

Active fire product fix: adding persistent anomaly flag

Persistent anomaly flag is added to both NetCDF and ascii formats of active fire product. Each fire pixel is categorized as:

- 0 – no persistent anomaly
- 1 - oil or gas flare
- 2 – volcano
- 3 – solar panel
- 4 – urban
- 5 – unclassified

Here is the description of the changes.

ASCII output: Additional column for persistent anomaly is added; the first (title) line is modified.

Before/after product:

AF_v1r1_j01_s201811182050381_e201811182052008_c201910162039090.txt

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year,month,day,hh,mm,lon,lat,mask,confidence,bright_t13,frp,line,sample,bowtie; nfire = 16
2018, 11, 18, 20, 50, -120.051445, 35.373226, 8, 75, 454.137024, 523.866943, 184, 1851, 0
2018, 11, 18, 20, 50, -120.053154, 35.379963, 7, 0, 458.887634, 568.377380, 185, 1851, 0
2018, 11, 18, 20, 50, -120.062065, 35.378429, 9, 87, 446.435364, 456.827118, 185, 1852, 0
2018, 11, 18, 20, 50, -120.083344, 35.388844, 8, 75, 488.237793, 911.507202, 187, 1854, 0
2018, 11, 18, 20, 50, -120.101158, 35.385788, 8, 39, 310.548340, 3.728809, 187, 1856, 0
2018, 11, 18, 20, 50, -118.601891, 36.226536, 7, 29, 300.670258, 3.968884, 274, 1661, 0
2018, 11, 18, 20, 50, -118.646439, 36.226280, 8, 35, 305.535767, 5.064438, 275, 1666, 0
2018, 11, 18, 20, 50, -118.622269, 36.236893, 9, 99, 357.488892, 53.261333, 276, 1663, 0
2018, 11, 18, 20, 50, -118.647957, 36.232841, 8, 45, 309.880249, 6.892451, 276, 1666, 0
2018, 11, 18, 20, 50, -118.640907, 36.240753, 9, 100, 398.086121, 155.975922, 277, 1665, 0
2018, 11, 18, 20, 50, -118.657928, 36.238068, 9, 84, 334.233887, 23.713444, 277, 1667, 0
2018, 11, 18, 20, 50, -118.739067, 36.395573, 7, 24, 300.086029, 4.420272, 302, 1671, 0
2018, 11, 18, 20, 50, -118.724632, 36.411800, 9, 96, 349.282104, 42.508846, 304, 1668, 0
2018, 11, 18, 20, 50, -118.726379, 36.418312, 9, 84, 326.054657, 18.055126, 305, 1668, 0
2018, 11, 18, 20, 50, -119.584526, 37.810020, 8, 74, 313.540253, 10.418139, 529, 1713, 0
2018, 11, 18, 20, 50, -119.593361, 37.808594, 8, 79, 319.367859, 13.668173, 529, 1714, 0
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year,month,day,hh, mm,lon,lat,mask,confidence,bright_t13,frp,line,sample,bowtie,persist_anomaly; nfire = 16
2018, 11, 18, 20, 50, -120.051445, 35.373226, 8, 75, 454.137024, 523.866943, 184, 1851, 0, 3
2018, 11, 18, 20, 50, -120.053154, 35.379963, 7, 0, 458.887634, 568.377380, 185, 1851, 0, 3
2018, 11, 18, 20, 50, -120.062065, 35.378429, 9, 87, 446.435364, 456.827118, 185, 1852, 0, 3
2018, 11, 18, 20, 50, -120.083344, 35.388844, 8, 75, 488.237793, 911.507202, 187, 1854, 0, 3
2018, 11, 18, 20, 50, -120.101158, 35.385788, 8, 39, 310.548340, 3.728809, 187, 1856, 0, 0
2018, 11, 18, 20, 50, -118.601891, 36.226536, 7, 29, 300.670258, 3.968884, 274, 1661, 0, 0
2018, 11, 18, 20, 50, -118.646439, 36.226280, 8, 35, 305.535767, 5.064438, 275, 1666, 0, 0
2018, 11, 18, 20, 50, -118.622269, 36.236893, 9, 99, 357.488892, 53.261333, 276, 1663, 0, 0
2018, 11, 18, 20, 50, -118.647957, 36.232841, 8, 45, 309.880249, 6.892451, 276, 1666, 0, 0
2018, 11, 18, 20, 50, -118.640907, 36.240753, 9, 100, 398.086121, 155.975922, 277, 1665, 0, 0
2018, 11, 18, 20, 50, -118.657928, 36.238068, 9, 84, 334.233887, 23.713444, 277, 1667, 0, 0
2018, 11, 18, 20, 50, -118.739067, 36.395573, 7, 24, 300.086029, 4.420272, 302, 1671, 0, 0
2018, 11, 18, 20, 50, -118.724632, 36.411800, 9, 96, 349.282104, 42.508846, 304, 1668, 0, 0
2018, 11, 18, 20, 50, -118.726379, 36.418312, 9, 84, 326.054657, 18.055126, 305, 1668, 0, 0
2018, 11, 18, 20, 50, -119.584526, 37.810020, 8, 74, 313.540253, 10.418139, 529, 1713, 0, 0
2018, 11, 18, 20, 50, -119.593361, 37.808594, 8, 79, 319.367859, 13.668173, 529, 1714, 0, 0
```

NetCDF output: Persistent anomaly flag is added both to sparse array of fire pixels and to QA mask.

Current product content:

Name	Type	Description	Dimension	Units	Range
fire mask	8 bit integer	Fire mask	3200 x 768	unitless	0 - 9
algorithm QA	32 bit Integer	Fire algorithm QA mask	3200 x 768	unitless	0 - 31
FP_line	16 bit Integer	Fire pixel line	Sparse data array 0 – N	unitless	0 - 768
FP_sample	16 bit Integer	Fire pixel sample	Sparse data array 0 – N	unitless	0 – 3200
FP_latitude	32 bit Float	Fire pixel latitude	Sparse data array 0 – N	degrees	-90 - 90
FP_longitude	32 bit Float	Fire pixel longitude	Sparse data array 0 – N	degrees	-180 - 180
FP_power	32 bit Float	Fire radiative power	Sparse data array 0 – N	MW	0 - 5000
FP_confidence	8 bit Integer	Fire detection confidence	Sparse data array 0 – N	%	0 – 100
FP_land	8 bit Integer	Land pixel flag	Sparse data array 0 – N	unitless	1 – land 0 – water
18 FP diagnostic variables	See netCDF4 metadata	Variables to describe observing and environmental conditions, and results of algorithm tests	Sparse data array 1 – N	See netCDF4 metadata	See netCDF4 metadata

* N is a dimension of sparse data array; defined in “nfire” variable

Added variable:

FP_PersistentAnomalyCategory	8 bit Integer	Persistent industrial or nature source	Sparse data array 0 – N	unitless	0 – 5
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Current QA Mask (4 bytes for each pixel in the granule)

Bits	Description
0-1	Surface Type (water=0, coastal=1, land=2)
2	On-ground bowtie deletion zone
3	Atmospheric correction (reserved for future use)
4	Day/Night (daytime = 1, nighttime = 0)
5	Potential fire (0/1)
6	N/A

7-10	Background window size parameter
11	Fire Test 1 valid (0 - No, 1 - Yes)
12	Fire Test 2 valid (0 - No, 1 - Yes)
13	Fire Test 3 valid (0 - No, 1 - Yes)
14	Fire Test 4 valid (0 - No, 1 - Yes)
15	Fire Test 5 valid (0 - No, 1 - Yes)
16	Fire Test 6 valid (0 - No, 1 - Yes)
17-19	N/A
20	Adjacent clouds (0/1)
21	Adjacent water (0/1)
22-23	Sun Glint Level (0-3)
24	Sun glint rejection
25	False Alarm 1 (excessive rejection of legitimate background pixels)
26	False Alarm 2 (water pixel contamination)
27	Amazon forest-clearing rejection test
28	Water pixel rejection due to land/coastal contamination in background
29-31	N/A

Persistent anomaly category is added in previously not used bits:

Bits	Description
29-31	Persistent anomaly category

Before/after product:

AF_v1r1_j01_s201811182050381_e201811182052008_c201910162039090.nc

The following is added:

FP_PersistentAnomalyCategory = 3, 3, 3, 3, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0;

011 is put in bits 29-31 for four pixels in this granule