# A New Perspective on United States Geography: The Closest Locations to the Most States

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**Abstract**

State boundaries in the United States reflect natural, historical and political considerations. There are many ways in which to study the resulting geography. In this work we offer a new perspective in finding the locations in the U.S. that are closest to the most states. The most well known of these locations is in the Southwest where Arizona, Colorado, New Mexico and Utah are a radius of zero distance from the "Four Corners" point where these states come together. The closest locations to larger numbers of states are within a non-zero distance to the given number of states. These locations reflect state sizes, shapes and the proximity of states to each other.

The motivation for this work is twofold. First, it is interesting to examine a previously-unexplored perspective on U.S. geography. Second, it is important to understand the locations that are relatively close to more states as the population of these locations are more likely to be aware of and be influenced by what happens in those states.

Among the results, we find this closest location (with a non-zero distance) to be spread among 15 states for different numbers of states. We also find that as the number of states grows in size, the set of states in the group is not a strict superset of the smaller group size with the state of Maine, in one corner of the U.S., being added and dropped as the group size changes. We find the closest locations transition from the Southwest (for the smallest number of states), to the East Coast, to the Ohio River region, to the Midwest and end in the West (for all 50 states).

In comparison with the geographic center based on area, our work also provides another approach for determining the "center" of the United States. We find the location closest to all 48 contiguous states is near Lohrville, Iowa, which is 265 miles from the geographic center of area near Lebanon, Kansas. Similarly, the location closest to all 50 states is near Adin, California, which is close to 900 miles from the geographic center of area near Belle Fourche, South Dakota.

*The image on the cover page of this report is a wooden map of the United States that hangs on my office wall. It was made by my father, Carl Wills, as a gift to recognize my love of maps. It is a special gift from a special man. There is no better way to illustrate a report on the geography of U.S. states.*

# 1 Introduction

State boundaries in the United States reflect natural, historical and political considerations. There are many ways in which to study the resulting geography. In this work we offer a new perspective in finding the locations in the U.S. that are closest to the most states. The most well known of these locations is in the Southwest where Arizona, Colorado, New Mexico and Utah are a radius of zero distance from the "Four Corners" point where these states come together. The closest locations to larger numbers of states are within a non-zero distance to the given number of states. These locations reflect state sizes, shapes and the proximity of states to each other.

The motivation for this work is twofold. First, it is interesting to examine a previously-unexplored perspective on U.S. geography. Second, it is important to understand the locations that are relatively close to more states as the population of these locations are more likely to be aware of and be influenced by what happens in those states.

# 2 Methodology

We use online mapping software to explore potentially closest locations and determine the distance to constituent states within a group. We primarily used tools available at `https://www.freemaptools.com/,` which allow us to measure distance between two points and draw a fixed size radius around a point on a map. These tools are built on the Google Maps platform.

The goal is straightforward—for a given number of states find the location with shortest distance to that number of states. This goal is accomplished by experimenting with different locations and radii. We also employ the intersection of circles from points on state boundaries to be considered for inclusion.

# 3 Results

We present results based on the number of states beginning with the closest locations to the smallest number of states up to the closest location to all 50 states. We conclude with additional results drawn from our findings.

## 3.1 Closest Locations for Groups of 1 to 5 States

All locations in the U.S. are within one state and all locations on a boundary between two states have a zero distance to those two states. All states except Alaska and Hawaii have such a boundary. Beginning with group sizes of at least three states, there are distinct locations and distances that exist on a U.S. map. There are a number of locations in the U.S. where the boundaries of three states come together. For example, the portion of the U.S. map in Figure 1 contains a point (not explicitly marked) at the boundary intersection of Colorado, New Mexico and Oklahoma. As indicated in Table 1, this is one of 60 such locations in the U.S. where the location is a distance of zero from three states. All but three states (Alaska, Hawaii and Maine) are part of at least one of these 60 locations. In general, the number of such locations for a state is the same or one less than the number of bordering states depending on whether the state is an interior state within or an exterior state on the perimeter of the country. Missouri and Tennessee each have the most bordering states at eight and each are part of the most locations (eight) where three state boundaries come together.

Table 1 (postal codes are used to identify states in this and subsequent tables) and Figure 1 show that there is only one location in the U.S. where the boundaries of four states come together. This point is the Four Corners area where the states of Arizona, Colorado, New Mexico and Utah meet. It is denoted by the symbol in Figure 1.

The problem of identifying the location closest to the most states starts to become interesting when considering a group of five states. As shown in Table 1 and Figure 1, this location (again marked by the symbol) is near Boise City in the panhandle of Oklahoma. At this location the states of Colorado, Kansas, New Mexico, Oklahoma and Texas can each be reached within a distance of 27 miles. The circle in Figure 1 is centered at this location with a radius of this distance. As comparison, we note that the next smallest distance is 30 miles centered in Barre, Massachusetts, which includes the five states of Connecticut, Massachusetts, New Hampshire, Rhode Island and Vermont. Despite smaller states in New England, the distinctive geography of Oklahoma allows a location in its panhandle to be the shortest distance to a group of five states.

Table 1: Closest Locations for Groups of 1 to 5 States

| # of States | Closest Location | Distance (Miles) | Set of States |
|---|---|---|---|
| 1 | all locations | 0 | includes 50 states |
| 2 | all border locations | 0 | includes 48 states (except AK, HI) |
| 3 | 60 3-way border locations | 0 | includes 47 states (except AK, HI, ME) |
| 4 | Four Corners, AZ/CO/NM/UT | 0 | AZ, CO, NM, OK |
| 5 | Boise City, OK | 27 | CO, KS, NM, OK, TX |

Figure 1: Closest Locations for Groups of 4 and 5 States

## 3.2    Closest Locations for Groups of 6 to 9 States

Table 2 and Figure 2 show the locations with the shortest distance for groups of six to nine states. In these cases, the relatively small states in New England and the Northeast result in each of these locations being in this area of the country. West Springfield, MA is the location that is the shortest distance of 43 miles to six states, which includes five of the New England states (all but Maine) and New York. The location closest to the six New England states is in Dunstable, MA at a distance of 47 miles.

Increasing the number of states to seven results in a location near Dublin, NH being within 64 miles of the previous six states as well as Maine. The notation in Table 2 shows that Maine is added to the previous set of six states to make up the group of seven.

The resulting location for a group of eight states is interesting in that Cornwall, CT is obtained by adding both New Jersey and Pennsylvania to the previous set while subtracting Maine. Retaining Maine and adding New Jersey to the set for seven states results in a location of Hamden, MA and a distance of 108 miles. Finally, Maine is added back into the set for a group of nine states with the resulting closest location being in Westhampton, MA where all states are within a distance of 117 miles.

Table 2: Closest Locations for Groups of 6 to 9 States

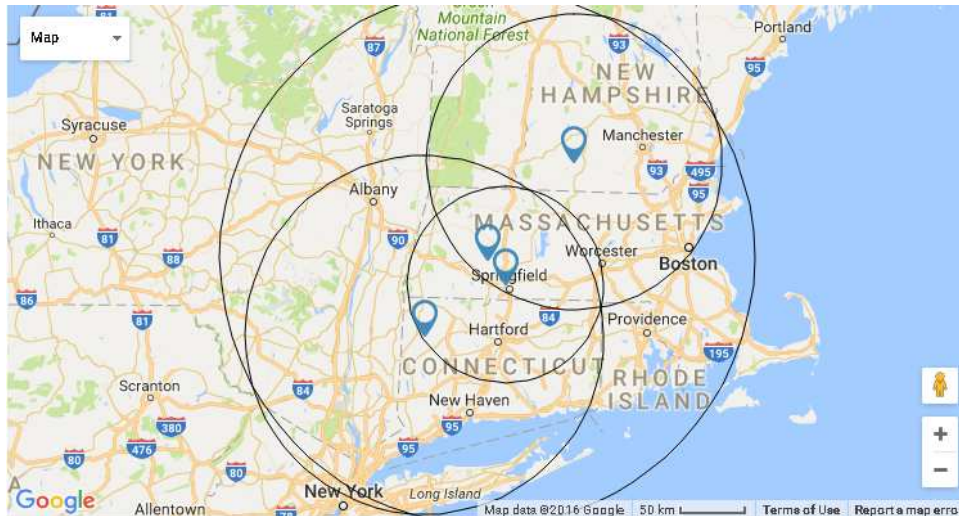| # of States | Closest Location | Distance (Miles) | Set of States |
|---|---|---|---|
| 6 | West Springfield, MA | 43 | CT, MA, NH, NY, RI, VT |
| 7 | Dublin, NH | 64 | +ME |
| 8 | Cornwall, CT | 79 | +NJ, +PA, -ME |
| 9 | Westhampton, MA | 117 | +ME |



Figure 2: Closest Locations for Groups of 6 to 9 States

## 3.3 Closest Locations for Groups of 10 to 12 States

Table 3 and Figure 3 show the closest locations as the required number of states grows. As was the case for a group of eight states, the closest location for ten states is obtained by dropping Maine and adding in Delaware and Maryland. Maine is then added back into the group for 11 states, but again dropped from the set for 12 states with Virginia and West Virginia being added. The result is that Hope, NJ is the closest location to 12 states with all of them being within a distance of 179 miles.

Table 3: Closest Locations for Groups of 10 to 12 States

| # of States | Closest Location | Distance (Miles) | Set of States |
|---|---|---|---|
| 10 | Southfields, NY | 135 | +DE, +MD, -ME |
| 11 | Brookfield, CT | 175 | +ME |
| 12 | Hope, NJ | 179 | +VA, +WV, -ME |



Figure 3: Closest Locations for Groups of 10 to 12 States

## 3.4 Closest Locations for Groups of 13 to 23 States

Table 4 and Figure 4 show the closest locations for group sizes of 13 to 23 states. Results for only the most notable numbers of states are shown.

Results in the table and figure show a marked change from smaller group sizes. Rather than simply making incremental changes to the group of 12 shown in Table 3, the results for a group of 13 include almost a completely new set of states with only one overlap (Virginia) from the group of 12. The location of Hartsville, TN is located within a distance of 200 miles from the 13 states of Alabama, Arkansas, Georgia, Illinois, Indiana, Kentucky, Missouri, Mississippi, North Carolina, Ohio, South Carolina, Tennessee and Virginia. As comparison, simply adding Maine to the previous group of 12 states results in a closest distance of 220 miles located in Tuxedo, NY.

Each subsequent result in Table 4 and Figure 4 builds on the previous set of states with the closest location moving north and east in the Ohio River region as the number of states grows and states in those directions are added into the groups.

Table 4: Closest Locations for Groups of 13 to 23 States

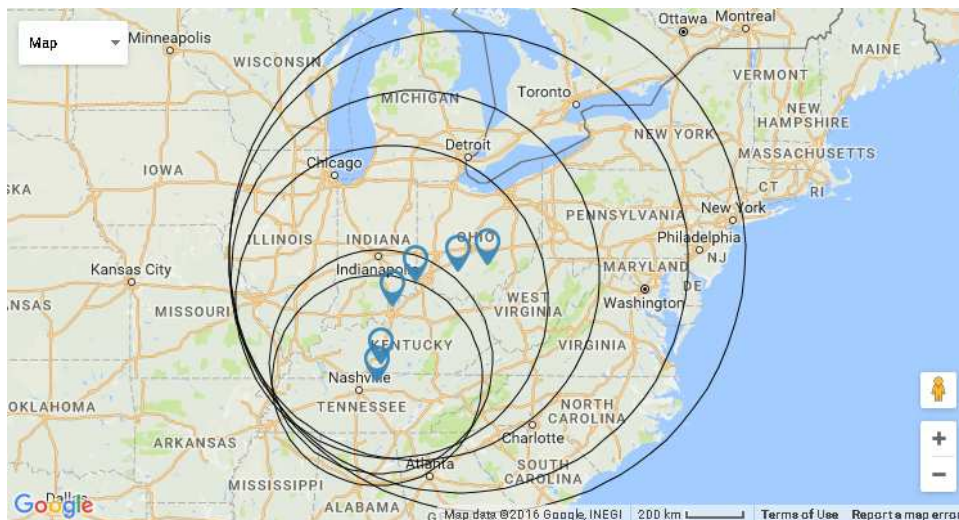| # of States | Closest Location | Distance (Miles) | Set of States |
|---|---|---|---|
| 13 | Hartsville, TN | 200 | AL, AR, GA, IL, IN, KY, MO, MS, NC, OH, SC, TN, VA |
| 14 | Lucas, KY | 211 | +WV |
| 17 | Charlestown, IN | 289 | +MI, +PA, +WI |
| 20 | Lawrenceburg, IN | 338 | +IA, +MD, +NY |
| 22 | Greenfield, OH | 415 | +DE, +NJ |
| 23 | Albany, OH | 470 | +CT |



Figure 4: Closest Locations for Groups of 13 to 23 States

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## 3.5    Closest Locations for Groups of 27 to 37 States

Results in Table 5 and Figure 5 show that the closest locations for groups of 27 to 31 states are in Ohio and West Virginia as the set grows into New England, extends to Florida and Maine, and then moves westward to encompass Louisiana and Minnesota. When the swath of six states from Texas up to North Dakota is added to make a set of 37 states then the closest location moves significantly west to St. Marys, OH with the set of states all within a distance of 720 miles.

Table 5: Closest Locations for Groups of 27 to 37 States

| # of States | Closest Location | Distance (Miles) | Set of States |
|---|---|---|---|
| 27 | Lower Salem, OH | 515 | +MA, +NH, +RI, +VT |
| 29 | Belington, WV | 580 | +FL, +ME |
| 31 | Sissonville, WV | 650 | +LA, +MN |
| 37 | St Marys, OH | 720 | +KS, +ND, +NE, +OK, +SD, +TX |



Figure 5: Closest Locations for Groups of 27 to 37 States

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## 3.6    Closest Locations for Groups of 41 to 50 States

The final set of results is shown in Table 6 and Figure 6 for notable group sizes between 41 and 50. As expected, the closest location moves west as the group size necessarily includes more of the western states. It is interesting that the location closest to most number of states excludes Maine as part of the set for sizes of both 43 and 47. This non-intuitive result was seen earlier for smaller group sizes and persists despite the states growing larger.

The final two results in Table 6 show the closest location for the 48 contiguous and all 50 states. The closest location to all 48 contiguous states is near Lohrville, IA, which is about 70 miles northwest of Des Moines, IA. It is within 1190 miles of the 48 states. In comparison, it is 265 miles northeast of the geographic center of area for the 48 contiguous states, which is located near Lebanon, KS.

The location closest to all 50 states is near Adin, CA, which is in northeast California. It is the midpoint of a line between Hana, Maui, Hawaii and the northern edge of the border between Maine and New Hampshire. From this location, the distance to each state is within 2487 miles. In comparison, the geographic center of area for the 50 states is near Belle Fourche, SD. The distance between these two locations is close to 900 miles.

Table 6: Closest Locations for Groups of 41 to 50 States

| # of States | Closest Location | Distance (Miles) | Set of States |
|---|---|---|---|
| 41 | Kankakee, IL | 870 | +CO, +MT, +NM, +WY |
| 43 | Center Point, IA | 1000 | +AZ, +ID, +UT, -ME |
| 45 | Braham, MN | 1068 | +NV, +ME |
| 47 | Corning, IA | 1150 | +CA, +OR, +WA, -ME |
| 48 | Lohrville, IA | 1189 | +ME |
| 50 | Adin, CA | 2487 | +AK, +HI |

## 3.7    Additional Results

Tables 1-6 yield other interesting results. They show that 15 states contain the closest location (with a non-zero distance) for different numbers of states.

The tables also identify which states are contained within the most and least number of the 50 state groups. Pennsylvania is contained within 43 groups, which is the most of any state. Virginia is next with a count of 42 groups. Despite most frequently occurring in groups of different sizes, it is interesting that neither state contains a location that is closest to a given number of states. At the other extreme, Hawaii and Alaska are in the fewest number of groups.

Finally, Figure 7 shows the distance that includes the given number of states for various group sizes. The results for sizes between 4 and 48 generally show a linear relationship indicating a linear correlation between group size and distance despite the location changing across different numbers of states.

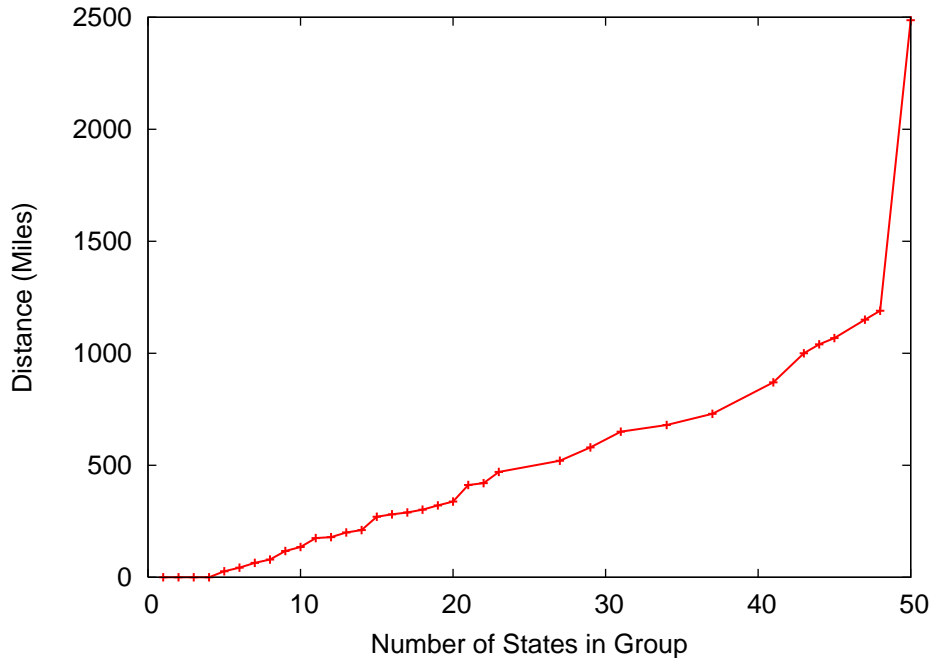Figure 6: Closest Locations for Groups of 41 to 50 States



Figure 7: Distance for Closest Location of State Group Size

# 4   Summary and Future Work

This work offers a new perspective on the study of U.S. geography by examining the locations that are closest to the most states. We determine these locations for numbers of states between one and fifty. We found a number of interesting results including that:

- 15 states contain the closest location (with a non-zero distance) for different numbers of states,

- as the number of states grows in size, the set of states in the group is not a strict superset of the smaller group size with the state of Maine, in one corner of the U.S., being added and dropped as the group size changes,

- the closest locations transition from the Southwest (for the smallest number of states), to the East Coast, to the Ohio River region, to the Midwest and end in the West (for all 50 states), and

- the location closest to all 48 contiguous states (Lohrville, IA) and all 50 states (Adin, CA) is far from the geographic center of area for each of these sets of states suggesting alternate "centers" for the United States using a different geographic measure.

The results of this work point to two directions for future work. The first is to examine locations furthest from the most states instead of those closest to the most states. Hawaii and Alaska are obviously the furthest away, but locations within Florida and Texas are 400 miles from any other state. There are also locations in the interior of large states that are far from any state border.

The second direction for future work is to apply the same metrics to world countries instead of U.S. states. Such a study might be even more interesting as the borders between countries often represent sharper changes in culture (and even language) than is the case for borders between states. The population of locations that are relatively close to or far from other countries may well exhibit differences based on these geographic characteristics.