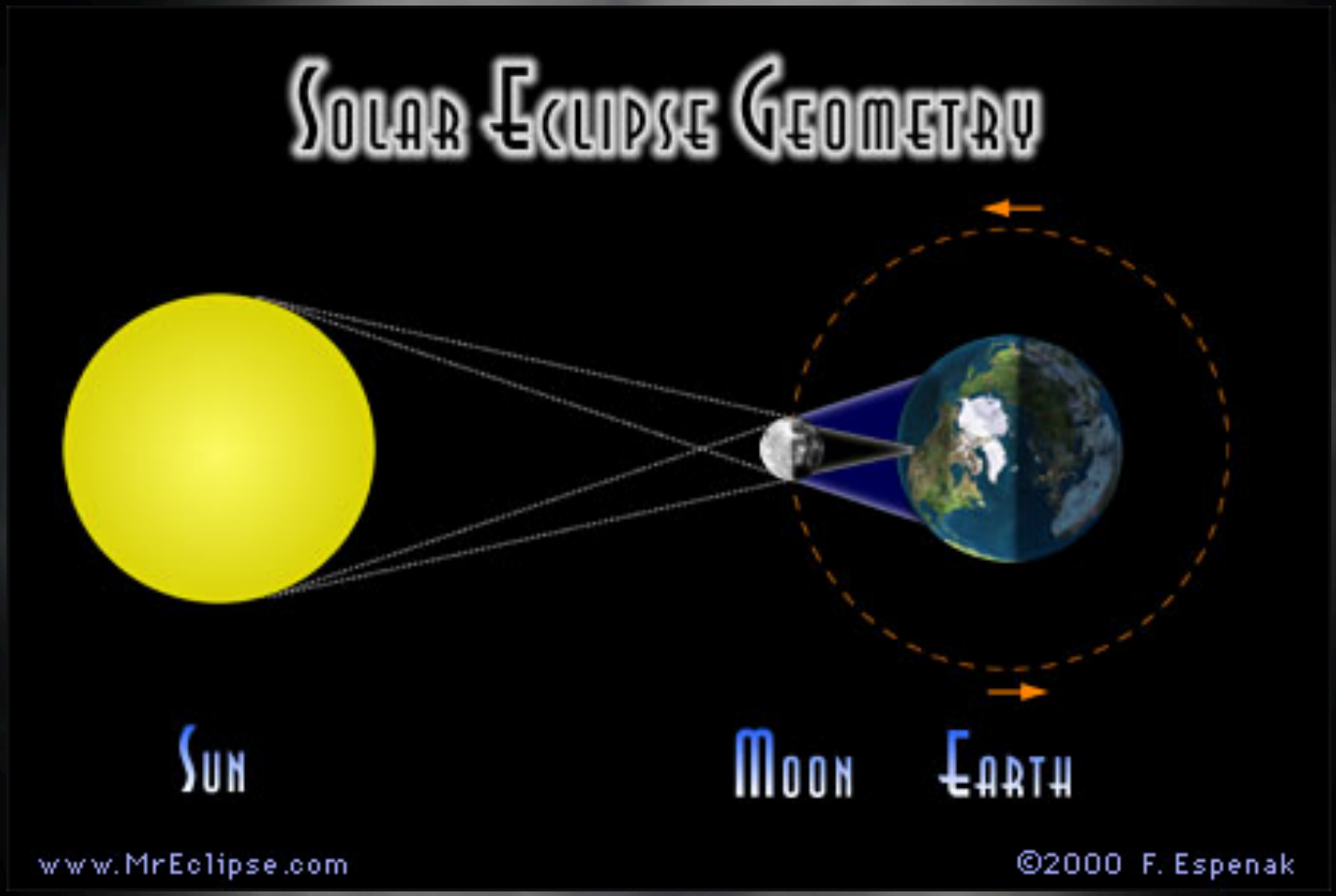

The Great American Eclipse!
Coming to your skies
August 21, 2017
By Mark 'Indy' Kochte
Star Quest XIV
July 22, 2017

A Brief History

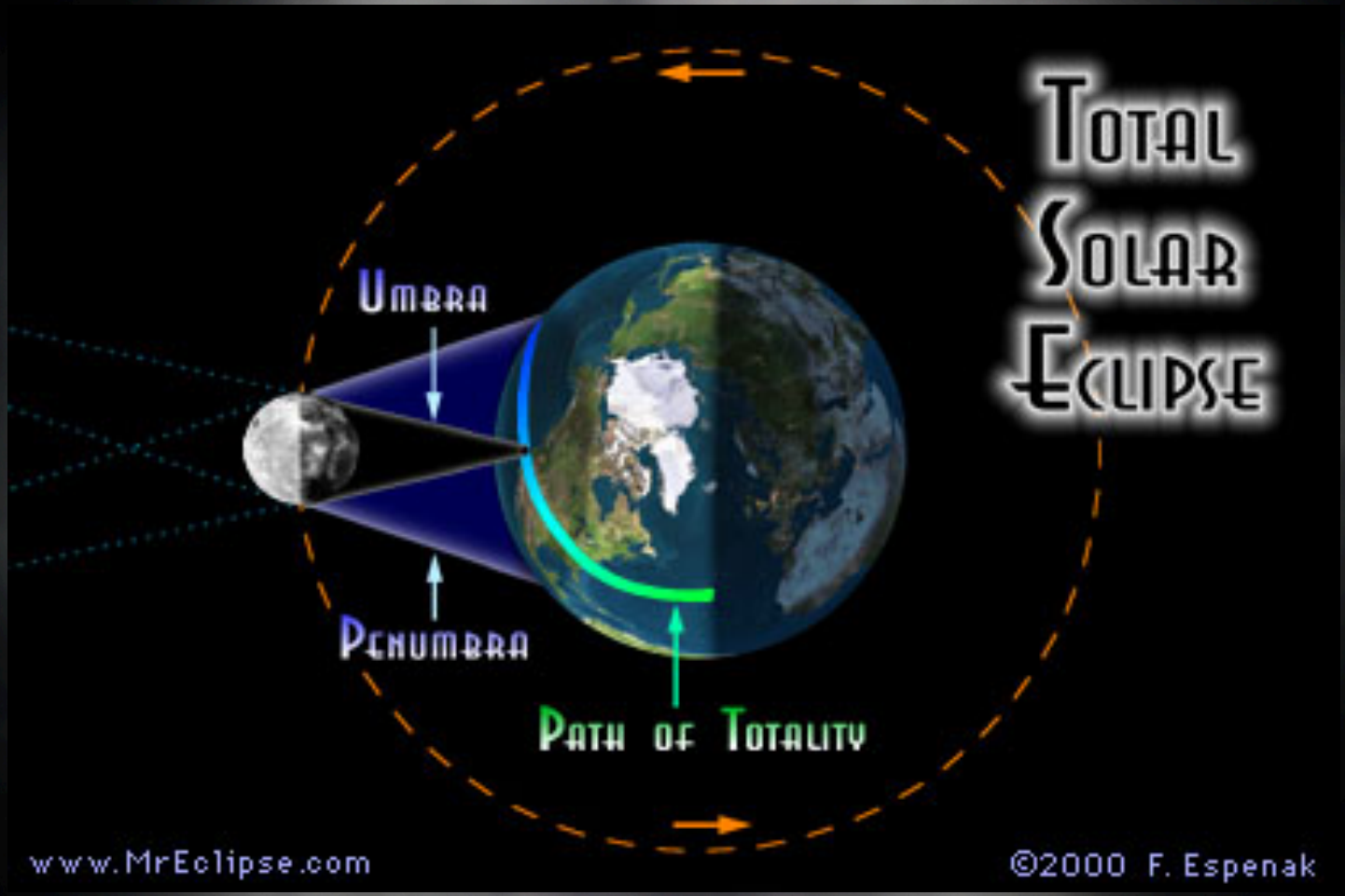
- Eclipses have been known to be observed for over 4000 years. (some new evidence suggests 4500 years)
- Often scary for cultures to witness. ‘Eclipse’ is of Greek origin meaning ‘abandonment’.
- Many cultures pinned signs and portents to eclipses, and failure by astrologers to predict them resulted in death (of the astrologers).
- Many cultures, even today, bang pots and cause a raucous to chase the eclipse demon away.
- The ancient Chinese thought it was a dragon eating the Sun. As did ancient cultures in India, Southeastern Asia, and Peru
  - By 20 BCE the Chinese understood the nature of eclipses.

Images (c)Bill Kramer, www.eclipse-chasers.com

How It Happens



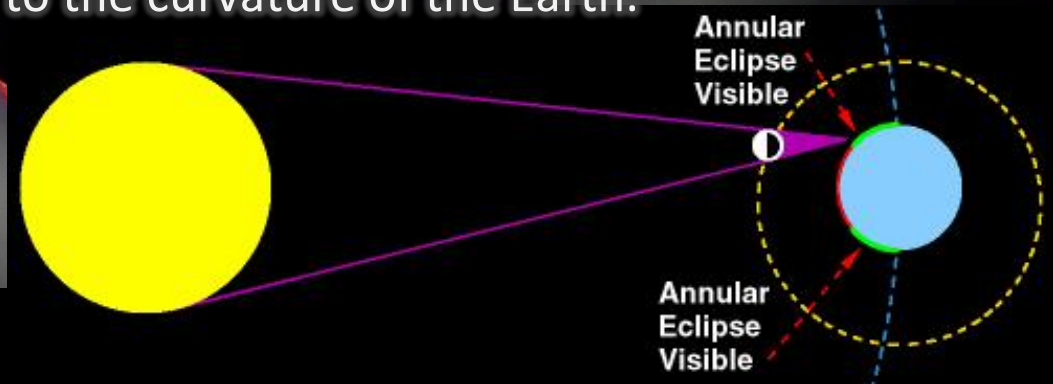
How It Happens



Miscellaneous Fun Facts

- A total solar eclipse occurs approximately ever 1.5 years. The shortest interval between total solar eclipses is 12 months.

- There are four types of eclipses: partial, annular, total, and hybrid (annular-total).
  - A Hybrid is when one part of the world gets an annular eclipse, and another part gets a total.
  - Hybrids occur due to the curvature of the Earth.



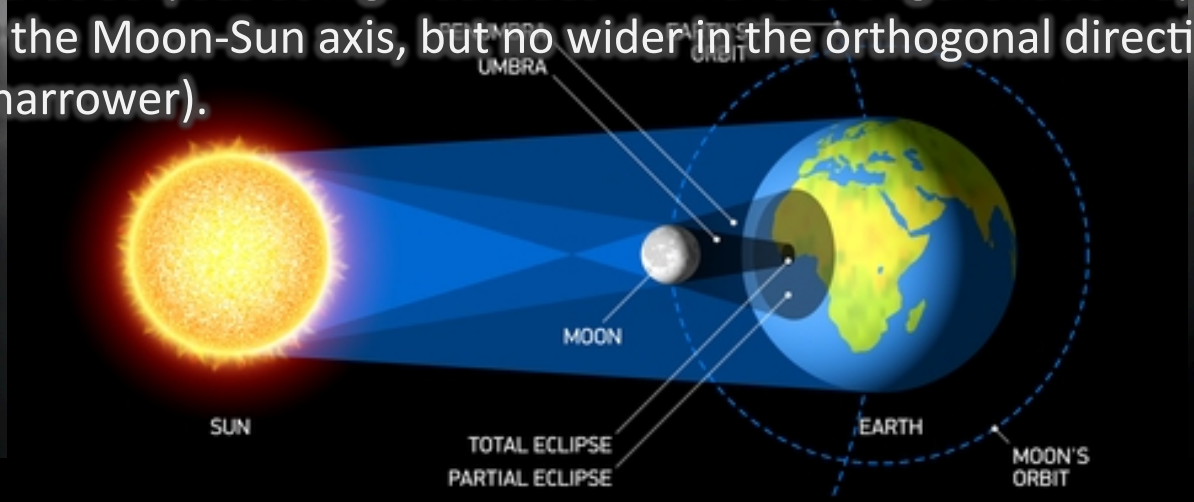
Miscellaneous Fun Facts

- Earth has a surface area of 196,940,00 square miles. The maximum area the shadow (umbra) of an eclipsing Moon can cover is 21642 square miles.

- This is about 0.01% of Earth's surface.
  - The 2017 eclipse shadow will cover 3848 square miles of Earth in any one instance, or 0.002%

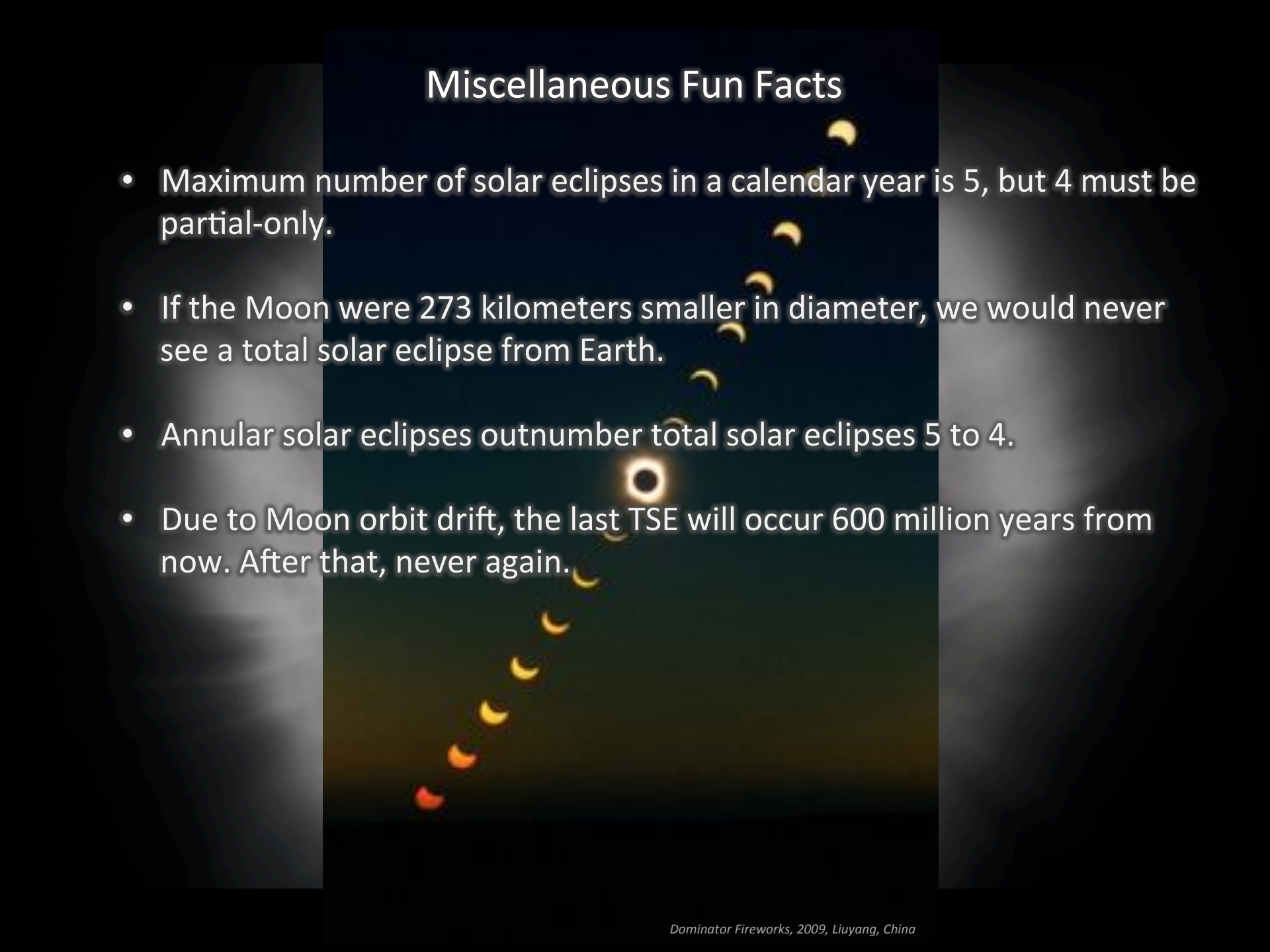
- The 2017 shadow will only be on the order of 60-70 miles across – more than a factor of 2 smaller than maximum coverage!

- Note that eclipses at high latitudes will have a longer shadow spread along the Moon-Sun axis, but no wider in the orthogonal directions (in fact, narrower).



Miscellaneous Fun Facts

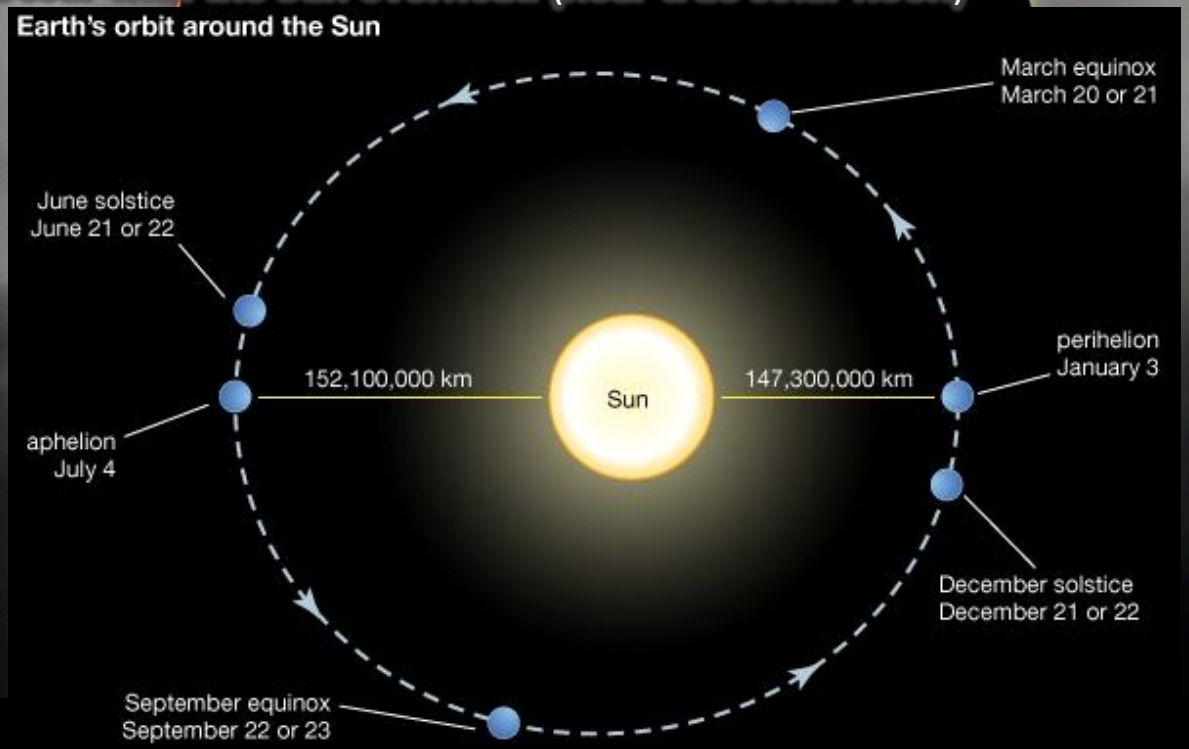
- Maximum number of solar eclipses in a calendar year is 5, but 4 must be partial-only.
- If the Moon were 273 kilometers smaller in diameter, we would never see a total solar eclipse from Earth.
- Annular solar eclipses outnumber total solar eclipses 5 to 4.
- Due to Moon orbit drift, the last TSE will occur 600 million years from now. After that, never again.



Dominator Fireworks, 2009, Liuyang, China

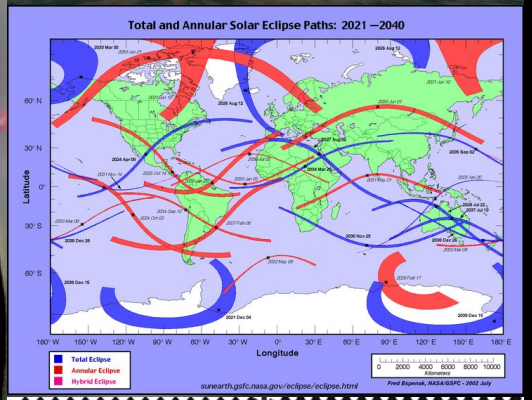
Miscellaneous Fun Facts

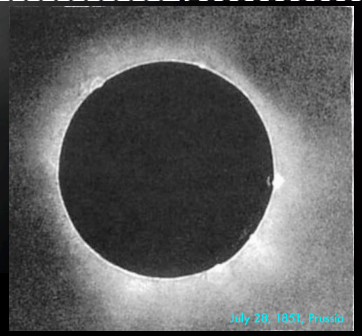
- Longest possible totality is 7 minutes 32 second; next time we have a 7 minute eclipse will be June 13, 2132 (at 6 min 55 sec). To have a long eclipse these criteria must be met:
  - Occur near July 4th when Earth is farthest from the Sun (aphelion)
  - Occur near lunar perigee when Moon is closest to Earth
  - Occur with a path close to the equator (slower speed of lunar shadow relative to Earth rotation)
  - Occur with the Sun overhead (near true solar noon)



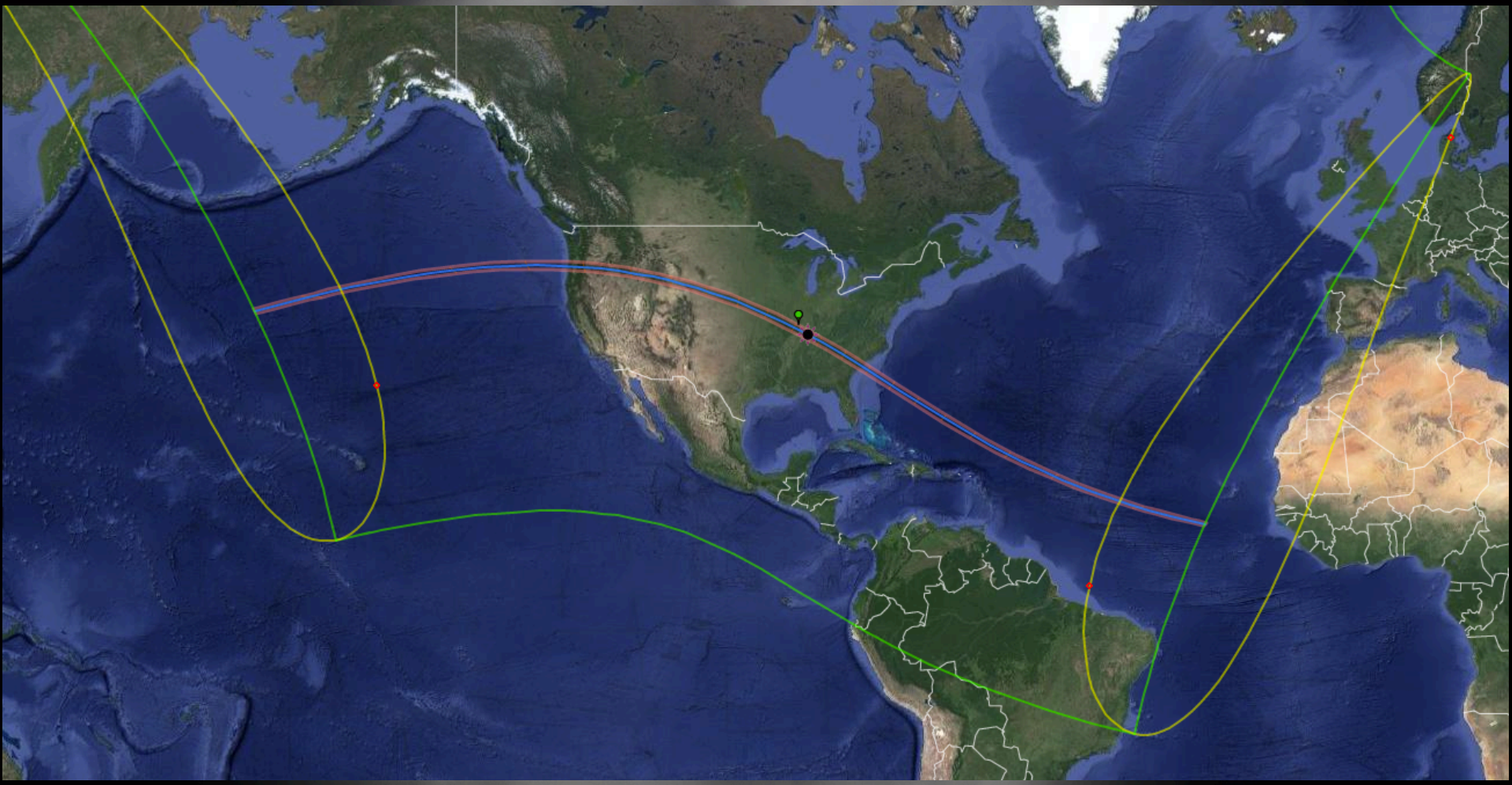
Miscellaneous Fun Facts

- NASA is going to launch 50(!) high-altitude balloons with video equipment to livestream (via “megastream”) the eclipse from an altitude of 30 km (100,000 feet).
- This will be the last total solar eclipse visible in the US until 2024 – and after that the next one will be 2044 (Montana and extreme NW North Dakota), with a better eclipse occurring in 2045 across the southern tier States.
- On June 20, 2017, the USPS came out with a new Forever postage stamp – that changes when you rub/heat it! (using thermochromic ink). The image is from Libya, 2006.
- The first photographed solar eclipse (total) was done July 28, 1851, in Konigsberg, Prussia, by photographer Johann Juliius Fredrich Berkowski.





Where!



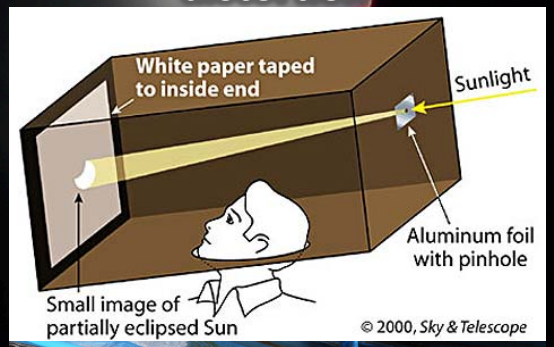
Xavier Jubier's 2017 Total Eclipse Interactive Google Map

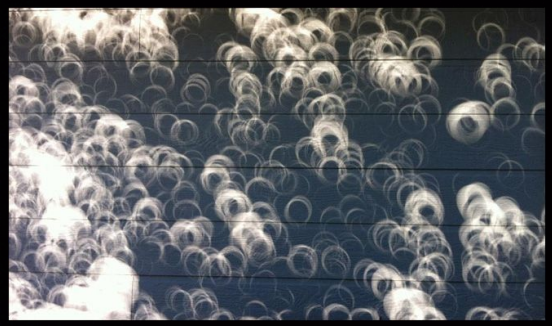
Safety Notes

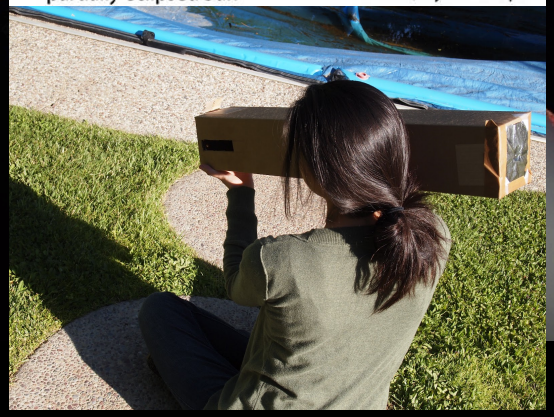
- **Pre- and post-totality, NEVER look/stare/gaze longingly at the Sun with the unprotected eye!**
  - ***Even when 99% of the photosphere is covered, there is still enough Sun visible to cause retinal burns***

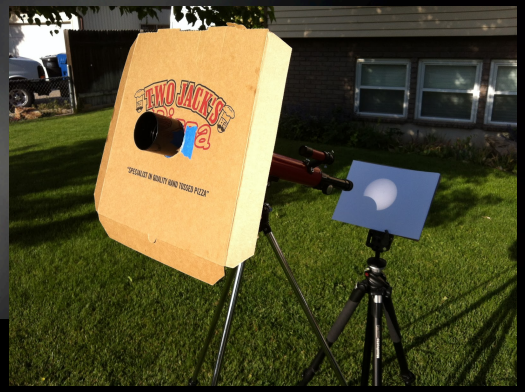
Safety Notes

- **Pinhole Projection**
  - Pinhole shoebox (or other pinhole projector)
  - Overlapping leaves in trees
  - Interlaced fingers, a colander, holes punched in a sheet of cardboard spelling out a phrase, etc
  - Binoculars or small telescope with projection screen – *absolutely never look through the binocular or telescope without a solar filter!! Note also internals of unfiltered binoculars/telescopes will heat up, possibly causing distortion*



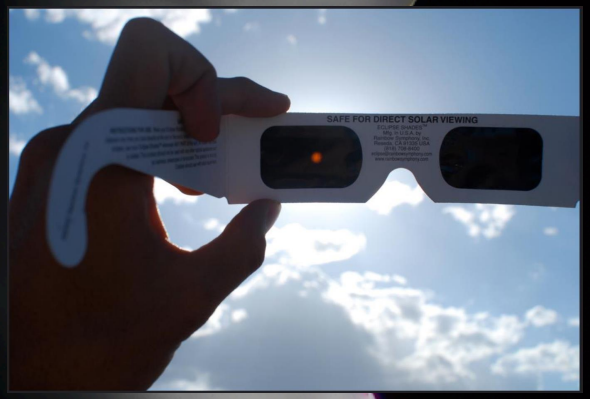






Safety Notes

- **Direct viewing**
  - Eclipse glasses *(must have ISO 12312-2 on them!)*
  - Welders goggles rated 14 or highter
  - Specially designed solar telescopes
  - Telescopes, cameras, binoculars with special solar filters



Factoids

- First total solar eclipse (TSE) on US soil since 1979 (38 years ago).
  - Perspective: *"Since the last eclipse in the continental United States, someone invented the internet!" – Alan Dyer*

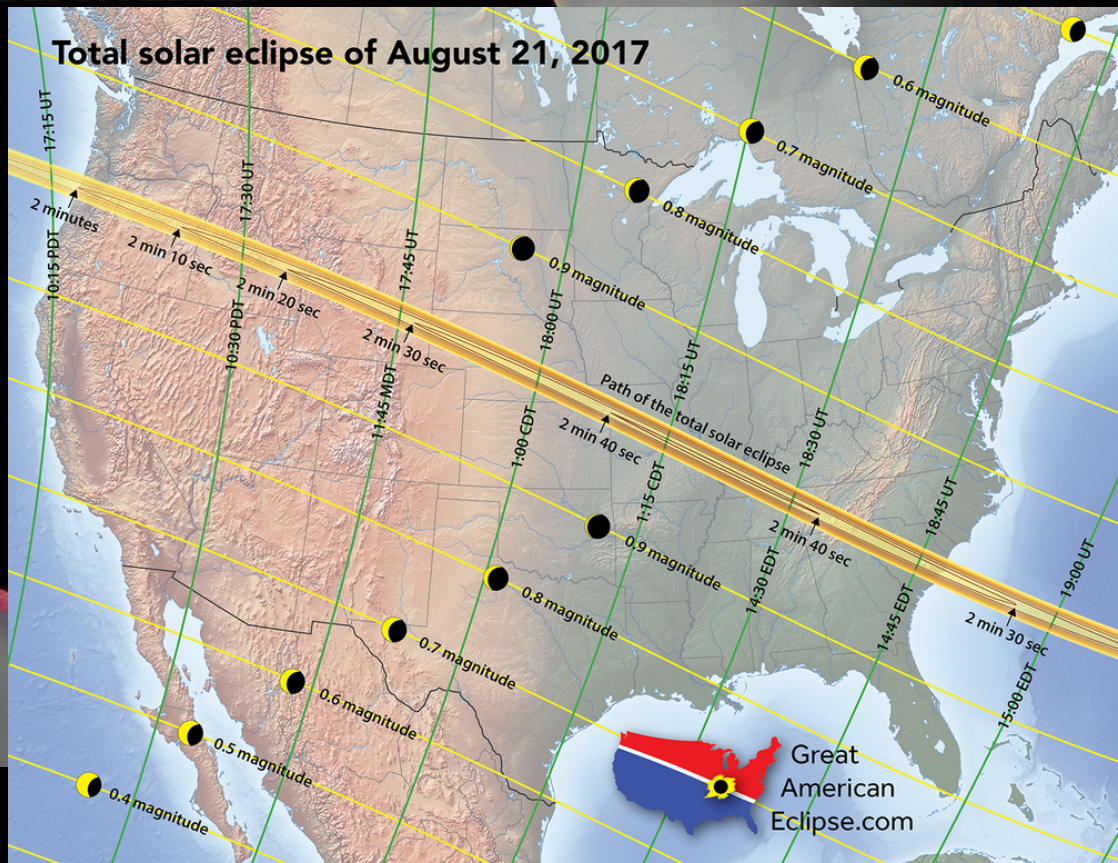
- First TSE to cross coast-to-coast since June 8, 1918.
  - 1918 eclipse was a late afternoon event for the US, as maxima was over the Pacific Ocean just south of Alaska.

- Path is only 60-70 miles wide.

- Sun coverage in Washington, DC, 81%.

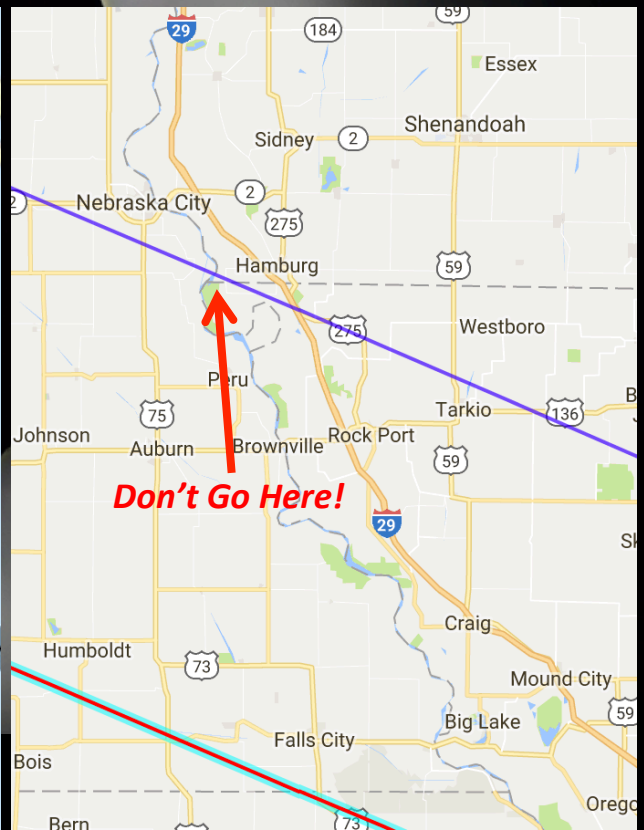
- At Green Bank, WV, 86.6%.

- Paraphrasing Buzz Aldrin, and Arnold Schwarzeneger in the movie *Total Recall*, get your @$$ to the shadow line!



Factoids

- Totality crosses 13 States: Oregon, Idaho, Wyoming, Nebraska, Kansas, Iowa*, Missouri, Illinois, Kentucky, Tennessee, North Carolina, Georgia, South Carolina.
  - The centerline passes through 10 of these States (not Illinois or Georgia)
  - * - A small **tiny** corner of Iowa is clipped by the edge of the eclipse, but the farmer who owns the land has allegedly threatened to shoot anyone who tries to get on it to observe the event



Factoids

- You may safely look at the *totally eclipsed* Sun. This is the **ONLY** time you can safely look at it without a filter – and you want to NOT use a filter in order to see the awesomeness of the event!
- You won't need a telescope to view the eclipse. Just a solar filter for pre- and post-totality. However, low-power binoculars may be nice to see some of the detail in the corona during totality. *And ONLY during totality!*
- Take a moment during totality to experience the things around you: breezes dying down, birds will stop chirping, shadows will be odd, and the horizon sky will still be bright (sunrise/sunset bright).

Balloon view, Svalbard, Iceland, 2015

Factoids

- Totality upwards of 2 minutes 40 seconds (i.e., only 160 seconds, tops).
  - Just south of Carbondale, Illinois, in Giant City State Park.

- The Sun's diameter is approximately 400x larger than the Moon – but coincidentally the Sun is also 400x further away! So effectively similar apparent size as the Moon.

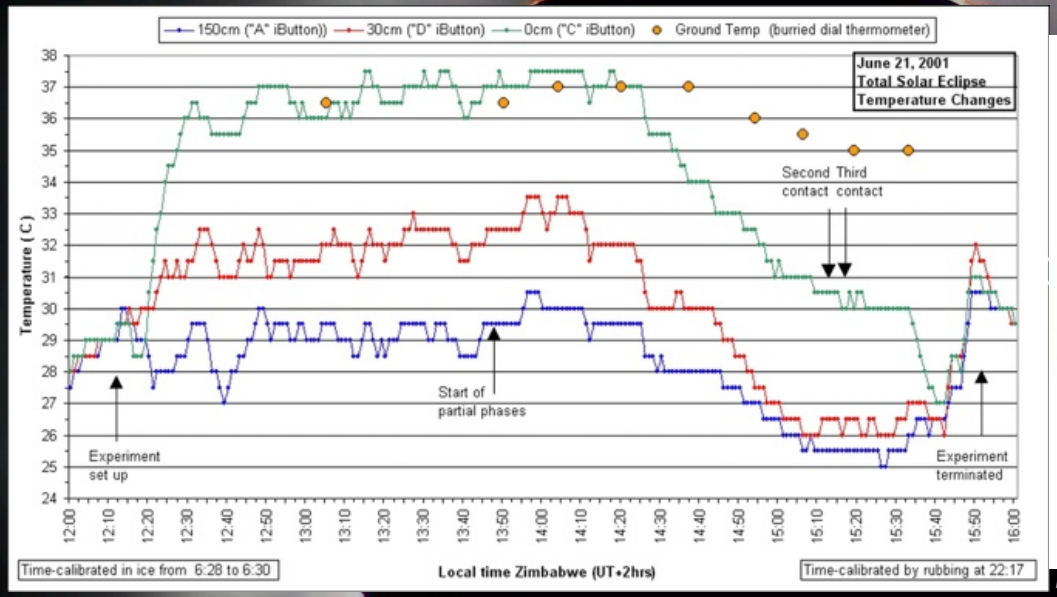
- During the partial phase, at about 85% totality Venus should be visible 34° to the west-northwest of the Sun.

Totality Tips

- *Totality will be the quickest 1-2 minutes (60-120 seconds) of your life!*
- Be flexible with the weather – check it the day/ night before! A list of links is available at the end of this presentation (really only useable if you have internet access, that is)
- Go pee long **before** totality hits (make a preemptive strike at least 45 minutes before totality). Seriously.
- Be considerate of others around you (e.g., don't be playing music or shooting off fireworks; if you want that, attend an event ☺). Remember: you won't be alone out there.

Totality Tips

- Have a thermometer handy, and set it up with a point-n-shoot in movie mode to record the temperature drop.
  - PS: you might also want to have a light sweater or jacket handy!



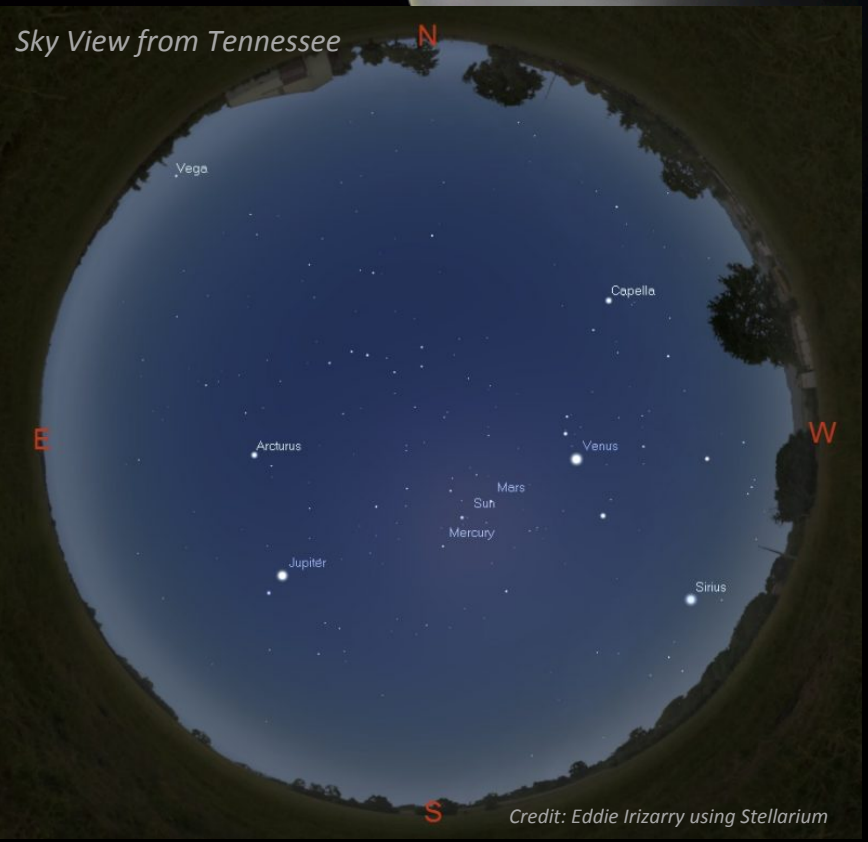
Images courtesy Alan Dyer

- If you're at an elevated location, watch for the approaching Moon's shadow! Though this won't be easy because it'll be traveling around 2400+ mph.

- If you don't have a filter, make a box pinhole 'camera' to view the pre- and post-totality events as noted earlier. Perhaps do a video of that as the Moon covers the Sun. Or loosely interlace your fingers and hold them up to cast a shadow.

Totality Tips

Take a moment and check out the 360º sunset/sunrise. Glance around to see what, if any, planets, stars, or constellations you can see. (hint: Regulus in Leo will be very close to the Sun, as will Mars and Mercury; Jupiter will be to the east near Spica in Virgo, Venus to the west near Castor and Pollux in Gemini)



Totality Tips

- Have a chair handy. And sunscreen. Sunglasses. A hat. Umbrella. Snacks and drinks (cold – this *will* be mid-August, remember) ahead of time.
- Also, protect your gear!! Overheated, it may fail. Use an umbrella, or even part of a cardboard box as a sun shade.

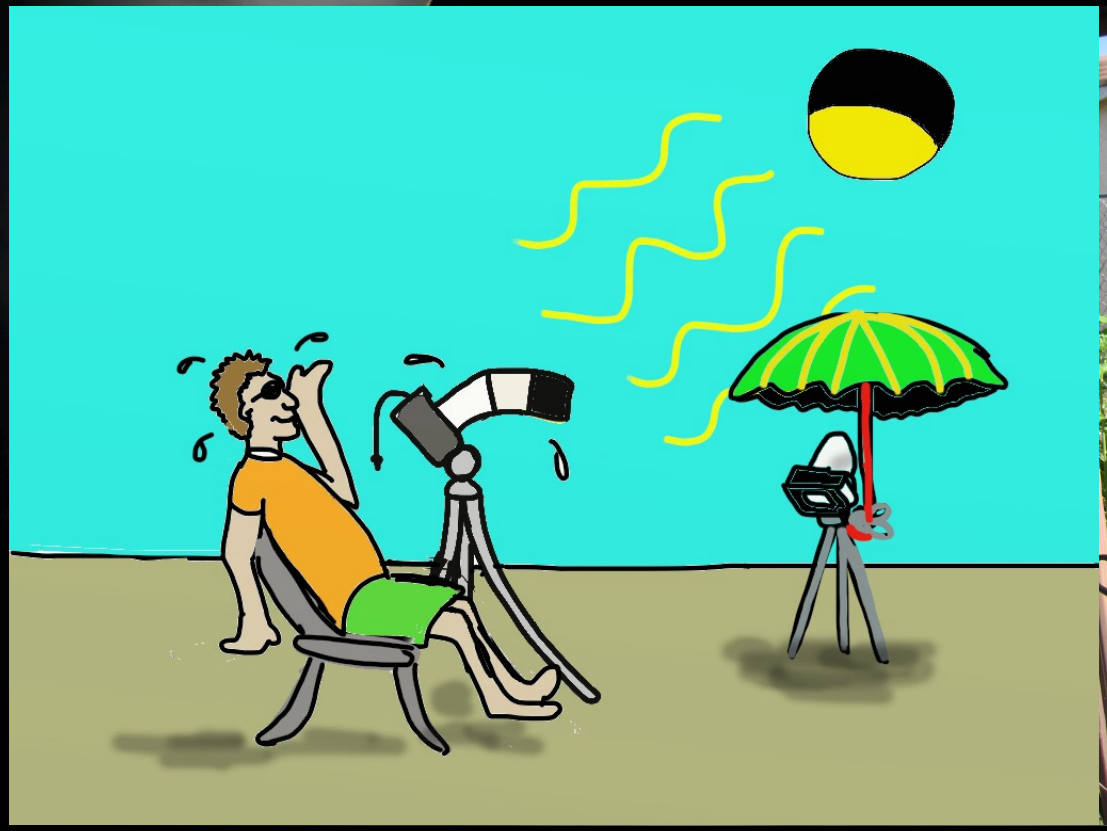


Image (c)Bill Kramer, www.eclipse-chasers.com

IndyVision Photography 2012

Photo Tips

It is suggested by many eclipseophiles that for your first eclipse to not photograph it. Just take it in. However, if you choose to buck conventional wisdom…

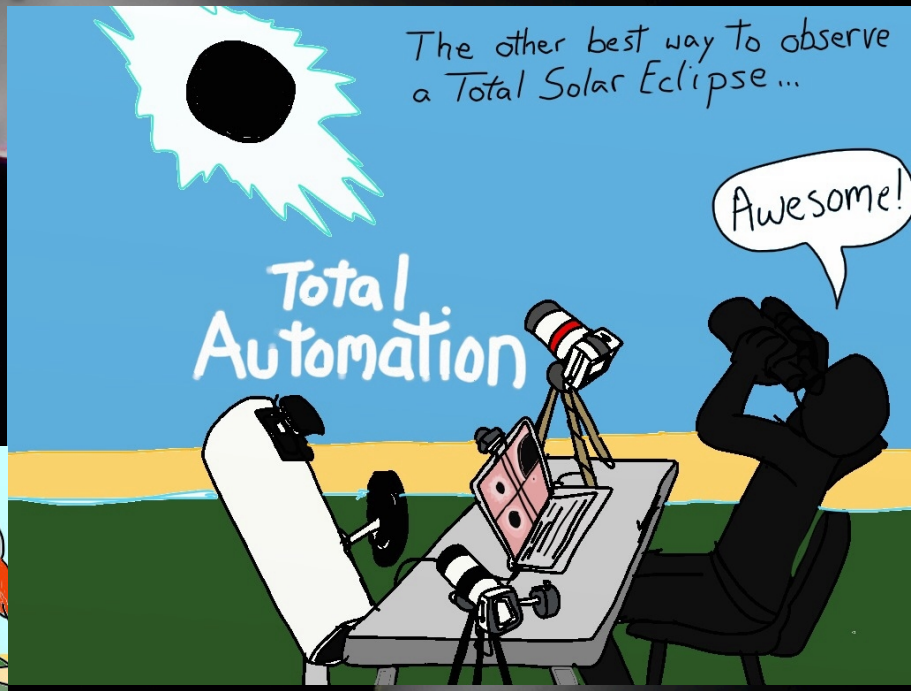
Practice ahead of time! (the Moon is a good non-equipment damaging target)

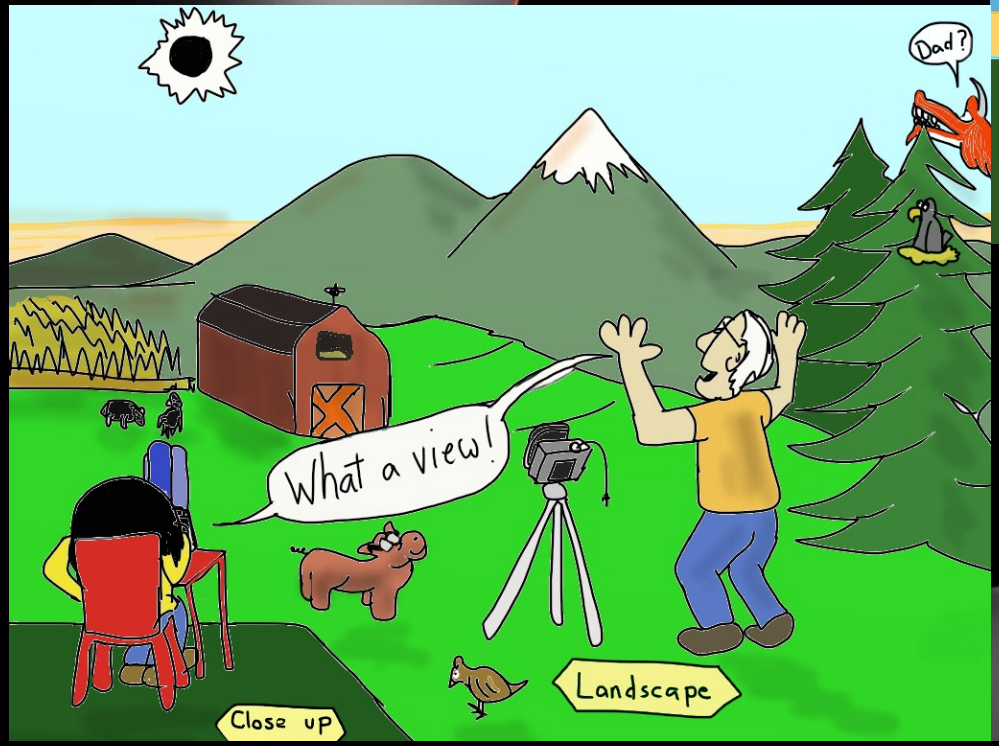
Also…Filters, people, filters! Protect your gear – but know when you can take off the filters (because you won't have any totality images with filters in place; 10-30 seconds before totality is considered safe)

Images (c)Bill Kramer, www.eclipse-chasers.com

Photo Tips

If you plan to do photos, set up your camera ahead of time, on automatic (time-lapse mode if you have it!) so you can enjoy the eclipse and not be messing with the camera. Remember to set your focus to infinity – *and turn off auto-focus!*





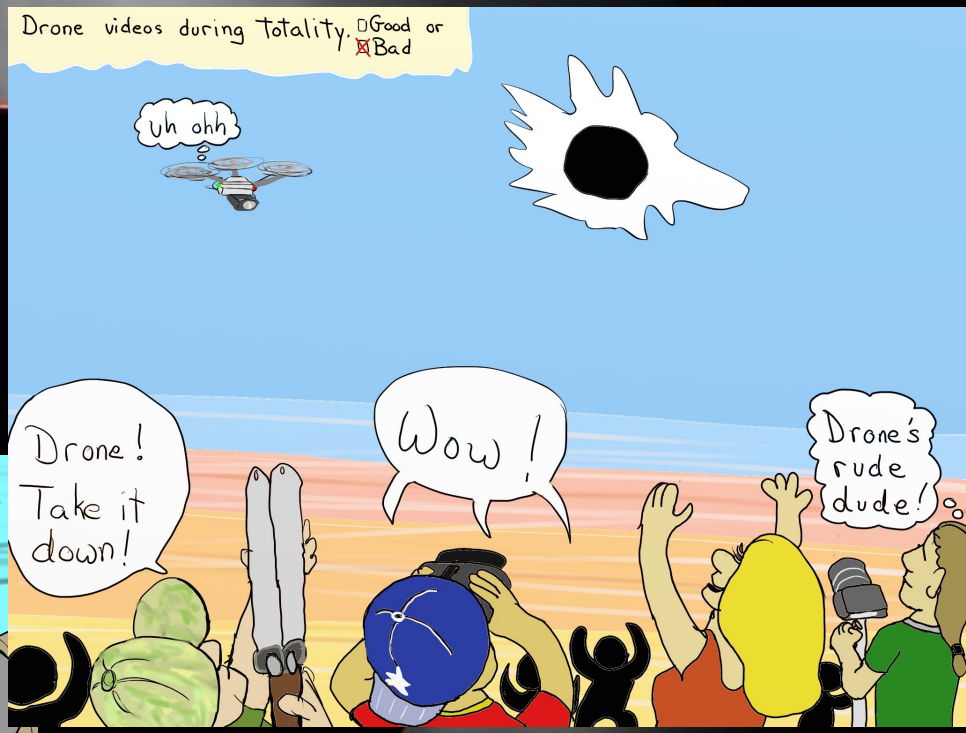
If you are using a wide angle lens, consider your foreground – is it what you want? Are there distracting things in your field of view? Are there dragons?

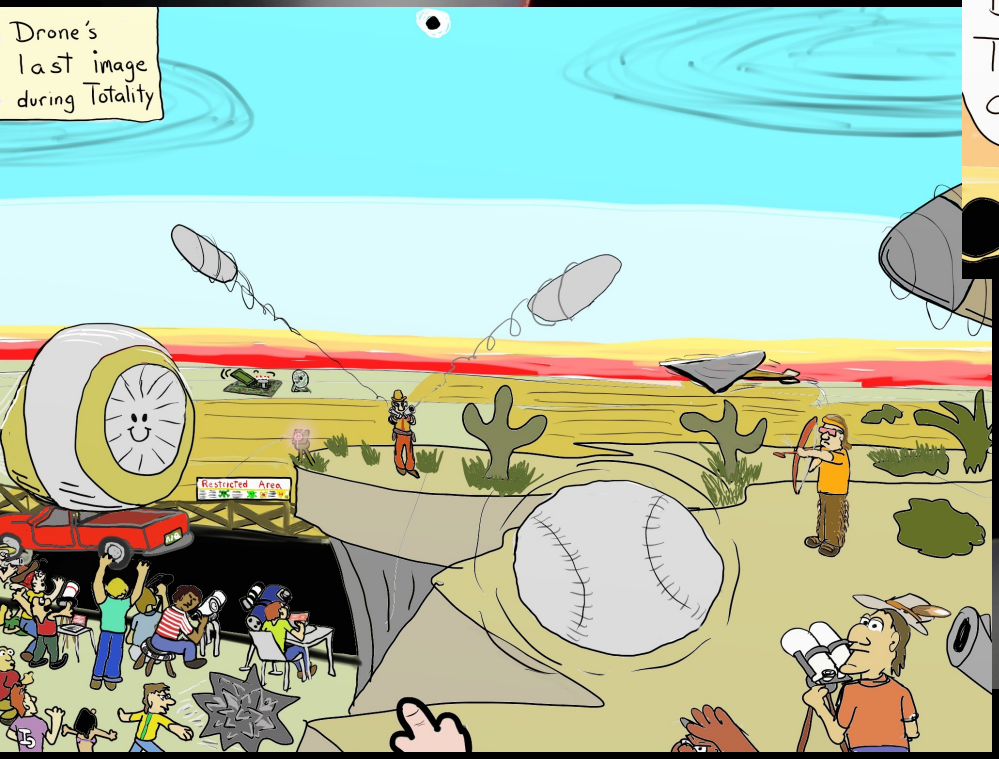
Images (c)Bill Kramer, www.eclipse-chasers.com

Photo Tips

Drones

Just don't





Images (c)Bill Kramer, www.eclipse-chasers.com

Photo Tips

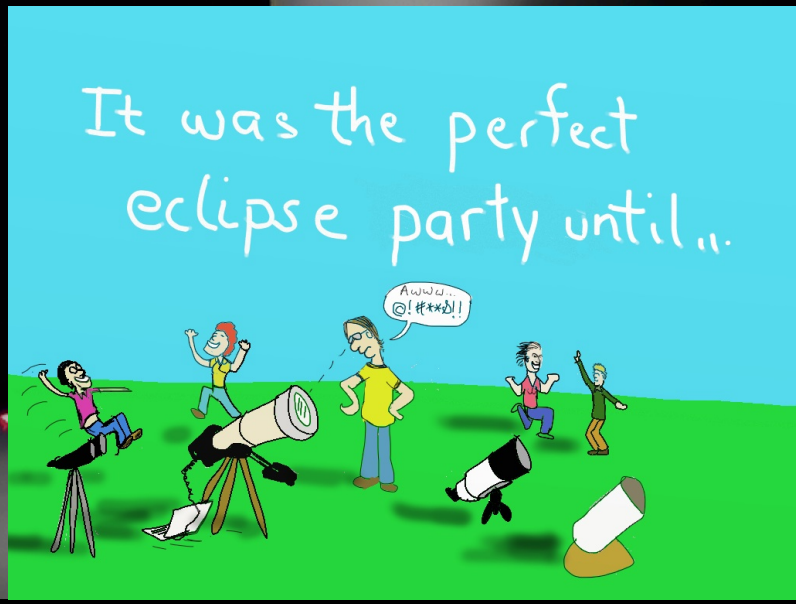
- Do not ask others around you for help if at or near a critical moment something goes awry. They will be busy with their own stuff, or trying to enjoy this ephemeral experience. If something fails, roll with it and just enjoy the visual show.

- *Learn how to use your equipment BEFORE the day of the event!* You don't want to try and figure out the nuances of your camera as the eclipse is starting.

Images (c)Bill Kramer, www.eclipse-chasers.com

Photo Tips

- Don't get caught up in all your gear that you miss the event!
- No flash photography! No, seriously. Turn your auto-flash off beforehand.
- If you're photographing the eclipse prior to totality (and are using a filter as you should be), don't forget to pop it off during totality. Otherwise…
- For more photography information, consult this site for *lots* of tips and suggestions:
  http://www.mreclipse.com/SEphoto/SEphoto.html



Images (c)Bill Kramer, www.eclipse-chasers.com

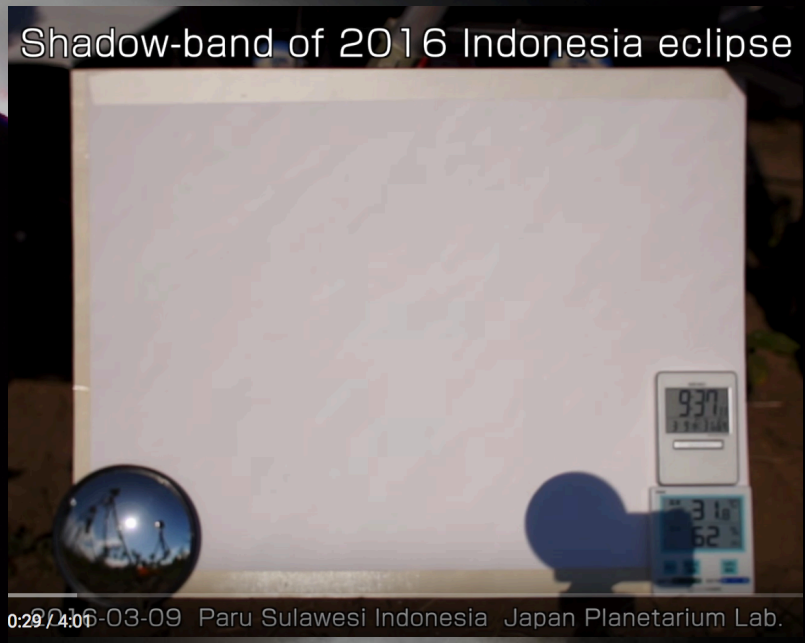
Packing Tips

- If you're traveling, make sure you have everything you need!
- Bring extra stuff (including food, water, clothing). Be prepared for lack of everything immediately before and after the event.
- Best suggestion? Checklists!

Images (c)Bill Kramer, www.eclipse-chasers.com

Things To Look For

- **Shadow bands**
  - ~1 minute before totality, moving wavy lines of light and dark can be seen on the ground and on walls.
  - Like ripples of sunshine on the bottom of a swimming pool, or faint wisps of smoke.
  - Result of turbulent atmosphere making little eddies of alternating high and low density with different refractive indices and act like little swirling lenses



- **Diamond Ring**
  - ~15 seconds before totality, just as the Moon moves to cover the final disk of the Sun, the last bit of the surface of the sun is visible as a dazzling bright jewel of sunlight at the edge of the Moon.

Things To Look For

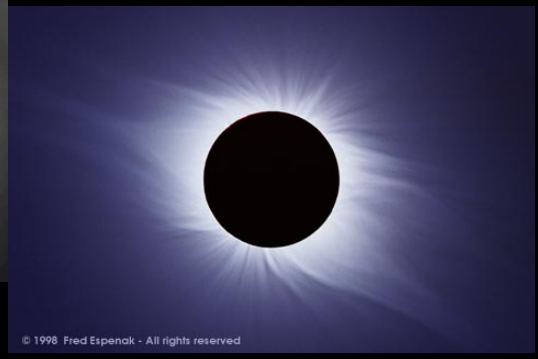
- **Baily's Beads**
  - ~5 seconds before totality, small bead-like blobs of light appear at the edges of the Moon.
  - Caused by gaps in the mountains and valleys on the Moon as seen edge-on.

Image courtesy Bruce Fraser

- **Chromosphere**
  - Lower layer of Sun's atmosphere, a reddish glow only visible for a few seconds after totality sets in.

Image courtesy Luc Viatour

- **Corona**
  - As the Diamond Ring fades, the full corona becomes visible as a faint ring of rays around the silhouetted Moon. (Note: due to solar minimum occurring now, activity on the Sun may be low to non-existent; corona will look more like a bipole magnetic field instead of having streamers)



After It's Over

- Party! Celebrate! Record your, before they fade from your mind! Either write things down, voice-record or video your thoughts/impressions, do short (30 second) video interviews of others around you. They'll help a decade or two down the road.

- But on consideration of others around you, wait until it's well over. Remember all those neat things that happened leading up to totality? They happen in reverse as the Moon uncovers the Sun, so if you missed them the first time around, you'll get a second chance, as fleeting as it may seem.

Ten great places to see the total solar eclipse on August 21, 2017

Sandhills of western Nebraska
Duration of totality is 2 min 30 sec
Totality beings at 11:49 a.m. MDT

The Sandhills country of Nebraska is a prime location for viewing the eclipse. A careful weather observer has taken notes over 20 years and reports that 70% of late August days are favorable for eclipse viewing. North Platte is a good staging area with hotels and good highways for distance traveling. A bonus is that you can enjoy dark summer nights and a glorious view of the Milky Way.

Carbondale, Illinois
Duration of totality is 2 min 41.6 sec
Totality begins at 1:20 p.m. CDT

Carbondale has a special distinction — it is near the crossing centerlines of both the August 21, 2017 total solar eclipse and the coming April 8, 2024 total solar eclipse! Also, the point of longest eclipse for 2017 is just southeast of Carbondale at the geographic location of 37° 34' 4.3" North latitude, 89° 06' 10.0" West longitude. Just don't forget to drive east or west if clouds threaten to eclipse totality!

Hopkinsville, Kentucky
Duration of totality is 2 m 41.2 sec
Totality begins at 1:24 p.m. CDT

The civic boosters of Hopkinsville cite their fair city as the best spot in the nation for the eclipse. While Hopkinsville is a great location, you can travel for hundreds of miles east and west along the eclipse centerline and receive within 1 or 2 seconds of maximum eclipse duration. But if you would like to join a festive crowd, Hopkinsville will certainly be a great location to enjoy the eclipse.

Great Smoky Mountains Natl. Park
Duration of totality is 1 m 17 sec
Totality begins at 2:35 p.m. EDT

While this area is different from the rest by being closer to the northern limit line of total solar eclipse, this park will be an intriguing location to view the eclipse due to its expansive views. This site provides the possibility of seeing the Moon's shadow racing across the landscape, a dramatic sight that will add another dimension to your experience of the eclipse.

Madras, Oregon
Duration of totality is 2 min 4 sec
Totality begins at 10:19 a.m. PDT

While the Oregon coast is at risk of marine clouds, the interior of this state actually enjoys the nation's best weather prospects. Madras is easily accessible from Portland with a two-hour drive and sits at the junction of four highways for good mobility. A bonus is the prospect of seeing Mt. Jefferson to the west darken as totality envelops this prominent peak 17 seconds before totality in Madras.

Snake River Valley, Idaho
Duration of totality is 2 min 18 sec
Totality begins at 11:33 a.m. MDT

The Snake River Valley in eastern Idaho consists of farmland and lava fields. This area is an attractive spot for eclipse chasers because of very good weather prospects and many roads for evasive maneuvering in the event of local clouds.

Casper, Wyoming
Duration of totality is 2 min 26 sec
Totality begins at 11:42 a.m. MDT

It is for good reason that the Astronomical League is holding their annual Astrocon Conference in Casper just before eclipse day. Not only does Casper have great weather prospects, but also uncrowded highways that extend west, east, north, and south that can be used for every weather contingency.

St. Joseph, Missouri
Duration of totality is 2 min 39 sec
Totality begins at 1:06 p.m. CDT

St. Joseph is right on the centerline of the eclipse path and enjoys one of the longest durations of any sizable city in the nation. A large eclipse viewing party is being organized at the Rosecrans Memorial Airport with educational speakers, solar telescopes, and more. If you would like to enjoy the eclipse in the company of astronomers, this is an ideal choice.

Nashville, Tennessee
Duration of totality is 1 min 57 sec
Totality begins at 1:27 p.m. CDT

Nashville deserves special note as the largest city wholly within the path of the total solar eclipse. While its location is offset from the centerline by about 20 miles, it still enjoys a good duration of nearly two minutes. Surely the nation's music capital will produce some memorable songs on the occasion of the Great American Eclipse.

Columbia, South Carolina
Duration of totality is 2 min 30 sec
Totality begins at 2:43 p.m. EDT

Columbia is a sizable city with long duration of totality and a fine network of highways for mobility on eclipse day. For millions of Americans along the Atlantic Seaboard, this will be the most accessible city with hotels in the path of total solar eclipse.

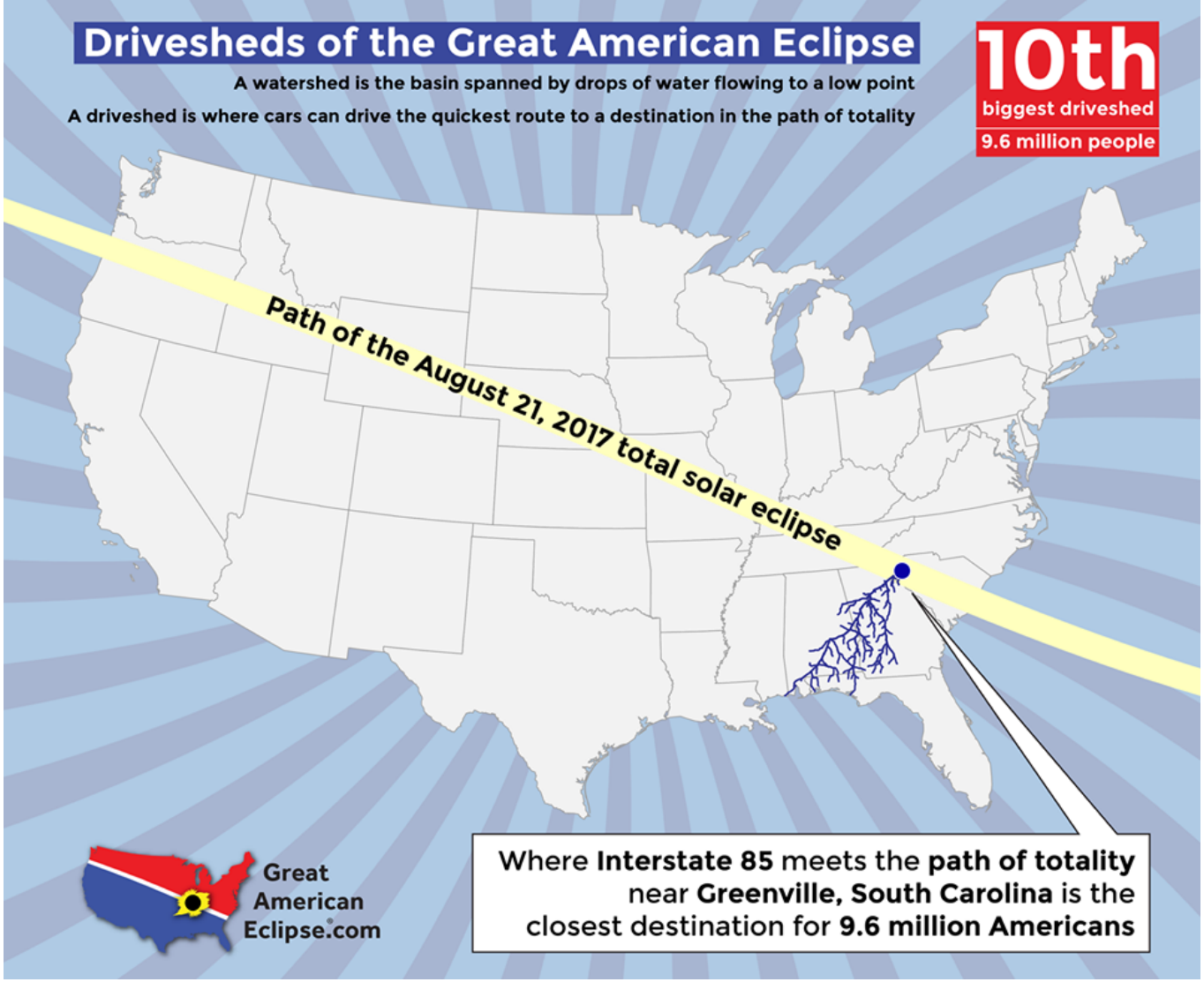
Great American Eclipse.com

Traffic Carnage and Misery Potential Map

Drivesheds of the August 21, 2017 eclipse. This map shows where the major traffic chokepoints will be. Our advice: arrive at least the day before and try to avoid the areas predicted to be most congested! – GreatAmericanEclipse.com

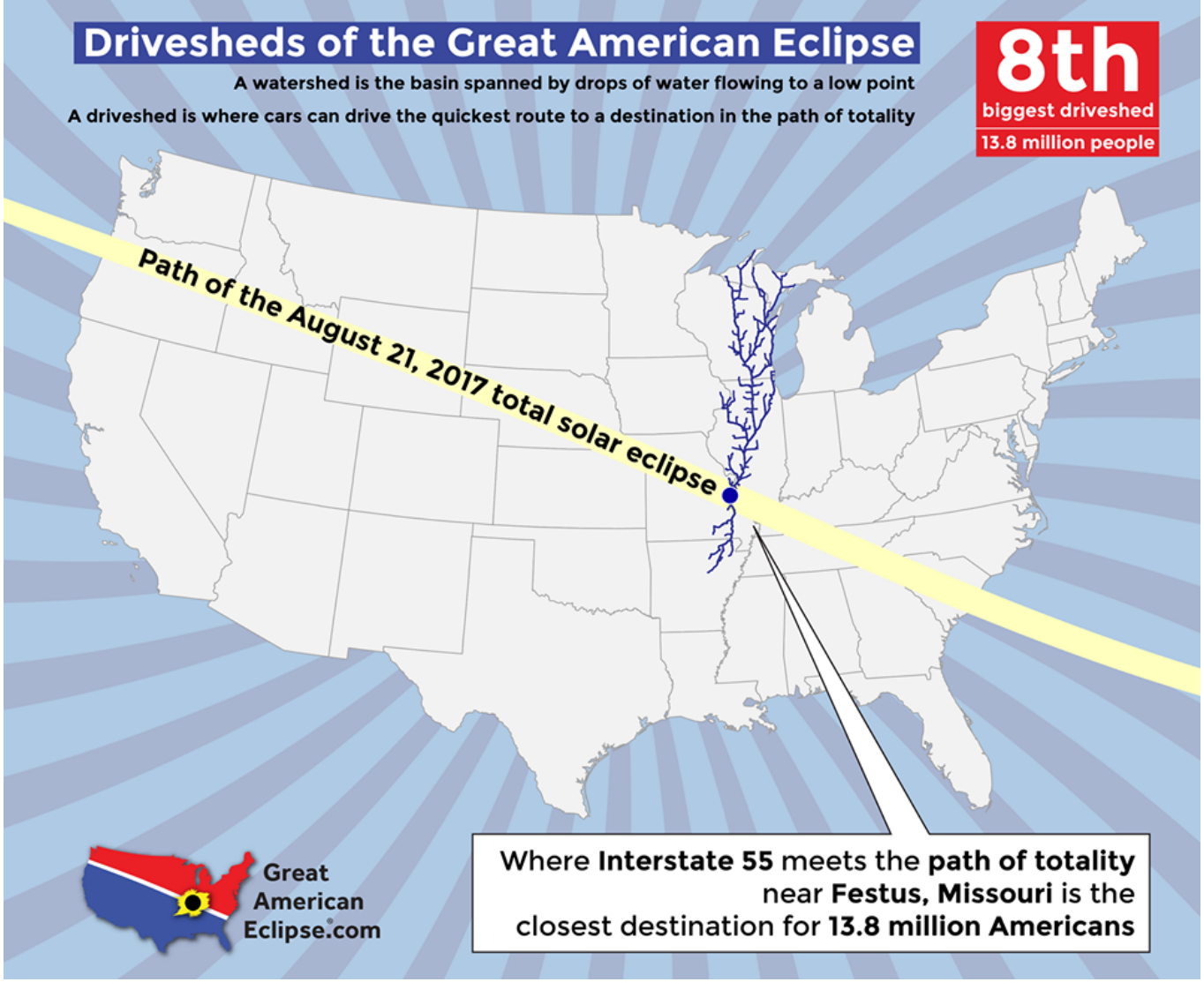
Drivesheds of the Great American Eclipse! This commences a countdown to the 12 biggest drivesheds this August 21, 2017. I've computed these spots using the national road network and US Census data. These maps are a public service to alert the public and authorities where severe traffic congestion can be expected and to advise people to arrive at least the day before the eclipse. - GreatAmericanEclipse.com

The 11th biggest driveshed for the August 21 2017 total solar eclipse is the I-25 corridor funneling New Mexico, Arizona, and Colorado traffic to Glendo, Wyoming. Many Denverites will get the idea to go see the eclipse just before eclipse day, so arrive at your destination the day before! If you can't get to Wyoming the day before, leave Denver at a silly hour like 2 a.m. - GreatAmericanEclipse.com

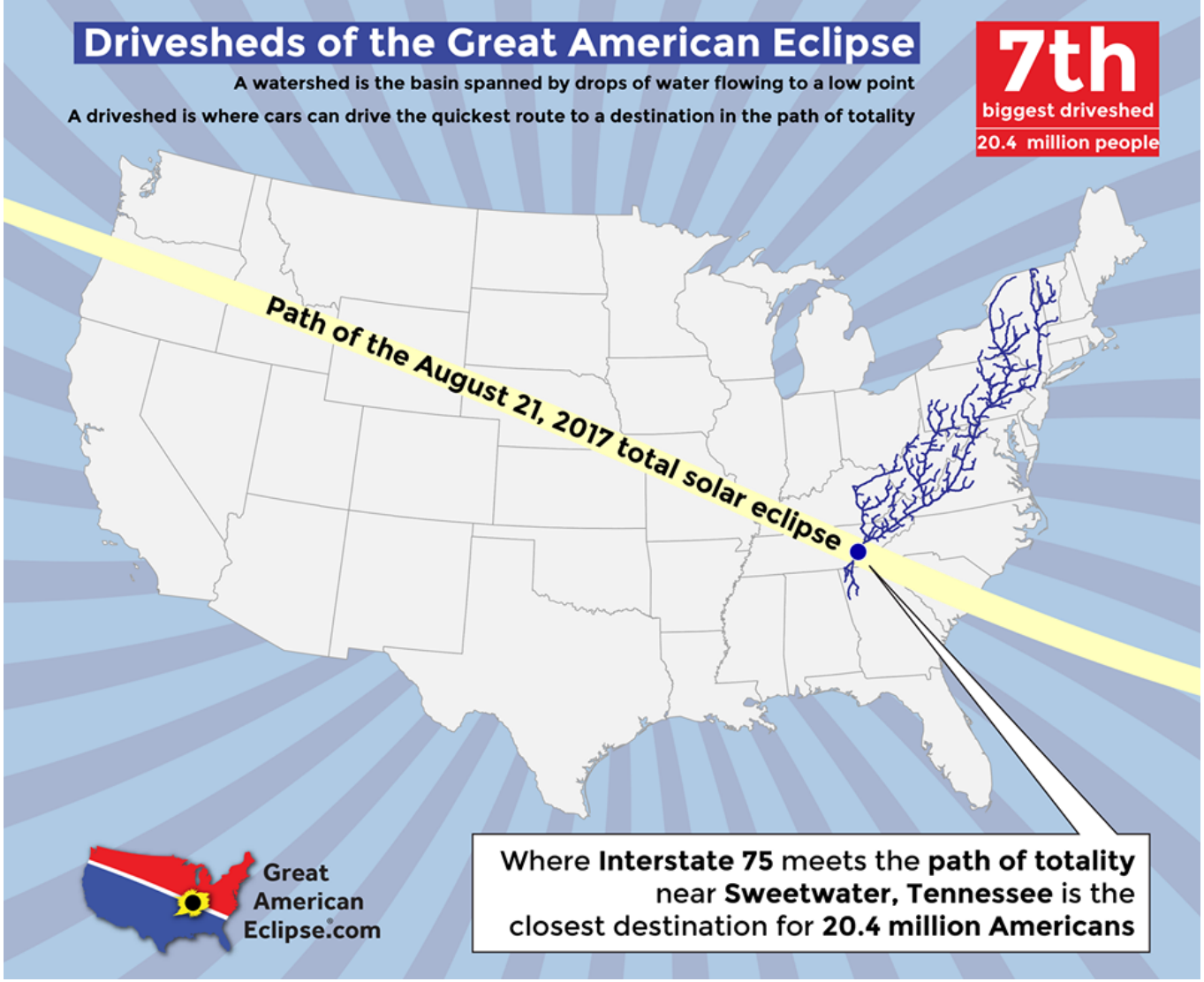


Greenville, South Carolina is the 10th biggest driveshed of the August 21, 2017 total solar eclipse? What's a driveshed? Simply, the area closest to cars to this point and we've done the math to sum up the potential population. – GreatAmericanEclipse.com

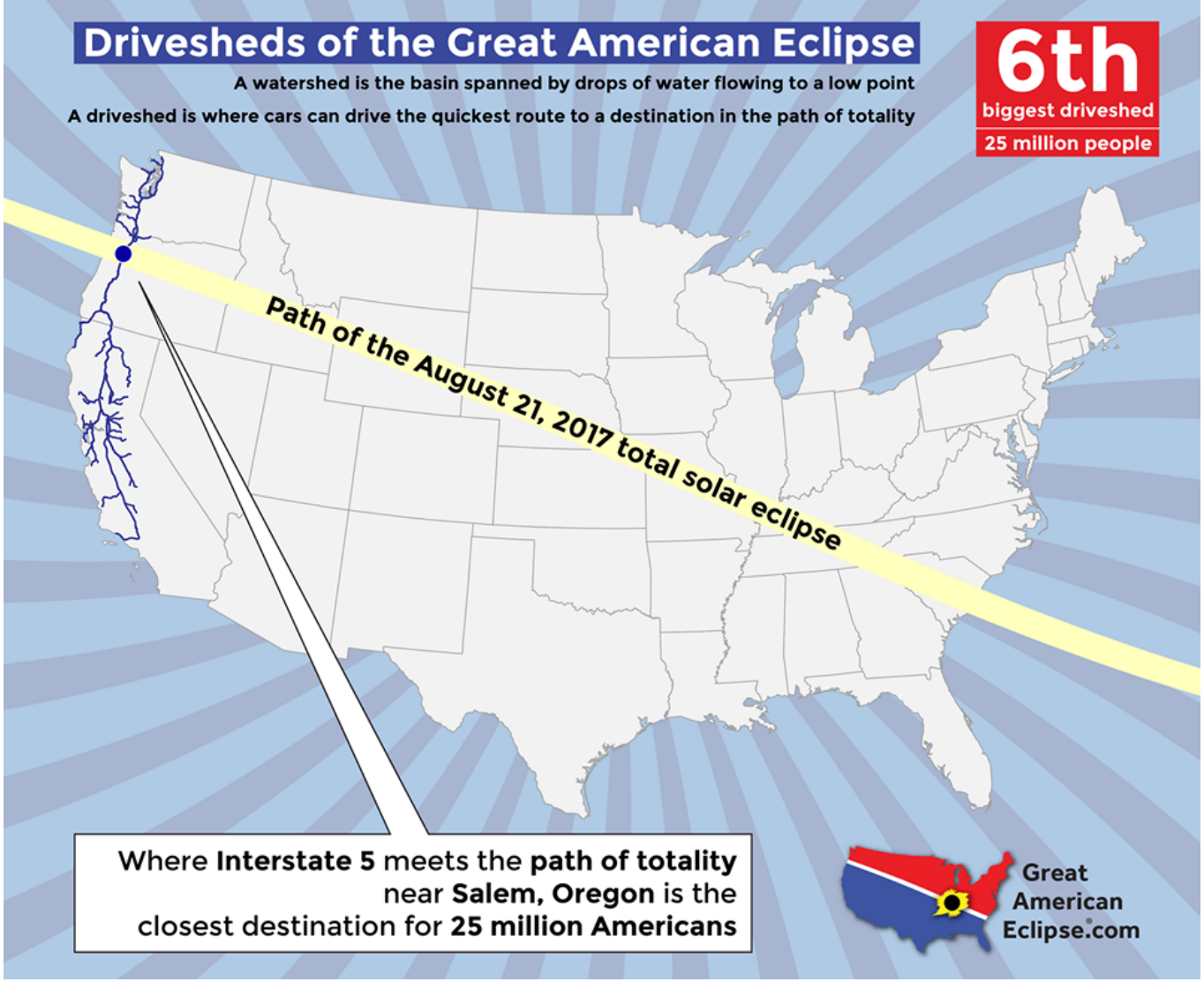
The 9th biggest drive shed funnels 12.5 million people from Minnesota, Iowa, Missouri, and Oklahoma to I-35 near Lathrop, Missouri. These chokepoints along the path are predicable and these maps serve as two pieces of advice: get to your destination the day before and avoid the biggest points of congestion! – GreatAmericanEclipse.com



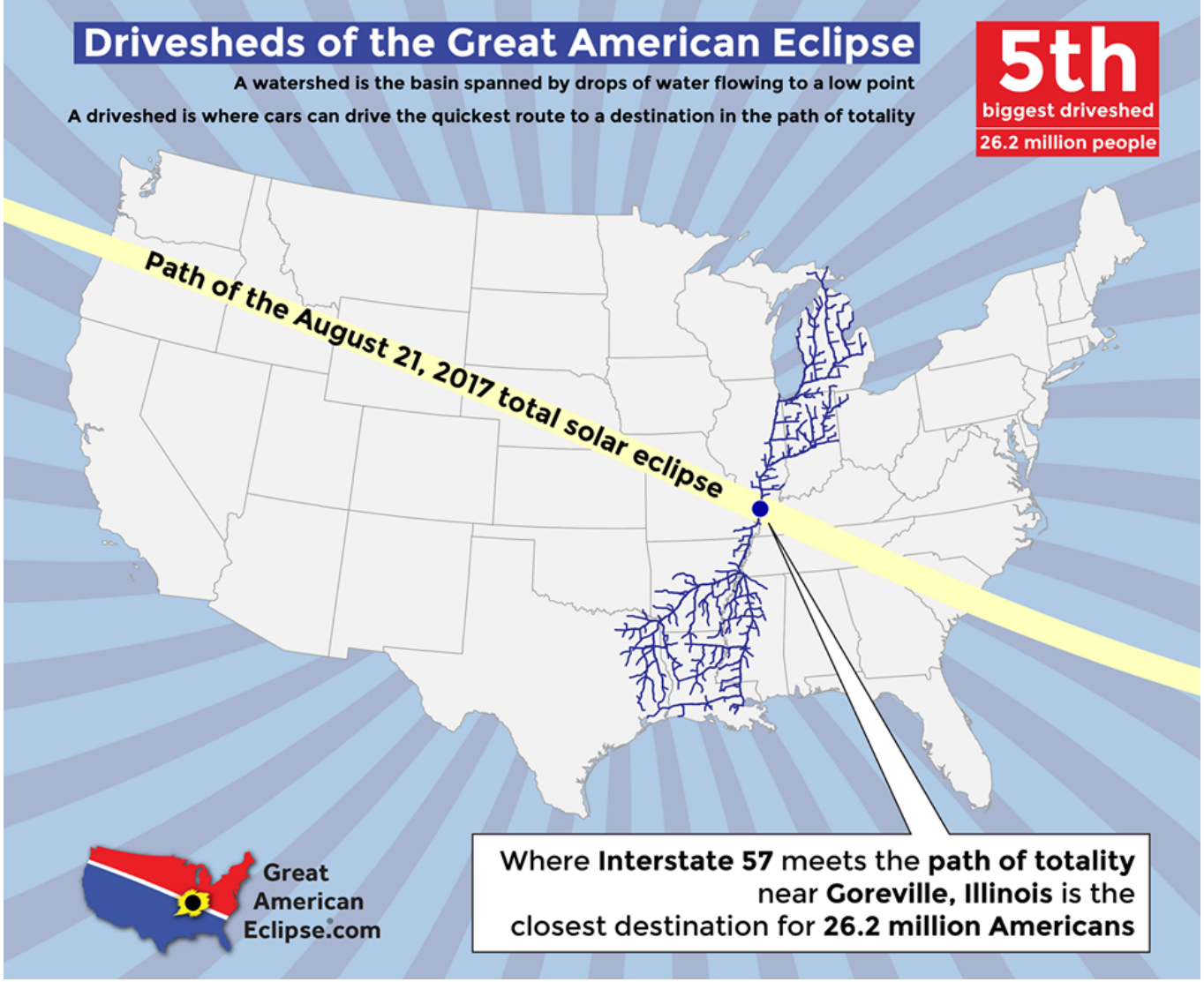
The 8th biggest driveshed of the August 21st total solar eclipse channels people from Wisconsin, Illinois, Missouri, and Arkansas to Festus, Missouri. A metropolis on the northern limit in this area is St Louis.– GreatAmericanEclipse.com



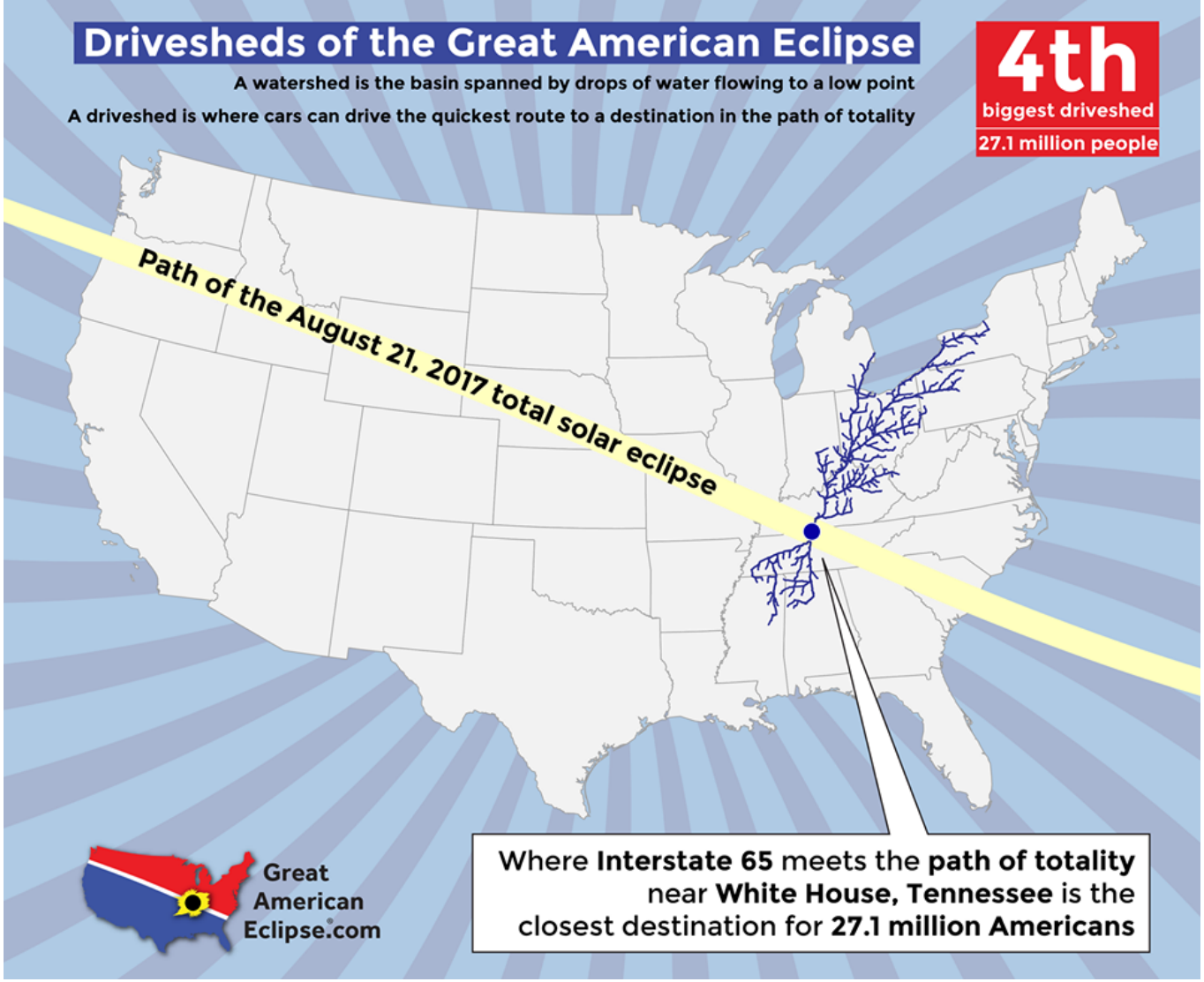
Where I-75 crosses the eclipse centerline near Sweetwater, Tennessee will be the closest destination for 20.4 million Americans from New England to Georgia. Our message: Get to your destination the day before! – GreatAmericanEclipse.com



The 6th largest driveshed converges on…Salem, Oregon! This is the most accessible spot for Seattle, Portland, and much of California. Where will YOU be? – GreatAmericanEclipse.com



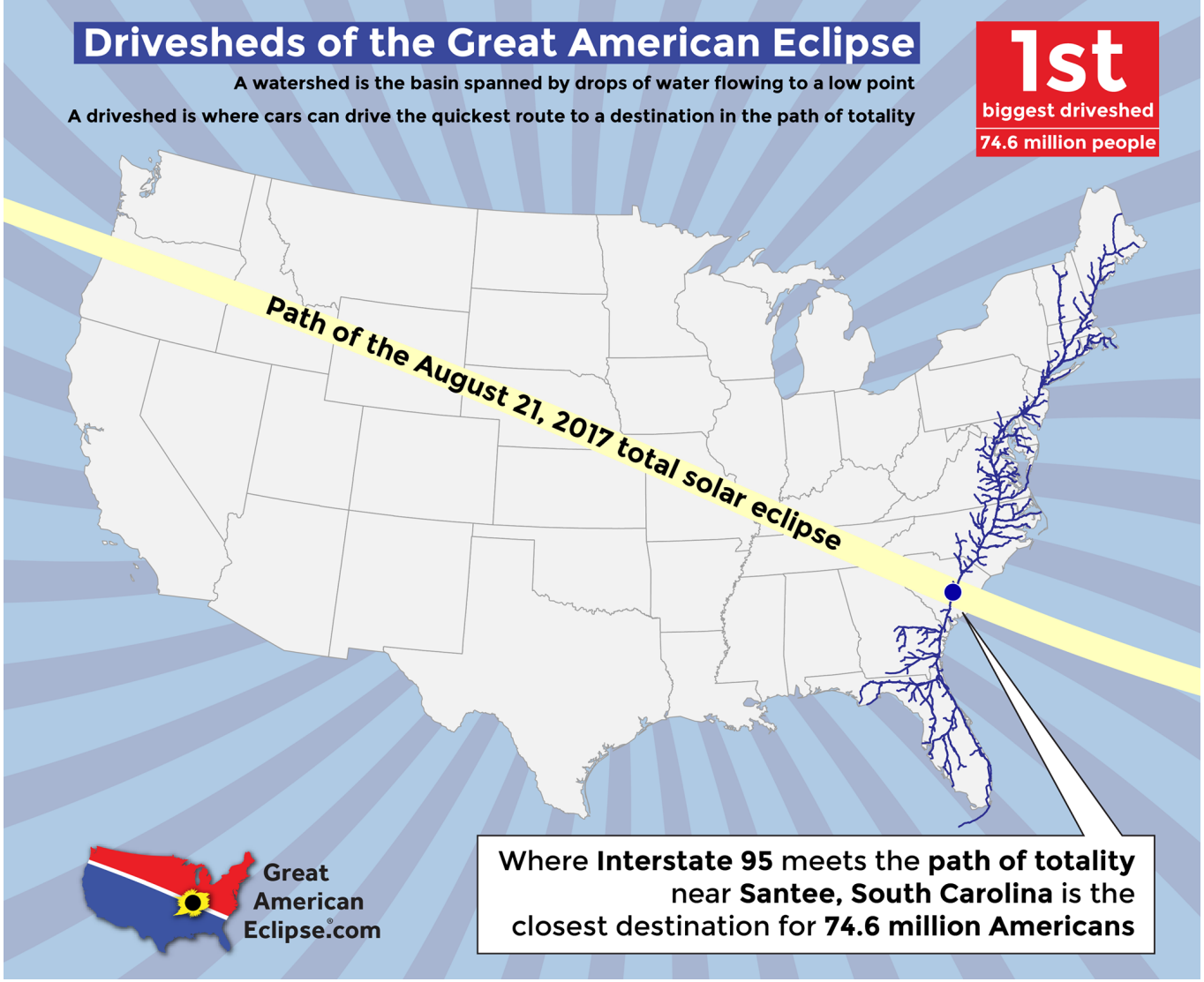
The FIFTH biggest driveshed converges on southern Illinois near Carbondale, Illinois! For 26 MILLION Americans, this will be the closest destination. This will be one of the key areas of predictable traffic congestion. Where will YOU be? – GreatAmericanEclipse.com



The FOURTH biggest driveshed converges upon White House, Tennessee. (Are you ready Tennessee?) This area is the closest destination of 27 million Americans from the Midwest and the deep South. Where will YOU be? – GreatAmericanEclipse.com

The nearest destination for 27 million American will be where Highway 75 meets the path of totality near Sabetha, Kansas. This is the closest point for most of Oklahoma and Texas.
– GreatAmericanEclipse.com

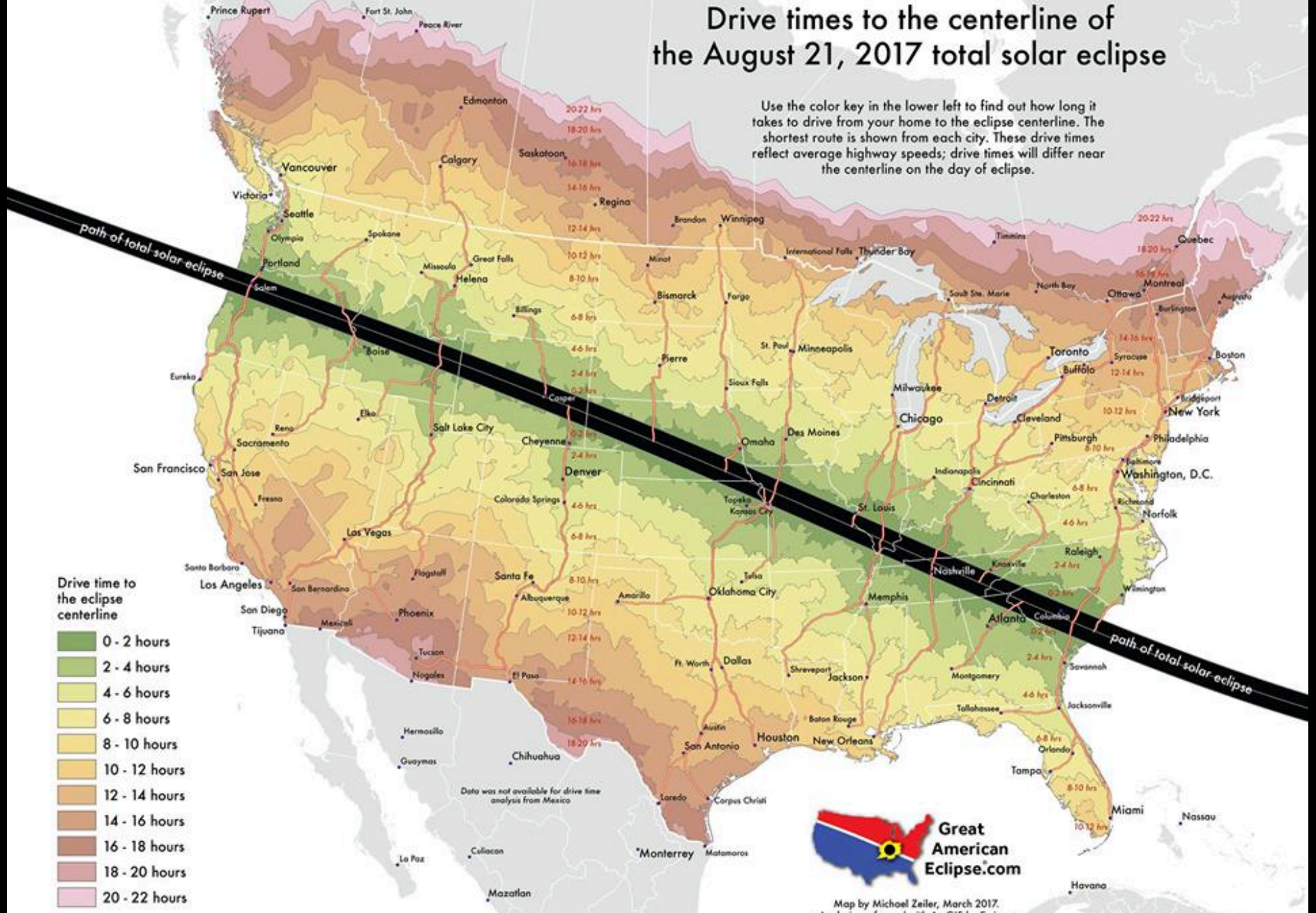
The biggest surprise of these driveshed maps is Idaho Falls, Idaho. This is the closest destination for 35 million Americans, including most of southern California, Arizona, Utah, Idaho, and Montana. This will be one of the top chokepoints that authorities need to prepare for. – GreatAmericanEclipse.com



The TOP destination for so many Americans will be Santee, South Carolina! This is the closest spot for 74 MILLION Americans from the Eastern Seaboard and Florida. Interstate 95 truly has the potential for traffic congestion of monumental proportions! – GreatAmericanEclipse.com

Drive times to the centerline of the August 21, 2017 total solar eclipse

Use the color key in the lower left to find out how long it takes to drive from your home to the eclipse centerline. The shortest route is shown from each city. These drive times reflect average highway speeds; drive times will differ near the centerline on the day of eclipse.

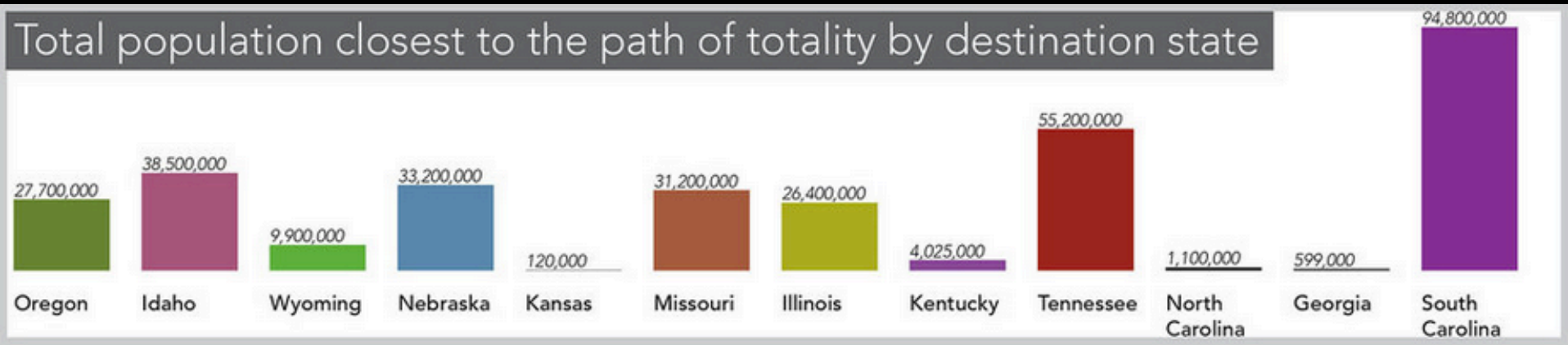


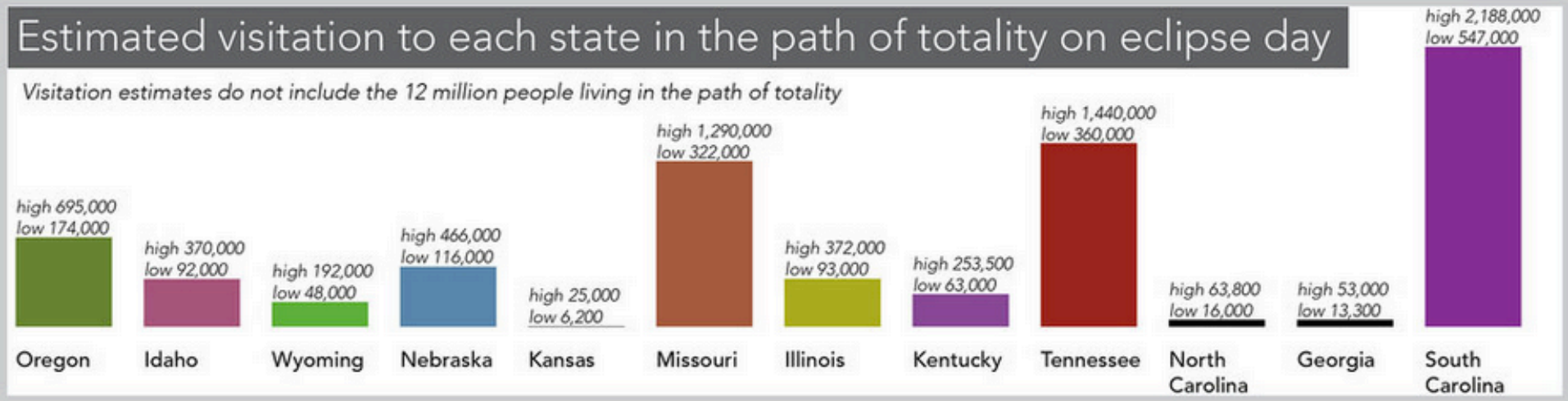
Map by Michael Zeiler, March 2017.
Analysis performed with ArcGIS by Esri.com

Estimated Visitation to Totality Path

Or

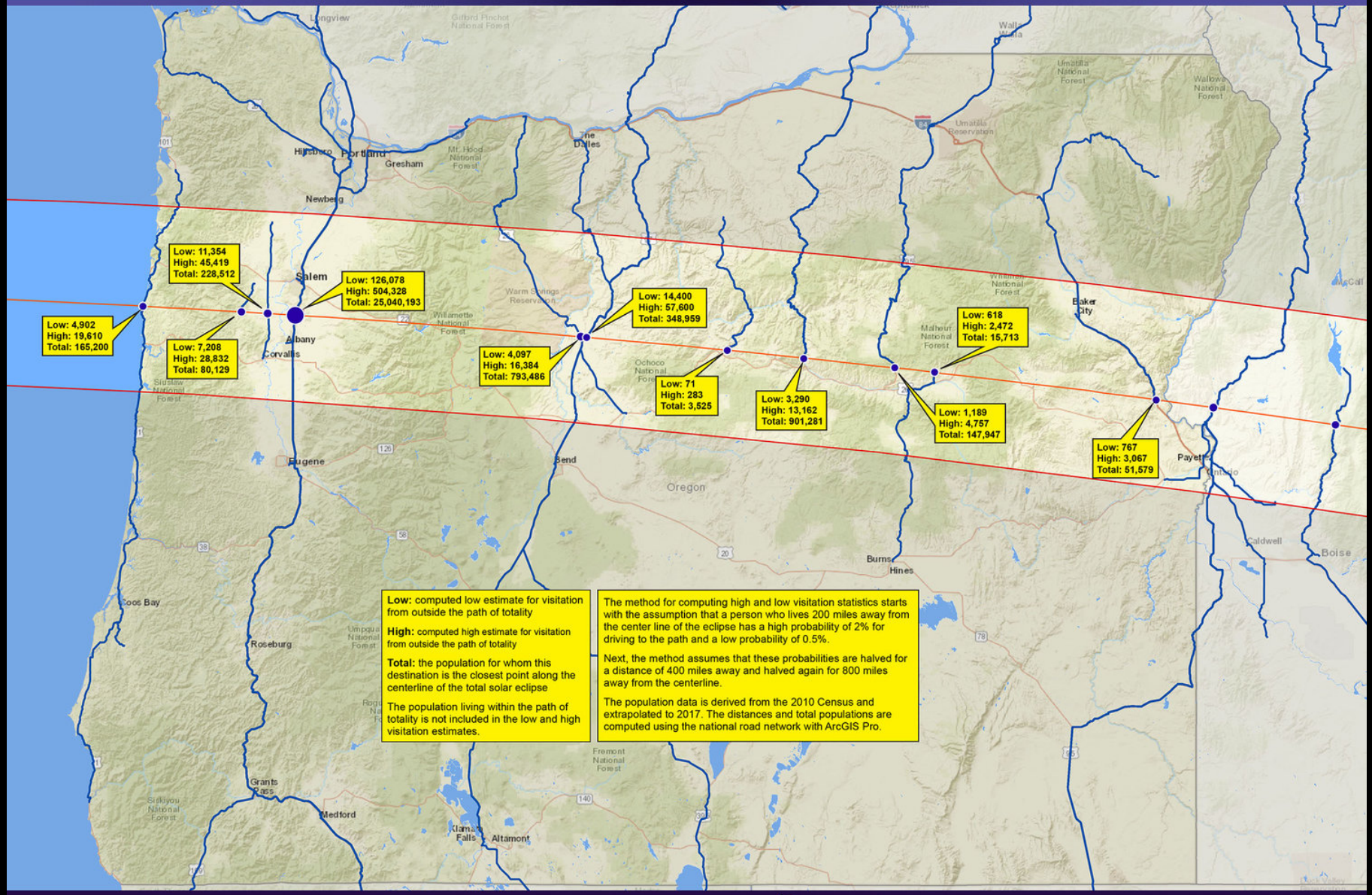
Be Prepared For Neighbors, Traffic, and Lack of PortaPotties





Credit: GreatAmericanEclipse.com

ECLIPSE VISITATION ESTIMATES FOR OREGON ON AUGUST 21, 2017



Low: computed low estimate for visitation from outside the path of totality

High: computed high estimate for visitation from outside the path of totality

Total: the population for whom this destination is the closest point along the centerline of the total solar eclipse

The population living within the path of totality is not included in the low and high visitation estimates.

The method for computing high and low visitation statistics starts with the assumption that a person who lives 200 miles away from the center line of the eclipse has a high probability of 2% for driving to the path and a low probability of 0.5%.

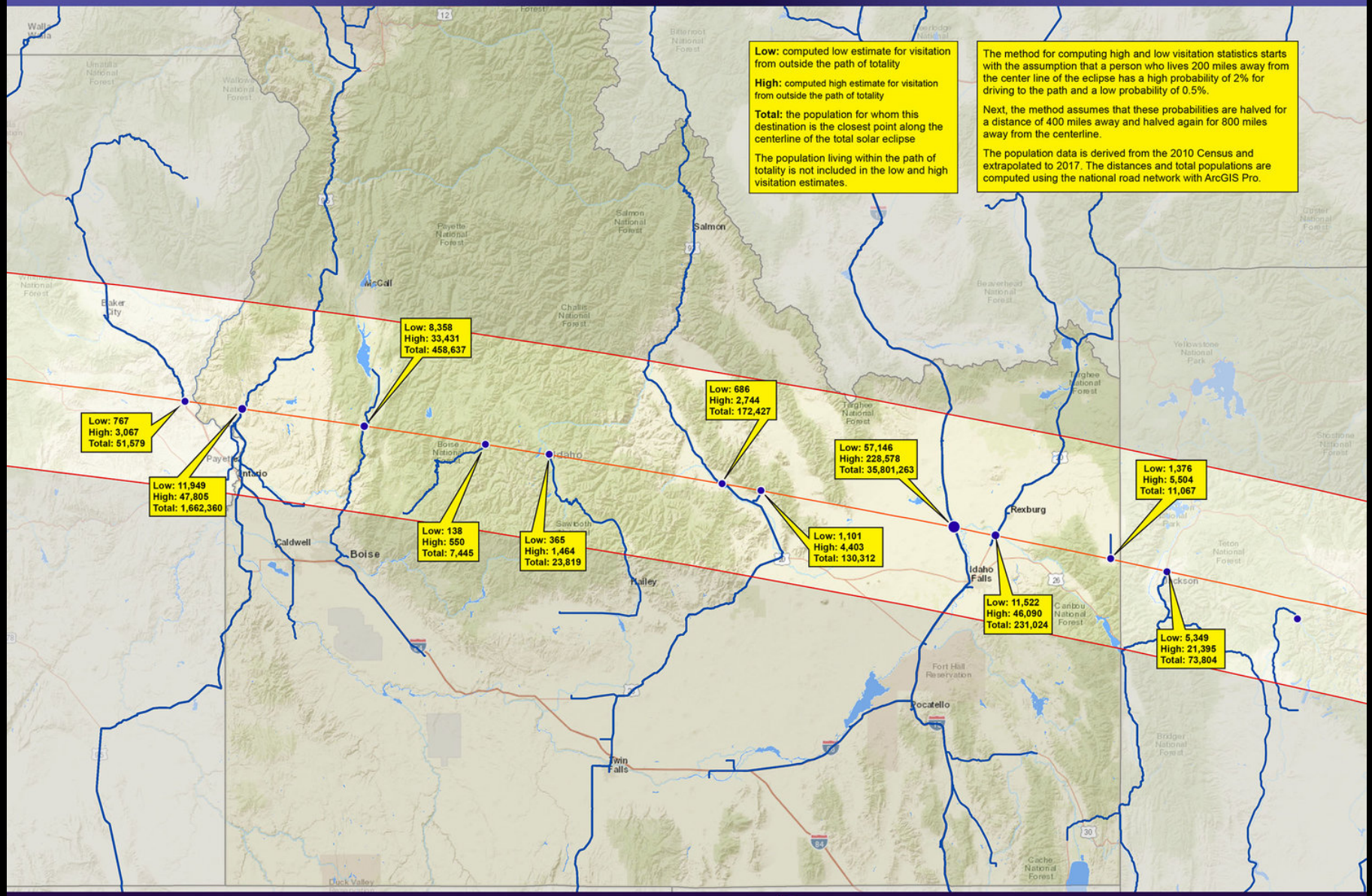
Next, the method assumes that these probabilities are halved for a distance of 400 miles away and halved again for 800 miles away from the centerline.

The population data is derived from the 2010 Census and extrapolated to 2017. The distances and total populations are computed using the national road network with ArcGIS Pro.

Where will YOU be on August 21, 2017?

GreatAmericanEclipse.com

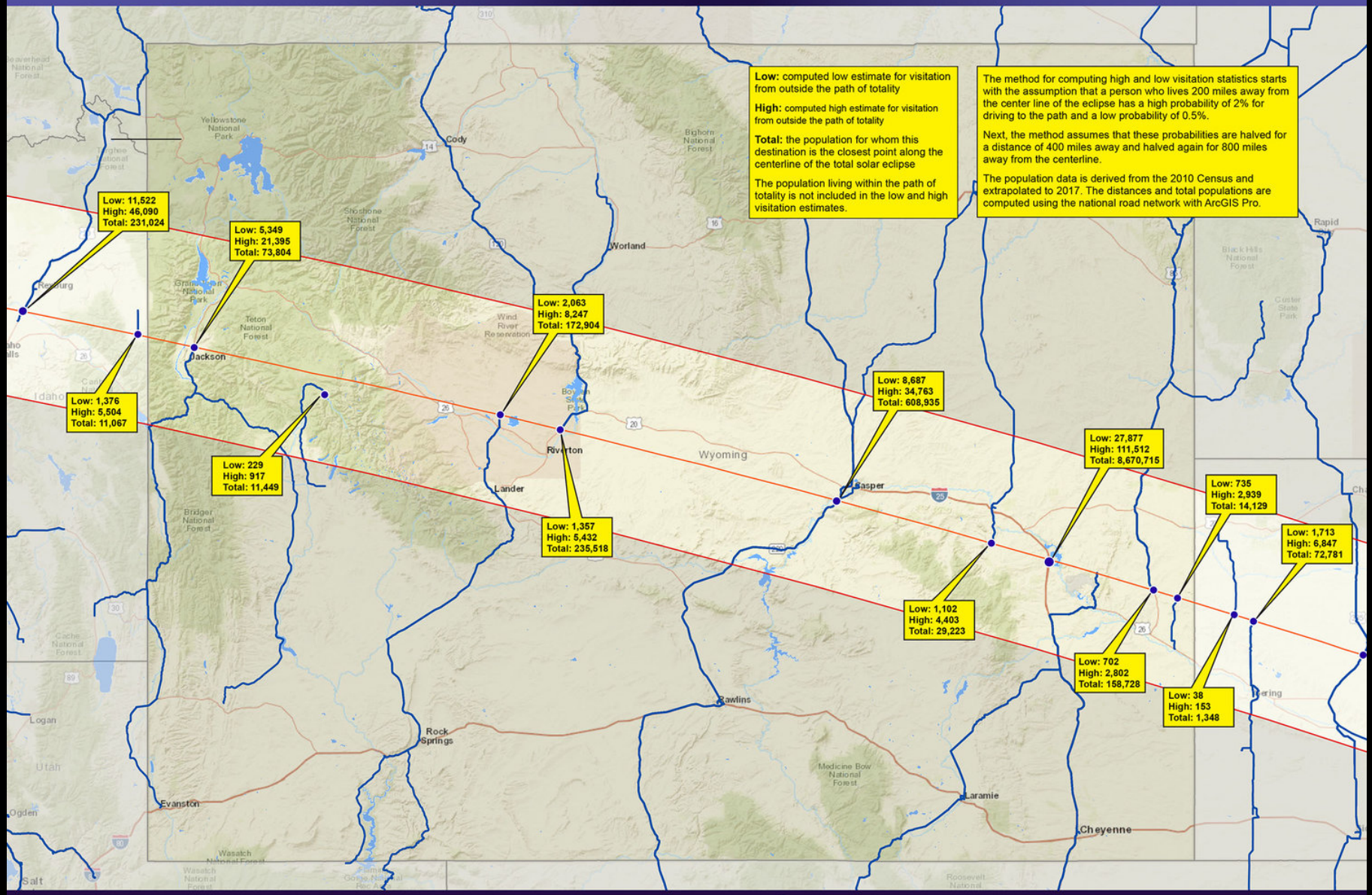
ECLIPSE VISITATION ESTIMATES FOR IDAHO ON AUGUST 21, 2017



Where will YOU be on August 21, 2017?

GreatAmericanEclipse.com

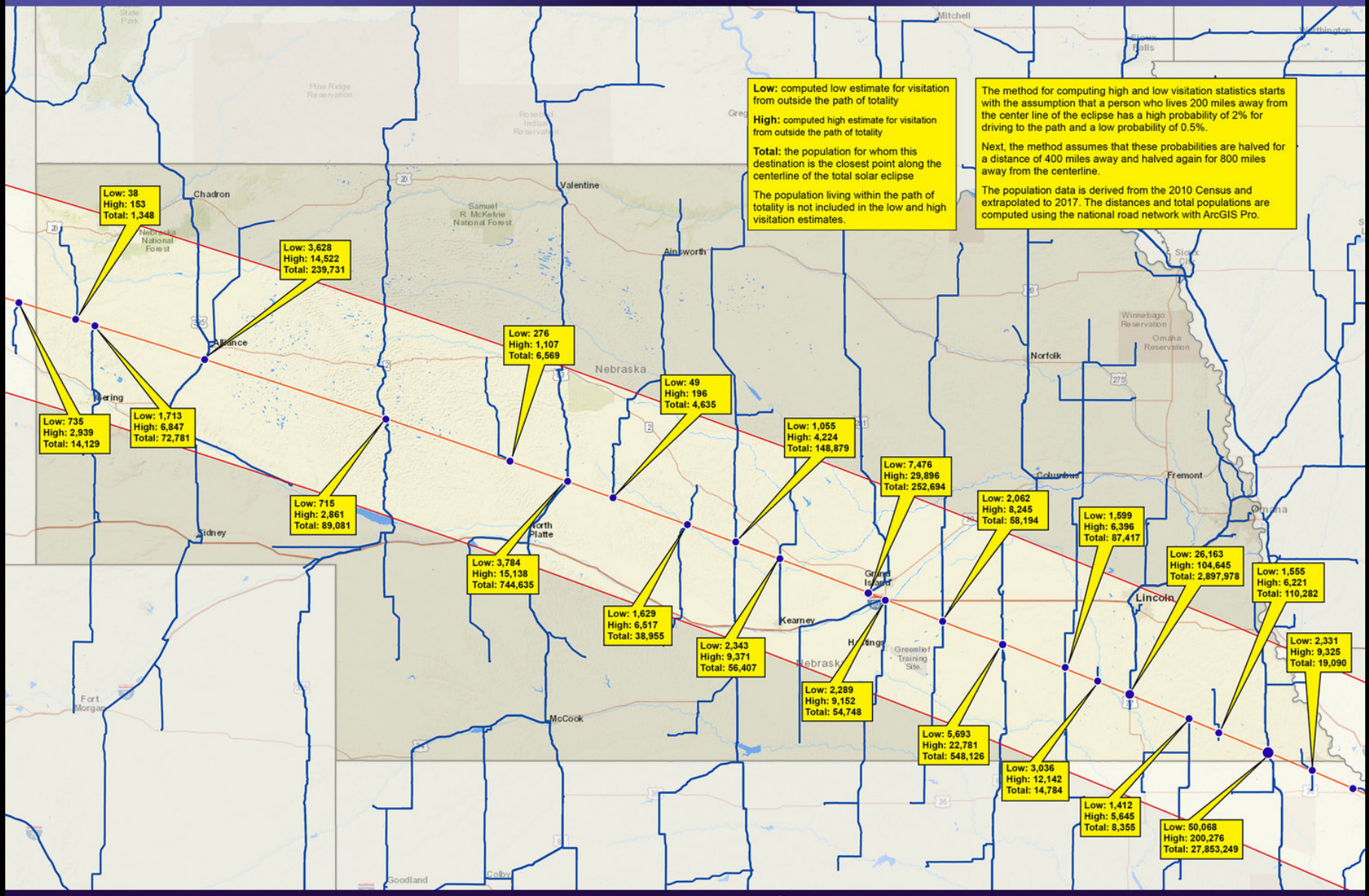
ECLIPSE VISITATION ESTIMATES FOR WYOMING ON AUGUST 21, 2017



Where will YOU be on August 21, 2017?

GreatAmericanEclipse.com

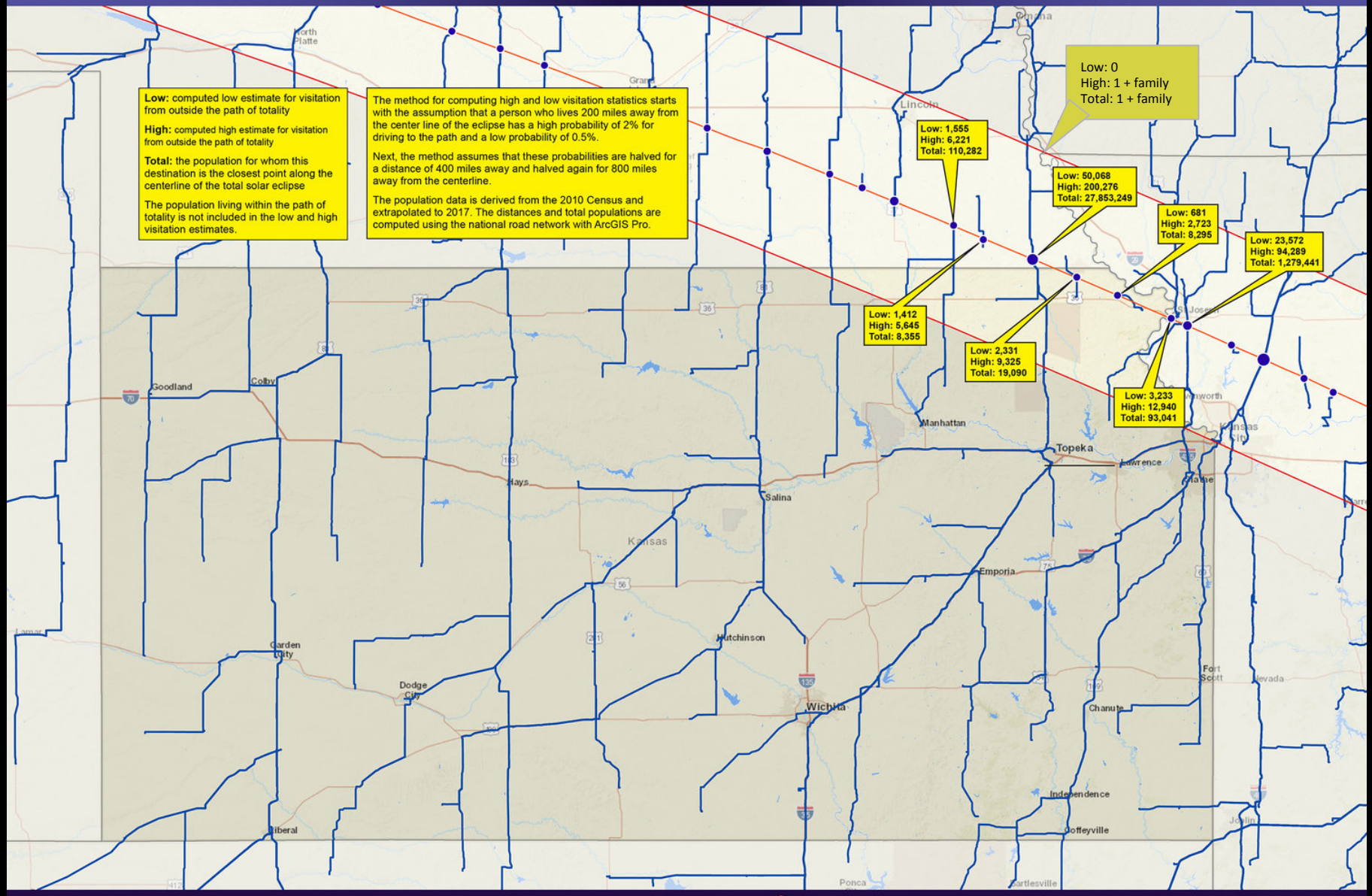
ECLIPSE VISITATION ESTIMATES FOR NEBRASKA ON AUGUST 21, 2017



Where will YOU be on August 21, 2017?

GreatAmericanEclipse.com

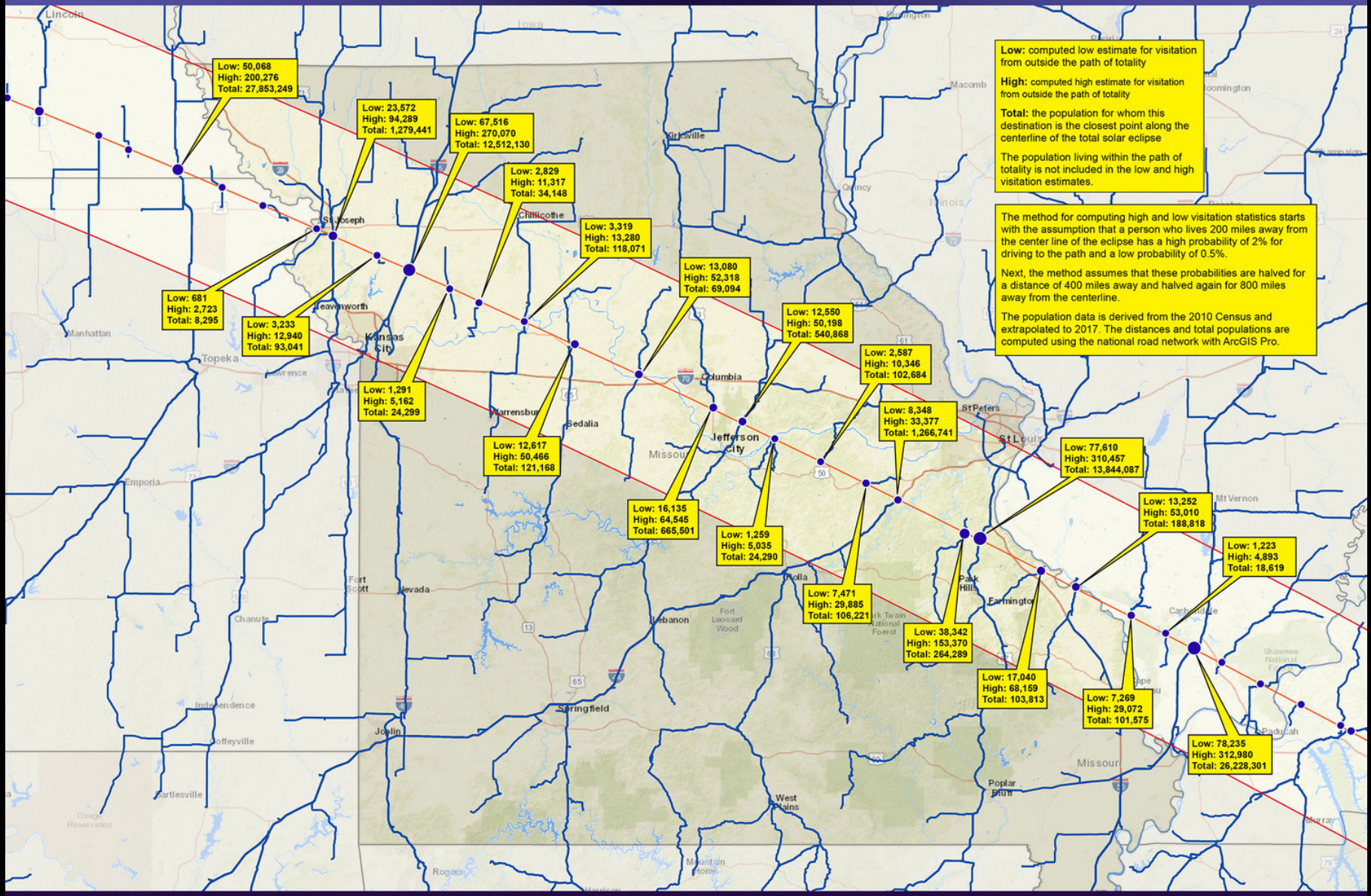
ECLIPSE VISITATION ESTIMATES FOR KANSAS ON AUGUST 21, 2017



Where will YOU be on August 21, 2017?

GreatAmericanEclipse.com

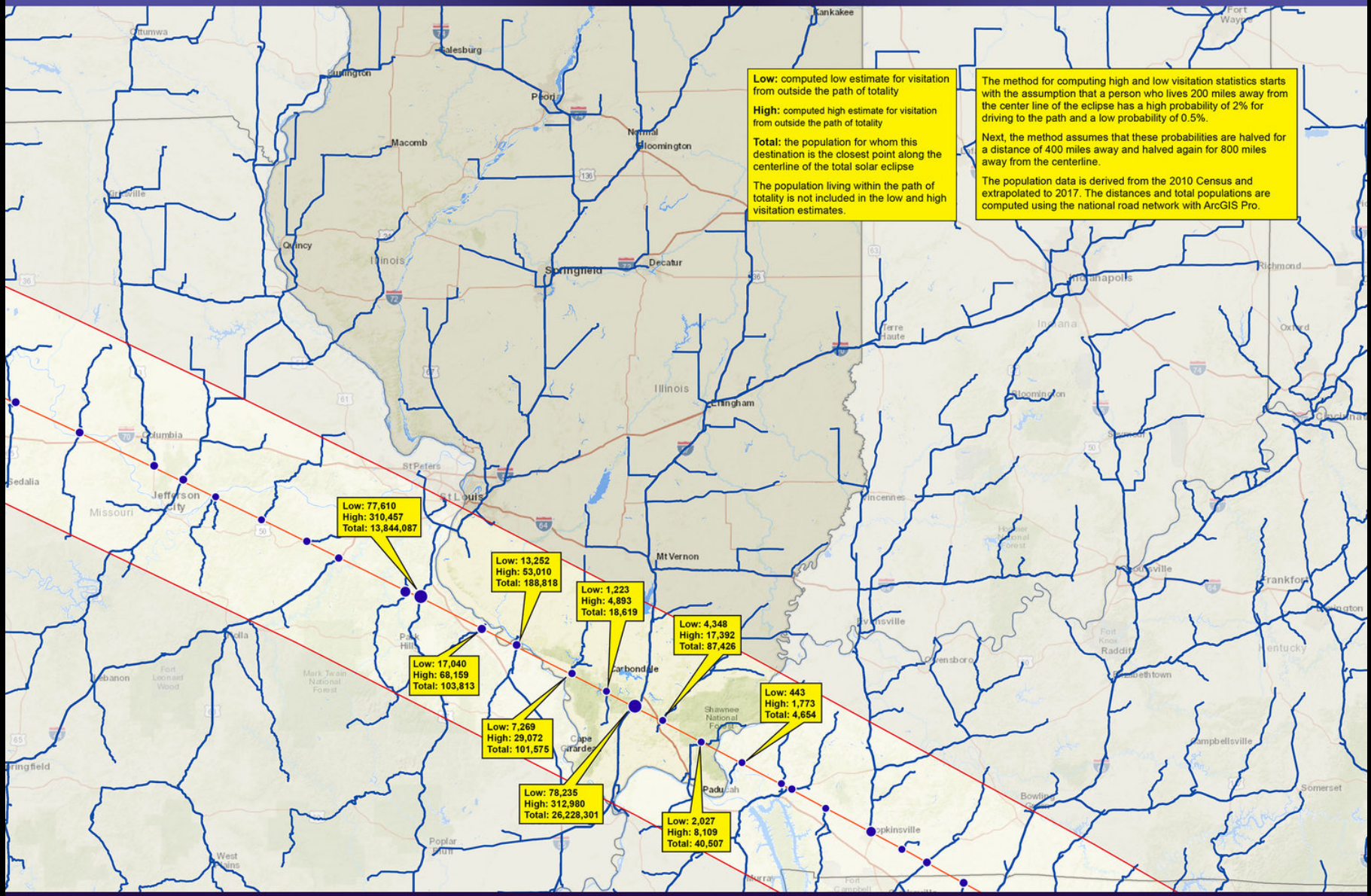
ECLIPSE VISITATION ESTIMATES FOR MISSOURI ON AUGUST 21, 2017



Where will YOU be on August 21, 2017?

GreatAmericanEclipse.com

ECLIPSE VISITATION ESTIMATES FOR ILLINOIS ON AUGUST 21, 2017



Where will YOU be on August 21, 2017?

GreatAmericanEclipse.com

ECLIPSE VISITATION ESTIMATES FOR KENTUCKY ON AUGUST 21, 2017

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Total: the population for whom this destination is the closest point along the centerline of the total solar eclipse

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The method for computing high and low visitation statistics starts with the assumption that a person who lives 200 miles away from the center line of the eclipse has a high probability of 2% for driving to the path and a low probability of 0.5%.

Next, the method assumes that these probabilities are halved for a distance of 400 miles away and halved again for 800 miles away from the centerline.

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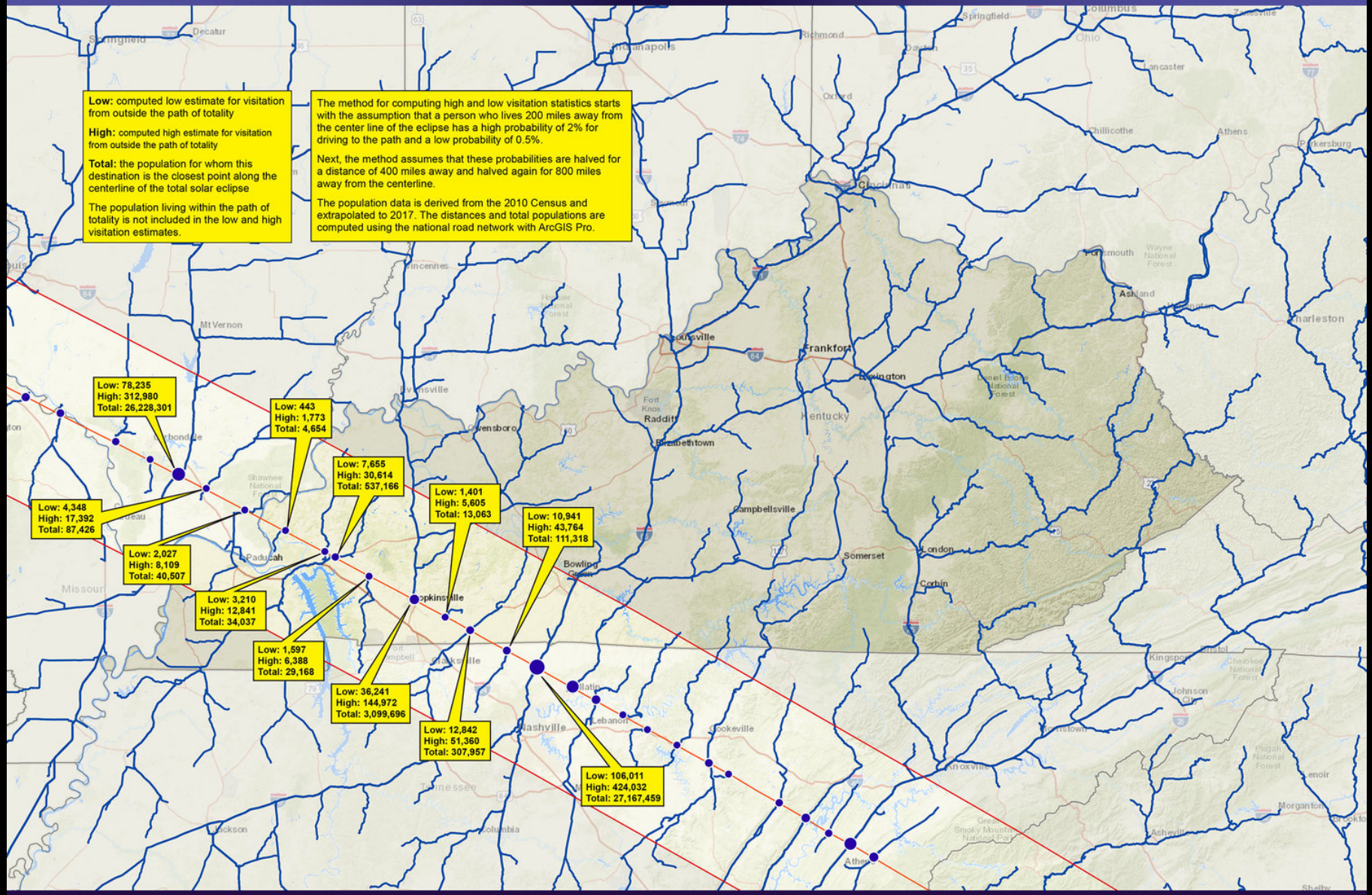
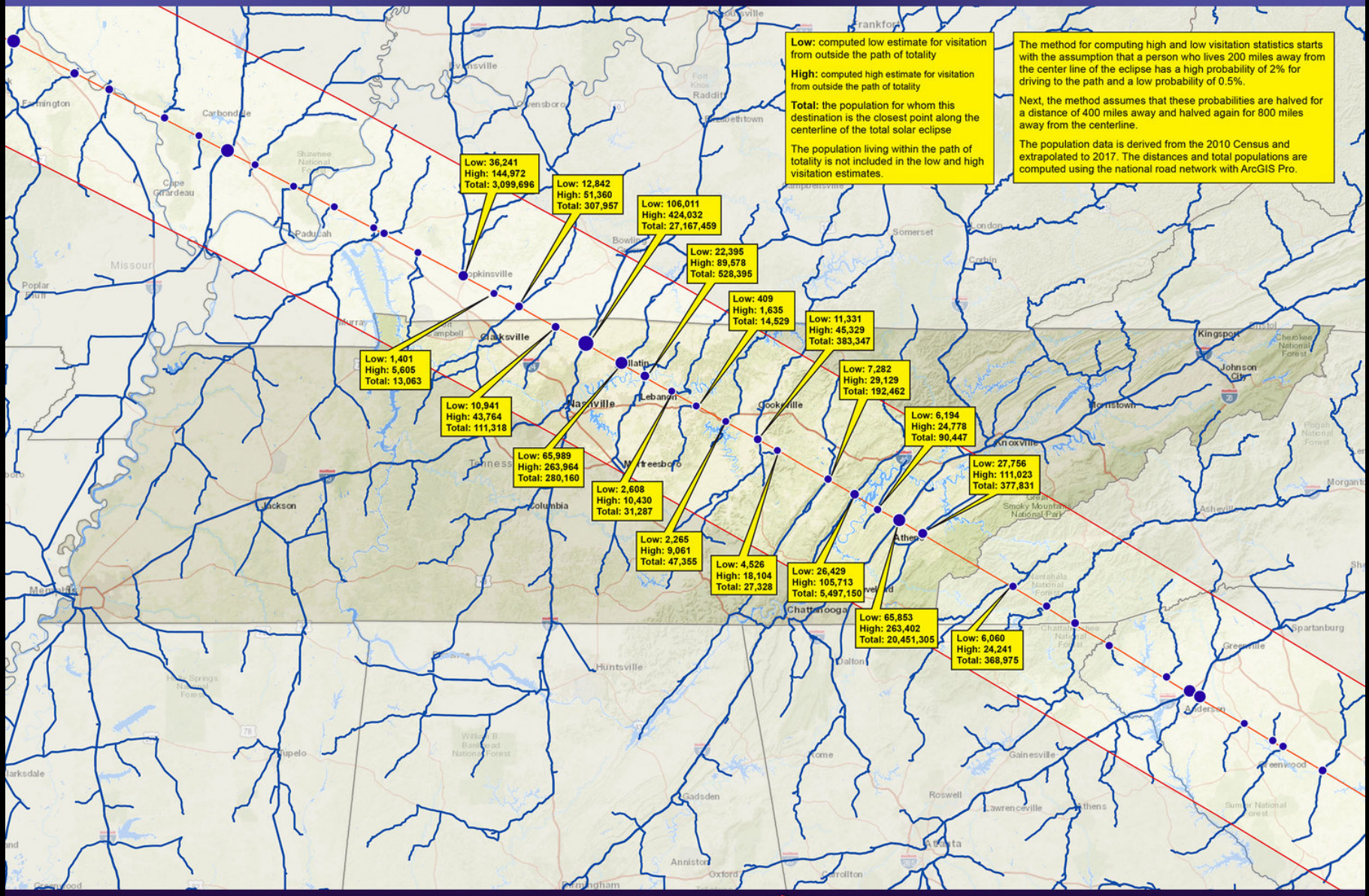


Where will YOU be on August 21, 2017?

GreatAmericanEclipse.com

ECLIPSE VISITATION ESTIMATES FOR TENNESSEE ON AUGUST 21, 2017



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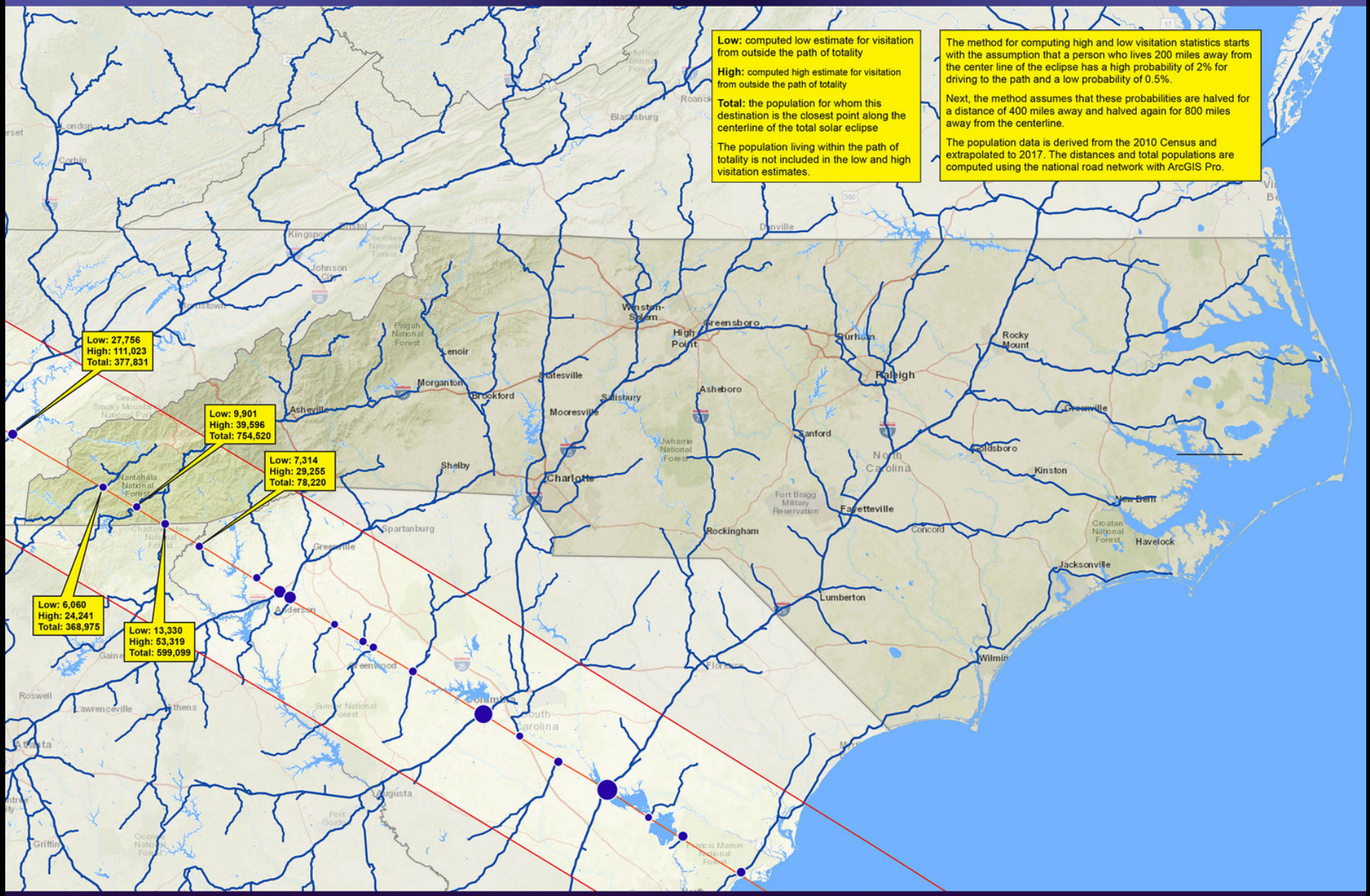
Where will YOU be on August 21, 2017?

GreatAmericanEclipse.com

ECLIPSE VISITATION ESTIMATES FOR NORTH CAROLINA ON AUGUST 21, 2017



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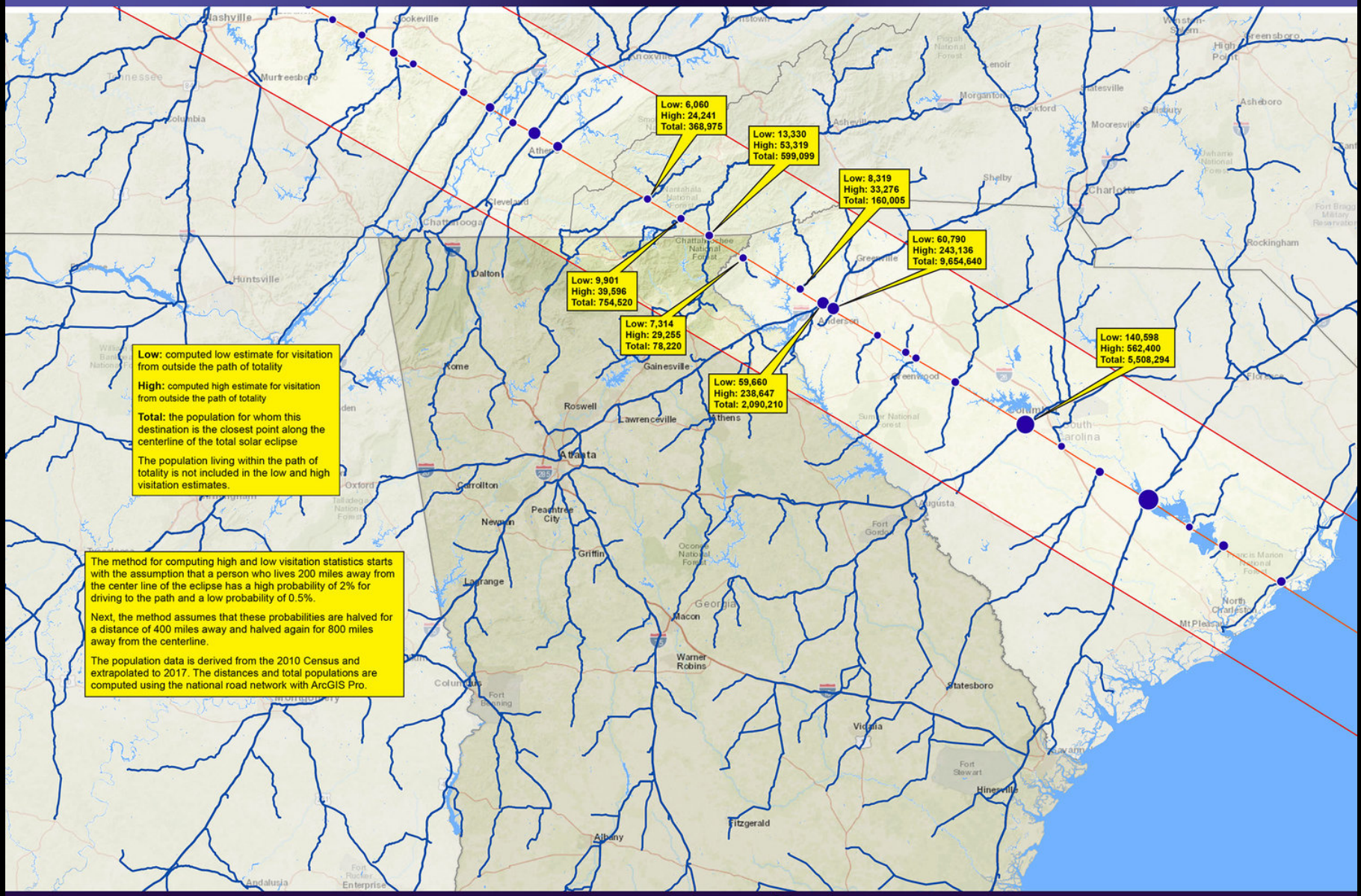
Where will YOU be on August 21, 2017?

GreatAmericanEclipse.com

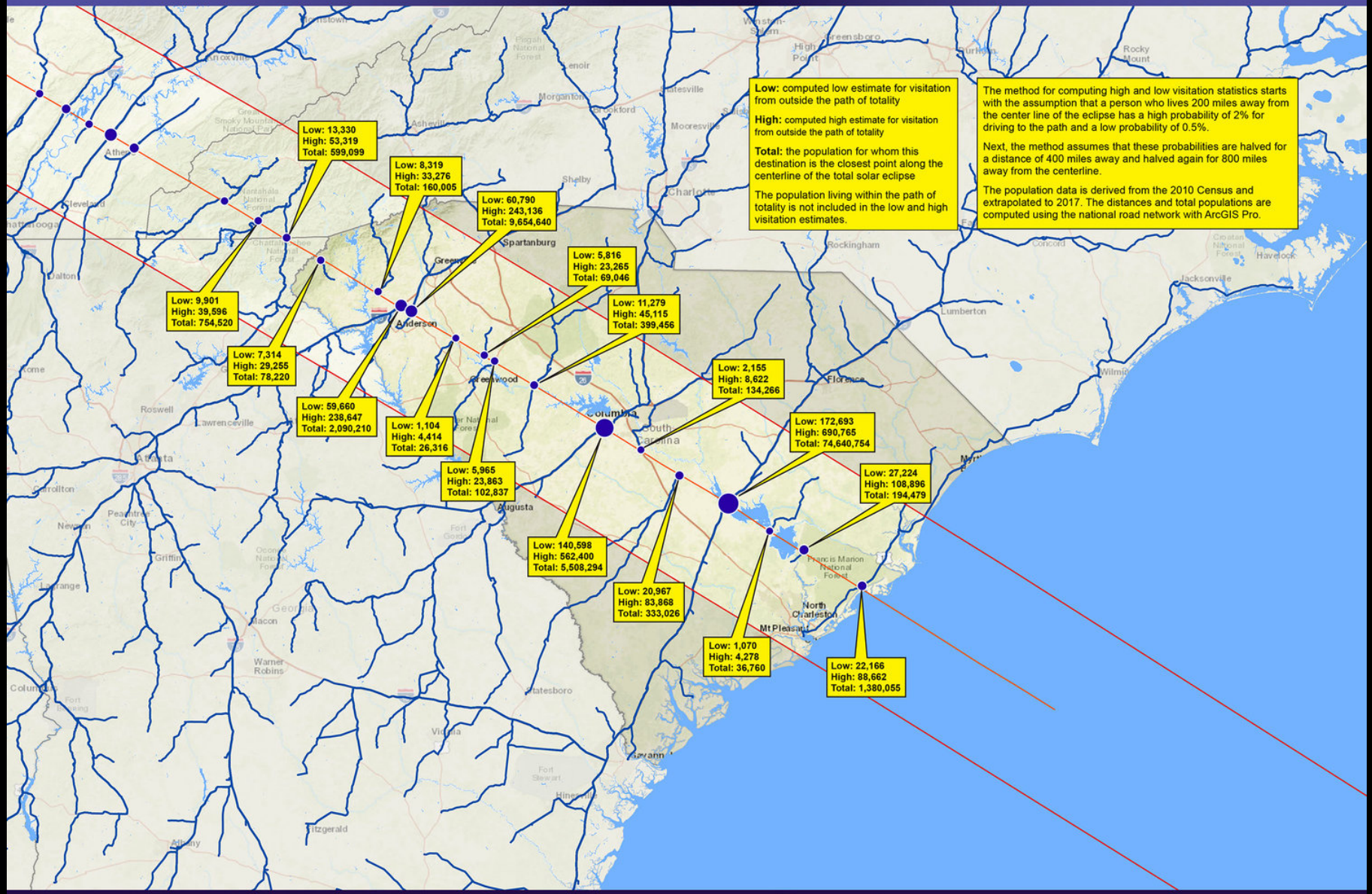
ECLIPSE VISITATION ESTIMATES FOR GEORGIA ON AUGUST 21, 2017



Where will YOU be on August 21, 2017?

GreatAmericanEclipse.com

ECLIPSE VISITATION ESTIMATES FOR SOUTH CAROLINA ON AUGUST 21, 2017



Where will YOU be on August 21, 2017?

GreatAmericanEclipse.com

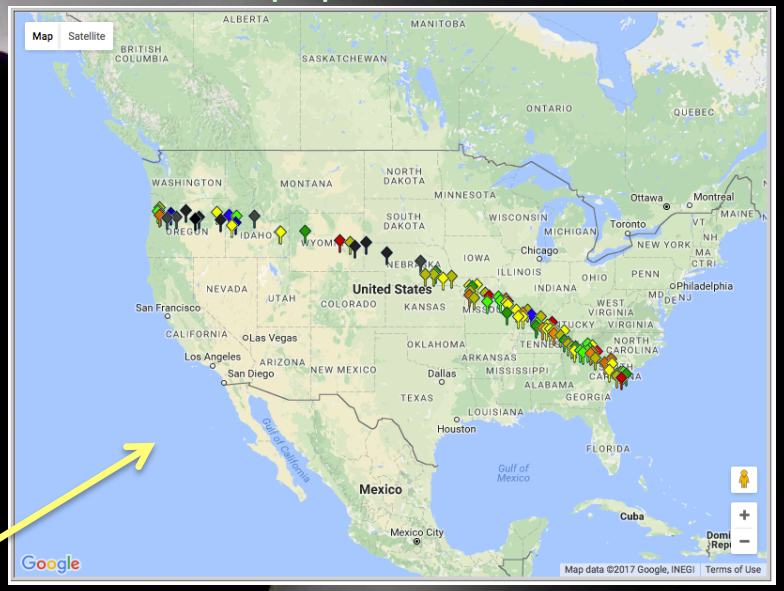
Weather Forecast Options

- **The National Center for Environmental Predictions (NCEP):**
  http://mag.ncep.noaa.gov/model-guidance-model-area.php

- **College of DuPage (COD) – goto site for storm chasers:**
  https://weather.cod.edu

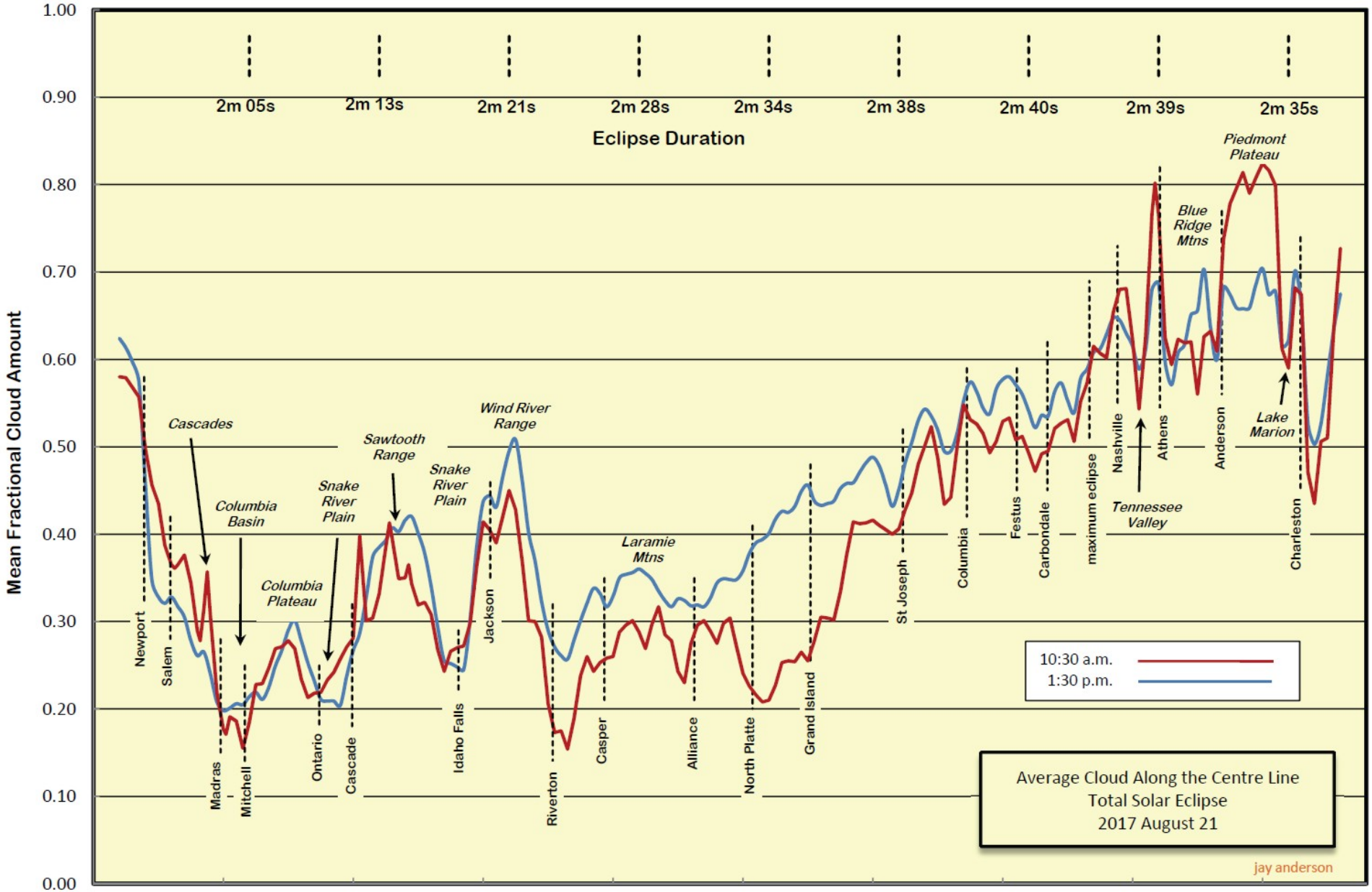
- **National Weather Service (NWS):**
  http://www.weather.gov

- **Clear Dark Sky's Clear Sky Charts (for cloud forecasts upwards of 48 hours):**
  http://www.cleardarksky.com/cgi-bin/find_chart.py?disp=gmap&title=Clear+Sky+Charts+along+the+2017+Eclipse+Path&keys=2017+Solar+Eclipse&skip=0&radius=100&nrecs=100&type=text&unit=0

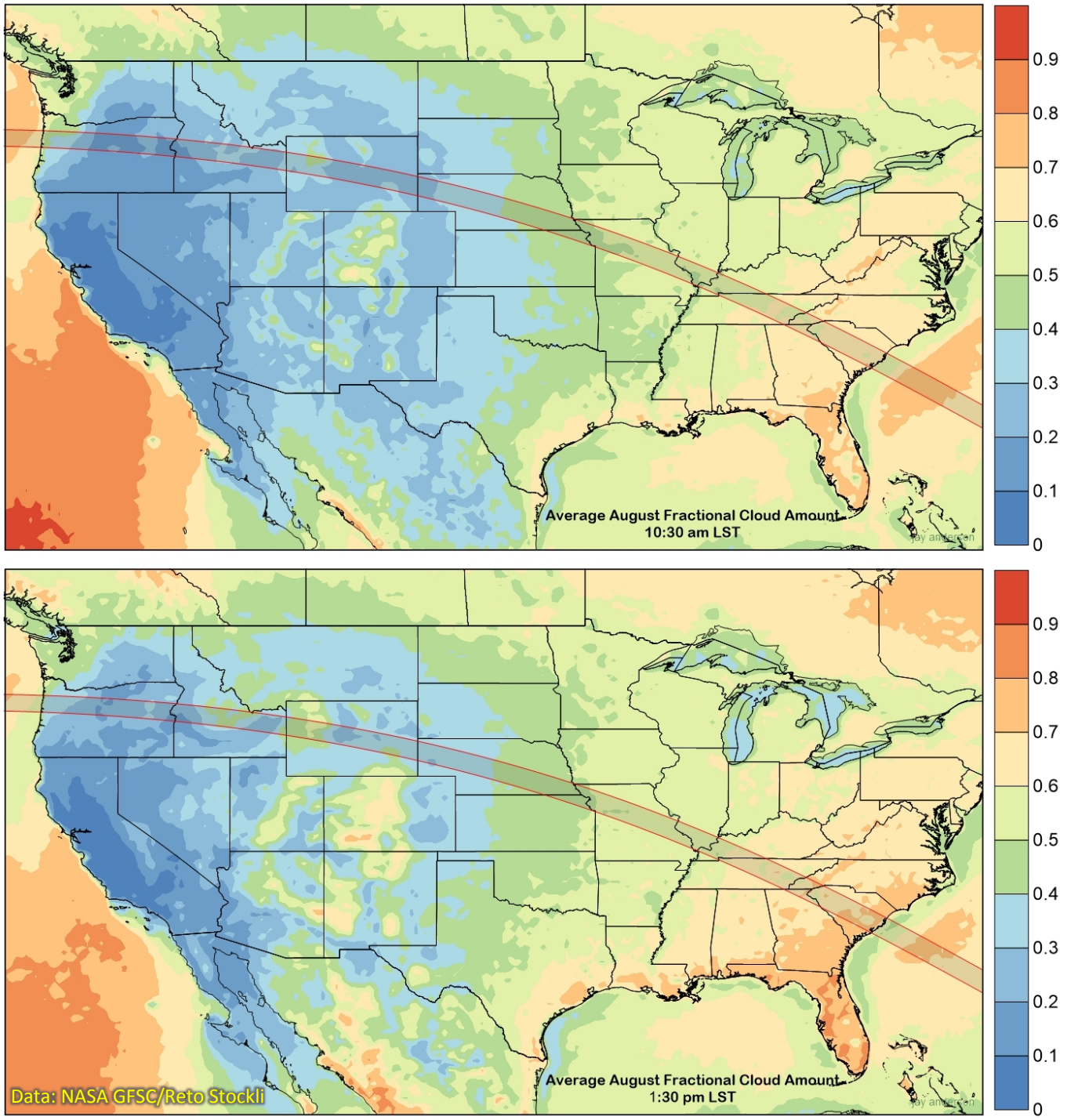


- **Other options include, but are not limited to:**
  - Accuweather
  - Wunderground
  - Weather.com
    - These sites rework the info from NWS's models and sometimes run their own models

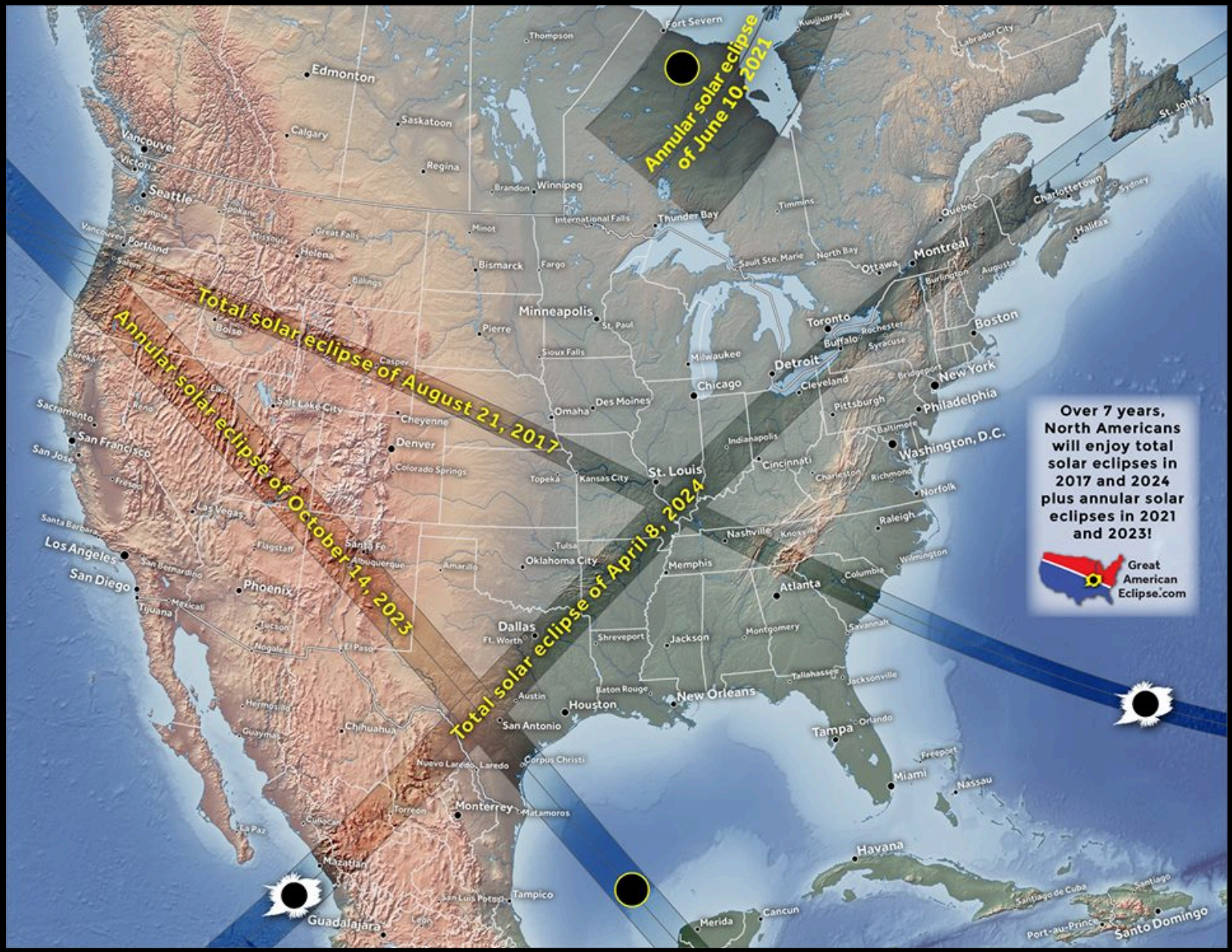
Average Cloud Coverage Along Center Line



Data: NASA GFSC


Average August Fractional Cloud Amount
10:30 am LST
Average August Fractional Cloud Amount
1:30 pm LST
Data: NASA GFSC/Reto Stockli
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0

If You Miss It!



Data: NASA GFSC

Some (of many) Links to Check Out

- Interactive Google Map! Visually pre-check your destination for terrain and road options:
  http://xjubier.free.fr/en/site_pages/solar_eclipses/TSE_2017_GoogleMapFull.html

- Interactive map from NASA (zoom in and click on map to get eclipse details):
  - https://eclipse2017.nasa.gov/sites/default/files/interactive_map/index.html

- Fantastic general informational and hardcopy road map source:
  https://www.greatamericaneclipse.com/

- Another interactive map with which to pre-recon your outing destination:
  http://www.astronomy.com/great-american-eclipse-2017

- A 'megamovie' cartoon illustrating what you will see from any given location:
  - https://eclipsemega.movie/simulator

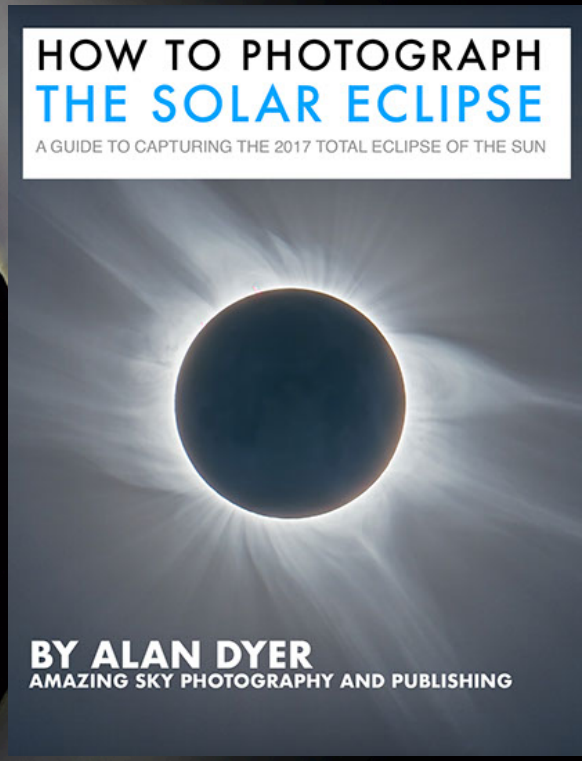
- More eclipse maps - free to use for educational and non-commercial purposes:
  http://eclipse-maps.com/Eclipse-Maps/Welcome.html

- Time and Date page, where you can get timing information on totality:
  https://www.timeanddate.com/eclipse/total-solar-eclipse.html

Some Photography Links

- *How to Photograph the Solar Eclipse* by Alan Dyer: contains a wealth of information covering different types of cameras, lenses, filters, compositioning, and post processing tips and tricks:
  http://www.amazingsky.com/eclipsebook.html

- MrEclipse.com: Lots of information and links as well as tips for photographing eclipses, and primers for novice eclipse viewers:
  http://www.mreclipse.com/MrEclipse.html

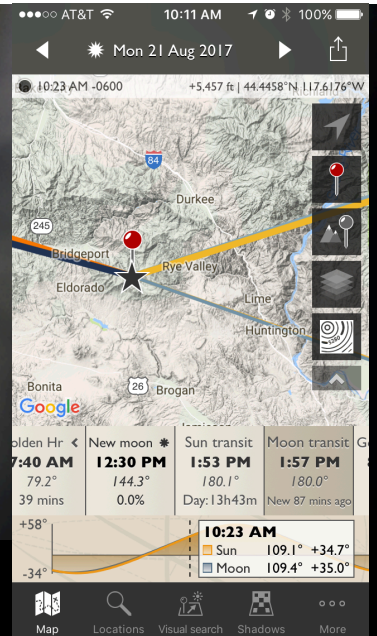


Finally….There's an app for that!

There are an overwhelming number of apps covering the eclipse that are available for smartphones and tablets. A couple are:

Eclipse2017.org
http://www.eclipse2017.org/2017/app.htm

The Photographer's Ephemeris:
http://photoephemeris.com/



Additional apps listed here:
https://eclipse.aas.org/resources/apps-software

So, now, the best location for the eclipse is...

Image (c)Bill Kramer, www.eclipse-chasers.com


August 21, 2017 – where will YOU be?


Credits:
Background image by Luc Viatour, 1999 eclipse in France
Maps courtesy Great American Eclipse