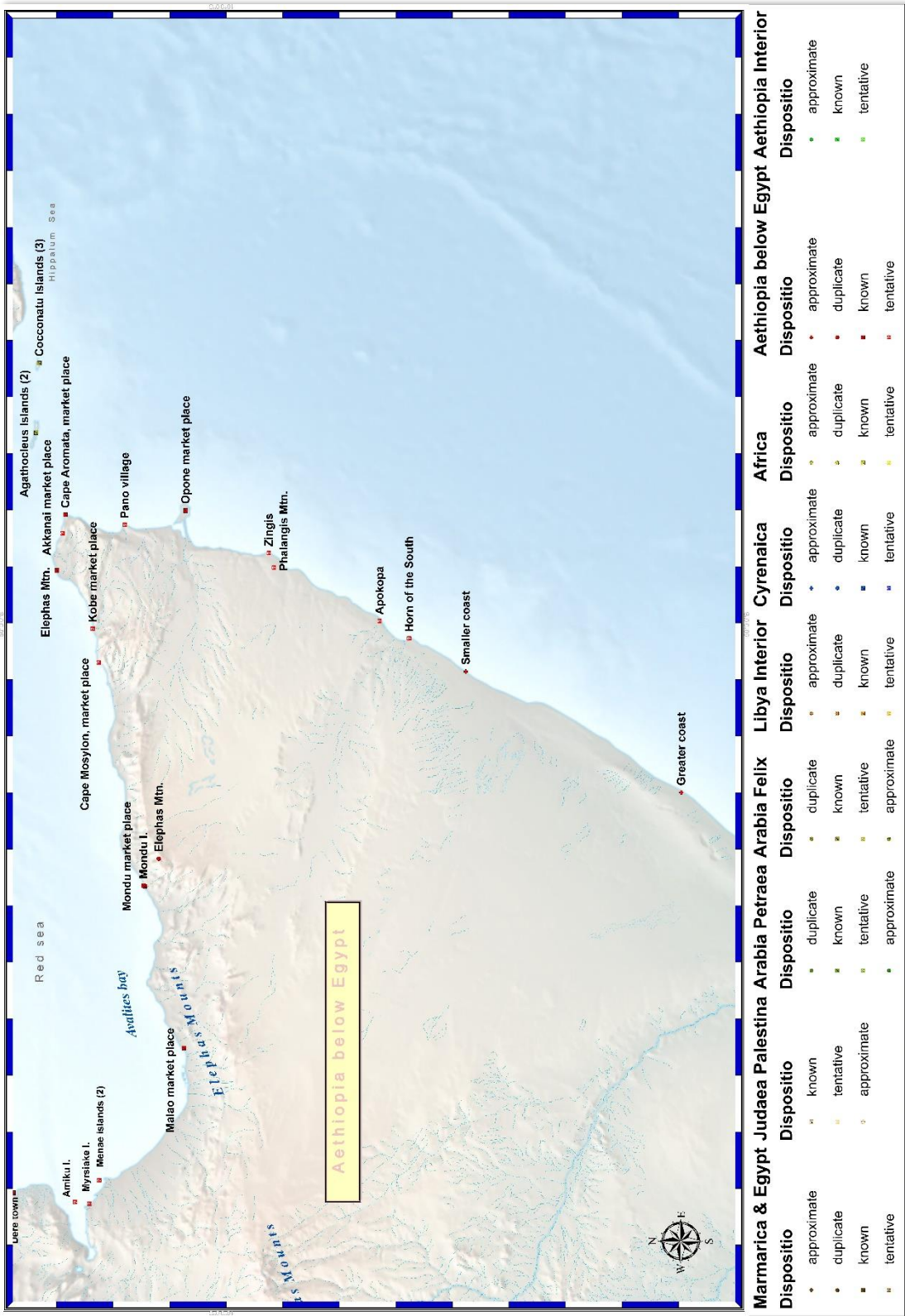


Figure 7: The eastern part of Ptolemy's Aethiopia below Egypt visualized in ArcGIS.

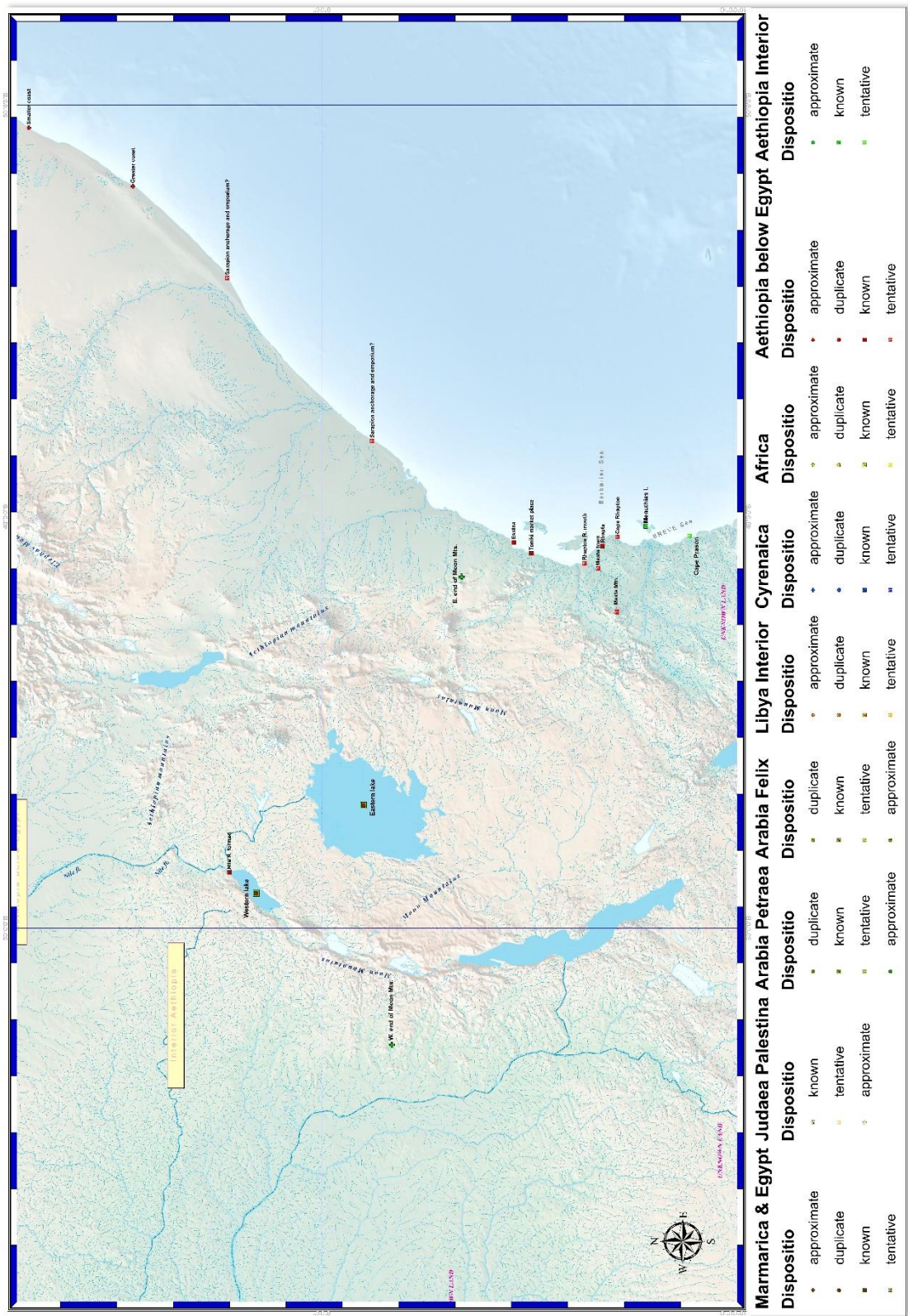


Figure 8: The eastern part of Ptolemy's Aethiopia Interior visualized in ArcGIS.

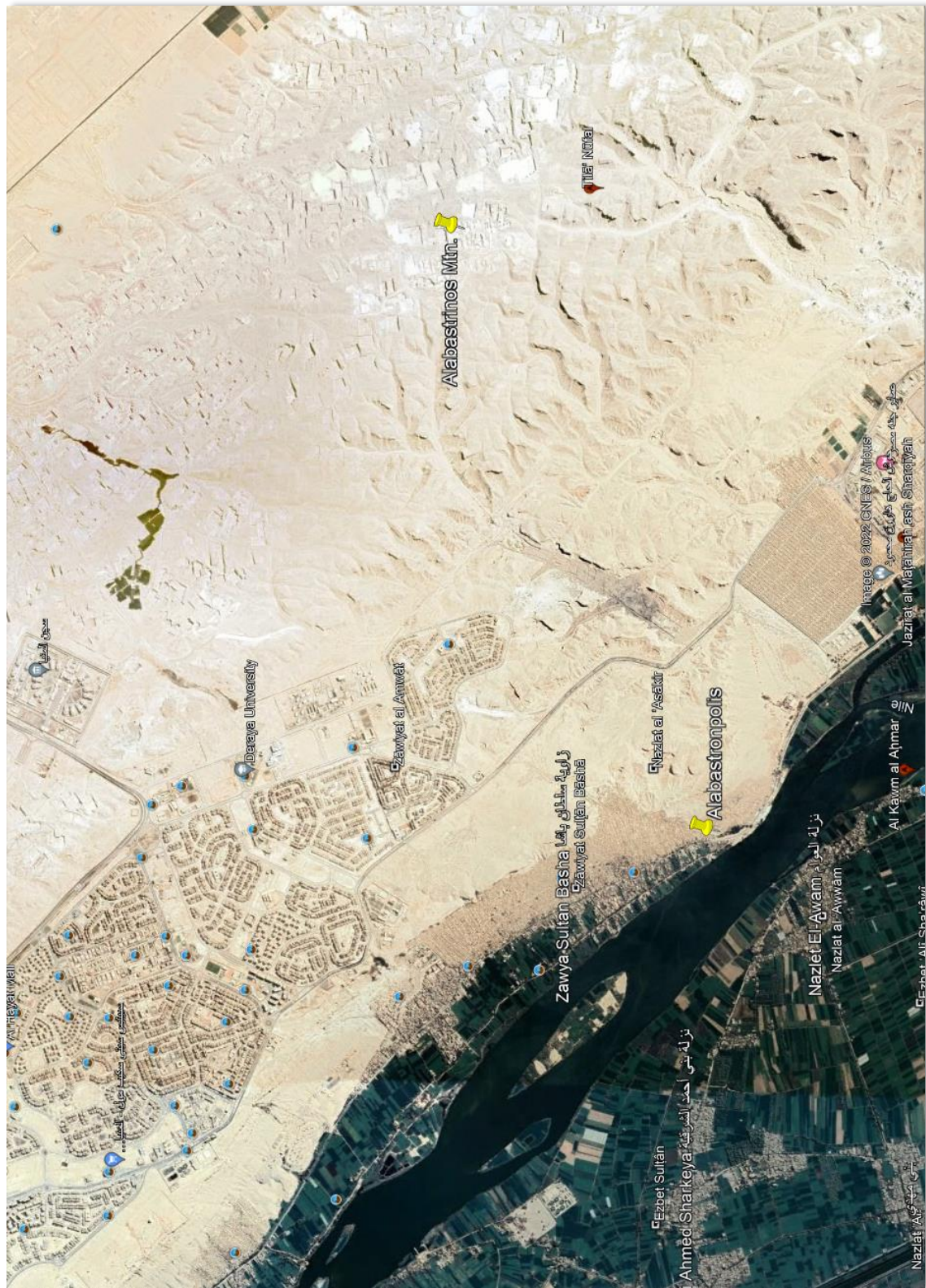


Figure 9: Ptolemy's Alabastronpolis and Alabastrinos Mountain (Tilā' Nūfal) in Google Earth.

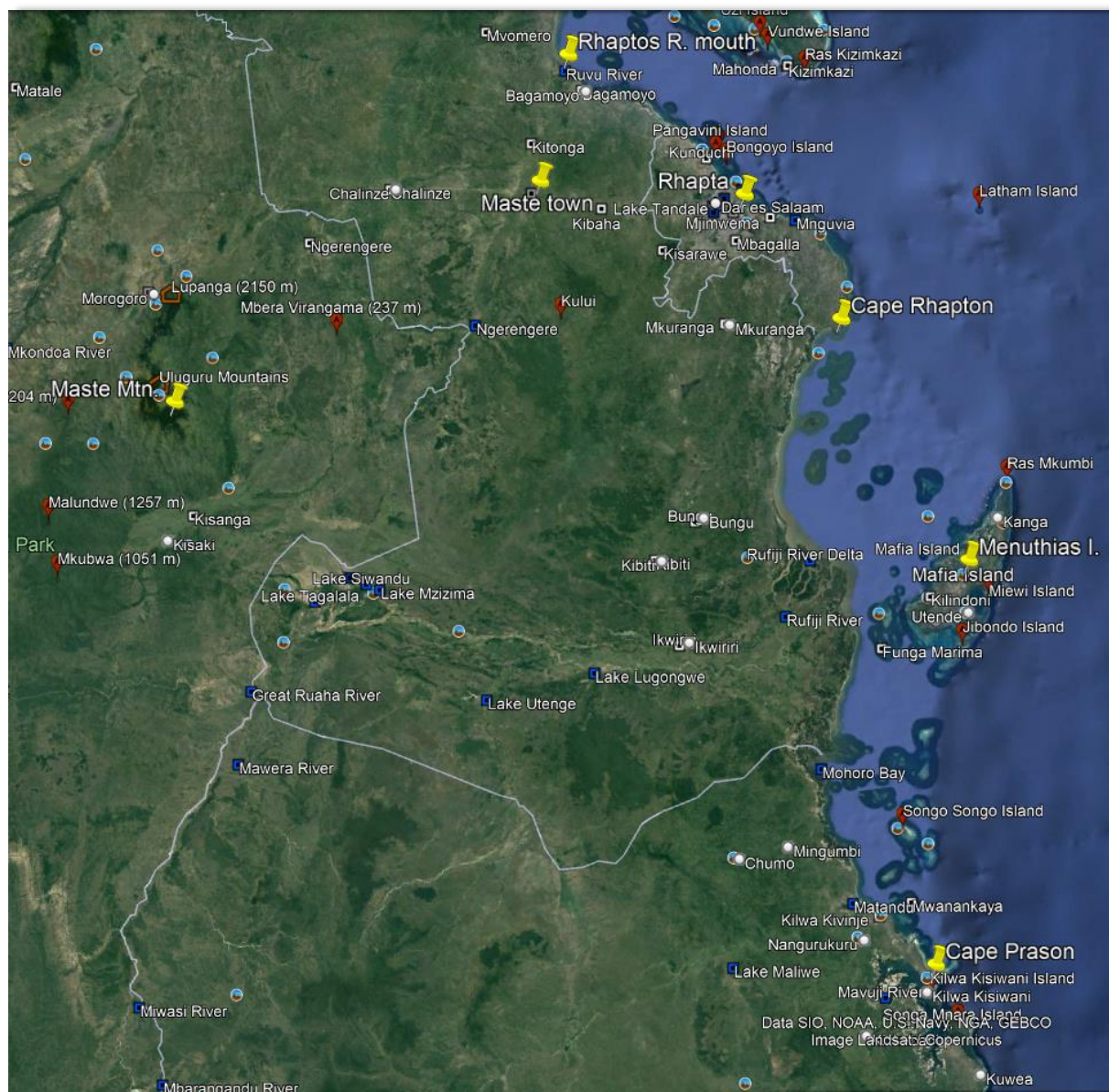


Figure 10: Ptolemy's Cape Prason located "where the shallow sea ends."

Conclusions and Future Work

We have presented a new digital reconstruction of Ptolemy's map of ancient East Africa and thus completed the second iteration of our study of the detailed description of the African continent (Libya) found in his classical *Geography*. Our results help improve understanding of how human civilization developed in East Africa and of the extent to which the ancient geographers knew about it. We are planning our next reconstruction to close the gap between Arabia and the Fertile Crescent in the west and India in the east. This proposed future work would cover the area of the modern Iran, Afghanistan, and Balochistan.

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Appendix A. Table of Known and Likely Duplicates

Table 1. Known and likely duplicates in Ptolemy's East Africa.

Ptolemy ID 1	Ptolemy Name 1	Ptolemy ID 2	Ptolemy Name 2	Modern Name(s)
4.04.01.05	Altars of Philaeni, border mark of Africa and Cyrenaica	4.03.14.10	Altars of Philaeni, border mark of Africa and Cyrenaica	Qarārat Qaşr at Turāb
4.05.04.05	Zygris village	4.05.04.07	Zagylis village	Zāwiyat Shammās?
4.05.12.06	Anthedon	5.16.02.11	Anthedon	Teda
4.05.13.05	Tip of the Arabian Bay	5.17.01.05	Tip of Arabian bay	Suez bay
4.05.21.06	Augilae	4.05.30.03	Augila	Awjilah
4.05.23.01	Ammoniaca Region	4.05.33.03	Ammon	Siwa
4.05.24.05	Skiathica Region	4.05.35.02	Skiathis	near Wadi El Natrun
4.05.24.06	Oasitae	4.05.57.03	Arsinoe	Al Fayyūm
4.05.31.06	Philonos	4.04.13.04	Philon village	Bi'r ath Thalāthah? / Khawlān
4.05.34.06	Antiphilu	4.05.07.03	Antiphrai village	near Ra's aḍ Ḍab'ah?
4.05.34.09	Palaimareia	4.05.32.11	Mareotis	Kom Turujah? / Hawariyyah
4.05.53.09	Oniu	4.05.54.04	Heliopolis	Al Matariyyah
4.05.73.09	Toum	4.05.73.10	Omboi	Kom Ombo
4.07.21.02	Sakolche	4.07.19.04	Sakole	Shendi? / Dangeil
4.07.24.01	Western lake	4.07.24.01	Western lake	Lake Albert
4.07.24.02	Eastern lake	4.07.24.02	Eastern lake	Lake Victoria
4.07.26.05	Elephas Mtn.	4.07.10.07	Elephas Mtn.	Shimbiris? / Raas Felug
4.07.28.06	Cape Bazion	4.05.15.08	Cape Bazion	Bi'r al Ḥaşá
4.07.29.05	Auxumitae	4.07.25.01	Auxume	Aksum

Appendix B. Tables of Known and Tentatively Identified Objects

Table 2. Known and tentatively identified locations in Cyrenaica.

Ptolemy ID	Ptolemy Name	Modern Name	Ptol. Lat.	Ptol. Lon.	Mod. Lat.	Mod. Lon.
4.04.01.05	Altars of Philaeni, border mark of Africa and Cyrenaica	Qarārat Qaşr at Turāb	29.00	46.75	30.3030	18.7923
4.04.03.02	Automala fortification	Jazīrat Bū Shu'ayfah	29.17	47.25	30.2915	19.1221
4.04.03.03	Cape Drepanon	Brega	29.33	47.25	30.4200	19.5797
4.04.03.04	Hyphali naval station	Az Zuwaytīnah	29.67	47.33	30.9526	20.1120
4.04.03.05	Diarrhoea harbor	Karkuretta?	30.00	47.25	31.3596	20.0643
4.04.03.06	Tower of Heracles	Kurkūrah?	30.50	47.33	31.4261	20.0268
4.04.03.07	Diachersis fortification	hill near Qaryat Abū al Aḥnāsh	30.83	47.33	31.7565	19.9238
4.04.03.08	Northern Cape, end of Syrtis	Ra's Tāwīnis, end of the Gulf of Sidra	31.17	47.25	31.9520	19.9436
4.04.03.09	Bryon shore	seaside near Al Karmah	31.25	47.50	32.0112	19.9817

4.04.04.02	Berenice or Hesperides	Benghazi	31.33	47.83	32.1245	20.0643
4.04.04.03	Lathon R. mouth	Al Haṭṭiyah	31.33	48.25	32.2189	20.1466
4.04.04.04	Arsinoe or Tauchira	Tūkraḥ	31.33	48.33	32.5364	20.5673
4.04.04.05	Ptolemais	Ṭulmaythah	31.17	49.08	32.7069	20.9530
4.04.04.06	Ausigda	Qaṣr ad Dīṣah	31.50	49.50	32.7833	21.4167
4.04.04.07	Aptouchou Hieron	Al Haniyah	31.67	49.50	32.8418	21.5206
4.04.05.01	Cape Phykes and Castle	Ras Sem	31.83	50.00	32.9241	21.6295
4.04.05.02	Apollonia	Susah	31.67	50.17	32.9023	21.9708
4.04.05.04	Naustathmos	ruins at the mouth of Wādī al Mashāyikh, near Ra's al Hilāl	31.67	50.33	32.9104	22.1664
4.04.05.05	Erythron	Al Athrūn	31.50	50.50	32.8694	22.2784
4.04.05.06	Chersis	Chersa	31.33	50.75	32.8501	22.4168
4.04.05.07	Cape Zephyrion	Ra's Bū Maddād	31.33	51.00	32.8031	22.5569
4.04.05.08	Darnis	Darnah	31.25	51.25	32.7661	22.6405
4.04.08.01	Mounds of Heracles	Hills near Bu Maryam	29.00	48.67	32.1604	20.4951
4.04.08.02	Velpa Mts.	Qārat ar Raqūbah?	25.50	47.33	28.9409	17.9468
4.04.08.03	Baekolikon Mtn.	Jabal al Wurayqāt?	26.50	51.00	29.5973	18.6184
4.04.08.04	Maritime lake formed by Lathon R.	Sabkhat 'Ayn as Salmānī	31.17	47.75	32.1170	20.0810
4.04.08.06	Maritime lake below Paliouros	near 'Ayn at Tamīmī springs	31.17	52.00	32.3589	23.0720
4.04.11.01	Cyrene	Shahhat	31.33	50.00	32.8192	21.8557
4.04.11.02	Archile	Al Qubbah?	31.25	50.50	32.7659	22.2301
4.04.11.03	Chairekla	near Al-Militaniya	31.00	48.50	32.2542	20.6440
4.04.11.04	Neapolis	Qasr Libya	31.33	49.00	32.6285	21.3950
4.04.11.05	Artamis	Massah	31.17	49.75	32.7473	21.6270
4.04.11.06	Zemythos	Gasr Khuraybah?	31.83	49.83	32.8612	21.9154
4.04.11.07	Barke	ruins near Al Marj	30.75	49.25	32.4996	20.8718
4.04.11.08	Eraga	Zawiat Elargoob?	31.00	49.67	32.6294	21.4722
4.04.12.01	Kelida	Sidi Nuah?	30.67	50.50	32.6830	21.1983
4.04.12.02	Hydrax	'Ayn Mārrah?	30.50	50.83	32.7503	22.3832
4.04.12.03	Alibaka	Qaryat Baṭṭah?	30.17	49.17	32.6598	21.1096
4.04.12.04	Thintis	Zāwiyat at Tarīt?	30.25	50.00	32.7907	22.0813
4.04.12.05	Kainopolis	Abū al Khunfus	30.50	50.75	32.7666	21.3500
4.04.12.06	Phalakra	Al Bayḍā'	30.50	49.75	32.7614	21.7564
4.04.12.07	Marabina	Marawah?	30.00	48.00	32.4839	21.4090
4.04.12.08	Aurigena	Al Abraḡ?	29.83	49.75	32.7845	21.9966
4.04.12.09	Akabis	Al Qayqab	29.67	50.50	32.7257	22.0215
4.04.13.01	Maranthi village	Al Maqrūn?	29.67	47.50	31.4411	20.1512
4.04.13.02	Agdaua village	Ajdabiya	29.00	47.75	30.7554	20.2262
4.04.13.03	Echinos	Ghawṭ al Ḥiṣān?	28.67	49.50	32.1866	20.6153
4.04.13.04	Philon village	Khawlān	28.67	51.00	32.5941	22.0967
4.04.13.05	Arimantos	Gasr Al-Karmūsah	28.92	51.00	32.5866	22.5040
4.04.14.01	Myrmex I.	near Ptolemais?	31.83	48.67	32.7176	20.9492
4.04.14.02	Laea or Aphrodite I.	Jazirat Kirissah	31.83	50.50	32.8382	22.4989

Table 3. Known and tentatively identified locations in Marmarica, Libyan nome, and Egypt.

Ptolemy ID	Ptolemy Name	Modern Name	Ptol. Lat.	Ptol. Lon.	Mod. Lat.	Mod. Lon.
4.05.02.03	Aziris village	Wādī al Khalīj	31.25	51.67	32.6609	22.9212
4.05.02.04	Greater Chersonesos	Ra's at Tīn	31.67	52.00	32.6137	23.1262
4.05.02.05	Phthia harbor	Bombah	31.25	52.17	32.4147	23.1252

4.05.02.06	Paliouros	At Tamīmī	31.25	52.25	32.3358	23.0612
4.05.02.07	Batrachos harbor	Al Qarḏabah	31.25	52.50	32.1399	23.4829
4.05.02.08	Petra Mikra harbor	Marsa Tarfaia	31.25	52.75	32.1758	23.4084
4.05.03.01	Antipyrgos harbor	Tobruk	31.25	53.17	32.0752	23.9606
4.05.03.02	Skythranios harbor	Marsá Bū al 'Ifrit?	31.17	53.50	31.9860	24.4149
4.05.03.03	Cape Kataionion	Ra's Wannah	31.25	53.75	32.0204	24.7386
4.05.03.04	Cape Ardanis	Ra's al Muraysah?	31.17	54.00	31.9132	25.0391
4.05.03.05	Petra Megale harbor	Al Bardīyah	31.17	54.17	31.7560	25.0853
4.05.04.02	Panormos harbor	Marsá al Murayjah?	31.17	54.33	31.7079	25.1181
4.05.04.03	Katabathmos Megas	As Sallūm	31.25	54.75	31.5536	25.1579
4.05.04.04	Ainesisphyra harbor	Sīdī Barānī	31.17	55.00	31.6117	25.9254
4.05.04.05	Zygris village	Zāwiyat Shammās?	31.17	55.25	31.5133	26.4091
4.05.04.06	Chettaia village	Marsá Jarjūb	31.17	55.50	31.5014	26.5597
4.05.05.01	Selenis harbor	Marsá al 'Āṣī	31.50	56.00	31.4803	26.7508
4.05.05.02	Trisarchi village	Ma'āṭin al Furaykhāt?	31.08	56.33	31.4364	26.8902
4.05.05.03	Apis sanctuary	Ageeba beach	31.08	56.67	31.4119	27.0070
4.05.06.01	Paraitonion	Marsa Matruch	31.17	57.00	31.3542	27.2372
4.05.06.02	Cape Pythis	Ra's 'Alam ar Rūm	31.17	57.17	31.3640	27.3533
4.05.06.03	Graias Gonu harbor	near Sāniyat al Murrah?	31.08	57.33	31.3196	27.3572
4.05.06.04	Cape Kallias	Ra's Ḥawālah	31.17	57.50	31.2059	27.5572
4.05.06.05	Zygis harbor	Zāwiyat Hārūn?	31.08	57.67	31.1758	27.6664
4.05.06.06	Leuke shore	near Zāwiyat Ashtūr	31.17	57.83	31.2070	27.7912
4.05.07.01	Cape Hermaia	Ra's al Ḥikmah	31.25	58.00	31.2470	27.8542
4.05.07.02	Phoinikon harbor	Bir el-Genefis	31.17	58.33	31.1375	27.8835
4.05.07.03	Antiphrai village	near Ra's aḏ Ḍab'ah?	31.08	58.67	31.0635	28.4563
4.05.07.04	Cape Derris	near Ad Darāziyah?	31.17	58.83	30.8875	28.8951
4.05.07.05	Leukaspis harbor	Marina Al 'Alamayn	31.08	59.00	30.8235	29.0120
4.05.07.06	Cape Glaukon	Ābār al 'Amā'id?	31.17	59.17	30.8322	29.1892
4.05.08.02	Cheimo village	Al Ḥammām	31.08	59.50	30.8547	29.3353
4.05.08.03	Plinthine	Sīdī Kurayr	31.00	59.75	31.0036	29.6099
4.05.09.01	Chersonesos Mikra	Al 'Ajāmī?	31.08	60.00	31.1315	29.7832
4.05.09.03	Alexandria	Alexandria	31.00	60.50	31.1946	29.9041
4.05.09.05	Kanobos	Abū Qīr	31.08	60.75	31.3209	30.0637
4.05.10.02	Herakleotic or Ka-nobic mouth	Herakleion (underwater ruins)	31.08	60.83	31.2983	30.1103
4.05.10.03	Bolbitine mouth	Rosetta mouth	31.08	61.25	31.4481	30.3805
4.05.10.04	Sebennyitic mouth	Būghāz al Burj	31.08	61.50	31.5793	30.9743
4.05.10.05	Pineptimi false mouth	'Izbat Abū 'Umayrah ash Sharqīyah?	31.08	61.75	31.5818	31.1854
4.05.10.06	Diolkos false mouth	near Naq'at al Qar'ah?	31.17	62.17	31.4990	31.4121
4.05.10.07	Phatnitic mouth	Damietta	31.17	62.50	31.4165	31.8133
4.05.10.08	Mendesian mouth	near Qaryat al Firdaws	31.17	62.75	31.3020	32.1707
4.05.10.09	Tanitic mouth	Om Fareg Mouth (historical)	31.25	63.00	31.1244	32.5030
4.05.10.10	Pelusiatic mouth	near Pelusium?	31.25	63.25	31.0596	32.5346
4.05.11.01	Pelusium	Tell Farama, near Baluza	31.25	63.50	31.0424	32.5400
4.05.11.02	Gerron	Al Maḥamdīyah?	31.25	63.67	31.0473	32.6655
4.05.12.02	Kasion	Al Qals	31.17	63.83	31.2116	33.0779
4.05.12.03	Outlet of Sirbonis lake	Būghāz Raqm Ithnān	31.17	64.00	31.2120	33.2698
4.05.12.04	Ostrakine	El Filusiyaat Island	31.17	64.25	31.1169	33.4309
4.05.12.05	Rhinokorura	Arish	31.83	64.67	31.1118	33.7969
4.05.14.02	Arsinoe	Suez	29.17	63.33	29.9731	32.5416
4.05.14.03	Klysma	Qulzum	28.83	63.33	29.9546	32.5740
4.05.14.04	Cape Drepanon	Zeit Peninsula?	27.83	64.00	27.7947	33.5799

4.05.14.05	Myos Hormos	near Wādī al Quṣayr al Qadīm?	27.50	64.08	26.1565	34.2437
4.05.14.06	Philoterar harbor	Esraa Bay?	26.75	64.25	25.9419	34.3871
4.05.14.07	Aias Mtn.	Jabal as Sibā'ī?	26.17	64.33	25.7151	34.1566
4.05.15.01	Leukos harbor	Port el Ghalib?	26.00	64.50	25.5364	34.6336
4.05.15.02	Akabe Mtn.	Jabal an Nābī'?	25.75	64.50	25.1592	34.4671
4.05.15.03	Nechesia	El Naaba?	25.50	64.50	25.3031	34.7470
4.05.15.04	Smaragdus Mtn.	Jabal Zabārah	25.00	64.83	24.7556	34.6995
4.05.15.05	Cape Lepte	Ra's Banās	24.67	64.67	23.8945	35.7877
4.05.15.06	Berenice	Barnīs	23.83	64.08	23.9103	35.4737
4.05.15.07	Pentadaktylon Mtn.	Jabal al Farā'id	23.50	64.75	23.5574	35.3643
4.05.15.08	Cape Bazion	Bi'r al Ḥaṣā	23.00	65.00	22.9683	35.6727
4.05.18.02	Ogdamon Mtn.	Ḥujayj al 'Adam	29.50	58.00	31.8183	23.9656
4.05.18.03	Thinodes Mtn.	Jabal ar Ramliyah	26.33	57.50	25.8099	30.5386
4.05.18.04	Azar Mts. (W. end)	Qārat Khazzī	23.50	51.50	21.3958	24.5076
4.05.18.05	Azar Mts. (E. end)	Jabal Naẓar	23.50	53.00	22.8734	25.1428
4.05.19.01	Libyan Mts. (N. end)	Hill Bluff	29.00	61.00	29.3832	29.8836
4.05.19.02	Libyan Mts. (S. End)	Jabal Gharrah	23.50	60.50	24.0435	32.5235
4.05.20.01	Cleartos lake	Sabkhat Karkūrah?	26.33	52.00	30.1038	19.1654
4.05.20.02	Lakkoi lake	Siwa Lake?	26.67	55.50	29.2164	25.4666
4.05.20.03	Lykomedes lake	Sitra lake	24.00	57.00	28.7350	27.0045
4.05.20.04	Helios spring	El Ganbi Spring	28.33	58.25	29.2609	25.9330
4.05.20.05	Mareia lake	Lake Mariout	30.83	60.25	31.1490	29.8985
4.05.20.06	Moiris lake	Qarun Lake	29.33	60.33	29.4536	30.5808
4.05.20.07	Sirbonis lake	Buḥayrat al Bardawīl	31.00	64.25	31.1551	33.2225
4.05.25.02	Thasiotae	Qaṣr al Farāfirah?	27.83	59.50	27.0565	27.9690
4.05.27.03	Troikos Stone Mtn.	Jabal Ṭurā	29.25	62.67	29.9335	31.3179
4.05.27.04	Alabastrinos Mtn.	Tilā' Nūfal	28.00	63.00	28.0619	30.8726
4.05.27.05	Porphyritos Mtn.	Mons Porphyrites	26.33	63.00	27.2155	33.2738
4.05.27.06	Black Stone Mtn.	Jabal Nuqrūṣ?	24.67	63.00	24.8092	34.5977
4.05.27.07	Basanites Stone Mtn.	Jabal Ḥashānīt?	23.50	64.00	24.3468	34.8499
4.05.28.02	Leukoe	near Cement factory Fattaih?	31.00	51.33	32.5987	22.7211
4.05.28.03	Mokchyris	Zāwiyat al Muraṣṣaṣ	31.00	52.33	32.1280	23.6681
4.05.28.04	Leukai Kaminoi	Kambūt?	30.83	53.17	31.9039	24.4782
4.05.28.05	Menelaos	Marsā al 'Awra'	31.00	53.67	31.9678	24.8831
4.05.28.06	Gaphara	Abyār az Za'farānah?	30.33	54.00	31.8885	24.2921
4.05.28.07	Masuchis	Abyār Maḥẓiyah?	30.67	53.50	31.9318	24.4200
4.05.28.08	Masadalīs	Ghawṭ al Musalliqūn?	30.50	51.33	32.5105	22.5706
4.05.29.01	Abathuba	Martūbah?	30.00	51.50	32.5758	22.7589
4.05.29.02	Leukai Napai	'Akramah?	30.50	52.50	32.0358	23.6788
4.05.29.03	Takaphoris	Abyār aṣ Ṣufayrah?	30.17	53.83	32.0684	22.9775
4.05.29.04	Dioskoron	Jikharra	28.83	52.50	29.3001	21.6470
4.05.29.05	Migo	Mukhaylā?	28.50	53.50	32.1584	22.2789
4.05.29.06	Saragina	Abyār Zarqūn	28.00	53.25	29.7504	24.7798
4.05.29.07	Alo	Jālū	28.50	54.50	29.0262	21.5489
4.05.29.08	Mazakila	Ḥusayyāt al Majābirah?	26.50	54.33	29.5793	24.6370
4.05.29.09	Billa	Bilad er-Rum?	25.67	54.50	29.2285	25.3994
4.05.30.03	Augila	Awjilah	28.00	52.50	29.1081	21.2869
4.05.30.04	Magri place	el-Maraki?	27.83	54.33	29.2743	25.3203
4.05.31.02	Tachorsa	Bi'r at Tawārisah?	30.83	54.50	31.4613	26.4316
4.05.31.03	Azikis	Zāwiyat Sīdī Barānī?	31.00	55.00	31.5549	25.9172
4.05.31.04	Nemesion	El Negaila?	30.83	55.50	31.4068	26.5875
4.05.31.05	Tisarchou	Kafrat Abū Ṭirahī?	30.83	55.83	31.4024	26.6637
4.05.31.06	Philonos	Bi'r ath Thalāthah?	30.50	55.83	31.1447	25.8078
4.05.31.07	Sophanus	Bi'r Sajifah?	30.83	56.50	31.2712	27.2097

4.05.31.08	Bibliaphorion	Qaryat al Laḥāmīyah?	30.67	56.33	31.1747	27.1437
4.05.31.09	Skope	Bolbitinos Stoma	30.50	56.67	31.4702	30.4098
4.05.32.01	Kalliu	Zawyet El Hawala	30.83	57.00	31.1958	27.4369
4.05.32.02	Laodamantion	near Ra's Abū Ḥashayfah	31.00	57.50	31.1900	27.6316
4.05.32.03	Katabathmos Mikros	Abou Haggag?	30.83	58.00	31.1341	27.8357
4.05.32.04	Pedonia	Marsa Abu Samra	31.00	58.33	31.0635	28.2610
4.05.32.05	Pnigeus	Fūkah?	30.50	58.50	31.0733	27.9150
4.05.32.06	Glaukon	Ābār al 'Amā'id?	30.83	59.00	30.8191	29.1817
4.05.32.07	Thanuthis	'Izbat Muṣṭafā Abū Naṣr	29.75	55.67	30.4304	30.8173
4.05.32.07	Tukkitora	Ḥisī Ṭarṭūrah?	30.25	55.17	30.2808	27.1075
4.05.32.08	Pednopon	Bi'r 'Abd an Nabī?	29.67	57.25	29.9881	26.9566
4.05.32.09	Klimax	Qattara Pass?	30.17	57.67	30.1920	27.2136
4.05.32.10	Siropon	El Qaneitra Crossing?	28.75	56.33	29.7526	26.8772
4.05.32.11	Mareotis	Hawariyyah	28.33	58.00	30.9948	29.6564
4.05.33.02	Camp of Alexander	Qārah	28.17	56.50	29.6216	26.4973
4.05.33.03	Ammon	Siwa	28.00	55.50	29.2051	25.5436
4.05.34.02	Monokaminon	Al Qaṣabah ash Gharbīyah?	30.83	59.33	30.7900	28.9101
4.05.34.03	Halmyrai	Al Ḥammām?	30.83	59.50	30.8454	29.3879
4.05.34.04	Taposiris	Abusir	31.00	59.83	30.9462	29.5187
4.05.34.05	Kobiu	Sidi Abd el-Rahman?	30.17	59.17	30.9662	28.7344
4.05.34.07	Hierax	Kawm al Baṣal	30.67	59.67	31.0383	30.3473
4.05.34.08	Phamothis	'Izbat Bakhātī	30.67	60.00	31.1094	30.3734
4.05.34.09	Palaimareia	Kom Turujah?	30.33	59.67	30.9631	30.1744
4.05.36.02	Bacchis	Kom el-Atl	29.67	60.50	29.5370	31.0042
4.05.36.03	Dionysias	Qasr Qarun	29.00	60.50	29.4057	30.4183
4.05.37.02	Oasis Minor	Al Bawīṭī	28.75	60.25	28.3534	28.8582
4.05.37.03	Oasis Major	Kharga	26.92	59.83	25.4765	30.5559
4.05.39.01	Great Delta		30.00	62.00	30.0927	31.2310
4.05.42.03	Fourth (nameless)		30.25	61.50	30.1719	31.1411
4.05.43.01	Delta					
4.05.43.01	Fifth (nameless)		30.83	61.00	31.1033	30.6653
4.05.46.03	Hermopolis Mikra	Damanhūr	30.83	61.00	31.0171	30.4484
4.05.46.05	Andronpolis	Shabur	30.33	61.17	30.8026	30.7811
4.05.46.07	Letopolis	Awsīm	30.08	61.50	30.1216	31.1346
4.05.47.04	Metelis	Fuwwah	31.00	61.00	31.2037	30.5490
4.05.48.04	Buto	Kawm al Farā'in	30.75	61.33	31.1969	30.7422
4.05.48.06	Kabasa	Shabas el-Shuhada	30.67	61.50	31.1235	30.7519
4.05.48.08	Sais	Ṣā al Ḥajar	30.50	61.50	30.9672	30.7695
4.05.49.02	Naukratis	Kom Geif	30.50	61.25	30.8972	30.5925
4.05.49.04	Nikiu	Zāwiyat Razīn	30.33	61.50	30.4122	30.8517
4.05.50.04	Pachneumunis	'Izbah Raqm Wāḥid wa Sab'un	31.00	61.67	31.3940	31.0196
4.05.50.06	Xoīs	Sakhā	30.75	61.67	31.0895	30.9509
4.05.50.08	Taua	Ṭanṭā	30.42	61.67	30.7648	31.0068
4.05.51.04	Onuphis	Munūf	30.67	62.08	30.4633	30.9218
4.05.51.06	Athribis	Tell Atrib	30.50	62.00	30.4706	31.1881
4.05.51.08	Thmuis	Tall Timayy	30.83	62.33	30.9389	31.5167
4.05.51.10	Sebennytos	Samannūd	30.33	62.33	30.9628	31.2396
4.05.51.12	Busiris	Abū Ṣīr Banā	30.25	62.50	30.9241	31.2353
4.05.51.14	Leontopolis	Tall al Moqdam	30.58	62.25	30.6835	31.3579
4.05.52.04	Panephrisis	Al Manزالah	31.08	62.67	31.1591	31.9543
4.05.52.06	Tanis	Tall Ṣān al Ḥajar	30.83	62.75	30.9778	31.8812
4.05.52.08	Pharbaithos	Hurbayṭ	30.50	62.75	30.7387	31.6149
4.05.53.03	Heracleopolis Mikra	Tall Tulaym	31.00	63.33	30.9784	32.1746

4.05.53.05	Phakussai	Abū Kabīr	30.83	63.17	30.7214	31.6709
4.05.53.07	Bubastis	Tell Basta	30.67	63.08	30.5703	31.5149
4.05.54.03	Babylon	Coptic Cairo	30.00	62.25	30.0062	31.2315
4.05.54.04	Heliopolis	Al Matariyyah	29.83	62.50	30.1293	31.3075
4.05.54.05	Heroonpolis	ʿIzbat al Maskhūṭ	30.00	63.17	30.5529	32.0993
4.05.55.05	Memphis	Mīt Ruhaynah	29.83	61.83	29.8500	31.2520
4.05.55.06	Akanthonpolis	Kafr ʿAmmār	29.67	61.67	29.5056	31.2403
4.05.56.01	Nile R. split at Heracleopolites I.	near Jazīrat ar Riqqah al Baḥrīyah	29.75	62.00	29.4411	31.2100
4.05.56.03	Nilopolis	Dalāṣ	29.50	62.00	29.1858	31.1343
4.05.57.01	Heracleopolis Megale	Ihnasaya el-Medina	29.17	61.83	29.0855	30.9346
4.05.57.03	Arsinoe	Al Fayyūm	29.50	61.67	29.3223	30.8335
4.05.57.04	Ptolemais	Al Lāhūn	29.33	61.67	29.2107	30.9788
4.05.57.06	Aphroditopolis	Aṭṭīḥ	29.67	62.25	29.4084	31.2517
4.05.57.07	Ankyronpolis	Jazīrat al Ḥibah	29.33	62.33	28.7883	30.9253
4.05.59.02	Oxyrhynchos	Al Bahnasā	28.83	61.67	28.5423	30.6516
4.05.59.04	Ko	Al Qays	28.67	61.83	28.4776	30.7818
4.05.59.05	Kynonpolis	Jazīrat ash Shaykh Faḍl	28.67	62.17	28.4870	30.8427
4.05.59.06	Akoris	Ṭihnā al Jabal	28.50	62.00	28.1805	30.7759
4.05.59.07	Alabastronpolis	Nazlat al ʿAsākir	28.33	62.50	28.0458	30.8287
4.05.60.02	Hermopolis Megale	Tall al Ashmūnayn	28.42	61.67	27.7813	30.8034
4.05.60.03	Phylakai	Mallawī?	28.25	61.83	27.7327	30.8413
4.05.61.02	Antinoopolis	Ash Shaykh ʿIbādah	28.17	62.08	27.8081	30.8793
4.05.63.02	Lykonpolis	Asyūṭ	28.00	61.75	27.1788	31.1785
4.05.64.02	Hypsele	Shuṭb	27.83	62.00	27.1441	31.2382
4.05.65.02	Aphroditopolis	Kawm Ishqāw	27.50	61.67	26.8434	31.4233
4.05.65.03	Crocodilopolis	Ar Ruzayqāt	27.33	61.67	25.5854	32.4646
4.05.66.02	Ptolemais Hermeiou	Al Minshāh	27.17	61.83	26.4768	31.8021
4.05.66.03	Abydos	El Araba El Madfuna	26.83	61.67	26.1864	31.9164
4.05.67.03	Diospolis Mikra	Hiw	26.67	61.83	26.0029	32.3105
4.05.68.02	Tentyra	Dendera	26.17	61.83	26.1431	32.6701
4.05.68.03	Pampanis	Al Ballāṣ	25.75	61.50	26.0201	32.7662
4.05.69.02	Tathyris	Najʿ Raml al Aqālītah	25.67	61.50	25.7004	32.5990
4.05.70.02	Hermonthis	Armant	25.33	61.83	25.6221	32.5443
4.05.70.03	Latopolis	Isnā	25.00	61.75	25.2935	32.5562
4.05.70.04	Apollonopolis Megale	Edfu	24.67	61.83	24.9779	32.8734
4.05.70.05	Phonthis	Bimbān	24.33	61.67	24.4321	32.8935
4.05.70.06	Elephantine I.	Elephantine	23.92	61.75	24.0847	32.8860
4.05.71.02	Antaiopolis	Al ʿItmānīyah	27.67	62.33	26.9007	31.5220
4.05.71.03	Passalos	Nazlat al Harīdī	27.50	62.17	26.7761	31.5534
4.05.72.02	Panopolis	Akhmīm	27.33	62.00	26.5650	31.7464
4.05.72.03	Lepidotonpolis	Nag el-Mashayikh	26.83	62.00	26.3239	31.8861
4.05.72.04	Chenoboskia	Kasr el-Saijad	26.50	62.00	26.0454	32.3066
4.05.72.05	Kainepolis	Qena	26.33	62.17	26.1601	32.7187
4.05.73.02	Koptos	Qift	26.00	62.50	25.9967	32.8159
4.05.73.03	Apollonopolis Mikra	Qūṣ	25.83	62.50	25.9180	32.7530
4.05.73.05	Diospolis Megale	Luxor	25.50	62.00	25.6996	32.6392
4.05.73.06	Tuphion	Ṭūd	25.33	62.00	25.5831	32.5336
4.05.73.07	Chnubis	El-Kab	25.00	62.00	25.1190	32.7980
4.05.73.08	Eileithyopolis	Nagaa Al Idwah	24.75	62.08	24.9616	32.8980
4.05.73.10	Omboi	Kom Ombo	24.08	62.00	24.4522	32.9284
4.05.73.11	Syene	Aswan	23.83	62.00	24.0811	32.8908
4.05.74.03	Lesser Cataract	The First Cataract	23.75	61.83	24.0704	32.8662
4.05.74.04	Hiera Sykaminos	Maharraqa (flooded)	23.67	61.75	23.0469	32.6842

4.05.74.05	Philae	Bilaq (flooded island)	23.50	61.67	24.0217	32.8889
4.05.74.06	Takompso	Djerar (flooded)	23.08	61.67	23.0561	32.6975
4.05.74.07	Pselchis	Dakka	23.67	61.17	23.1957	32.7494
4.05.75.04	Aedonis I.	Jazīrat al 'Ulbah	31.83	52.67	32.2326	23.2822
4.05.75.05	Tyndareioi Cliffs (3)	Ishaila Rocks	31.50	55.75	31.5202	26.6392
4.05.75.06	Ainesippa I.	Jazīrat Abū Ḥashāyfah	31.67	56.50	31.1925	27.6411
4.05.75.07	Phokussai Islands (2)	Umm ar Rakham Reef	31.50	56.83	31.4035	27.0924
4.05.75.08	Pedonia I.	Jazīrat al Khunfus	31.50	58.50	31.1412	27.9166
4.05.76.01	Didymai Islands (2)	Jazīrat al Marābiṭ and Jazīrat al Kunayyisah	31.50	60.00	31.1477	29.7880
4.05.76.02	Pharos I.	Pharos I. near Alexandria	31.08	60.33	31.2139	29.8857
4.05.76.03	Argaiu I.	Jazīrat Disūqī	31.67	61.42	31.3580	30.1060
4.05.77.02	Sapphire I.	Jazīrat Shākīr	28.00	64.83	27.5037	33.9813
4.05.77.03	Aphrodite I.	Jazīrat Wādī al Jimāl?	25.00	65.25	24.6670	35.1621
4.05.77.04	Agathon I.	Jazīrat Zabarjad	23.67	65.25	23.6103	36.1961

Table 4. Known and tentatively identified locations in Aethiopia below Egypt.

<i>Ptolemy ID</i>	<i>Ptolemy Name</i>	<i>Modern Name</i>	<i>Ptol. Lat.</i>	<i>Ptol. Lon.</i>	<i>Mod. Lat.</i>	<i>Mod. Lon.</i>
4.07.05.02	Prionoton Mtn.	Jabal Shendib?	22.50	65.00	22.0159	36.2764
4.07.05.03	Chersonesos	Ra's al Ḥadāribah?	22.00	65.00	22.0653	36.8916
4.07.05.04	Cape Mnemeion	Ras Abū Shagrāb?	21.50	65.17	21.0660	37.3189
4.07.05.05	Ision Mtn.	Jibāl Erbā?	21.33	65.50	20.7875	36.8433
4.07.05.06	a deep harbor	Rawāyah	21.00	65.00	21.0500	37.1832
4.07.05.07	Dioskoron harbor	Marsá Fanoidig?	20.50	65.00	20.4539	37.1870
4.07.05.08	Cape of the Demeter watch	near Marsa Shalak al Kabīr?	20.25	65.67	20.4582	37.2116
4.07.06.01	Cape Aspis	East Town?	19.75	65.50	19.6052	37.2377
4.07.06.02	Cape Diogenes	N from Graham Point?	19.67	65.67	19.1354	37.3606
4.07.06.03	Satyron Mtn.	Jibāl Ōdā?	19.00	65.67	20.3145	36.6762
4.07.06.04	Monodaktylon Mtn.	Jabal Kaiai?	18.50	65.50	19.9079	36.7983
4.07.06.05	Gauron Mtn.	Jabal Nawērat?	18.00	65.67	19.3157	36.6872
4.07.06.06	Harbor of the Protecting Gods	Suakin Island?	17.50	65.50	19.1113	37.3371
4.07.06.07	Evangelon harbor	Trinkitat?	17.00	65.75	18.6754	37.7465
4.07.07.01	Ptolemais Theron	Hillat 'Agig?	16.42	66.00	18.2222	38.1843
4.07.07.02	Sabastrikon R. mouth	Khor Shakat?	16.00	65.50	18.0984	38.4377
4.07.07.03	Cape of the Altar of Eros	Ra's Kasr	15.00	67.00	18.0182	38.5804
4.07.07.04	Great Coast		14.25	66.00	17.0000	39.0400
4.07.07.05	Kolobon Mtn., cape	Ras Harb	13.67	68.00	15.7908	39.4431
4.07.08.02	Sabat town	near Hamassat?	12.50	68.33	15.6375	39.4393
4.07.08.03	Mountainous peninsula	Ghedem?	12.17	68.00	15.4213	39.5503
4.07.08.04	Adulis	Adulis archaeological site	11.33	67.00	15.2709	39.6830
4.07.08.05	Cape Kronos	Ras Corali	11.67	68.00	15.5038	39.8716
4.07.08.06	Antiochos canal	Bay of Anfile?	10.25	72.00	14.7749	40.7866
4.07.08.07	Mandaith village	Edd?	10.33	73.00	13.9308	41.6938
4.07.08.08	Arsinoe	Ras Dumēra YeMidir Zerf Ch'af	10.67	73.75	12.7099	43.1311
4.07.09.02	Dere town	Siyyân	11.00	74.50	12.4484	43.3160
4.07.10.02	Avalites marketplace	Assab	8.42	74.00	13.0144	42.7408
4.07.10.03	Malao marketplace	Berbera	6.50	75.00	10.4398	45.0198
4.07.10.04	Mondu marketplace	Xiis	7.50	78.25	10.8964	46.9211

4.07.10.05	Cape Mosylon, marketplace	Aantaara?	9.00	79.00	11.4425	49.5516
4.07.10.06	Kobe marketplace	Raas Cosbaley?	8.00	80.00	11.5135	49.9477
4.07.10.07	Elephas Mtn.	Raas Felug	7.50	81.00	11.9352	50.6322
4.07.10.08	Akkanai marketplace	Rakamma?	7.00	82.00	11.8673	51.0714
4.07.10.09	Cape Aromata, marketplace	Ras Asir	6.00	83.00	11.8345	51.2867
4.07.11.02	Pano village	Raas Binna?	5.00	82.00	11.1348	51.1689
4.07.11.03	Opone marketplace	Raas Xaafuun	4.00	81.25	10.4216	51.3358
4.07.11.04	Zingis	Dhigdhig?	3.50	81.00	9.4432	50.8386
4.07.11.05	Phalangis Mtn.	Colline Sagaleh?	3.50	80.00	9.3834	50.6668
4.07.11.06	Apokopa	Gabbac?	3.00	79.00	8.1420	50.0386
4.07.11.07	Horn of the South	Raas Ilig?	1.00	79.00	7.7945	49.8343
4.07.11.10	Essina	Wasini	3.5000	73.1667	-4.6586	39.3662
4.07.11.11	Sarapion anchorage and emporium	Warshiikh?	-3.0000	73.0000	2.3000	45.8000
4.07.11.11	Sarapion anchorage and emporium	Burgabo?	-3.0000	73.0000	-1.2193	41.8371
4.07.11.12	Toniki marketplace	Tanga	-4.0000	73.0000	-5.0890	39.1024
4.07.12.01	Rhaptos R. mouth	Ruvu R. mouth?	-7.0000	72.5000	-6.3802	38.8619
4.07.12.02	Rhapta	Dar es Salaam	-7.0000	71.0000	-6.8187	39.2869
4.07.12.04	Cape Rhapton	Ras Pembamnasi?	-8.4167	73.8333	-7.1845	39.5022
4.07.14.02	Great Cataract	The Second Cataract (submerged)	22.5000	60.5000	21.4800	30.9558
4.07.15.01	Tasitia	Saras West	22.0000	61.5000	21.5667	31.0333
4.07.15.02	Boon	Buhen (flooded)	21.6667	62.0000	21.9133	31.2960
4.07.15.03	Autoba	'Unaybah (flooded)?	21.5833	61.5000	22.6331	31.9498
4.07.15.04	Phthuris	Faras (flooded)	21.3333	61.2500	22.2009	31.4660
4.07.15.05	Pistre	Tūshkah Gharb (flooded)?	20.6667	61.0000	22.5128	31.7703
4.07.15.06	Ptemithis	Arminna (flooded)?	20.2500	61.0000	22.5004	31.8679
4.07.16.01	Abunkis	Ballana (flooded)	20.0000	59.5000	22.2840	31.5860
4.07.16.02	Treasury of Cambyse	Abu Simbel Temples	18.0000	59.0000	22.3368	31.6258
4.07.16.03	Erchoas	Argin (flooded)	18.0000	59.5000	21.9846	31.3428
4.07.17.01	Satachtai	Aksha (flooded)	18.0000	60.5000	22.1577	31.4233
4.07.17.02	Moru	Marru Island	18.6667	61.5000	18.9678	33.5674
4.07.17.03	Naki	Naqa	19.5000	62.0000	16.2688	33.2747
4.07.17.04	Tathis	Anguri	17.0000	61.0000	19.4059	30.4695
4.07.18.01	Pnups	Saras East?	22.1667	62.0000	21.5634	31.0984
4.07.18.02	Berithis	Gezira Dabarosa (flooded)?	21.5000	62.2500	21.9423	31.3301
4.07.18.03	Gerbo	Garrib I.?	21.0000	62.0000	17.8518	33.9940
4.07.18.04	Pataita	Kawa	20.5000	61.6667	19.1231	30.4966
4.07.18.05	Ponteris	'Amara East?	20.0000	61.1667	20.8010	30.3859
4.07.19.01	Primis Mikra	Kasr Ibrim	19.5000	60.0000	22.6497	31.9926
4.07.19.02	Arabis	Wādī al 'Arab (flooded)	18.5000	60.5000	22.7648	32.5798
4.07.19.03	Napata	Jabal Barkal	20.2500	63.0000	18.5349	31.8310
4.07.19.04	Sakole	Dangeil	19.5000	63.0000	18.1313	33.9595
4.07.19.05	Sandake	Saqadi Shariq	18.5000	63.0000	17.1323	33.7119
4.07.19.06	Orbadaru	Baladras I.?	18.0000	62.6667	19.5000	33.2500
4.07.19.07	Primis Megale	Megal?	17.0000	62.0000	19.5000	33.3167
4.07.21.01	Meroe	Meroe	16.4167	61.5000	16.9370	33.7490
4.07.21.02	Sakolche	Shendi?	15.2500	61.6667	16.7000	33.4351
4.07.21.03	Eser	Haye el 'Arda el Mineqla?	13.5000	61.6667	17.4357	33.8960
4.07.21.04	Daron village	Ed Damer?	12.5000	62.0000	17.5863	33.9546
4.07.22.01	Astapus R. joins Nile R.	Blue Nile joins White Nile	12.0000	61.0000	15.6133	32.5277

4.07.22.02	Astaboras R. joins Astapus R.	Atbara R. joins Nile R.	11.5000	62.5000	17.6767	33.9714
4.07.23.01	Nile R. formed	Albert Nile and Victoria Nile join	2.0000	60.0000	2.2563	31.3497
4.07.24.03	Koloe lake	Lake Tana	0.0000	69.0000	12.0000	37.3035
4.07.25.01	Auxume	Aksum	11.0000	65.5000	14.1319	38.7192
4.07.25.02	Koloe town	Gondar?	4.2500	62.0000	12.6000	37.4667
4.07.25.02	Koloe town	Qohaito?	4.2500	62.0000	14.8687	39.4226
4.07.25.03	Maste town	Mlandizi?	-4.2500	65.0000	-6.7095	38.7426
4.07.26.04	Garbato Mts. (middle)	Ras Dashen	6.0000	69.0000	13.2358	38.3684
4.07.26.05	Elephas Mtn.	Shimbiris?	5.5000	78.0000	10.7352	47.2451
4.07.26.07	Pylaei Mts.	Ch'ok'ē Terara?	0.0000	65.0000	10.7149	37.8508
4.07.26.08	Maste Mtn.	Kimhondū Mtn.?	-5.0000	68.0000	-7.1658	37.6797
4.07.36.03	Astarte I.	Jazīrat Ḥalā'ib al Kabīrah?	22.1667	66.0000	22.2675	36.6496
4.07.36.04	Altar of Athene I.	Jazīrat Magarsam?	21.5000	66.5000	20.8009	37.2653
4.07.36.05	Gypsites I.	Burns Reef?	19.6667	67.0000	19.1540	37.6268
4.07.36.06	Gomadeon islands (2)	South West Island and Al Zaharat I.?	19.0000	67.5000	18.9682	37.4376
4.07.36.07	Myron I.	Harorayeet I.?	18.0000	67.0000	18.8922	37.7616
4.07.37.01	Chelonitides or Kathathrai islands (2)	Talla Talla Saqir I. and Talla Talla Kebir I.	17.5000	68.0000	18.7790	38.0109
4.07.37.02	Thrisitides islands (2)	Long I. and Sumar I.	17.5000	67.5000	18.7769	37.6636
4.07.37.03	Magon I.	Gazirat 'Iri?	16.0000	68.0000	18.2213	38.3261
4.07.37.04	Daphnine I.	Difnein I.?	15.3333	68.5000	16.6146	39.3245
4.07.37.05	Akanthine I.	Entesile I.?	15.0000	68.5000	16.5045	39.3180
4.07.37.06	Makaria I.	Nokra Desēt?	14.0000	68.5000	15.7041	39.9374
4.07.37.07	Orneon I.	Dahlak Kebir	14.0000	69.0000	15.6597	40.1142
4.07.38.01	Bacchi and Antibacchi islands	Shumma and Asarka islands?	13.2500	69.5000	15.5376	40.0030
4.07.38.02	Pan I.	Dissei I.	12.0000	68.6667	15.4695	39.7479
4.07.38.03	Diodoros I.	Dilemni I.?	12.5000	70.0000	15.4985	39.8974
4.07.38.04	Isis I.	Hawakil I.?	11.5000	70.0000	15.1554	40.2478
4.07.39.02	Mondu I.	Xiis I.	8.5000	77.0000	10.9173	46.9285
4.07.40.02	Amiku I.	Moucha I.?	4.0000	85.0000	11.7194	43.2094
4.07.40.03	Menae islands (2)	Saacada Diin I. and Ceebaad I.?	2.5000	84.0000	11.4369	43.4652
4.07.40.04	Myrsiake I.	Ouaramous I.?	1.0000	83.5000	11.5520	43.1889

Table 5. Known and tentative locations in Aethiopia Interior.

Ptolemy ID	Ptolemy Name	Modern Name	Ptol. Lat.	Ptol. Lon.	Mod. Lat.	Mod. Lon.
4.07.24.01	Western lake	Lake Albert	-6.00	57.00	1.6006	30.8476
4.07.24.02	Eastern lake	Lake Victoria	-7.00	65.00	-1.0083	32.9873
4.08.06.02	Ion Mts.	Mont No (1070 m)?	-8.42	10.00	7.6492	-7.6987
4.08.06.04	Mesche Mts.	Maisajeh Hill (1593 m)?	-13.00	25.00	10.4031	8.9639
4.08.06.05	Barditus Mts.	Emi Koussi (3415 m), in Tibesti Mts.?	-6.00	45.00	19.7929	18.5512
4.08.06.08	Cape Prason	Ras Mso	-15.00	80.00	-8.9346	39.5286
4.08.06.09	Menuthias I.	Mafia I.	-12.50	85.00	-7.8700	39.7600