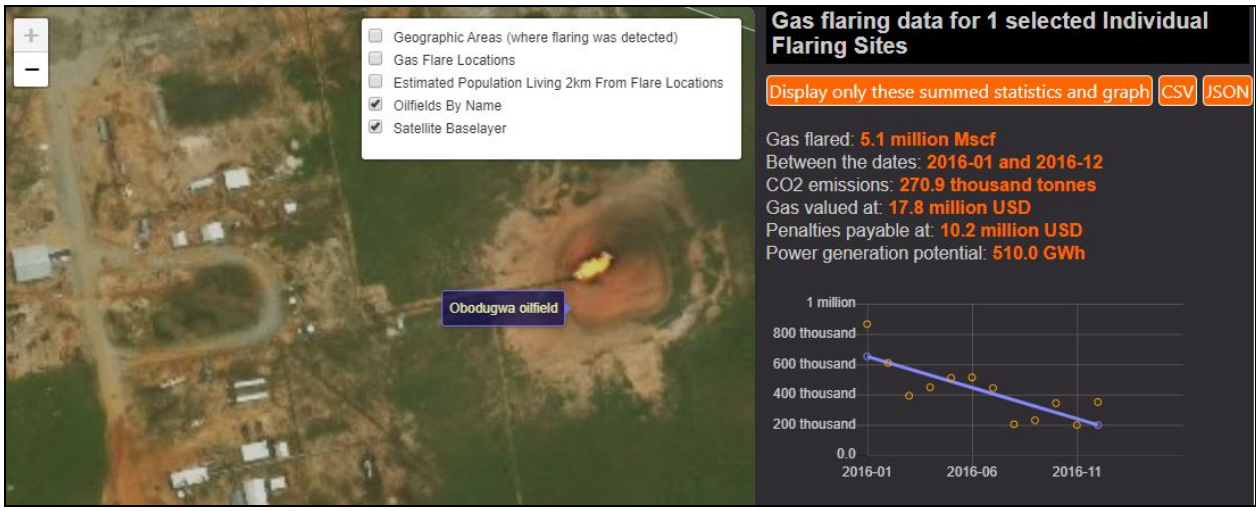
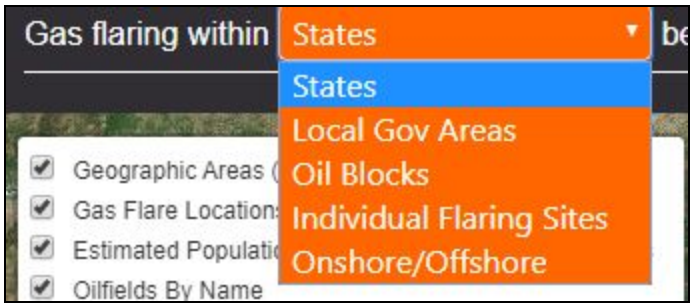
Gas Flare Tracker - User guide



This user guide accompanies the Gas Flare Tracker application and video demonstrations of the application found at https://nosdra.gasflaretracker.ng#training . More information about Gas Flaring in Nigeria, about the data used in the Gas Flare Tracker can be found at nosdra.gasflaretracker.ng.

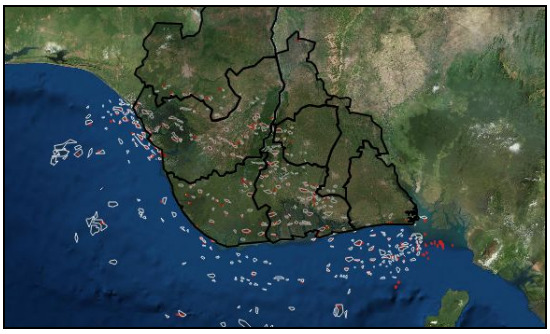
First we open the application 'full screen' to give us more room on the screen. This can also be achieved by going directly to the application at gasflaretracker.ng, instead of to the website at nosdra.gasflaretracker.ng

Exploring gas flaring volume estimates within different geographical boundaries such as States, LGAs, Onshore/Offshore or at Individual Flare Sites

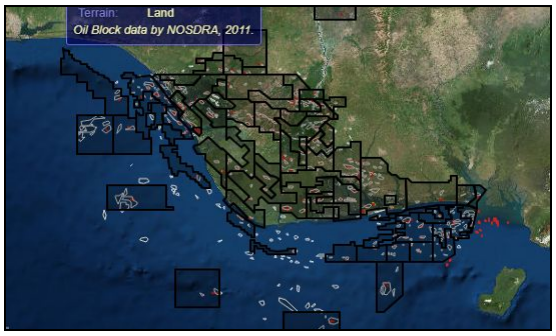


Firstly let us demonstrate the 'Gas flaring within… ' dropdown filter. This changes the 'Geographic areas' map selection layer which allows us to sum all gas flaring volume estimates within different geographical boundaries. By default the 'Geographic areas' map layer allows us to explore gas flaring within State boundaries, but by changing the dropdown we can also select LGA's, Oil Blocks, Individual Flaring Sites and Onshore/Offshore.

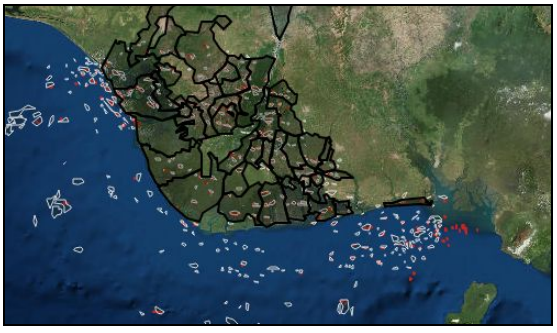
It is important to note that States and LGA geographic selections are limited to calculating only gas onshore gas flaring within the State/LGA boundary.



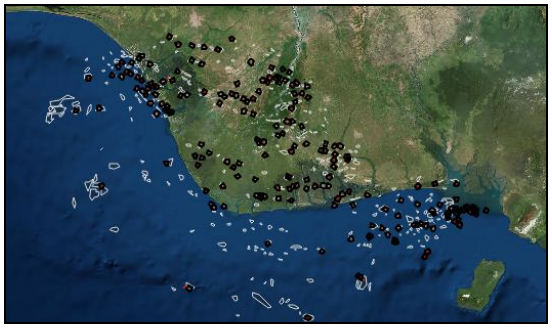
State geographical areas



Oil block geographical areas



LGA geographical areas

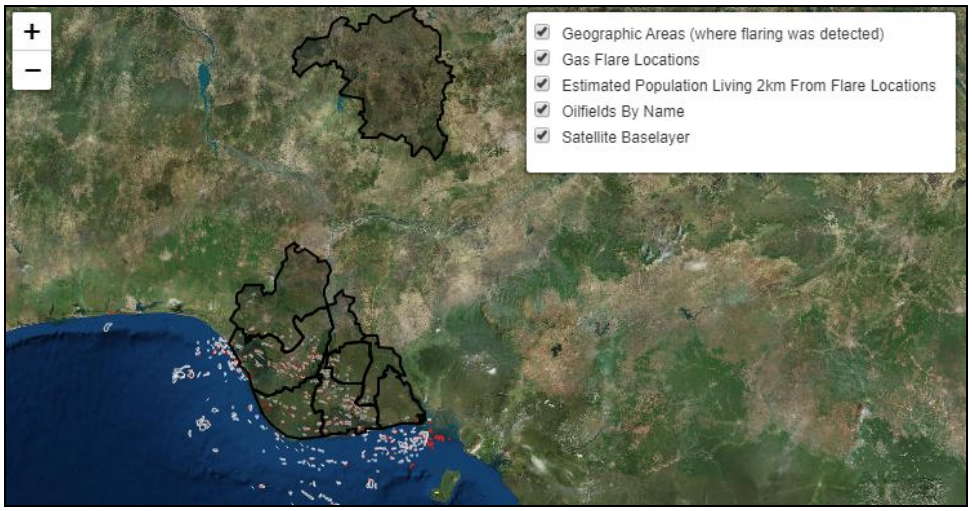


Individual Flare Sites geographical areas

Onshore/Offshore geographical areas

Showing the different geographical types of areas that gas flaring volumes estimates can be summarised within. The areas are selectable from the map.

It is important to note that the Geographic Areas layer is stacked on top of, and therefore obscures, all other layers beneath it.



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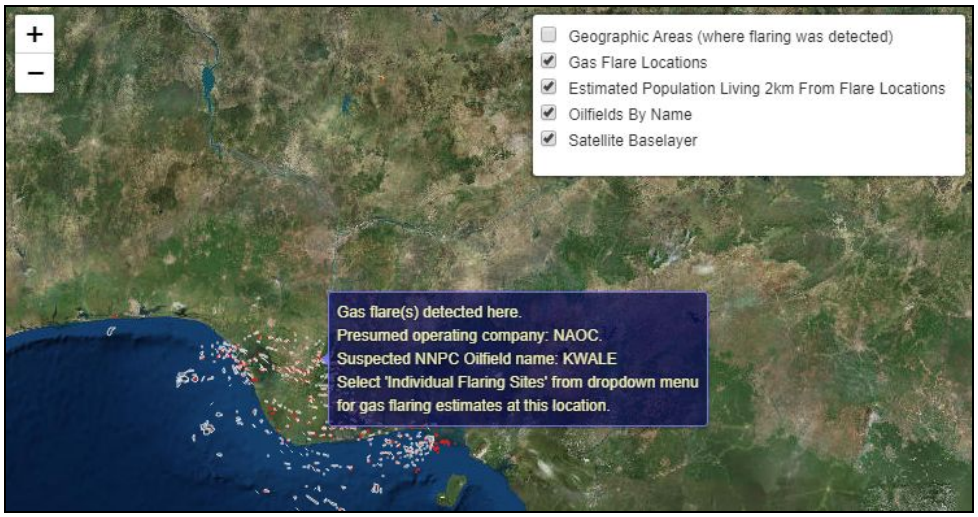
With Geographic Areas layer (States) turned on



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With Geographic Areas layer (States) turned off

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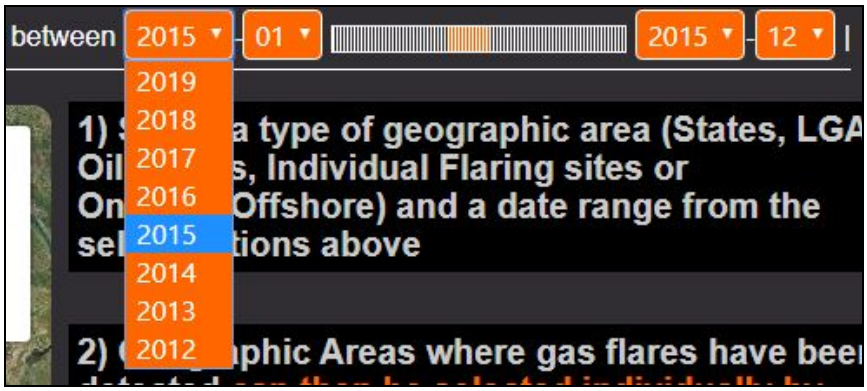
And allowing access to the data held in the other layers underneath.

Defining a date range to show gas flaring volume estimates within

Next we will demonstrate how the date filter works to define date ranges.



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Use the Year and Month dropdowns to set a start and end date

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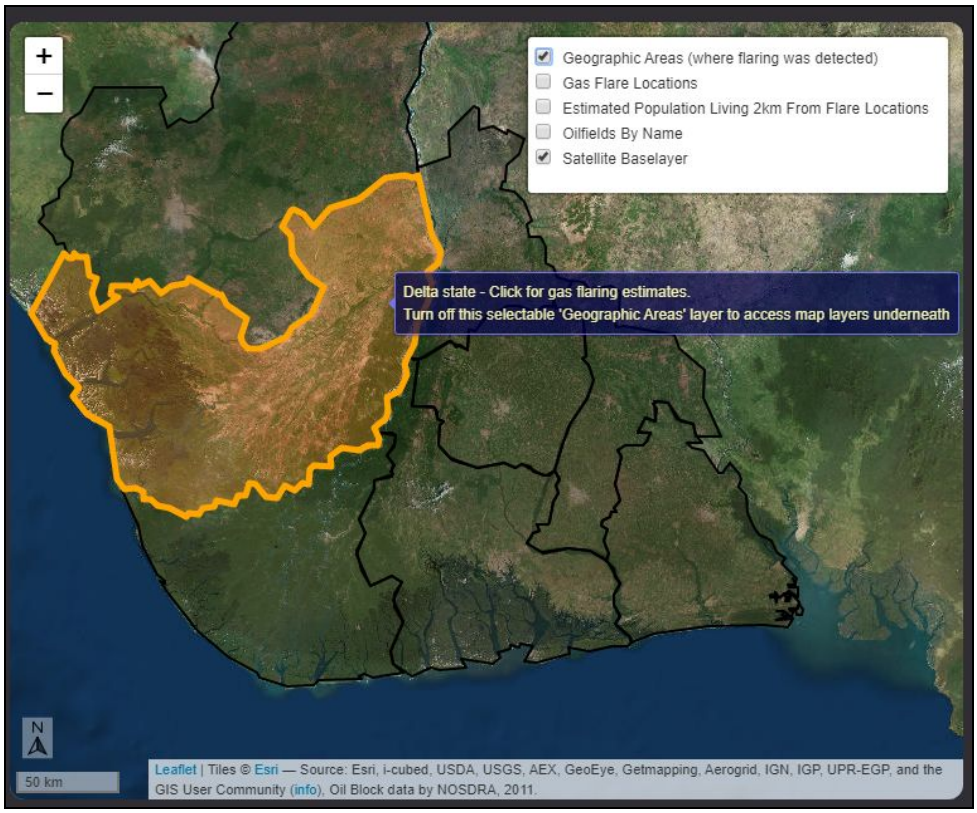
Or the date range bar slider instead

It is important to note that once a time period is selected, that it will stick and remain applied even when changing the geographic area selector.

Exploring the supplementary data available in other map layers

Next we are going to look at the different map layers of extra data that are available to switch on and off. It is important to note that there is a hierarchy to these layers, and that layers higher up the layer order obscure the layers below. This is particularly important when analysing details of specific gas flare sites as the top 'Geographic area' layer obscures everything beneath it.

There are 5 main map layers:



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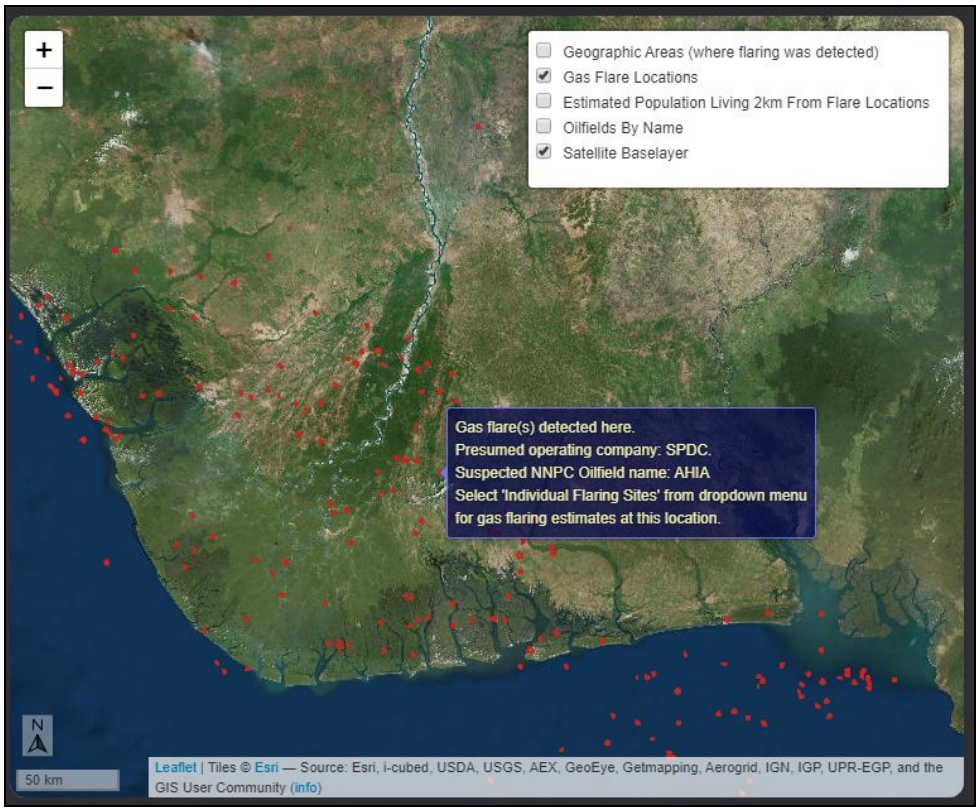
Geographic areas (This changes based on the selected dropdown, and allows you to get the satellite derived gas flaring volume estimates within differing areas).



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Gas Flare Locations (This provides contextual information regarding the location of gas flaring sites including who it is presumed to be run by and its oilfield name reference for checking volumes reported by the NNPC)

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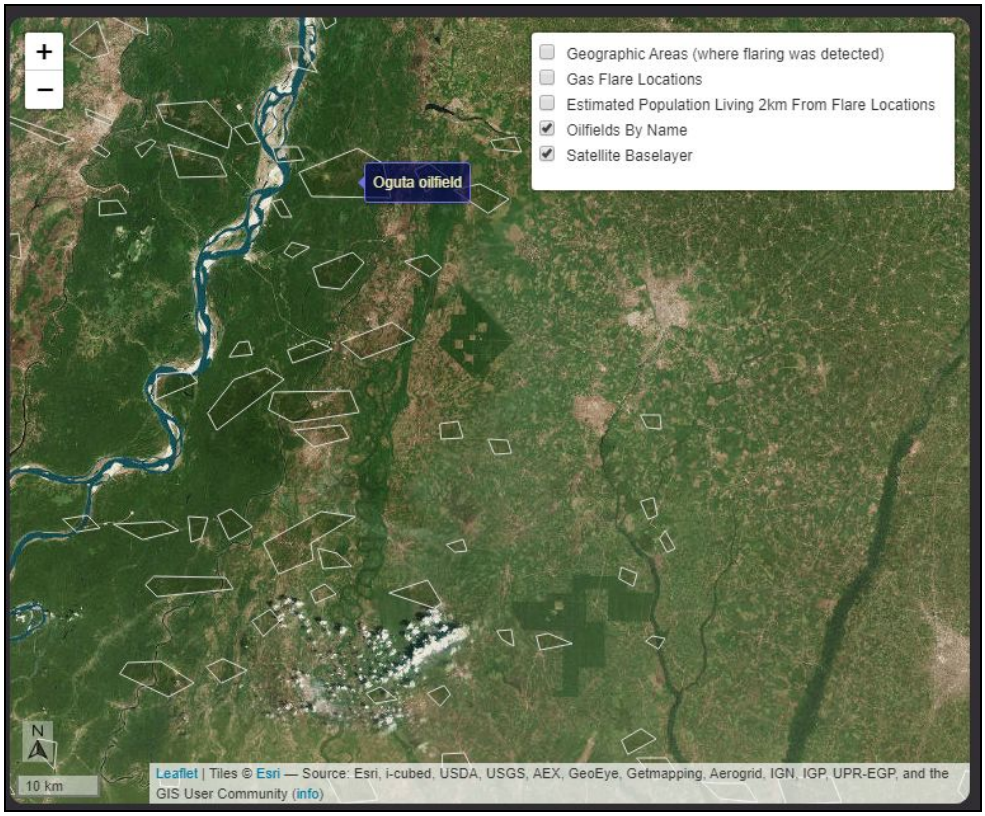
Estimated population within 2km (This provides a crude estimate of the number of the population living within 2km based upon a population per hectare measurement provided by worldpop project)



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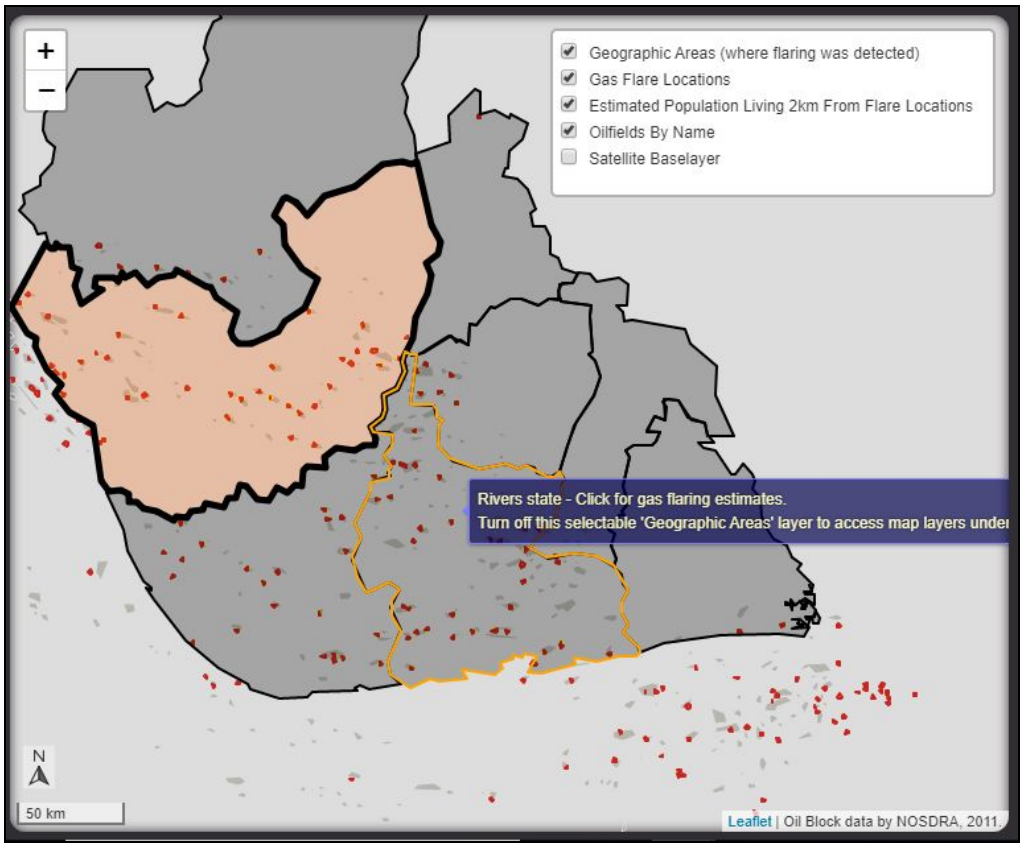
Oilfields by name (This provides an oilfield name and boundary based upon a google map of Nigerian oilfields)



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Satellite baselayer, shown here with all other layers switched on (This is a tiled satellite RGB baselayer provided by ESRI that provides context to the geolocated gas flare volumes)

It is worth noting that all the satellite baselayer is network-heavy, and for those with limited network data, it might be worth turning off this layer whilst working with the system.

Using the map and chart interfaces to further refine selected geographical areas

Lastly we are going to demonstrate how to use the selectable 'Geographic areas' layer on the map to find out gas flare volume estimates from specific selected areas.

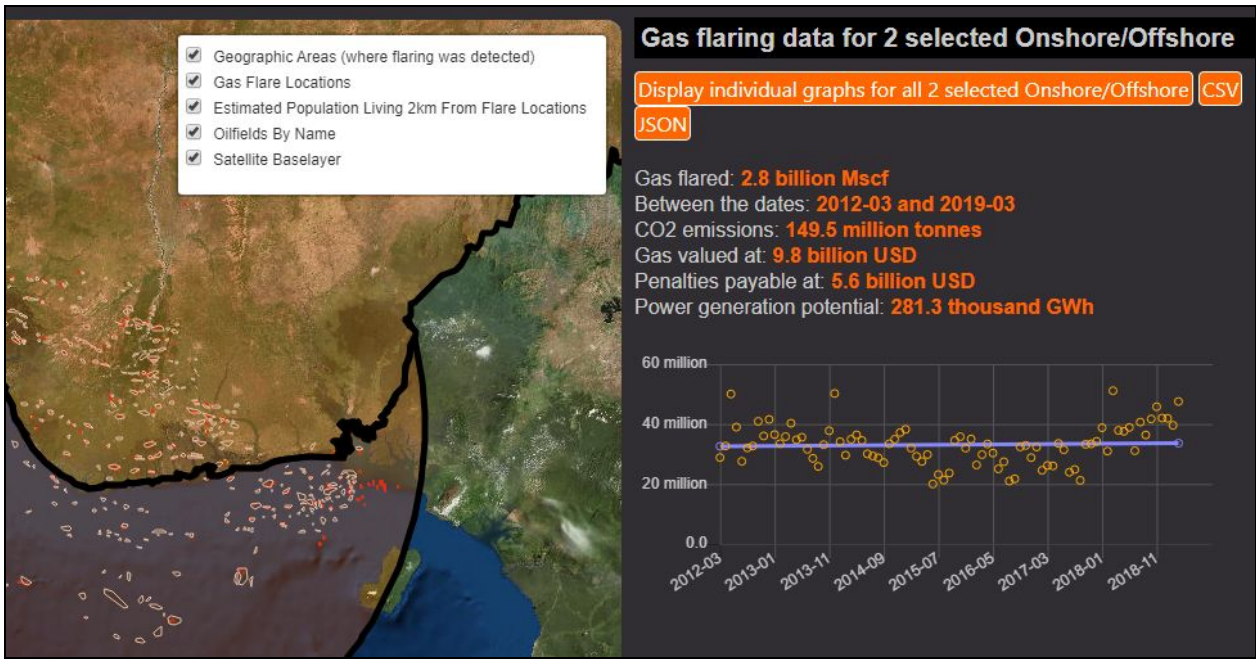
All of these selectable 'Geographic areas' behave in the same way. When they are selected they display graphs showing the gas flare volumes within those areas.

Once we have chosen our 'Geographic area' and the map has loaded we have two choices:

1. Either select an area from the map
2. Or select all areas using the orange button

We can either use the map to select individual geographic area to report gas flare volumes within, or click on the orange button to 'Select all of the x areas with gas flaring detected.':

Either way when we make a selection we are first greeted with a summary graph of all the current selections - it is important to note that the first graph, always stacked on the top of the other graphs, is a sum of all currently selected areas.



Underneath you will then find the graphs for individual areas shown separately.

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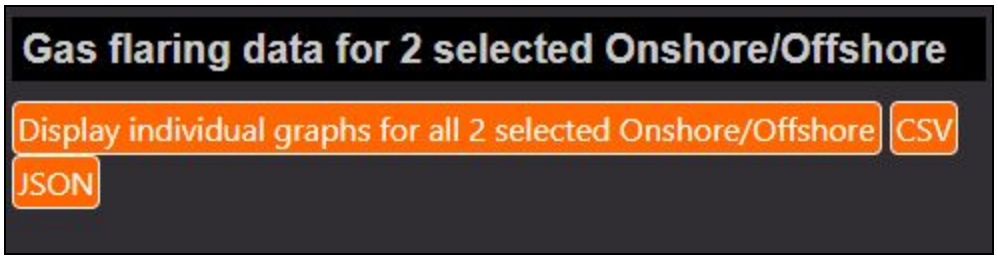
This button 'Display only these summed statistics and graph' turns off all the separate graphs for the individual geographic areas in the current selection.



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This button 'Display individual graphs for all x [geographical areas]' turns on all the separate graphs for the individual geographic areas in the current selection and displays them underneath the main graph.

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By clicking on the title of a graph it is possible to highlight and zoom to this geographical area in the map. Likewise by selecting a geographic area on the map it's graph will be brought to the top of all the other graphs currently on display.

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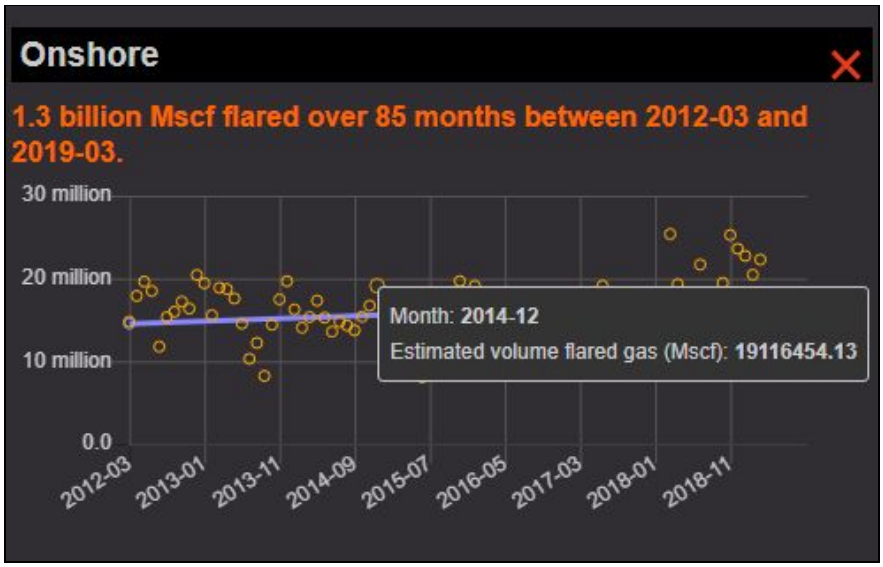
By clicking on the red x in the title of a graph, it can be removed from the current selection. Likewise by deselecting an area from the map, its graph will be removed from the graphs currently on display.



So now let us have a look at the graphs themselves. Each graph has a yellow circle indicating a monthly calculation of gas flare volumes in Mscf (Thousand standard cubic feet). When we roll over these yellow circles the month is displayed, as well as the satellite derived gas volume estimate.

It is important to note that the same behaviour and features are available regardless of the 'Geographic area' currently selected.

Gas Flare Tracker workshop activities session

Now that you are more familiar with the Gas Flare Tracker, try to carry out the practical exercises below that are aimed at getting you practicing using the system to get information you might need.

- What is the estimation for flared gas volumes in Delta state during 2017?
- What is the estimation for flared gas volumes from the Kaduna refinery during the first 6 months of 2018?
- Locate Rumuekpe oilfield (it is in Emohua, Rivers state) and find out the estimated population living with 2km from the gas flare there.
- Which company is suspected of operating the North Apoi and Funiwa oilfields, situated near-offshore from Bayelsa state?
- What is the estimation for offshore flared gas volumes between May 2016 and May 2017?
- What was the estimated value in dollars of estimated flared gas volumes for Warri North LGA in the last 6 months of 2018?
- What was the estimation for flared gas volumes onshore during the month of August 2016?

    - What was the power generation potential of the gas flare volumes burned at the main Bonny export terminal during the last quarter of 2018?
    - How much gas is estimated to be flared from Nembe creek from January to March (inclusive) during 2018?
    - Overall, is gas flaring estimated to have increased or decreased onshore during 2014?
    - During 2018, is gas flaring estimated to have increased or decreased in Bayelsa state?

Guidance on using the Gas Flare Tracker to support advocacy activities

Use the Gas Flare Tracker to identify areas where local gas-to-power or gas-to-fuel initiatives might prove successful.

- The Gas Flare Tracker can be used to identify gas flares near high population densities, where localised gas-to-power generation units or gas-bottling plants could be installed to feed local energy needs.
- By identifying consistently burning gas flare sites, as opposed to those that flare sporadically, it would be further possible to identify gas flare sites that would provide a continuous flow to gas to localised gas-to-power generation units or gas-bottling plants.

Use the Gas Flare Tracker to lobby for improved official reporting on gas flare volumes from companies and the NNPC

- Highlight the oil companies/NNPC's poor quality and lack of detailed gas flare reporting and encourage these to be improved.
- Identify companies or flare sites whose satellite-derived flare volume data seems to be greatly at odds with NNPC data. It should be possible to identify companies that are underreporting gas flaring.
    - Be reminded that most/many gas flares not not have flow meters, and so estimates of flared gas from companies are often made based on the oil-to-gas ratio of an oilfield.
    - If oil companies or the NNPC question the Gas Flare Tracker data, ask them to outline clearly how their gas flare volume calculations are made, and to provide their own volume data for all of their gas flare sites, with geospatial referencing. Ask them to clarify if their gas flares are metered or whether their volume estimates are based on the oil-to-gas ratio calculation.
- Lobby for improved official reporting from companies and/or the NNPC that:
    - Is accurate and consistent - current NNPC gas flare data is neither with Mscf and Mmscf often confused and decimal places often out.

- Is up-to-date - current NNPC data is between 1 and 2 years out of date
- Is spatially explicit - where exactly are reported flare volumes referring to? Which flare sites on the gas flare tracker do they relate to?
- Uses the same standard metric for all volumes reported - not Mscf one moment and Mmscf the next
- Is publicly available and published online using charts and graphs that can be easily interpreted and cross referenced by other regulatory agencies and the general public. Their current pdf format of their reports is difficult to access and obscures the data they hold from general scrutiny.

Use the Gas Flare Tracker to generate gas flare volume estimates to track progress towards flare-out and support advocacy initiatives

- Bearing in mind Nigeria has signed a World Bank commitment to end routine gas flaring by 2030, the satellite gas flare estimations and trends can be used to support advocacy initiatives at local and regional levels by:
    - Enabling those engaging in advocacy to show the gas flaring trends in their Local Government Area or State, and hold companies and regulators to account
    - Providing media with the data they need to make local, regional and national arguments against gas flaring and tracking progress to flare-out
    - Showing clearly the amount of wastage and the environmental impacts of gas flaring at local, regional and national levels.