

# Calculating Line Lengths and Statistics

QGIS Tutorials and Tips



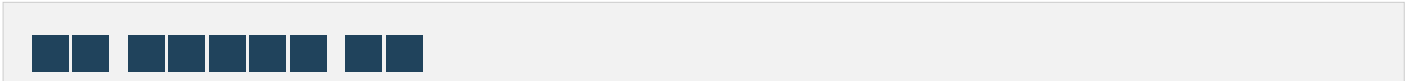
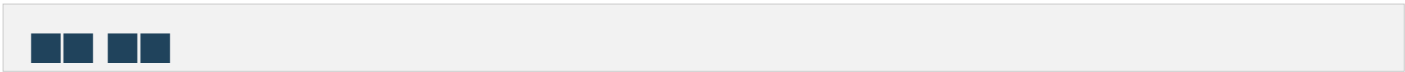
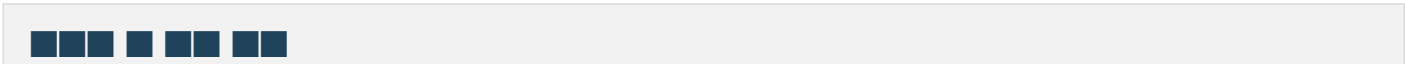
Author

Ujaval Gandhi

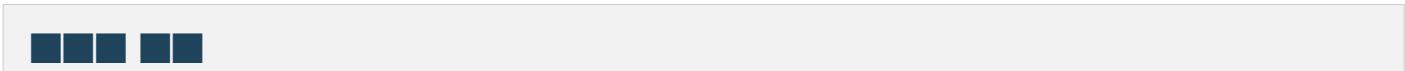
<http://google.com/+UjavalGandhi>

Translations by

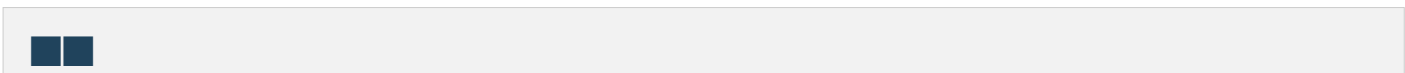
SongHyun Choi

[illegible][illegible]

- **■■■■ ■■■■■ ■■■■ ■■**
- **■■■■■■■■ ■■■■ ■■■■**(Projected Coordinate Reference System, CRS)■ ■■■■ ■ ■■■.
- **■■■■■■■■ ■■■■■ ■■ ■■**



```
`Natural Earth  
<http://www.naturalearthdata.com/downloads/10m-cultural-vectors/railroads/>`_■■■ ■■ ■■■■ ■■  
■■■■■■ ■■■■. ■■■■ `North America supplement <http://www.naturalearthdata.com/http/www.naturalearthdata.com/download/10m/cultural/ne\_10m\_railroads\_north\_america.zip>`_■■■■■■ ■■■■  
■■■ ■■ [NATURALEARTH]
```



1. ■■■■ :menuselection: Layer --> Add Vector Layer`■ ■■■■.



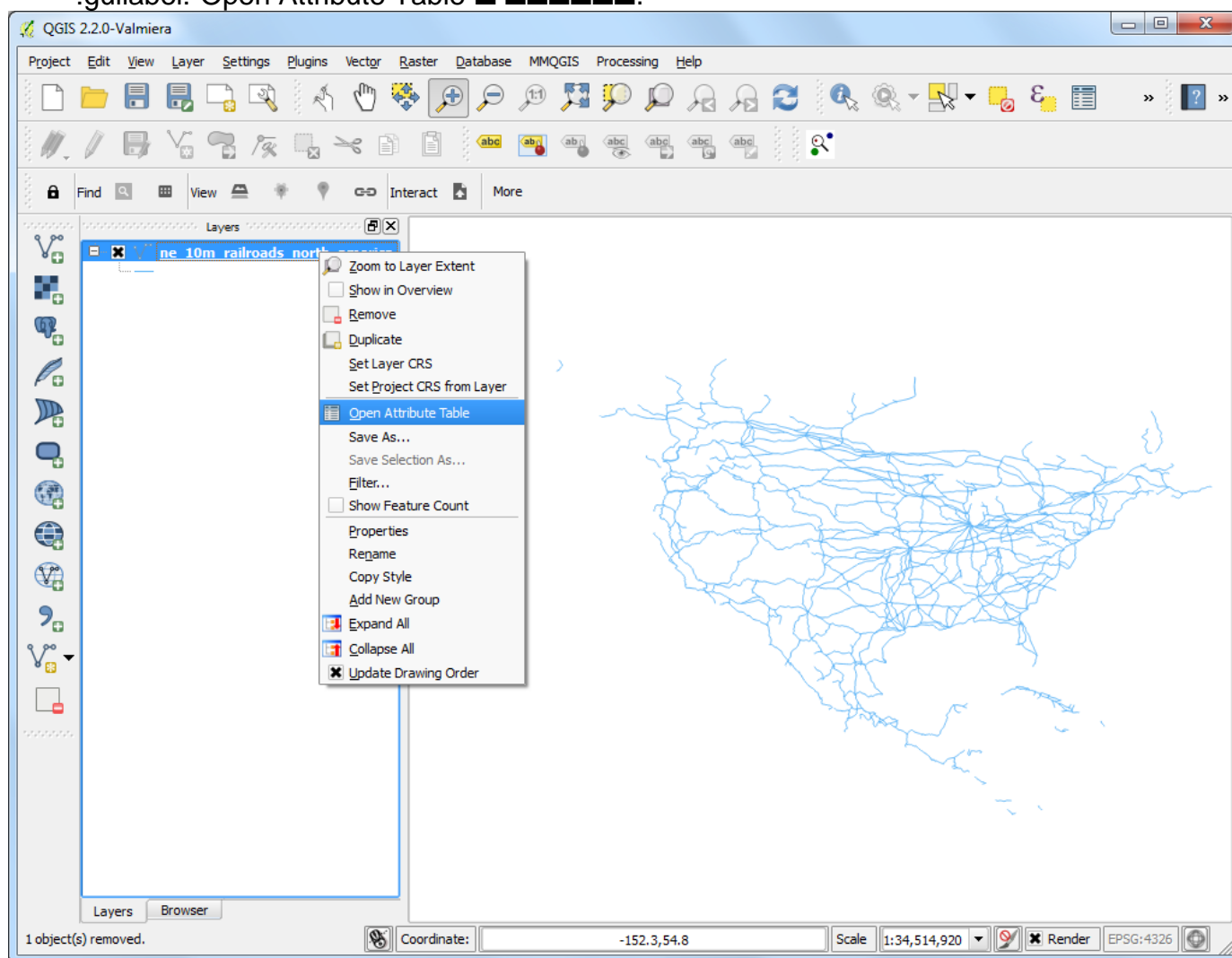
2. ``ne\_10m\_railroads\_north\_america.zip`` :guilabel:OK`



3. In the *Select layers to add...* dialog, choose ne\_10m\_railroads\_north\_america.shp layer.



4. **Click on the 'Open Attribute Table' button in the context menu.**



5. **Click on the 'sov\_a3' button in the context menu.**


Attribute table - ne\_10m\_railroads\_north\_america :: Features total: 1127, filtered: 1127, selected: 0

|    | scalerank | featurecla | sov_a3 | uident | add | natrscale | continent     |
|----|-----------|------------|--------|--------|-----|-----------|---------------|
| 0  | 8         | Railroad   | USA    | 1506   | 0   | 0         | North America |
| 1  | 9         | Railroad   | USA    | 1606   | 1   | 5         | North America |
| 2  | 8         | Railroad   | USA    | 1706   | 0   | 0         | North America |
| 3  | 8         | Railroad   | USA    | 1806   | 0   | 0         | North America |
| 4  | 8         | Railroad   | USA    | 1906   | 0   | 0         | North America |
| 5  | 8         | Railroad   | USA    | 2006   | 0   | 0         | North America |
| 6  | 8         | Railroad   | USA    | 2106   | 0   | 0         | North America |
| 7  | 9         | Railroad   | USA    | 2206   | 1   | 5         | North America |
| 8  | 8         | Railroad   | USA    | 2306   | 0   | 0         | North America |
| 9  | 8         | Railroad   | USA    | 2406   | 0   | 0         | North America |
| 10 | 8         | Railroad   | USA    | 2506   | 0   | 0         | North America |
| 11 | 8         | Railroad   | USA    | 2606   | 0   | 0         | North America |
| 12 | 8         | Railroad   | USA    | 2706   | 0   | 0         | North America |
| 13 | 8         | Railroad   | USA    | 2806   | 0   | 0         | North America |
| 14 | 9         | Railroad   | USA    | 2906   | 1   | 5         | North America |
| 15 | 9         | Railroad   | USA    | 3006   | 1   | 5         | North America |
| 16 | 8         | Railroad   | USA    | 3106   | 0   | 0         | North America |
| 17 | 8         | Railroad   | USA    | 3206   | 0   | 0         | North America |
| 18 | 8         | Railroad   | USA    | 3306   | 0   | 0         | North America |
| 19 | 8         | Railroad   | USA    | 3506   | 0   | 0         | North America |
| 20 | 8         | Railroad   | USA    | 3606   | 0   | 0         | North America |
| 21 | 8         | Railroad   | USA    | 3706   | 0   | 0         | North America |
| 22 | 8         | Railroad   | USA    | 3806   | 0   | 0         | North America |
| 23 | 9         | Railroad   | USA    | 3906   | 1   | 5         | North America |

Show All Features

6. ■■■ ■■■■ Attribute Table■■■■ ■■■■ ■■■■ ■■■■ :guilabel:'Select features using an expression■■■■ ■■■■.

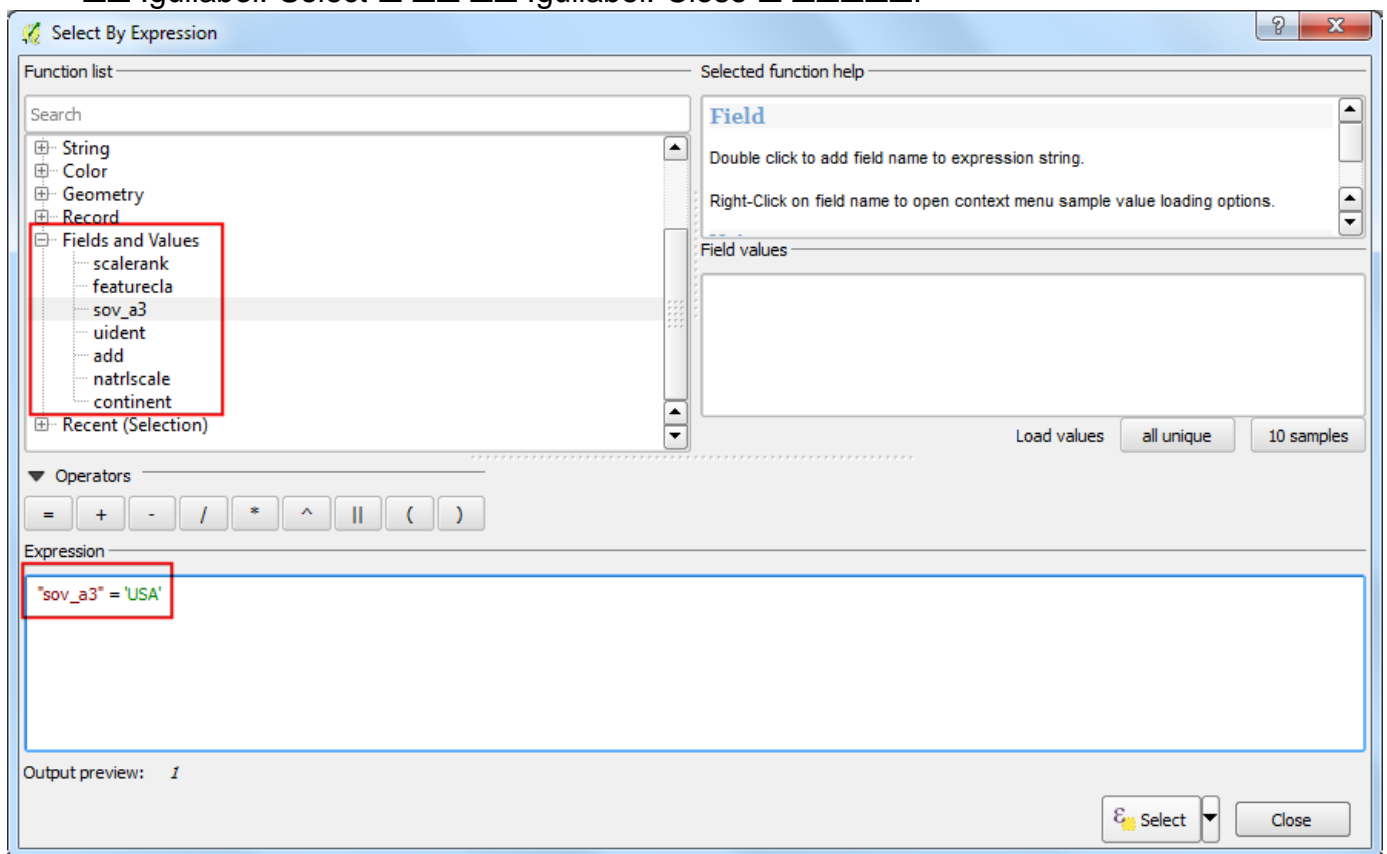
Attribute table - ne\_10m\_railroads\_north\_america :: Features total: 1127, filtered: 1127, selected: 0



|    | scalerank | Select features using an expression | uident | add  | natrscale | continent       |
|----|-----------|-------------------------------------|--------|------|-----------|-----------------|
| 0  | 8         | Railroad                            | USA    | 1506 | 0         | 0 North America |
| 1  | 9         | Railroad                            | USA    | 1606 | 1         | 5 North America |
| 2  | 8         | Railroad                            | USA    | 1706 | 0         | 0 North America |
| 3  | 8         | Railroad                            | USA    | 1806 | 0         | 0 North America |
| 4  | 8         | Railroad                            | USA    | 1906 | 0         | 0 North America |
| 5  | 8         | Railroad                            | USA    | 2006 | 0         | 0 North America |
| 6  | 8         | Railroad                            | USA    | 2106 | 0         | 0 North America |
| 7  | 9         | Railroad                            | USA    | 2206 | 1         | 5 North America |
| 8  | 8         | Railroad                            | USA    | 2306 | 0         | 0 North America |
| 9  | 8         | Railroad                            | USA    | 2406 | 0         | 0 North America |
| 10 | 8         | Railroad                            | USA    | 2506 | 0         | 0 North America |
| 11 | 8         | Railroad                            | USA    | 2606 | 0         | 0 North America |
| 12 | 8         | Railroad                            | USA    | 2706 | 0         | 0 North America |
| 13 | 8         | Railroad                            | USA    | 2806 | 0         | 0 North America |
| 14 | 9         | Railroad                            | USA    | 2906 | 1         | 5 North America |
| 15 | 9         | Railroad                            | USA    | 3006 | 1         | 5 North America |
| 16 | 8         | Railroad                            | USA    | 3106 | 0         | 0 North America |
| 17 | 8         | Railroad                            | USA    | 3206 | 0         | 0 North America |
| 18 | 8         | Railroad                            | USA    | 3306 | 0         | 0 North America |
| 19 | 8         | Railroad                            | USA    | 3506 | 0         | 0 North America |
| 20 | 8         | Railroad                            | USA    | 3606 | 0         | 0 North America |
| 21 | 8         | Railroad                            | USA    | 3706 | 0         | 0 North America |
| 22 | 8         | Railroad                            | USA    | 3806 | 0         | 0 North America |
| 23 | 9         | Railroad                            | USA    | 3906 | 1         | 5 North America |

Show All Features

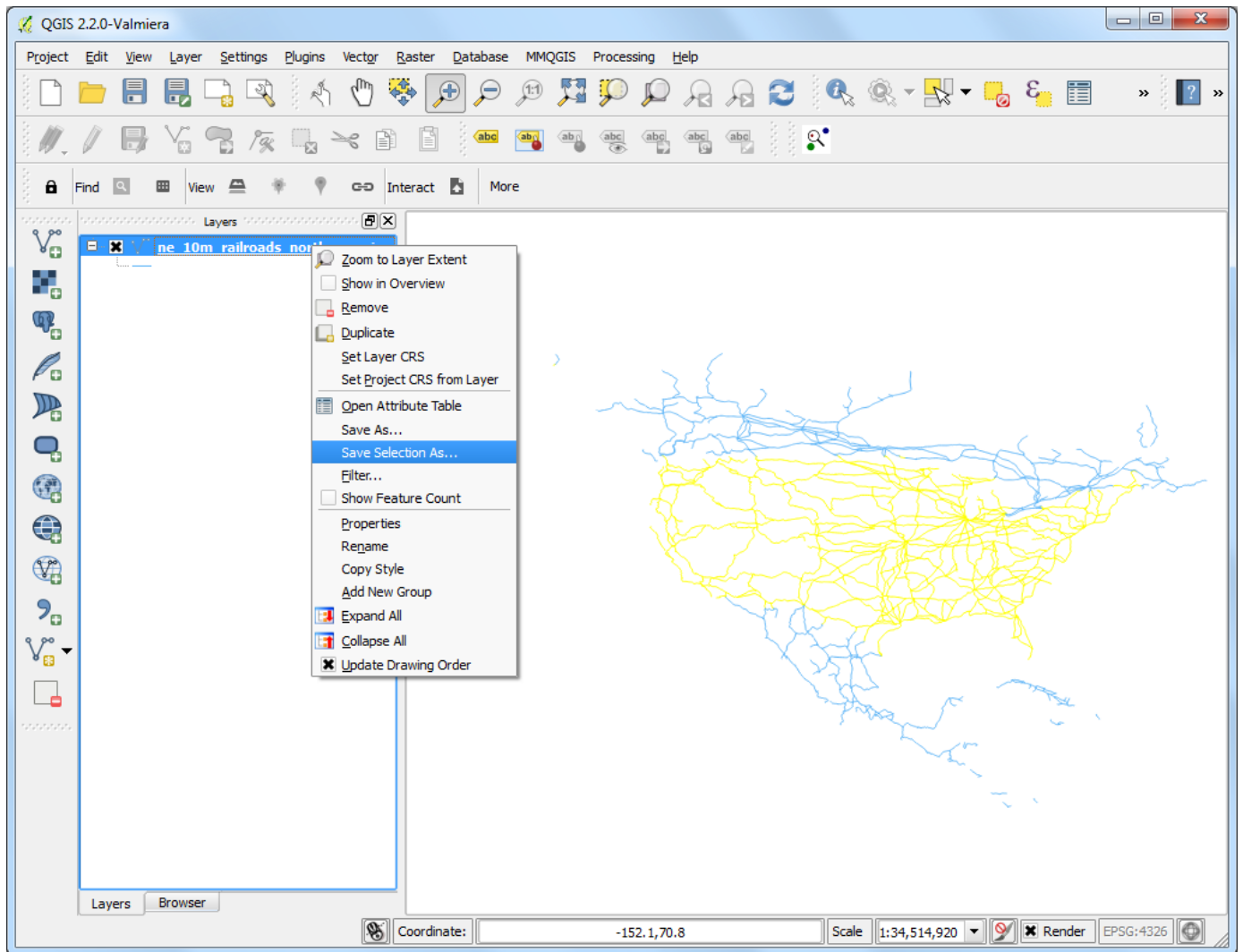
7. ■■■ Select By Expression ■■■■■■■■■■ ■■■■■■■■■■. ■■■■■ Functions list ■■■■■ ■■■■■ ■■■■■ Fields and Values ■■■■■ sov\_a3 ■■■■■ ■■■■■. ■■■■■ ■■■■■ ■■■■■ ■■■■■ :guilabel:`Expression` ■■■■■ ■■■■■ ■■■■■. "sov\_a3" = 'USA' ■■■■■ ■■■■■. ■■■■■ :guilabel:`Select` ■■■■■ ■■■■■ :guilabel:`Close` ■■■■■■■■■■.



8. Back in the main QGIS window, you will see that all lines that fall in USA are selected and appear in yellow.



9. `ne_10m_railroads_north_america`. ``ne\_10m\_railroads\_north\_america``  
:guilabel: Save Selection As...



10. `guiabel:Browse`` `usa_railroads.shp``. `CRS`` `guiabel:CRS`` `guiabel:Browse``.

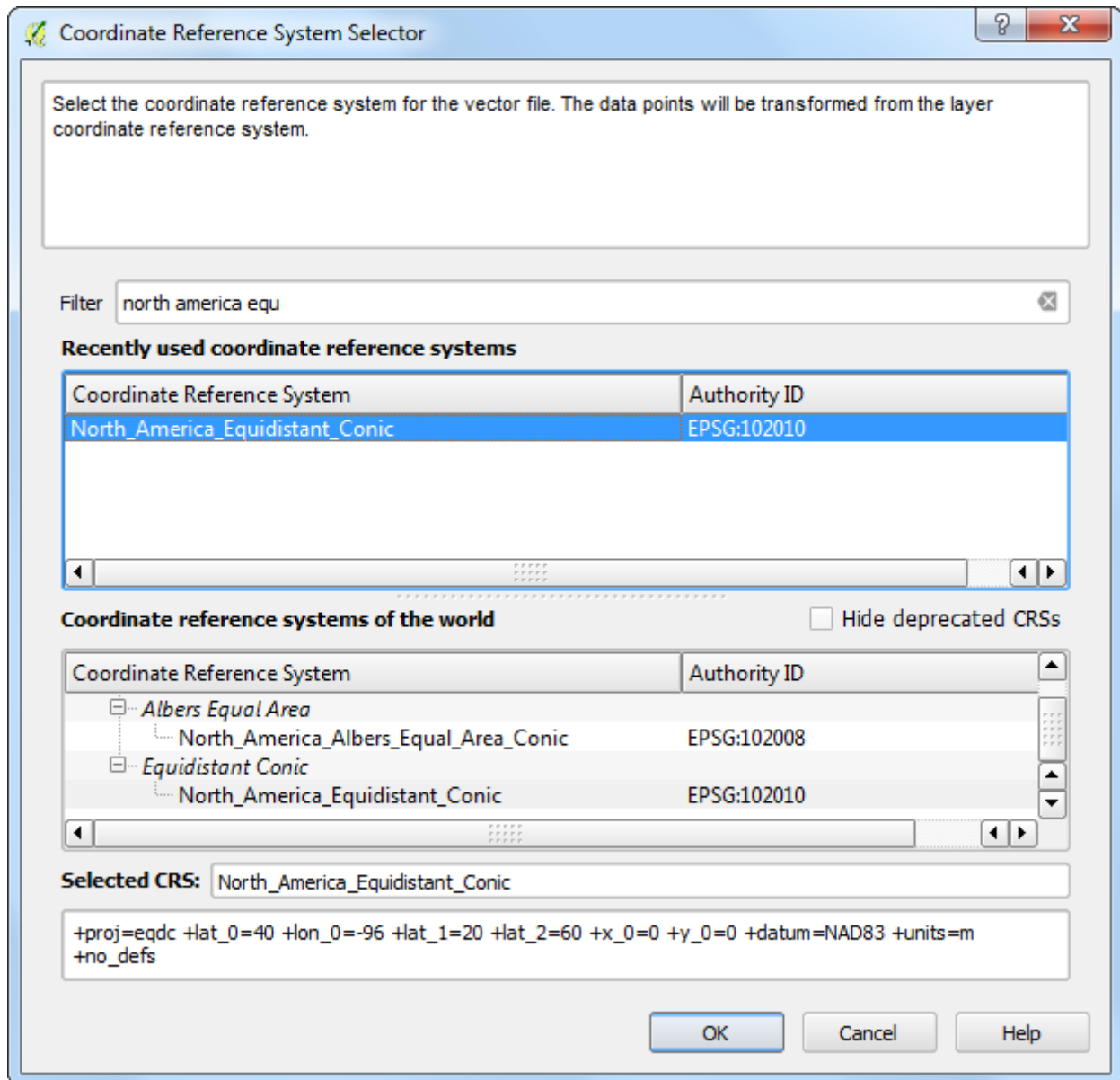
## Note

`CRS`` `EPSG:4326`` `(CRS)`` `**degrees`` `**degrees`` `square degrees`` `**meters`` `**feet``.





```
11. ■■■■ ■■■■ ■■■■ ■■■■ ■■■■ ■■■■. ■■■ :guilabel:`Filter` ■■■ ■■■■ :guilabel:`north`  
america equ` ■■■■ ■■■■. ■■■■ ■■■■ CRS■  
:guilabel:`North_America_Equidistant_Conic` EPSG:102010` ■■■■ :guilabel:`OK` ■■■  
■■■■.
```



12. ■ ■■■■■ ■■ ■■■ ■■■■ Save vector layer as... ■■■■■■ ■■■ ■■■ ■■■ ■■■  
 :guilabel:`Add saved file to map` ■ ■■■■■ :guilabel:`OK` ■ ■■■■■.



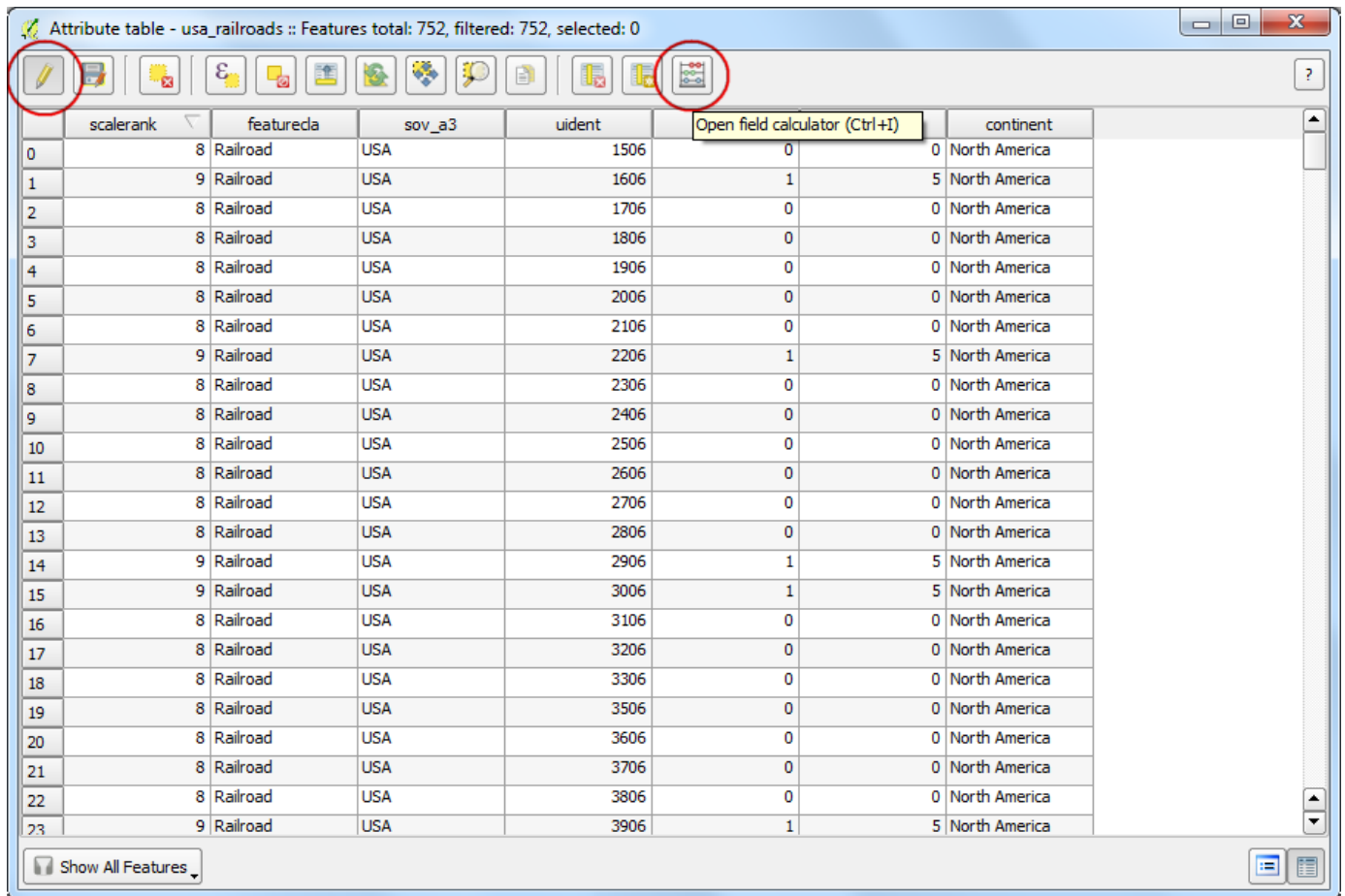
13. ■■■ ■■■■ ■■■■ ■■■■ ■■■■  
 usa\_railroads` `■■■■ QGIS ■■■■. ■■■■ ``ne\_10m\_railroads\_north\_america  
 ■■■■ ■■■■ ■■■■ ■■■■ ■■■■ ■■■■ ■■■■ ■■■■ ■■■■ ■■■■



14. ``usa\_railroads`` ■■■■ ■■■■ ■■■■ ■■■■ ■■ ■■■■ ■■ :guilabel: Open Attribute Table`■  
■■■■■.



15. ■■■ ■ ■■■■ ■■ ■■ ■■■■ ■■■■■. ■■■■■■ :guilabel: 'Toggle editing' ■■■■ ■■■■  
 ■■■■ ■■■■■ ■■■■. ■■ ■■■■■■ ■■■■■■■■ :guilabel: 'Open field calculator' ■■■■  
 ■■■■■■.



16. **Field Calculator** **Create a new field**. **Output field name** **length\_km**. **Output field type** **Decimal number (real)**. **Precision** **2**. **Function list**, **Geometry** **\$length**. **Expression** **length / 1000**. **CRS** **meters** **km** **length / 1000**. **OK** **OK**.



17. ■■■■■ Attribute Table`■ ■■■■ ■■■ ■■ :guilabel:`length\_km`■ ■■■■ ■■■. ■■■■■■ :guilabel:`Toggle editing` ■■■ ■■■■ ■■■ ■■■ ■■■■■.

Attribute table - usa\_railroads :: Features total: 752, filtered: 752, selected: 0

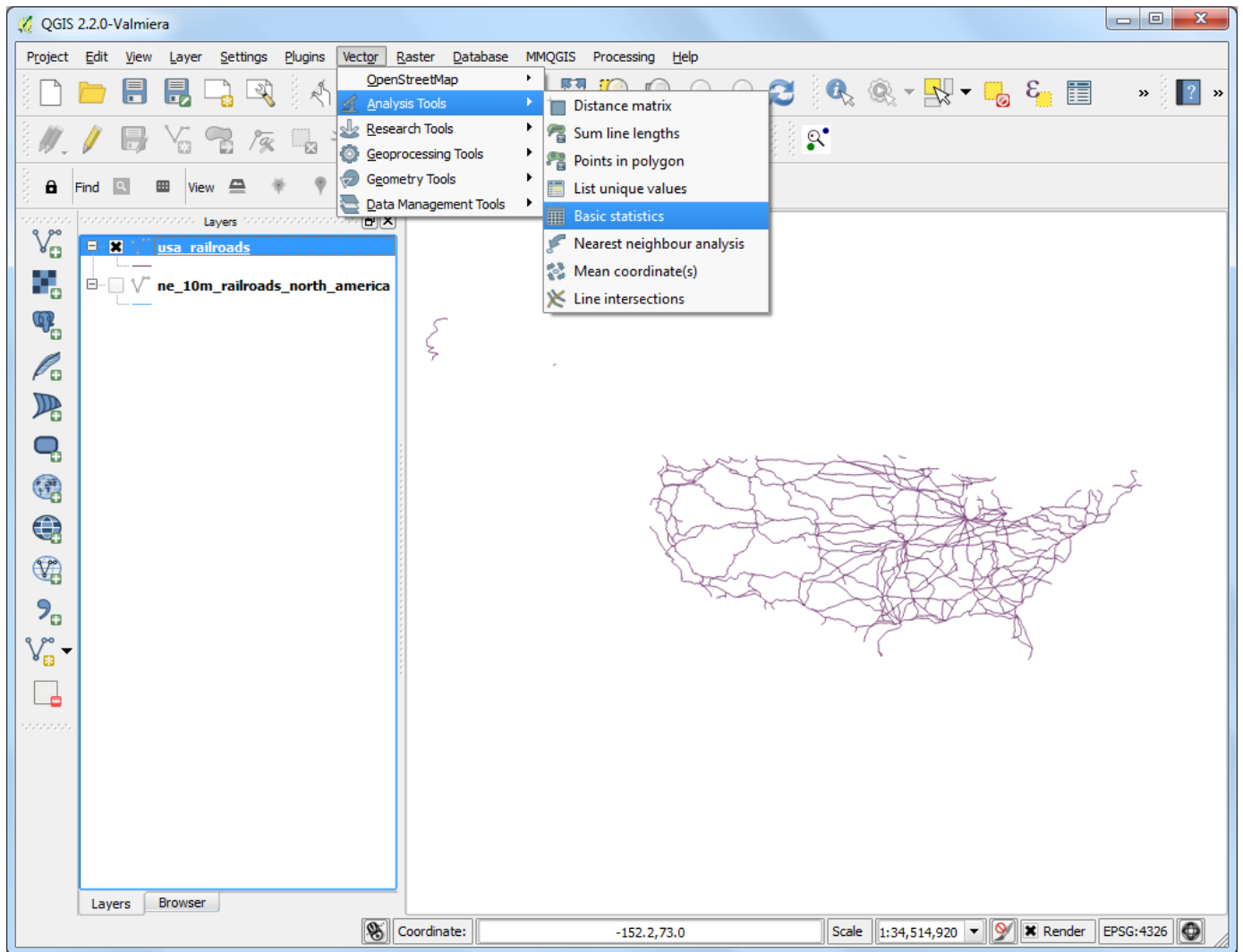


|    | scalerank | featuredata | sov_a3 | uident | add | natrscale | continent     | length_km |
|----|-----------|-------------|--------|--------|-----|-----------|---------------|-----------|
| 0  | 8         | Railroad    | USA    | 1506   | 0   | 0         | North America | 637.07    |
| 1  | 9         | Railroad    | USA    | 1606   | 1   | 5         | North America | 16.27     |
| 2  | 8         | Railroad    | USA    | 1706   | 0   | 0         | North America | 96.22     |
| 3  | 8         | Railroad    | USA    | 1806   | 0   | 0         | North America | 20.15     |
| 4  | 8         | Railroad    | USA    | 1906   | 0   | 0         | North America | 0.01      |
| 5  | 8         | Railroad    | USA    | 2006   | 0   | 0         | North America | 79.95     |
| 6  | 8         | Railroad    | USA    | 2106   | 0   | 0         | North America | 67.00     |
| 7  | 9         | Railroad    | USA    | 2206   | 1   | 5         | North America | 196.45    |
| 8  | 8         | Railroad    | USA    | 2306   | 0   | 0         | North America | 60.61     |
| 9  | 8         | Railroad    | USA    | 2406   | 0   | 0         | North America | 20.03     |
| 10 | 8         | Railroad    | USA    | 2506   | 0   | 0         | North America | 147.21    |
| 11 | 8         | Railroad    | USA    | 2606   | 0   | 0         | North America | 68.33     |
| 12 | 8         | Railroad    | USA    | 2706   | 0   | 0         | North America | 1.62      |
| 13 | 8         | Railroad    | USA    | 2806   | 0   | 0         | North America | 4.34      |
| 14 | 9         | Railroad    | USA    | 2906   | 1   | 5         | North America | 60.92     |
| 15 | 9         | Railroad    | USA    | 3006   | 1   | 5         | North America | 157.26    |
| 16 | 8         | Railroad    | USA    | 3106   | 0   | 0         | North America | 131.39    |
| 17 | 8         | Railroad    | USA    | 3206   | 0   | 0         | North America | 58.84     |
| 18 | 8         | Railroad    | USA    | 3306   | 0   | 0         | North America | 432.74    |
| 19 | 8         | Railroad    | USA    | 3506   | 0   | 0         | North America | 29.55     |
| 20 | 8         | Railroad    | USA    | 3606   | 0   | 0         | North America | 94.90     |
| 21 | 8         | Railroad    | USA    | 3706   | 0   | 0         | North America | 577.78    |
| 22 | 8         | Railroad    | USA    | 3806   | 0   | 0         | North America | 223.04    |
| 23 | 9         | Railroad    | USA    | 3906   | 1   | 5         | North America | 143.94    |

Show All Features

18. ■■■ ■■■■■ ■ ■■ ■■■ ■■■■■ ■■■■■■■■■. ■ ■■ ■■ ■■■ ■■■ Total ■■■■■ ■■■■■. ■■■■■ ■■ --> ■■■■■ --> ■■■■■ :menuselection:`Vector --> Analysis Tools --> Basic Statistics` ■ ■■■■.





19. `guiabel:Input Vector layer`` ```usa_railroads``` `guiabel:Target field`` ```length_km``` `guiabel:OK`` `guiabel:Sum``

## Note

Basics statistics

Input Vector Layer  
usa\_railroads

☐ Use only selected features

Target field  
length\_km

Statistics output

| Parameter               | Value          |
|-------------------------|----------------|
| Mean                    | 127.751569149  |
| StdDev                  | 125.80562595   |
| Sum                     | 96069.18       |
| Min                     | 0.01           |
| Max                     | 936.6          |
| N                       | 752.0          |
| CV                      | 0.984767755... |
| Number of unique values | 743            |

Press Ctrl+C to copy results to the clipboard

0% OK Close