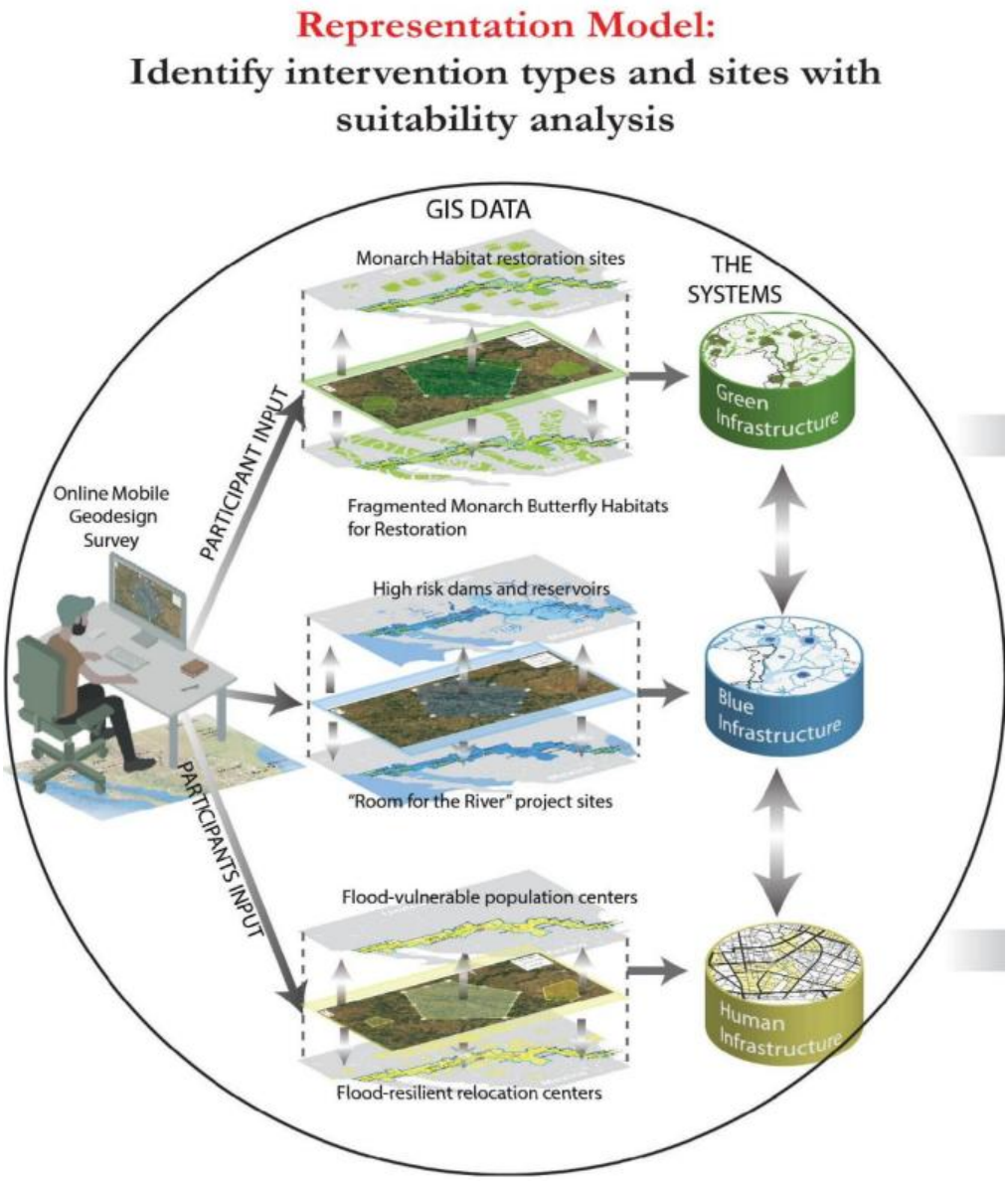
Why do we need pre-game mobile geo-surveys?



We will target green, blue, and human infrastructure systems to build our adaptive capacities to respond to the impacts of climate change for both humans and non-human species. Mobile geo-surveys enable you to help us identify suitable sites for each component within each system. This bottom-up input will be used to ground truth the pre-existing systems of geographic information available as digital maps. Through synthesizing user-generated and preexisting digital maps, we intend to create a

comprehensive and accurate inventory of as many components as possible for the three target systems of geographic information for climate adaptation.

How can I complete the mobile geo-surveys?

Step 1: Select one of the following networks of water resources regions

South Central Network (SCN):
Texas Gulf, Rio Grande, and Arkansas White Red WRRs
Southeast Network (SEN):
Lower Mississippi, South Atlantic Gulf, and Tennessee WRRs
Northeast Network (NEN):
Ohio, Great Lakes and Upper Mississippi WRRs
North Central Network (NCN):
Souris-Red Rainy and Missouri WRRs

Upon entering the geo-survey site (https://tamu-studio.surge.sh/), you will be asked to select one network of water resources regions (Figure 1, Left). The networks of water resources regions are determined by the geographic domains of climate adaptation science centers (CASC) (Figure 2, Right). Only four networks of water resources regions can be selected because we are only interested in the contributing watersheds of the Gulf of Mexico (GoM). Please choose one network at a time until you have had a chance to provide your input for all four networks.

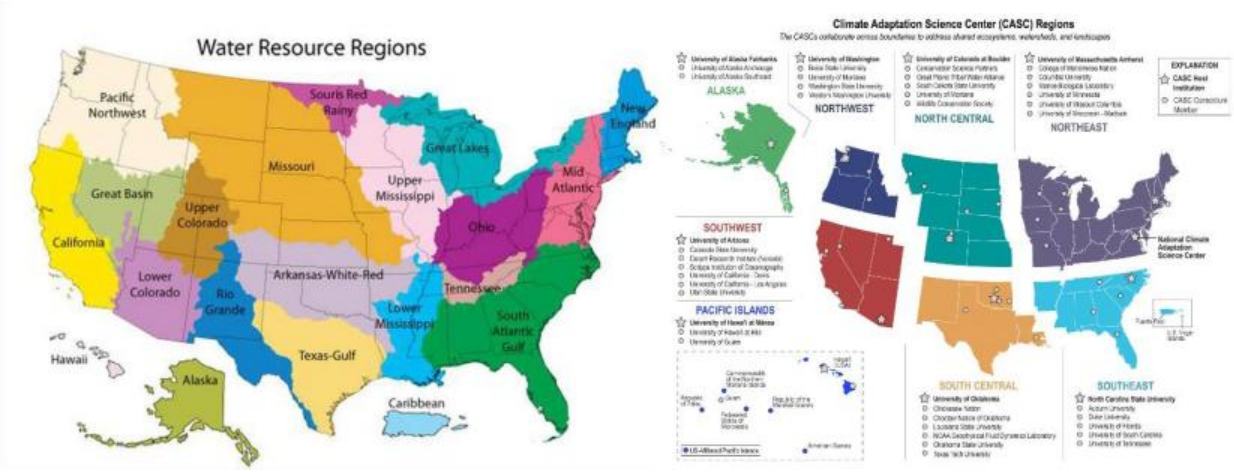


Figure 1. USGS Water Resources Regions (Left) and Institutions in CASC Megaregions (Right)

Once you have chosen a network of water resources region with start with, you will be asked to choose green, blue, or human infrastructure system to start with.

Once you have chosen one system, you will be asked to draw polygons or lines on aerial images with other layers of geographic information that you can turn on or off. Please use the polygons or lines to delineate suitable sites or corridors for implementing

specific components and connections of the green, blue, or human infrastructure system respectively.

Green Infrastructure Mobile Geo-survey:

Conservation of Monarch Butterflies. We need your help to inventory priority sites to help monarch butterflies adapt to climate extremes, thus enhancing migratory connectivity as an opportunity and addressing population decline as a threat. These sites might be important because 1) their sizes are important for creating effective core zones for monarch conservation areas; 2) their locations are within a critical gap along the migration route without stopover sites within monarch butterfly's daily migration distance; and 3) their landscape and terrains offer refuges and microclimatic advantages for protecting monarch butterflies from lethal conditions caused by more climate extreme events.

1) their sizes are important for creating effective core zones for monarch conservation areas;
2) their locations are within a critical gap (that is longer than monarch's daily migration distance) along the migration route without stopover sites;
3) their landscape contains fir trees, pine trees, milkweeds, and other plants that shelter the monarch butterflies from hot, cold, and windy conditions;
4) their terrains have large elevational changes within short distances to offer a diversity of aspects and microclimates to protect monarch butterflies from lethal climate extremes; and
5) they are located on southwest facing slopes by waterways with mild microclimates and proximity to water and food.

GI categories:
Existing monarch habitats to be protected (GI-EXT)
Fragmented or lost monarch habitats to be restored (GI-RES)
New monarch habitats to be created (GI-NEW)

Instructions for naming green infrastructure selections by categories and suitability:
Name the most suitable site for protecting existing monarch butterfly habitats as "GI_EXT_1_place_description"
Name the second most suitable site for protecting existing monarch butterfly habitats as "GI_EXT_2_place_description" and
change the number to 3, 4, and 5 for the third, fourth, and fifth most suitable sites

Name the most suitable site for restoring fragmented or lost monarch butterfly habitats as "GI_RES_1_place_description"

Name the second most suitable site for restoring fragmented or lost monarch butterfly habitats as "GI_RES_2_place_description" and
change the number to 3, 4, and 5 for the third, fourth, and fifth most suitable sites

Name the most suitable site for creating new monarch butterfly habitats as "GI_NEW_1_place_description"
Name the second most suitable site for creating new monarch butterfly habitats as "GI_NEW_2_place_description" and
change the number to 3, 4, and 5 for the third, fourth, and fifth most suitable sites

Blue Infrastructure Mobile Geo-survey:

Figure 1 shows that many counties within the water resources regions that contribute to the Gulf of Mexico have experienced more frequent and intense flash and riverine flooding than the rest of the United States. Figure 2 shows that these counties appear to have more high-risk dams located upstream of populations centers. As storms become more intensive and frequent, these high-risk dams are become more vulnerable to dam breaks to cause catastrophic flash floods and massive losses of life.

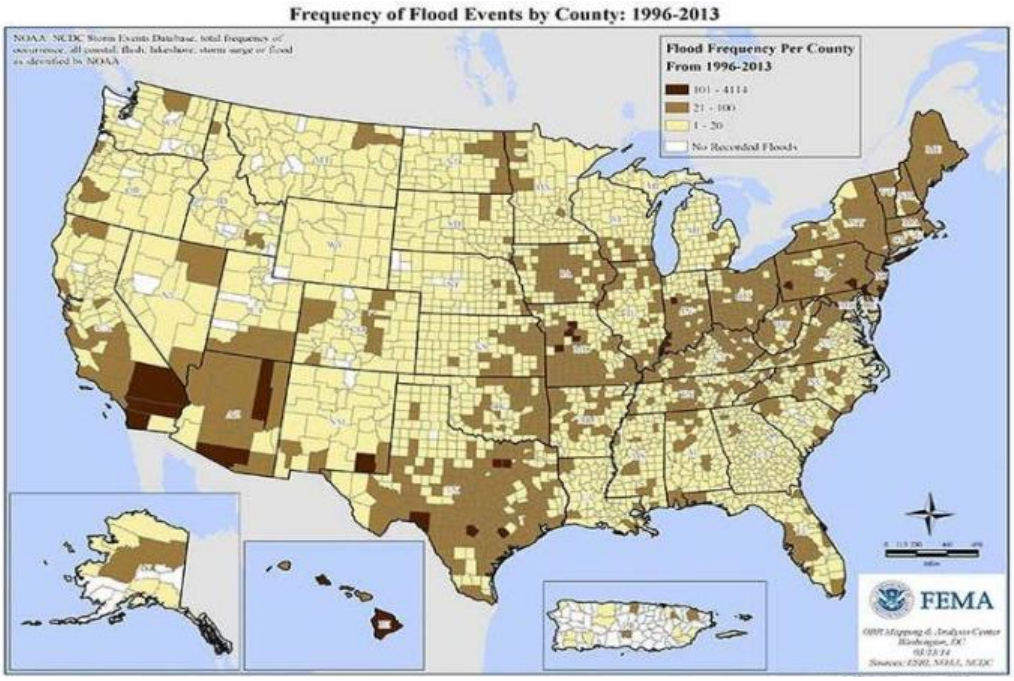


Figure 1. FEMA Flood Risks Map based on Historic Flood Events

Figure 2 United States Army Corps of Engineers National Dam Inventory

More decentralized water retention and detention areas are necessary upstream of these high-risk dams to help reduced their water pressures and volumes. More room for the river projects are required downstream of these high-risk dams to help minimize the impacts of emergency overflows and flash floods from these high-risk dams. Furthermore, when enough water volumes can be handled through a decentralized system of water retention upstream and water detention downstream as the room for the river projects, some of the dams may be decommissioned before potential dam breaks take place.

Mitigation of Flash and Riverine Flooding. We need your help to identify suitable sites for implementing distributed networks of decentralized water retention areas upstream of high-risks dams. These upstream water bodies will help capture enough runoff to eliminate the need to have high-risk dams downstream for flood control. In the event there is not enough open space upstream to capture enough volume of runoff, room for the river projects can be implemented downstream of a dam to detain flood water in the event of riverine flooding and flash flooding due to dam break. These mitigation measures are especially important for locations with industrial facilities and gas pipelines that could potentially explode due to flooding.

1. Delineate five most suitable sites for water retention upstream of each dam selected
2. Delineate five most suitable sites for room-for-the-river projects downstream of each dam selected
3. Delineate five most dangerous dams upstream of major population centers to be decommissioned

BI categories:
Decentralized water detention/retention areas upstream of dams (BI_DW)
Room for the river project sites (BI_RR)
Dams to be decommissioned (BI_DD)

Instructions for naming blue infrastructure selections by categories and suitability:
1) Name the most suitable site for decentralized water detention/retention areas upstream of dams as "BI_DW_1_place_description"
2) Name the second most suitable site for decentralized water detention/retention areas upstream of dams as "BI_DW_2_place_description" and change the number to 3, 4, and 5 for the third, fourth, and fifth most suitable sites

3) Name the most suitable site for room for the river sites as "BI_RR_1_place_description"
4) Name the second most suitable room for the river site as "BI_RR_2_place_description" and
change the number to 3, 4, and 5 for the third, fourth, and fifth most suitable sites

5) Name the most suitable site for dam decommissioning as "BI_DD_1_place_description"
6) Name the second most suitable dam decommissioning site as "BI_DD_2_place_description" and change the number to 3, 4, and 5 for the third, fourth, and fifth most suitable sites

Human Infrastructure Mobile Geo-Survey: We need your help to delineate potential relocation destination sites for individuals and businesses that have been displaced or will likely to be impacted by two catastrophic instantaneous flooding events due to rapid sea level rise from solar storms melting all ice on earth (Figure 3) or tidal waves from polar reversal (Figure 4). The flooding events will also trigger widespread flood-induce explosions near gas and oil production facilities to impact around 12 million people living within the threat radius of these facilities (Figure 4, 5, and 6). All residents within 4-mile radius of these potentially explosive sites will need to be evacuated.

There is a need to create job training and opportunities in town-gown districts with civilian conservation corps/free trade zones with employment opportunities as job-based proactive relocation destinations. There is also a need to provide networks of routes and launch/landing pads for flying taxis and space transit habitats 1) on elevated structures in existing flood-prone population centers and; 2) near new job centers within commute distances from existing flood-prone population centers through the use of planned high speed rail lines.

1. Delineate five most suitable sites for job-based proactive relocation destinations (safe from flood-induced explosions of gas and oils production facilities and rapid sea level rise associated with solar storms and tidal waves from polar reversal)
2. Delineate five most suitable high speed rail stations and lines for enabling residents from flood-prone population centers to commute to job-based proactive relocation destinations to work or receive job training
2. Delineate five most suitable sites as routes and launch/landing pads for flying taxis and transits to facilitate emergency evacuation from flood-prone population centers to safe relocation destinations in the event of rapid sea level rise associated with solar storms and tidal waves from polar reversal.

HI categories:
Job-based proactive relocation destinations/town-gown districts (HI_TGD)
High speed rail stations and lines (planned and proposed) (HI_HSR)
Air taxi and transit habitat landing and launch sites and routes (planned and proposed) (HI_ATN)

HI instructions for naming user input:
Name the most suitable site for job-based proactive relocation destinations as "HI_TGD_1_place_description"
Name the second most suitable site for job-based proactive relocation destinations as "HI_TGD_2_place_description" and
change the number to 3, 4, and 5 for the third, fourth, and fifth most suitable sites

Name the most suitable site for planned and proposed high speed rail stations and lines as "HI_HSR_1_place_description"
Name the second most suitable site for high speed rail stations and lines as "HI_HSR_2_place_description" and
change the number to 3, 4, and 5 for the third, fourth, and fifth most suitable sites

Name the most suitable site for planned and proposed air taxi landing and launch sites and routes as "HI_ATN_1_place_description"
Name the second most suitable site for planned and proposed air taxi landing and launch sites and routes as "HI_ATN_2_place_description" and
change the number to 3, 4, and 5 for the third, fourth, and fifth most suitable sites

Figure 3. The Extent of Permanent Inundation due to Solar Storms Melting all Ice on Earth

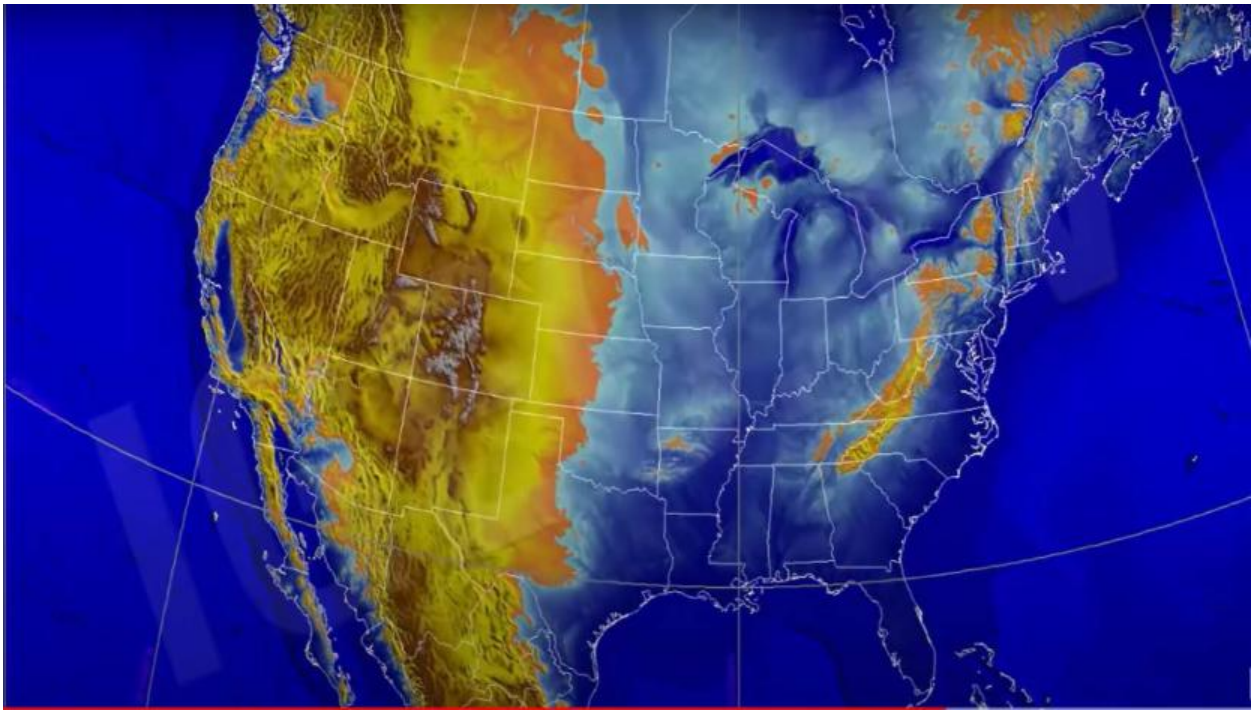


Figure 4. The Extent of Instantaneous Inundation by Tidal Waves due to Polar Reversal

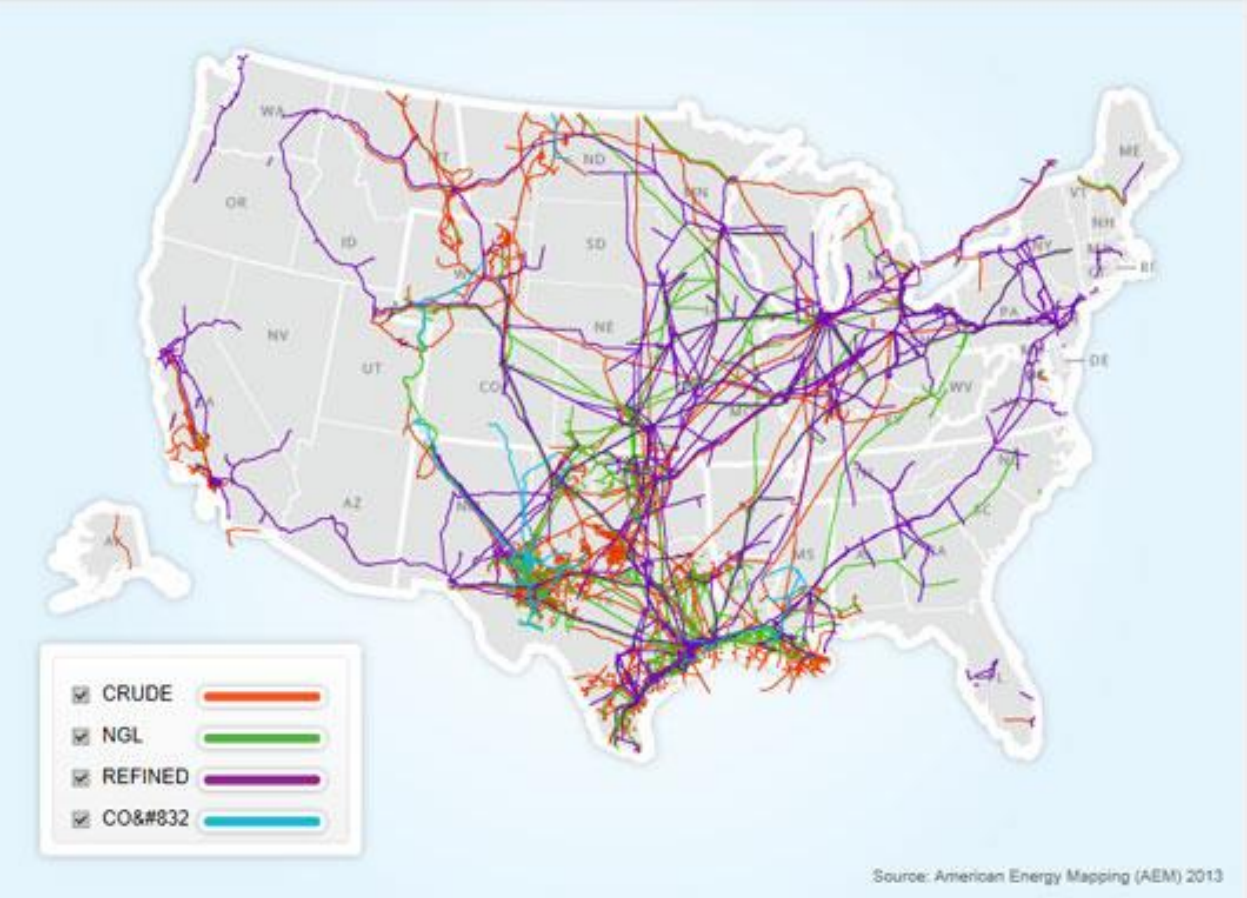


Figure 5. More than 190,000 Miles of Liquid Petroleum Pipelines in the United States

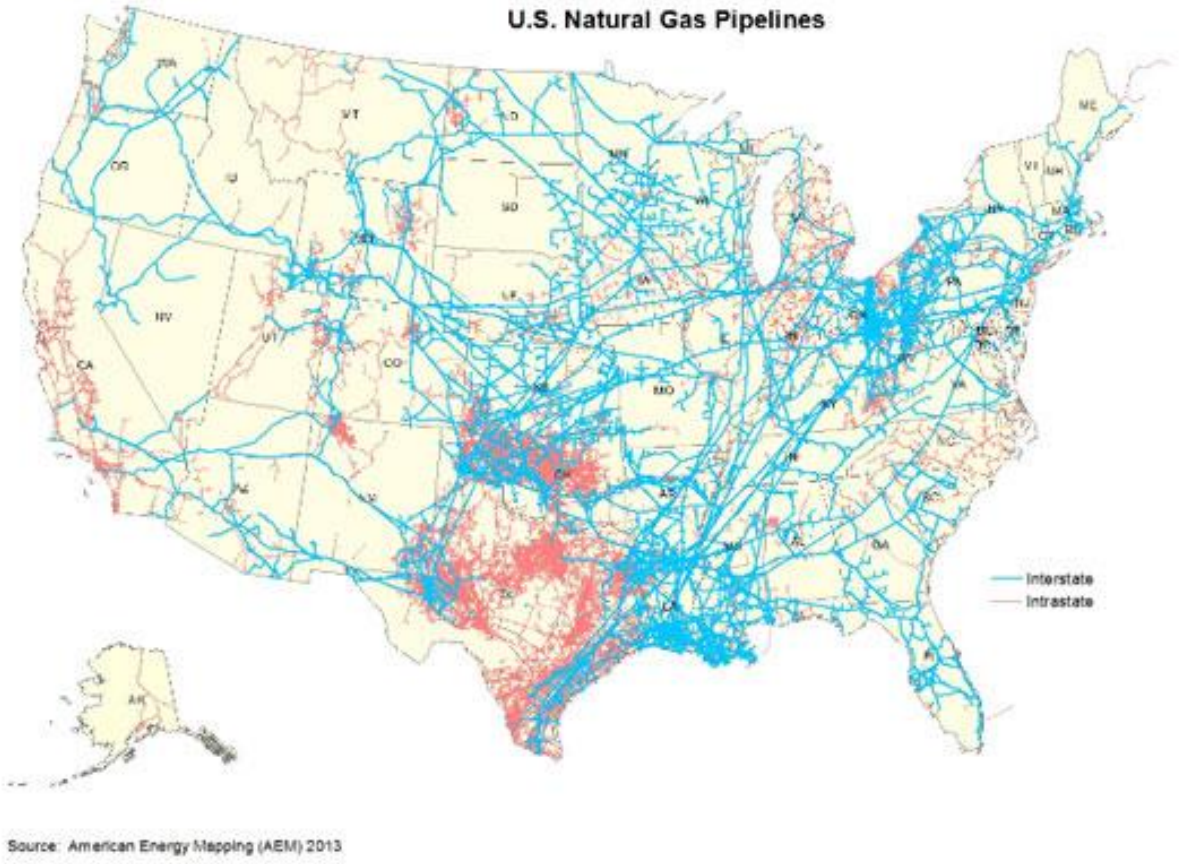


Figure 6. More than 2.4-million miles of underground pipelines for natural gas distribution.

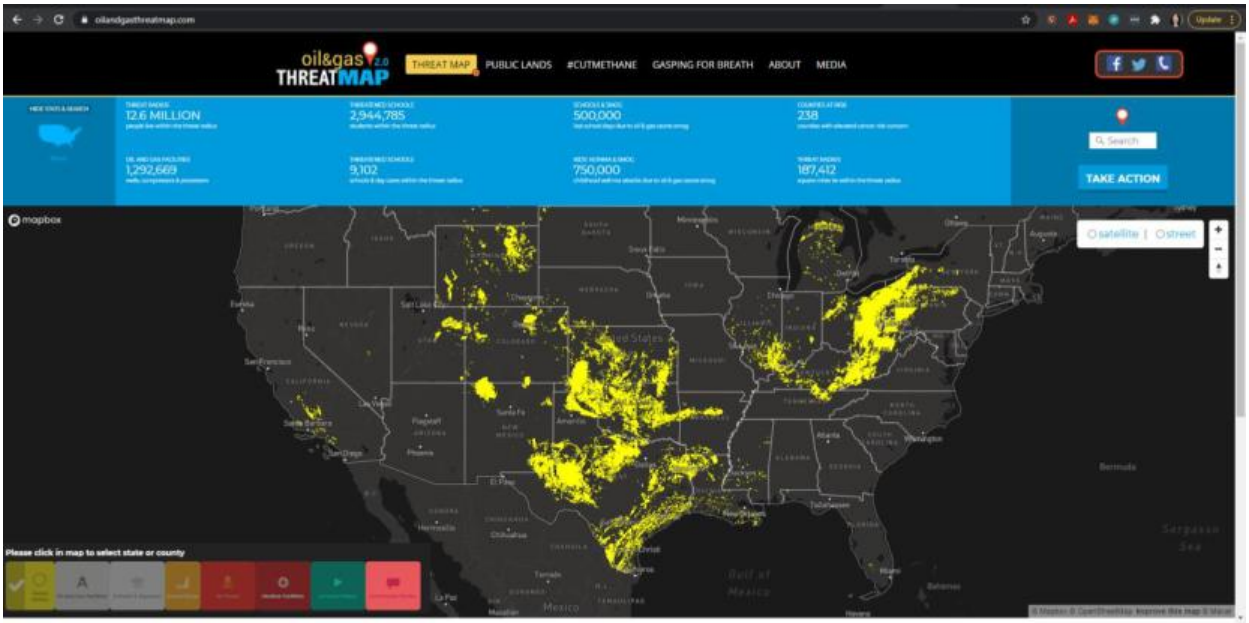


Figure 7. More than 12.6 Million people live within the threat radius from oil and gas facilities.