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## The Narrow Pass and Narrow Passage

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The last post entitled [The Narrow \(Small\) Neck of Land](#) showed why many Book of Mormon students think a) the narrow (small) neck of land, b) Lib's city, c) the east-west Bountiful/Desolation line, d) Hagoth's port and e) the place where the sea divides the land are all clustered near each other along f) the Nephite west coast. We showed plausible correlates on the modern map for all 6 of these geographic referents and demonstrated with satellite imagery how our candidates are a good fit to the text. That is a lot going on in a relatively compact area (the Municipio of Tonalá, Chiapas) but there is more. In this post we analyze in-depth the narrow pass mentioned in [Alma 50:34](#), [Alma 52:9](#) and [Mormon 3:5-8](#) as well as the narrow passage referenced in [Mormon 2:29](#). We also look at the fortified defensive line described in [Helaman 4:6-8](#).

A natural question: Do all 3 references to the "narrow pass" refer to the same topographic feature? Yes. Common textual motifs such as borders of the lands Bountiful & Desolation, movement into the lands northward and southward, fortifications, military activity and proximity to the sea assure us that we are dealing with the same place on the Nephite map.

A second question: Are the "narrow pass" and the "narrow passage" the same thing? Probably not. The text in [Mormon 2:29](#) lacks most of the motifs mentioned above, so we will assume the narrow pass and narrow passage are two different topographic features.

A third question: Is the narrow pass near the narrow neck of land? Yes. In point #18 of the article "[Narrow and Small Things](#)" we identified three textual motifs common to the passages ([Alma 22:32](#), [Alma 63:5](#) and [Ether 10:20](#)) describing the narrow (small) neck of land: a) the narrow or small neck of land was located near the land southward/land northward border which was also the land Bountiful/Desolation border, b) the narrow (small) neck of land was on the seacoast, with 2 of the 3 relevant texts identifying the sea as the west sea, and c) the narrow (small) neck was a travel corridor for people going northward or southward. We find all 3 textual motifs in the passages ([Alma 50:34](#), [Alma 52:9](#), and [Mormon 3:5-8](#)) describing the narrow pass: a) the land southward/land northward border which was also the land Bountiful/Desolation border appears prominently in these passages, b) the narrow pass was near the seacoast, with 1 of the relevant texts specifically mentioning the west sea, and c) the narrow pass was in a travel corridor for people going northward or southward. There is also a fourth textual motif

that further links the narrow neck and narrow pass together geographically: [Alma 22:33](#) describes Nephite guards and armies who prevented the Lamanites from moving through the narrow neck of land area into the land northward. Denying Lamanite access to the land northward at this particular point was a strategic Nephite military objective. We find the same thing in [Alma 50:34-35](#). Teancum militarily engaged Morianton to prevent the Nephite dissenters from moving into the land northward. In [Alma 52:9](#) Captain Moroni ordered Teancum to militarily fortify and secure the narrow pass area to prevent Lamanite incursions into the land northward. Over 400 years later Mormon did the same thing. [Mormon 3:5-6](#) talks about armies and fortifications attempting to prevent the Lamanites from breaching a Nephite defensive line established by the narrow pass. The conclusion is unmistakable. All 6 texts are describing the same locale using similar words and concepts. The narrow neck of land and the narrow pass are very near each other.

This means the 15 textual criteria we established for the narrow (small) neck of land (see the blog article "[The Narrow \(Small\) Neck of Land](#)") are directly relevant to the narrow pass as well.

Careful exegesis allows us to identify sixteen additional criteria the narrow pass must satisfy, enumerated as **1** - **16** with aqua shading.

Morianton and his people were moving northward but had not yet reached the land northward [Alma 50:33](#) when they encountered Teancum and his army. Teancum was moving southward, coming to the battle from the Desolation (northward) side of the Bountiful/Desolation line [Alma 50:34](#). Both groups were in a hurry and would have traveled via efficient routes. Teancum had the advantage that he could travel through Nephite controlled areas while Morianton, with the Nephite equivalent of an all points bulletin and a warrant out for his arrest, would have avoided places with a strong Nephite presence. Where did Teancum come from? [Alma 50:35](#) tells us that Teancum had been with Captain Moroni in the fortified city of Moroni. So, Teancum traveled from the extreme south eastern corner of Nephite lands to the west coast and arrived at the east-west Bountiful/Desolation border ahead of Morianton. We should find two logical travel routes **1** into the narrow pass. One route should come from the northward (Desolation) side of the Bountiful/Desolation line and the other should come from the southward (Bountiful) side.

Coming up from the southward, the narrow pass led a) by the sea **2** and b) into the land northward **3** [Alma 50:34](#). The next textual phrase has perplexed many Book of Mormon students: "yea, by the sea on the west and on the east" [Alma 50:34](#). Were there

two seas here? No. Royal Skouson has taught us that "yea clauses" in the Book of Mormon expand on an immediately prior phrase. There was only one sea, the one the narrow pass was adjacent to. But, at this place in Nephite geography, the one sea whose primary direction was west also had an eastern extension. We will find a salt water || dry land || salt water topographic pattern [4](#) by the narrow pass. It sounds like a coastal sandbar fronting a salt water lagoon.

Teancum and his troops fought a battle, killed Morianton and repatriated the Nephite dissenters who followed him by the narrow pass in the 24th year of the reign of the judges, ca. 68 B.C. There must be land immediately adjacent to the narrow pass large enough for two armies [5](#) to engage in battle. We are not told the size of the armies. No adjectives such as "small" or "large" modify the singular noun "army." Based on our analysis of the term "small" in the article "[Narrow and Small Things](#)" we estimate an army to have been at minimum 3,000 troops. Our analysis of troop strengths elsewhere in the text (see the article "[Population Sizes and Casualty Counts](#)") reinforces this number as reasonable for the size of a militia from a newly-planted land (Morianton) on the Nephite settlement frontier ca. 68 B.C.

Two years after defeating Morianton by the narrow pass, Teancum received orders from his commanding officer, Captain Moroni, to militarily fortify the land Bountiful and secure the narrow pass [Alma 52:9](#) with a portion of his troops. The remainder of Teancum's forces and Teancum himself remained in the general vicinity of the city Bountiful on the extreme northern edge of the Nephite east coast. The term "fortify" is not a great deal of help. Six years earlier, Captain Moroni had his troops busily digging up "heaps" and "ridges" of earth around every city throughout "all the land" under Nephite control [Alma 50:1](#). Securing the narrow pass, though, gives us a quantifiable textual requirement to consider. The narrow pass had to be small enough that an army probably not exceeding 5,000 men [6](#) could prevent movement along it. The narrow pass was clearly a natural choke point in the terrain [7](#) because Lamanite control of this strategic west coast area would bottle up the Nephites and deny them access to their land northward escape route [Alma 52:9](#). It is important to note that at the precise time Teancum received these orders, the Lamanites already controlled most of the Nephite east coast from Moroni on the south to Mulek on the north.

Over 400 years later, ca. A.D. 360, Mormon was the supreme commander of Nephite military forces. He gathered much of the Nephite nation together in the area around the city Desolation [8](#) just north of the east-west Bountiful/Desolation line [Mormon 3:5](#) by the narrow pass. This means the area northward of the narrow pass opens up into an expanse

wide enough [9](#) to accommodate at minimum several hundred thousand people. This also means the area just north of the narrow pass had a high carrying capacity [10](#). In other words, enough food could be produced in this area to feed the large Nephite population gathered there.

We saw in Alma [50:34](#) and Alma [52:9](#) that when coming from the southward, the narrow pass led into the land northward. From Mormon's perspective already in the land northward, the narrow pass led into the land southward [Mormon 3:5](#). This means a portion of the narrow pass was northward of the east-west Bountiful/Desolation line and another portion was southward [11](#).

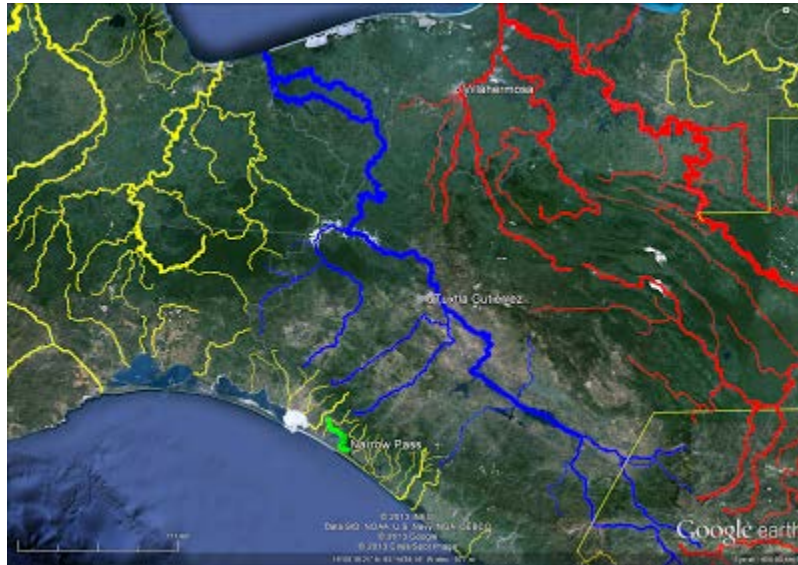
Mormon caused the Nephites to fortify their lands around the city Desolation against Lamanite invasion "with all our force" [Mormon 3:6](#). Mormon knew this was the Nephite's last real chance to hold sizable contiguous territory for a substantial period of time. The fortifications he directed were extraordinary [12](#). Captain Moroni, one of Mormon's heroes (see [Alma 48:17](#)), directed extensive fortification efforts using earth and stone [Alma 48:8](#) throughout the entire Nephite nation which ranged from the sea east to the sea west. Mormon's fortifications were more intensive in a limited area. Early in his career, Mormon had directed the fortifications around Angola that ultimately proved ineffective [Mormon 2:4](#). Late in his career, Mormon's military engineering was so effective that not only did the Nephites win two decisive battles around the city of Desolation [Mormon 3:7-8](#), they could have remained in and around their fortified city indefinitely [Mormon 4:4](#) had they not arrogantly gone on the offensive and mounted a disastrous invasion of Lamanite lands which decimated their ranks.

The Lamanites came down to the city of Desolation to battle their ancient foes [Mormon 3:7](#). This means the city of Desolation was lower in elevation [13](#) than the Lamanite homelands. The city of Desolation was on the seacoast [14](#) because after a battle large numbers of Lamanite dead were cast into the sea [Mormon 3:8](#).

The narrow pass crossed the Bountiful/Desolation border which was also the land southward/land northward border. "Bountiful" was a political entity in Nephite times, but the name also had ecological connotations. See the article "[Bountiful Context](#)" in this blog. We should find observable differences [15](#) between the lands Bountiful and Desolation that justify the ecological implications of the term "Bountiful."

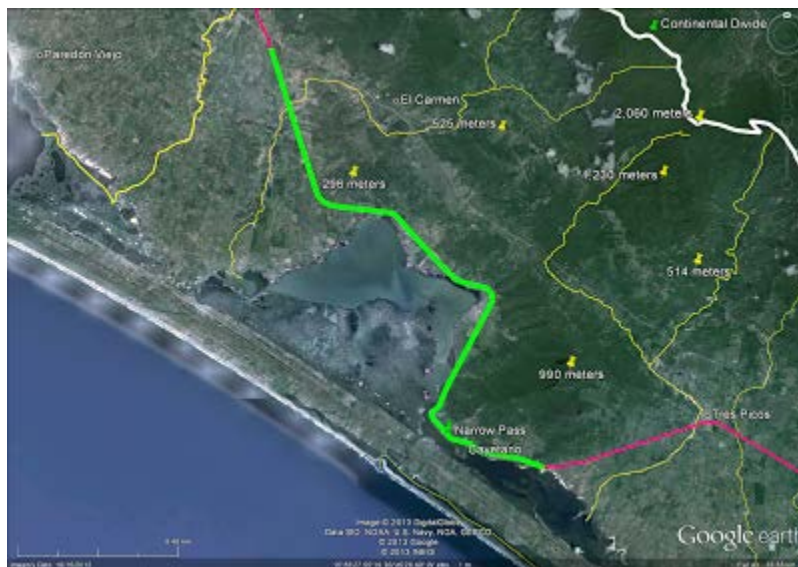
The narrow pass must be narrow [16](#). Anything over 5 kilometers wide would be inconsistent with Nephite usage of the term "narrow" as we found in the article "[Narrow and Small Things](#)."

Our candidate for the narrow pass is the route the Isthmian Railroad follows today as it winds around the southern flank of Cerro Bernal and the northern shore of Laguna de la Joya. This map shows our narrow pass in green in its Mesoamerican context. The Mezcalapa-Grijalva River in blue is shown as it flowed in early Nephite times (See the blog article "[Wandering River](#)").



Proposed Narrow Pass in Green on the Pacific Coast of Chiapas

This map shows a closeup of the narrow coastal plain between the mountains and the sea. The magenta line represents the modern railroad, with the section we are designating the narrow pass in green.



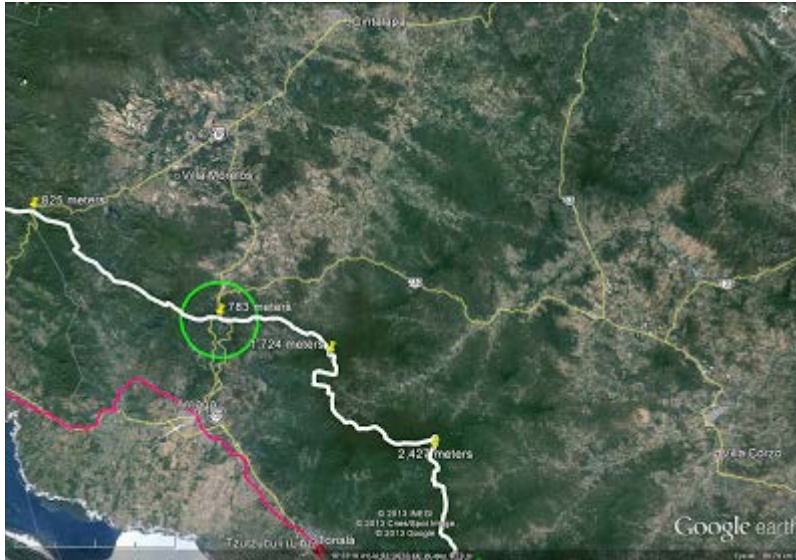
And this map shows the narrow pass in context with the other six geographic features (narrow (small) neck of land, Bountiful/Desolation line, city of Lib, Hagoth's port, place where the sea divides the land, and sea west) we discussed in the prior article "[The Narrow \(Small\) Neck of Land](#)." The white line is the continental divide running along the ridge line of the Sierra Madre Mountains. The blue line is a tributary of the Mezcalapa-Grijalva river, and the yellow lines are small rivers emptying into the Pacific Ocean. As before, the magenta line shows the route of the Trans Isthmian Railroad with the section we call the narrow pass shown in green.



Proposed Narrow Pass, Narrow Neck and Nearby Features

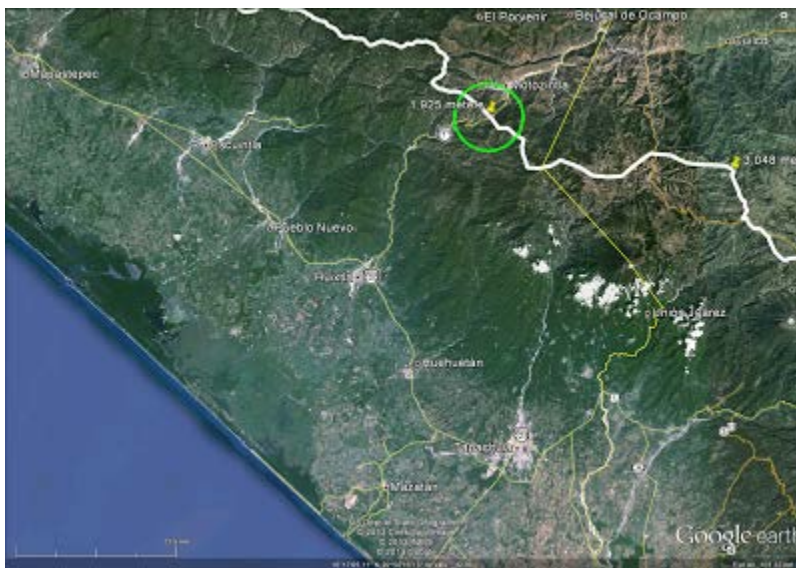
Let's see how our proposed narrow pass fits the sixteen textual requirements outlined above.

**1.** A number of minor trails are known from the Central Depression of Chiapas over the Sierra Madre down to the Chiapas coast, but there are two major routes that people used anciently and still use today. See Carlos Navarrete, "The Prehispanic System of Communications Between Chiapas and Tabasco" in Thomas A. Lee, Jr. and Carlos Navarrete, *Mesoamerican Communication Routes and Cultural Contacts, Papers of the New World Archaeological Foundation Number 40*, Provo: BYU [NWAFF](#), 1978. This map shows modern Mexican highways in yellow. The northward route into the Tonalá area comes from Cintalapa or Villa Corzo through a natural pass in the Sierra Madre Mountains (highlighted as a green circle) and into Arriaga before coming southward into Tonalá. The magenta line represents the Trans Isthmian Railroad.



Northward Pass Through the Sierra Madre Mountains into Arriaga

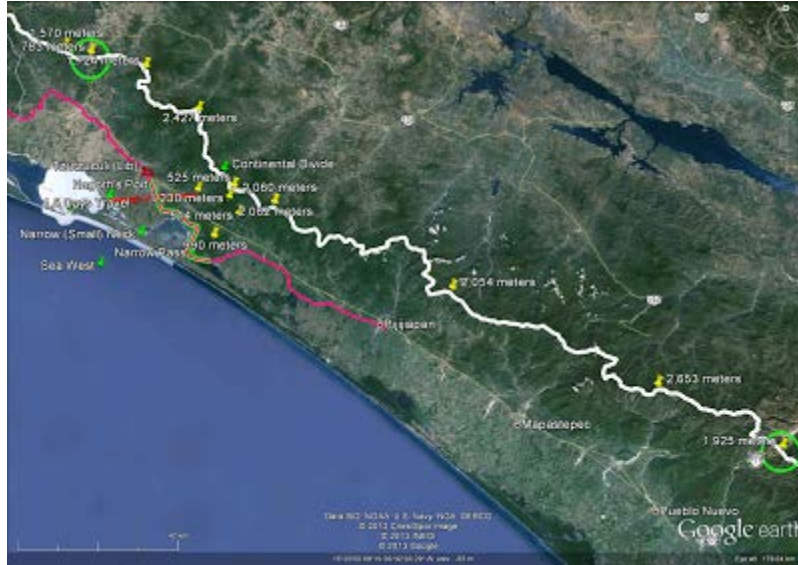
The southward route into Tonalá goes from Motozintla over a natural pass in the Sierra Madre Mountains (highlighted as a green circle) into Huixtla, and from there along the coastal route northward into Mapastepec and beyond.



Southward Pass Through the Sierra Madrea Mountains into Huixtla

This map shows the Narrow Pass area with the two major routes over the Sierra Madre Mountains highlighted as green circles.





Northward and Southward Routes into the Tonalá Area

We do find 2 logical travel routes into our proposed narrow pass, one coming in from the northward (Desolation) side and the other from the southward (Bountiful) side. Criterion 1 satisfied.

**2, 3.** Coming from the southward, our proposed narrow pass is 3.5 kilometers across the Barra San Marcos [our narrow (small) neck of land] from the open Pacific Ocean.



Proposed Narrow Pass by the Sea

It certainly does lead by the sea into the land northward (across the red Bountiful/Desolation line). Criteria 2 & 3 satisfied.

4. Now things get really interesting. At this precise point along the Chiapas coast, the topography deftly matches Mormon's description of a narrow pass by the sea on the west and also on the east. The Pacific Ocean is the sea on the west. The salt water Laguna de la Joya is a credible eastward extension of the west sea. On this map, we call it "Sea West East" which means that part of the sea west that lies east of the narrow neck of land.



Proposed Narrow Pass Leading by the Sea on the West and on the East

Our narrow pass clearly goes by the sea west, the Pacific Ocean, and then by the eastward extension of the sea west, the Laguna de la Joya. Criterion 4 satisfied.

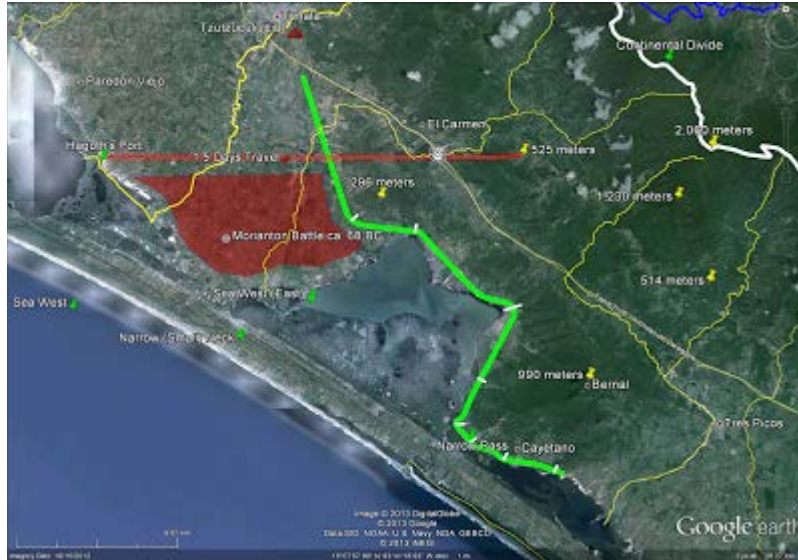
5. Just south of the Bountiful/Desolation line, there is an area west of our narrow pass large enough to have been the battlefield where Teancum slew Morianton. It is highlighted as a red-shaded polygon in the map below.



Proposed Teancum Morianton Battlefield

The red-shaded polygon covers 46 square kilometers, much more than enough territory for a battlefield accommodating 6,000 to 10,000 combatants. Criterion 5 satisfied. As a point of comparison, the 2010 Mexican census from [INEGI](#) reported the modern city of Tonala, shown on the map above, with a population of 35,322.

6. To determine the defensibility of our proposed narrow pass, we selected 8 points along it and set a .5 kilometer transect perpendicular to it at each point. Transects begin at the water's edge and run up the slope of Cerro Bernal. In one case, the transect is 1 kilometer in length because the Trans Isthmian Railroad is already .5 kilometers from the coastline. This map shows the 8 transects in white.



8 Transects Perpendicular to our Proposed Narrow Pass

Google Earth has a feature called "Elevation Profile" that graphs the elevation along a line. This is the elevation profile for Narrow Pass Transect #7. It shows a steep rise from near sea level to over 100 meters in elevation across the .5 kilometer length of the transect.



Elevation Profile, Narrow Pass Transect 7

We see very similar results on all 8 transects. Moving from southward to northward, maximum transect elevations are 109 meters, 127 meters, 171 meters, 87 meters, 127 meters, 50 meters (on the 1-kilometer-long transect), 107 meters, and 111 meters. We chose transect lengths of .5 kilometers (500 meters) because history shows that is a reasonable length for a defensive line protected by a small army of a few hundred men.

At each of our 8 sample points, attackers would have had a very small coastal plain to maneuver before encountering the steep, heavily forested slopes of Cerro Bernal where defenders would have held a significant uphill advantage.

The narrow coastal plain around Cerro Bernal is clearly a place where a Nephite army of fewer than 5,000 troops could have prevented large scale northward movement. Criterion 6 satisfied.

7. To show the dramatic terrain around our proposed narrow pass, we turn on shaded relief, resulting in this map.



Proposed Narrow Pass Area in Shaded Relief

Cerro Bernal is a spur of the Sierra Madre nearly 1,000 meters in elevation. It is the place along the entire Chiapas coast where the mountains come closest to the sea. This creates a natural choke point in the topography where movement northward or southward is channeled in three narrow travel corridors. The Trans Isthmian Railroad, a portion of which we have designated the narrow pass, follows the middle of these corridors. Criterion 7 satisfied.

8, 9. The following map shows our concept of the land Bountiful in green overlay and the land Desolation in brown overlay with the east west Bountiful/Desolation line in red between them.



Proposed City of Desolation Area North of the East West Bountiful/Desolation Line

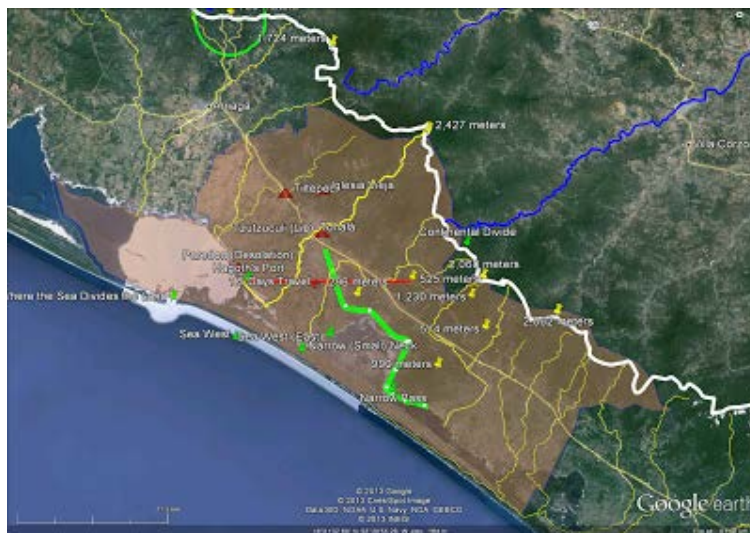
Two things are readily apparent on the map above. 1) A poorly studied ancient site known to archaeologists as Paredon lies on the coast of Mar Muerto just north of our Bountiful/Desolation line. Paredon could have been the city of Desolation. The surveyed ruins are engulfed by the modern city of Paredon which had a population of 6,126 in the 2010 Mexican Census. So, we find a candidate for the city of Desolation in the precise place where our model predicted it should be. 2) The coastal plain which is less than 1 kilometer wide along most of our narrow pass broadens out to 12 kilometers between the cities of Paredon and Tonalá as the yellow ruler on the map above indicates. Assuming that the greater city of Desolation area where Mormon concentrated the Nephites ran from our east west Bountiful/Desolation line to the Tiltepec River and was bounded on the west by the Mar Muerto and on the east by our proposed border of the land Desolation, the area would have looked like the yellow-shaded polygon on the map below.



Proposed Greater City of Desolation in Yellow

The area in yellow is 278 square kilometers. As a point of comparison, Washington D.C. has a surface area of 177 square kilometers. Is this Tonalá, Chiapas area large enough to have been the Nephite capital from ca. A.D. 360 to ca. A.D. 363? Yes. 278 square kilometers should have been adequate space for the events being described in Mormon chapters 3 & 4. Criteria 8 & 9 satisfied.

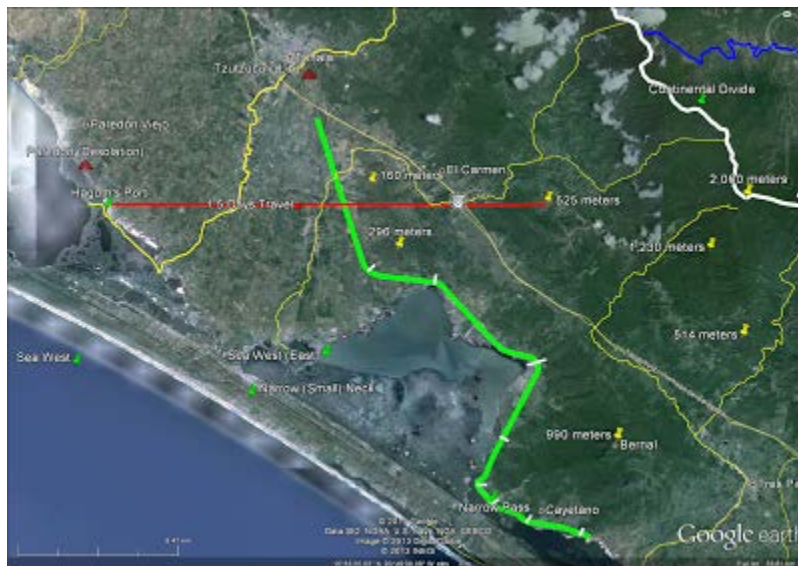
10. The Mexican government uses the 2,348 municipios in the country as primary units for statistical reporting and analysis. The municipio of Tonalá is shown in the map below.



Municipio of Tonalá, Chiapas, Mexico

Among the 122 municipios in the state of Chiapas, Tonalá is the leading producer of fish and shrimp. The large Mar Muerto is one of the most productive fisheries in all of Mexico, and the city of Paredón is the leading fishing port on the Mar Muerto coast. Tonalá also exports large quantities of beef. It is the third most important cattle ranching area in Chiapas. Other important agricultural exports include corn and mangoes. See production statistics published by [SAGARPA](#), Secretaria de Agricultura, Ganaderia, Desarrollo Rural, Pesca y Alimentacion. As a large net exporter of foodstuffs, the Tonalá area has a high carrying capacity. Criterion 10 satisfied.

**11.** As the map below shows, the Cerro Bernal mountain spur extends north westerly beyond our Bountiful/Desolation line shown in red. This means our narrow pass, shown in green, crosses over the land southward/land northward border and can properly be described as leading into the land southward when one is coming from a northward direction, or leading into the land northward when one is coming from a southward direction.



Proposed Narrow Pass Northward and Southward  
of the Bountiful/Desolation Line

Criterion 11 satisfied.

**12.** If we have sited the city and land Desolation in the right place, we should find evidence of unusually effective fortifications in use anciently, and we do. The area around Tonalá has archaeological sites described as "megalithic" or in other words, built of very large stone blocks. And the type of stone being used? Granite with a hardness of 6 on the mohs scale. The Tonalá area is unique in all Mesoamerica in its use of megalithic



architectural granite. Some of the granite blocks are 3 meters long and weigh more than a ton. This is a geologic surface map of Mexico published in 1992 by the Instituto de Geologia de la [UNAM](#) showing where the granite came from.



Granite Outcroppings in the Tonalá, Chiapas Area

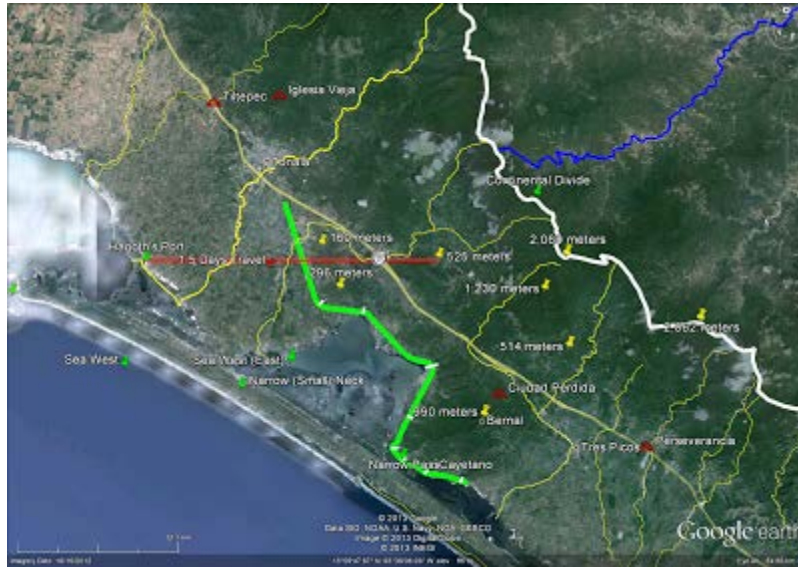
The red oval on the map above highlights the location of the kind of granite used anciently as building material. The stone came from the Cerro Bernal and a small area immediately north of the modern city of Tonalá. This particular type of architectural grade granite is quite rare in Mexico, but abundant in the precise location we have identified as the narrow neck of land - narrow pass area.

In 2007, [INAH](#) began a major excavation project at the large site of Iglesia Vieja 4 kilometers north of the city of Tonalá. The lead investigator is Akira Kaneko. An accessible early field report is Akira Kaneko, "[Investigacion Arqueologica en la Region Tonalá de la Costa del Pacifico de Chiapas](#)" in J. P. Laporte, B. Arroyo and H. Mejia, *XXII Simposio de Investigaciones Arqueologicas en Guatemala, 2008*, Guatemala City: Museo Nacional de Arqueologia y Etnologia, 2009. Some items of interest to Book of Mormon students from the Kaneko report:

- Tzutzuculi was an Olmec site that flourished from ca. 1,000 B.C. to ca. 400 B.C. Originally it had more than 14 major mounds. 11 large sculptures have been discovered to date, including a stone head .91 meters high. No megalithic architecture is known from this site.
- Tiltepec was an Olmec site that flourished from the middle preclassic to the late preclassic, ca. 950 B.C. to ca. 400 B.C. More than 60 mounds have been reported, as well as 36 sculpted monuments carved from granite.

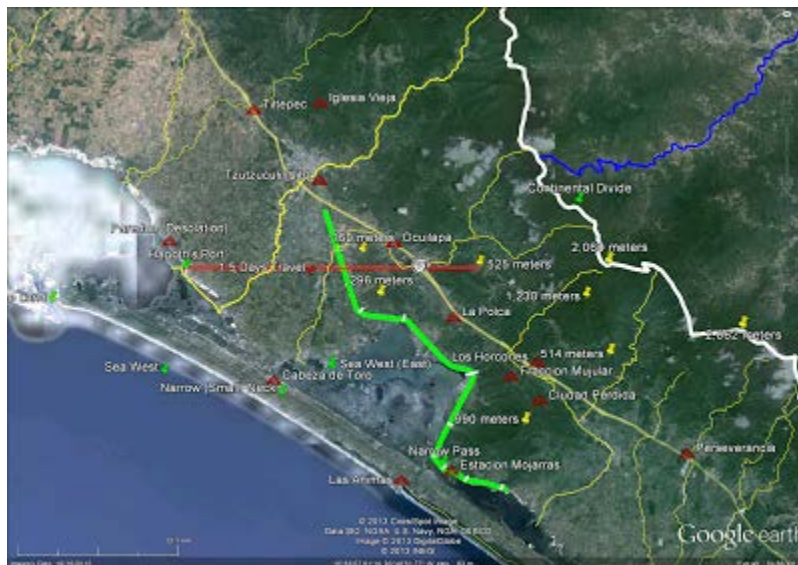
- La Perseverancia was a large site that flourished from ca. 400 B.C. to ca. A.D. 200. It is similar in many ways to Izapa and Takalik Abaj, but without any known stone sculpture. This site used large granite blocks for structural cornerstones and stairways.
- Iglesia Vieja consists of 80 structures in 5 architectural groups covering 60 hectares. Structures are built on natural hills. Some structures are surrounded by walls. Megalithic granite is used throughout. The large blocks are joined without mortar. Radio carbon dates from this site range from A.D. 242 to A.D. 385.
- The site of Ciudad Perdida on Cerro Bernal had close ties with Iglesia Vieja. It was also built with metalithic granite throughout. It is located strategically on the narrowest part of the Chiapas coast to control movement along the coastal travel route.
- The site of Los Horcones sits beside Cerro Bernal. It had more than 100 structures oriented north - south. 4 stelae, carved from granite, are known. Most archaeologists believe Los Horcones was a trading center and one of its main functions was to control the travel route between Teotihuacan (near Mexico City) and Kaminaljuyu (Guatemala City).
- Over 20 ancient sites are known in the Tonalá area. The earliest sites were located by rivers in the typical Olmec and Mesoamerican pattern. Later sites from the late preclassic and early classic (ca. A.D. 200 to A.D. 400) were built atop natural hills to maximize defensive potential. The later sites also made more extensive use of megalithic granite. Many sites are clearly located to control transit routes along the Chiapas coast. This part of the Chiapas coast was strategically located on a natural transportation corridor.
- The human effort required to construct large sites with heavy granite blocks was enormous. This area is blessed with a natural environment that provided enough food to sustain large populations, freeing up labor for massive public works.

This map shows the 4 sites studied to date that were built with megalithic granite architecture.



4 Ancient Megalithic Granite Architecture Sites

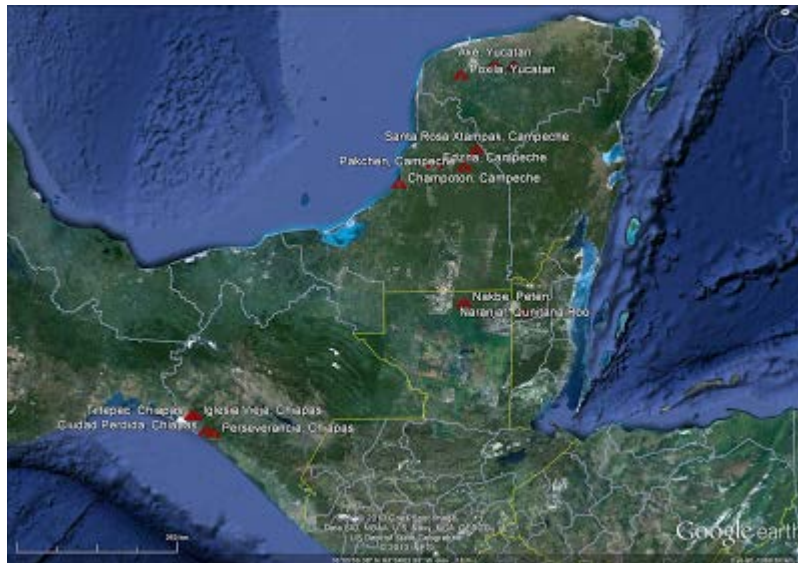
And this map shows 13 of the 20+ archaeological sites currently known to science in the Municipio of Tonalá, Chiapas.



13 Known Archaeological Sites in and around Tonalá

So, unique in all Mesoamerica, we do find extraordinary defensive fortifications made of granite sitting atop natural hills in the precise area where we have sited the narrow neck of land and the narrow pass. Criterion 12 satisfied.

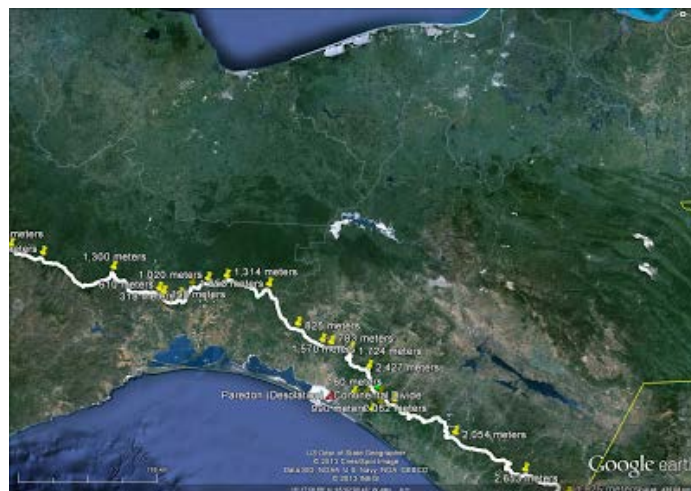
Megalithic architecture has been reported at a number of Maya sites. This map shows Kaneko's list of known sites built with very large stone blocks.



### Megalithic Architecture in Mesoamerica

The Maya sites all used some form of limestone which averages a hardness of 3 on the mohs scale. The granite used in the Tonalá sites was orders of magnitude more difficult to work, but also much more effective as a defensive building material.

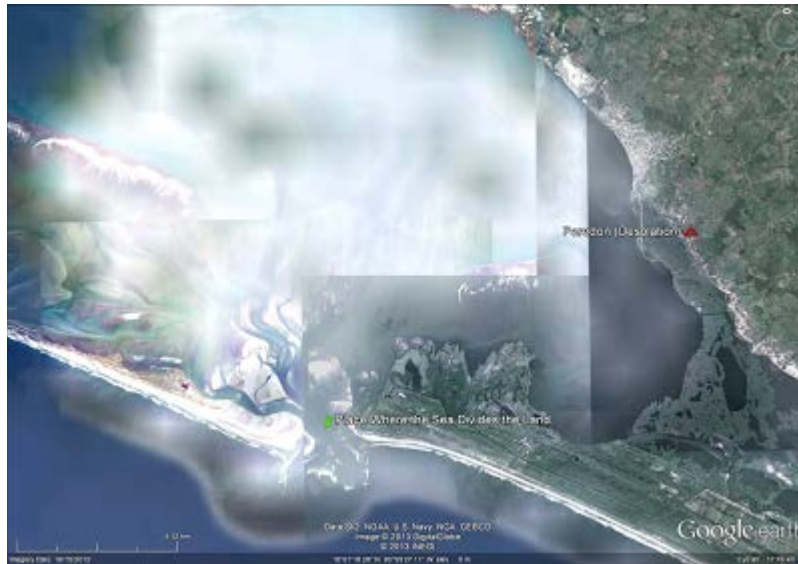
**13.** Our candidate for the city of Desolation, Paredon, is essentially at sea level on the coast of the large Mar Muerto. Practically anywhere the Lamanites would have come from would have been up in elevation relative to Paredon.



Paredon, Chiapas Surrounded by the Sierra Madre Mountains

This topography precisely fits the text. The Lamanites would have come down to battle the Nephites in their city Desolation by the sea. Criterion 13 satisfied.

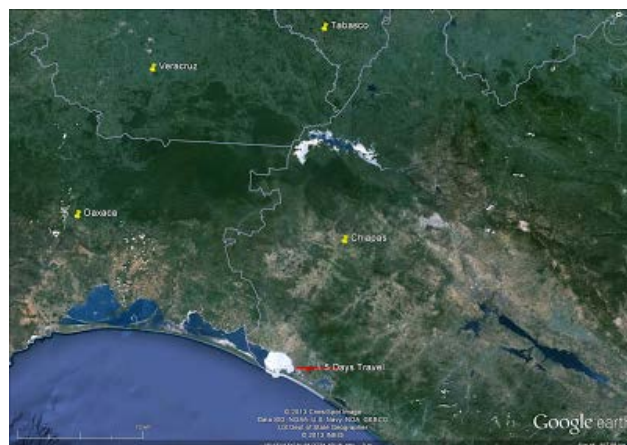
14. Zooming in on our candidate city of Desolation, Paredon, we see that it is indeed on the seacoast of the large Mar Muerto lagoon that opens to the Pacific Ocean.



The Ancient Site of Paredon by the Sea

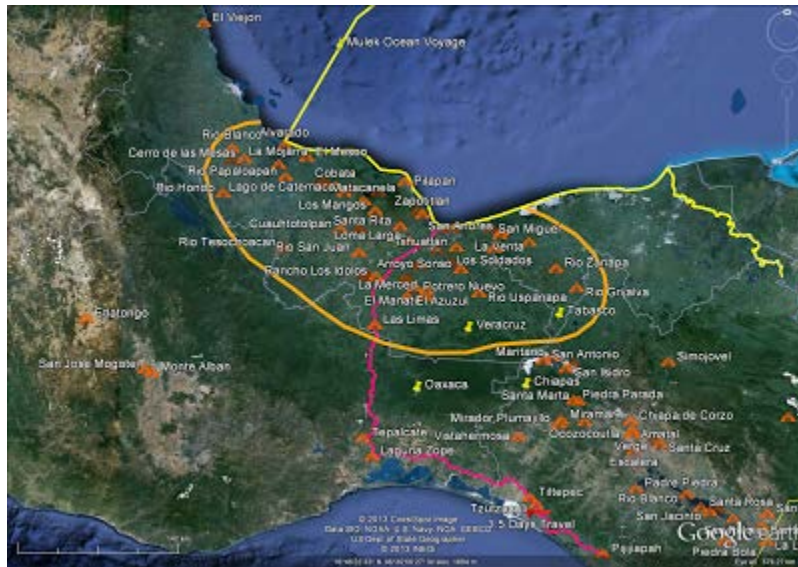
Criterion 14 satisfied.

15. Our proposed boundary between the lands of Bountiful and Desolation is very near the political border between the modern Mexican states of Chiapas to the southward and Oaxaca to the northward. The east west Bountiful/Desolation line is shown in red on the map below.



Bountiful/Desolation Line near the Chiapas/Oaxaca Border

Part of the meaning of "Desolation" in Nephite parlance was cultural, derived from the presence of Jaredite ruins in the land [Alma 22:30](#). This is a map of known Olmec and Olmec-influenced sites northward from our Bountiful/Desolation line in red.



Bountiful/Desolation Line Relative to the Olmec Heartland

The orange line surrounds Olmec heartland sites in southern Veracruz and western Tabasco. The magenta line represents the Trans Isthmian Railroad that follows the ancient communication route between the Chiapas coast and the Gulf of Mexico. The yellow line is our representation of the route Mulek and his colony took landing first in the Papaloapan River Basin, coasting by the Coatzacoalcos and Mezcalapa-Grijalva River Basins and finally settling in the Usumacinta River Basin. Northward from our Bountiful/Desolation line in red, the ancient route to the Veracruz coast passed by the Olmec sites Tzutzuculi, Tiltepec, Laguna Zope, and Tepalcate before crossing the center of the Isthmus of Tehuantepec and entering the Olmec heartland via the site of Las Limas. This direct connection between the Tzutzuculi/Tiltepec area and the Olmec heartland supports our use of the term "Desolation" near Tonalá.

Another part of the meaning of "Desolation" in Nephite usage was ecological. Desolation had far fewer trees than Bountiful [Helaman 3:6-7](#), [Helaman 3:9](#). This map based on satellite imagery from [NASA](#) shows land cover with denser vegetation darker shades of green.



NASA Land Cover Classification

The red line is our east west Bountiful/Desolation line referenced in [Alma 22:32](#). The yellow line is our proposed boundary between the entire lands of Bountiful and Desolation. It is clear that vegetation is much denser on the Bountiful side of the border.

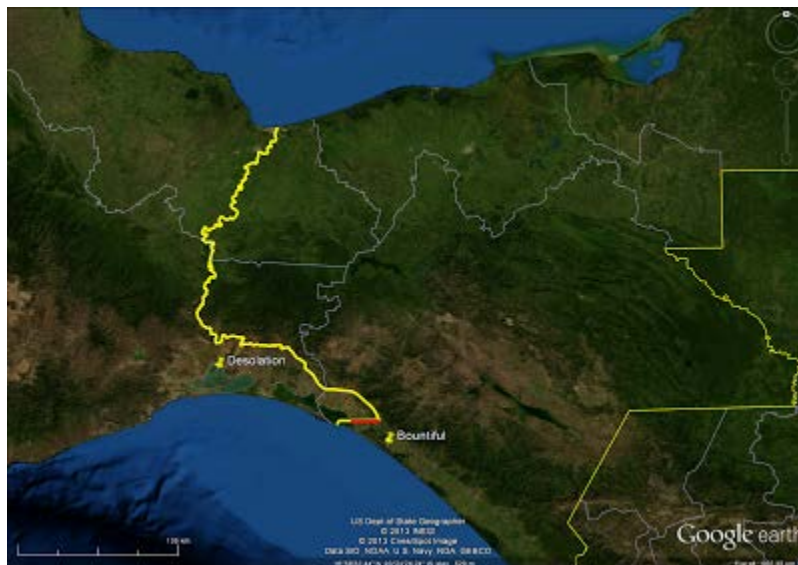
Satellite imagery also has the ability to map forest canopy heights. In this map from [NASA](#), darker green means taller trees.



NASA Forest Canopy Heights

It is obvious that there are more trees and taller trees on the Bountiful side of the border.

This image is from [NASA](#)'s famed Blue Marble series. It shows our area of interest in the dry season.



NASA Blue Marble Image - Dry Season

Clearly, the earth is much greener on the Bountiful side of the border.

This map from [INEGI](#) shows areas of dense vegetation.

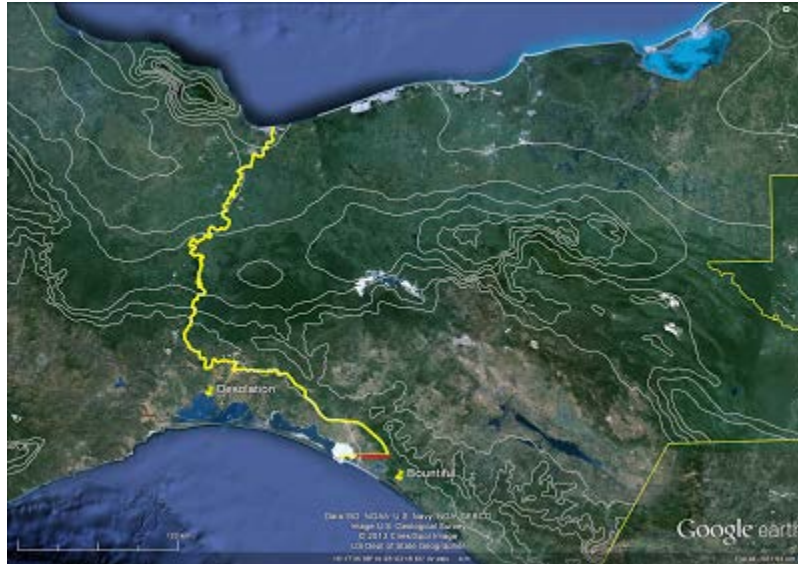


Areas of Dense Vegetation per INEGI

Desolation has fewer areas of dense vegetation than Bountiful.



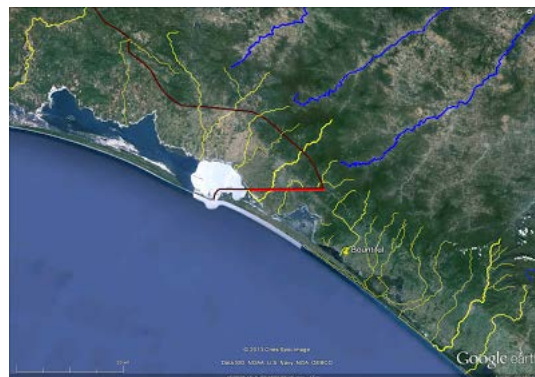
This is a map from [INEGI](#) showing average annual precipitation. We are only showing isobars for those areas that receive more than 1,500 millimeters of precipitation each year.



Areas Receiving more than 1,500 Millimeters of Average Annual Precipitation per INEGI

In the southern part of the Isthmus of Tehuantepec, our Bountiful/Desolation border is a pretty stark line. All points immediately on the Bountiful side of the boundary receive at least 1,500 millimeters of precipitation annually. Almost all points immediately on the Desolation side of the border are drier.

Rainfall is reflected in stream flow. This map shows rivers and streams emptying into the Pacific in yellow. Tributaries of the Mezcalapa-Grijalva are show in blue. Our east west Bountiful/Desolation line is in red, and our proposed boundary between the entire lands of Bountiful and Desolation is in brown.

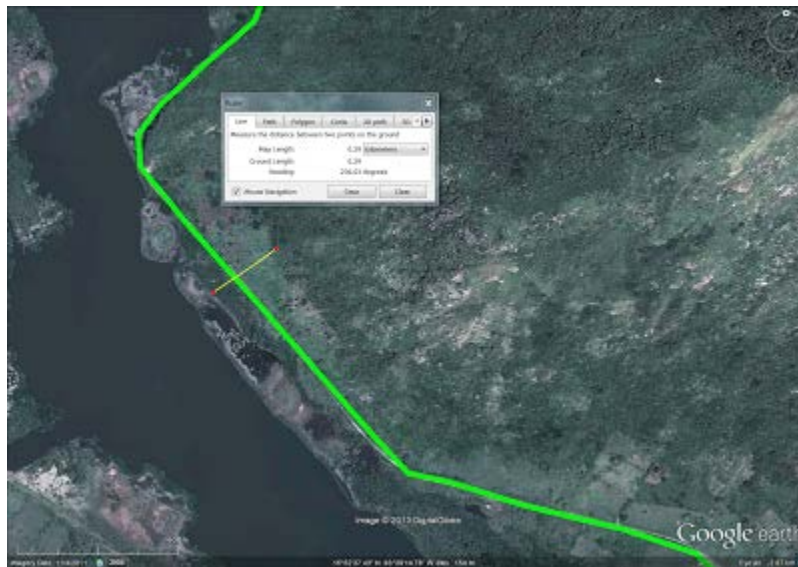


Streams Emptying into the Pacific

As you move northward across the east west Bountiful/Desolation line and travel across our land Desolation, the streams become fewer and further between.

The Bountiful/Desolation line which is also the land southward/land northward line clearly separates areas that differ politically, culturally (in antiquity) and ecologically. In general, the area we have called "Bountiful" has denser vegetation, more and taller trees, higher rainfall and more flowing streams than the area we have called "Desolation." There is ample justification for the ecological implications of our use of the term "Bountiful." Criterion 15 satisfied.

**16.** Our proposed narrow pass truly is narrow according to the Nephite sense of that term. Here is a close-up of our narrow pass skirting around the south western edge of Cerro Bernal.



Proposed Narrow Pass around Cerro Bernal

At the point indicated by the yellow ruler in the image above, the coastal plain flanking Cerro Bernal is .29 kilometers wide. This is narrow enough to fit the definition we have established based on Nephite usage of the term. Criterion 16 satisfied.

Our candidate for the narrow pass, the route of the Trans Isthmian Railroad around Cerro Bernal and Laguna de la Joya, is a decidedly good fit to the text. It comfortably meets all 16 criteria we developed through careful reading.

A single verse, [Mormon 2:29](#), refers to a geographic feature called the narrow passage which led into the land southward. The context was ca. A.D. 350 when the Nephites negotiated a treaty with the Lamanites and Gadianon Robbers. The Nephites got the

entire land northward, their enemies the entire land southward. There are 3 reasons we believe the narrow passage was in the same locality as the narrow (small) neck of land and the narrow pass:

- The language Mormon used to describe the narrow passage (which led into the land southward) is identical to his description of both the narrow (small) neck of land (which led into the land northward) [Alma 63:5](#) and the narrow pass (which led into the land southward) [Mormon 3:5](#).
- The narrow passage was clearly at the border between the lands northward and southward. All other references in the text to this border can be shown in context to refer to the area near the narrow (small) neck of land and the narrow pass.
- Events in the text after A.D. 350 ([Mormon 3:5](#)) show that the Nephites were in the area near the narrow (small) neck of land and the narrow pass.

This means there were 3 different land routes to move between the lands northward and southward:

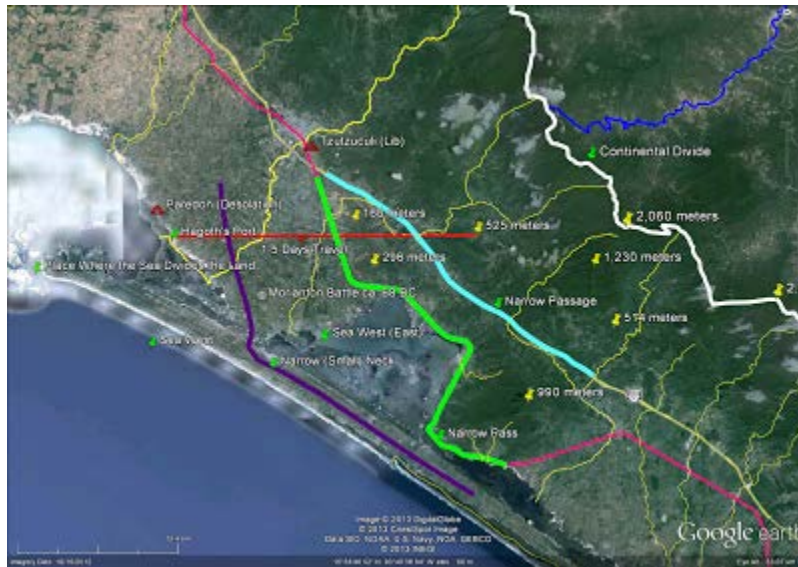
- via the narrow (small) neck of land
- via the narrow pass
- via the narrow passage

Our candidate for the narrow passage is the route followed by Mexican Federal Highway 200 as it passes between Cerro Bernal and the Sierra Madre Mountains. This map shows our proposal as an aqua colored line.



Proposed Narrow Passage in Aqua

This map shows the 3 different land routes to move between the lands northward and southward. The narrow (small) neck of land route is shown in purple, the narrow pass route in green, and the narrow passage route in aqua.



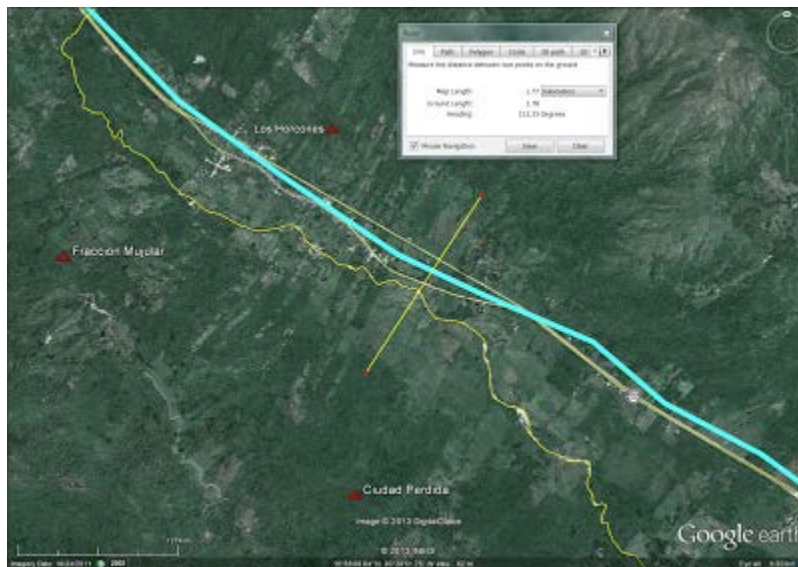
3 Routes Across the Bountiful/Desolation Line

The known archaeological sites in the Municipio of Tonalá, Chiapas correlate remarkably well with the 3 land routes we have identified. Cabeza de Toro and Las Animas are on Barra San Marcos which we correlate with the narrow (small) neck of land. Estacion Mojarras guards our narrow pass. And, Ocuilapa, La Polca and Los Horcones all straddle our proposed narrow passage. Fraccion Mujular and Ciudad Perdida overlook our narrow passage from the heights of Cerro Bernal, while Perseverancia is just down the road following the same trajectory. So, the locations of the ancient sites in the area support our 3 proposed travel routes through the constricted Cerro Bernal area.



Ancient Sites Correlated with our 3 Routes across the Bountiful/Desolation Line

One final question: Is the proposed narrow passage truly narrow? This is a closeup of the area around the site of Los Horcones.



Proposed Narrow Passage near the Site of Los Horcones

As the yellow ruler on the map above indicates, our narrow passage at this point measures 1.77 kilometers from mountain to mountain. Our analysis (see the article "[Narrow and Small Things](#)") suggests that a topographic feature less than 5 kilometers wide could reasonably be considered "narrow" according to Nephite usage. Our narrow passage candidate easily qualifies. An archaeologist who recently worked in this area, Claudia Garcia-Des Lauriers, called the passage a "narrow natural corridor" Claudia Garcia-Des Lauriers, "[The Early Classic Obsidian Trade at Los Horcones, Chiapas, Mexico](#)," [FAMSI](#): 2008.

One final feature will complete our map of the narrow (small) neck of land, narrow pass area. [Helaman 4:7](#) describes a fortified east west defensive line that lay entirely within the land of Bountiful on the west coast. It had the familiar trappings of military defenders trying to keep the Lamanites from invading the land northward. Our candidate for this fortified line is shown in red on the map below, beginning at the modern town of La Polka on the shores of Laguna de la Joya, passing through the site of Los Horcones, and terminating at an elevation of 514 meters in the Sierra Madre.



Proposed East West Bountiful Defensive Line with Ruler

These are the 3 textual requirements for this fortified line (in aqua) we have gleaned from our reading:

1. There was a land near the land Bountiful southward from Bountiful [Helaman 4:5](#).
2. The defensive line began at the west sea and terminated at an unspecified location to the east [Helaman 4:7](#).
3. The line was approximately 15 straight line kilometers long based on the standard Nephite unit of measure "a day's journey" discussed in the article "[Land Southward Travel Times](#)."

1. In the map above, the land Desolation is represented with a brown overlay. The land Bountiful is represented with a green overlay. The land which was near the land Bountiful is represented with a blue overlay. The land of Joshua mentioned in [Mormon 2:6](#) may be a later appellation for this same land. There is a plausible space southward from our land Bountiful that could have been the land which was near the land Bountiful. Criterion 1 satisfied.

2. In the map above, the east west Bountiful defensive line begins at the salt water Laguna de la Joya which is an eastward extension of the Pacific Ocean. It runs east, up the slopes of the Sierra Madre Mountains. This feature is very similar to the east west Bountiful/Desolation line that figures so prominently in our discussion of the narrow (small) neck of land, narrow pass area. Our Bountiful/Desolation line begins at the Mar

Muerto and terminates at an elevation of 525 meters. Our Bountiful defensive line begins at the Laguna de la Joya and terminates at an elevation of 514 meters. Criterion 2 satisfied.

3. The ruler placed on the map above shows the length of our Bountiful defensive line as 15 straight line (air) kilometers. Criterion 3 satisfied.

Have any ancient fortifications been discovered along our proposed Bountiful defensive line? F. Richard (Ric) Hauck has reported fortification walls at the site of Los Horcones (Joe V. Andersen, personal communication). The megalithic architecture at the site of Ciudad Perdida was defensive in nature. This poorly studied hilltop fort overlooked the natural travel corridor we have identified as the Book of Mormon's narrow passage. See Akira Kaneko, "Investigacion Arqueologica en la Region Tonala de la Costa del Pacifico de Chiapas" in J. P. Laporte, B. Arroyo and H. Mejia, *XXII Simposio de Investigaciones Arqueologicas en Guatemala, 2008*, Guatemala City: Museo Nacional de Arqueologia y Etnologia, 2009.

So, our proposed east west Bountiful defensive line is a good fit to the text with 3 of 3 criteria correlating well.

We end up with a map that includes these 15 features from Nephite geography:

- Bountiful defensive line (1 day's journey) [Helaman 4:7](#) (red line running east from the modern town of La Polka on the shores of Laguna de la Joya)
- Bountiful/Desolation line (1.5 day's journey) [Alma 22:32](#), [3 Nephi 3:23](#) (red line running east from a point south of the modern city of Paredon on the shores of Mar Muerto)
- city of Desolation [Mormon 3:5-7](#) (ancient site of Paredon)
- city of Lib [Ether 10:19-20](#) (ancient site of Tzutzuculi)
- Hagoth's port [Alma 63:5](#) (Mar Muerto coast south of the modern city of Paredon)
- land Bountiful [Alma 63:5](#) (green overlay, political but also ecological entity)
- land Desolation [Alma 63:5](#) (brown overlay, political entity with ancient cultural, ecological implications)
- land which was near the land Bountiful [Helaman 4:5](#) (blue overlay)
- narrow (small) neck of land [Alma 22:32](#), [Alma 63:5](#), [Ether 10:20](#) (purple path runs through it into the land northward)

