Testing Example:

Land Information System - Alaska

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| **id**  (*Should = STAC Collection id*) | lis-alaska-nrt  (*Should be a singular word with hyphens or underscore e.g., lis-alaska-nrt or lis\_alaska\_nrt* ) |
| **name**  Dataset title to be displayed on the website (*Should = STAC Collection title*) | Land Information System - Alaska |
| **description**  Short description - displayed on dataset cards and header for the dataset page. | State of Alaska vegetation and hydrological information produced by NASA’s Short-term Prediction and Transition Center – Land Information System (SPoRT-LIS). |
| **media**  See [media.md](https://github.com/NASA-IMPACT/veda-ui/blob/main/docs/content/frontmatter/media.md) - Used on the dataset card and dataset page header. | ***Link to cover image:*** ./media/lis-alaska-nrt-cover.jpg  Note: Image must have 2:1 ratio and a size of at least (2000x1000px). Images should not weigh more than 500KB.  ***Image text (alt):*** Medenhall Glacier Outlook, Juneau, Alaska  ***Author name:*** Figure by Mike  ***Author URL:*** https://stock.adobe.com/images/medenhall-glacier-outlook-juneau-alaska/138501742?prev\_url=detail |
| **tags**  (see [tag options](#_x4928bwfxfim)) | * **Topic:** Agriculture, Climate, Drought, Evapotranspiration, Hydrology, Water Resources * **Source:** NASA * **Product Type:** Assimilated Observations, Model Output, Satellite Output |
| **layers**  Color ramp options: <https://matplotlib.org/stable/tutorials/colors/colormaps.html>  The conversion process will automatically convert between hex and rgb colors based on the 2nd argument call within function. | ***This is the sequence the layers should appear in:***  Layer name: Relative Soil Moisture (0-10cm), Updated Daily  stacCol: lis\_ak\_rsm\_10cm  Layer id: alaska\_relative\_soil\_moisture\_10cm  Layer description: Relative soil moisture (RSM) is a ratio of the volumetric soil moisture between the wilting and saturation points for a given soil type.  Units: % percentage  Color ramp: Manual (5% percentile breaks)  Stops:  ['#8b6459',  '#b48b81',  '#e1beb4',  '#a50000',  '#e11300',  '#ff3200',  '#ff6000',  '#ffa000',  '#ffbf3c',  '#ffe778',  '#95f58b',  '#4ff04f',  '#1db41d',  '#1364d1',  '#2881f0',  '#4fa5f5',  '#95d1fa',  '#a08bff',  '#6f60db',  '#3c28b4']  ***You must keep the colors as a python list, even if it is blank. The python list is simply any items enclosed within brackets. Do not add anymore brackets other than color stops in this document or else there may be an error.***  Layer name: Relative Soil Moisture (0-40cm), Updated Daily  stacCol: lis\_ak\_rsm\_40cm  Layer id: alaska\_relative\_soil\_moisture\_40cm  Layer description: Relative soil moisture (RSM) is a ratio of the volumetric soil moisture between the wilting and saturation points for a given soil type.  Units: % percentage  Color ramp: Manual (5% percentile breaks)  Stops:  ['#8b6459',  '#b48b81',  '#e1beb4',  '#a50000',  '#e11300',  '#ff3200',  '#ff6000',  '#ffa000',  '#ffbf3c',  '#ffe778',  '#95f58b',  '#4ff04f',  '#1db41d',  '#1364d1',  '#2881f0',  '#4fa5f5',  '#95d1fa',  '#a08bff',  '#6f60db',  '#3c28b4']  Data format: arc  Projection: equirectangular  Legend minimum: 0  Legend maximum: 100  Legend type: gradient  Layer name: Green Vegetation Fraction, Updated Daily  stacCol: lis\_ak\_green\_veg\_fraction  Layer id: alaska\_gvf  Layer description: Green Vegetation Fraction (GVF) from VIIRS on Suomi NPP.  Units: % percentage  Color ramp: Manual (percentile breaks for each 10% increment)  Stops:  ['#784f45',  '#a0786e',  '#c7a095',  '#ffe778',  '#a0e632',  '#b4faaa',  '#78f573',  '#37d13c',  '#1db41d',  '#0ea00e']  Data format: arc  Projection: equirectangular  Legend minimum: 0  Legend maximum: 100  Legend type: gradient  Layer name: Snow Depth, Updated Daily  stacCol: lis\_ak\_snow\_depth  Layer id: alaska\_snow\_depth  Layer description: Snow depth for the state of Alaska  Units: % percentage  Color ramp: Need information from Clay Blankenship to determine the color categories  Stops:  [,]  Data format: arc  Projection: equirectangular  Legend minimum: 0  Legend maximum: 100  Legend type: gradient  Layer name: Green Vegetation Fraction, Updated Daily  stacCol: lis\_ak\_green\_veg\_fraction  Layer id: alaska\_gvf  Layer description: Green Vegetation Fraction (GVF) from VIIRS on Suomi NPP.  Units: % percentage  Color ramp: Manual (percentile breaks for each 10% increment)  Stops:  ['#784f45',  '#a0786e',  '#c7a095',  '#ffe778',  '#a0e632',  '#b4faaa',  '#78f573',  '#37d13c',  '#1db41d',  '#0ea00e']  Data format: arc  Projection: equirectangular  Legend minimum: 0  Legend maximum: 100  Legend type: gradient |

**INFORMATION ON DATASET LANDING PAGE (Single Prose block)**

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| **content\_topic**  (*Can include:*  *Agriculture, Air Quality, Biomass, Burn Severity, Climate, Climate Model, COVID 19, Disasters, Drought, Evapotranspiration, Groundwater, Hydrology, Land Cover, Land Surface Model, Precipitation, Runoff, Snow, Snow Water Equivalent, Socioeconomic Surface Meteorology, Temperature, Tropical, Water Model, Water Quality, Water Resources, Water Storage Trends, Wildfire*) | Value: Land Surface Model, Soil Moisture, Hydrology |
| **content\_source**  This data should not need to be re-entered. But if it is different than it will override. Can include things like NASA, NOAA, FEMA, etc | \*\*\* This will automatically pull from whatever source is added in the first table (see above) within the ***Tags*** section. Leave as null if you want the exact same TAG information.  Value: null |
| **content\_product\_type:**  Examples include (Assimilated Observations, Model Output, Satellite Output) | Value: Assimilated Observations, Model Output, Satellite Output |
| **temporal\_extent**  Date ranges of the data | Start: 12/01/2021  End: 12/31/2021 |
| **temporal\_resolution**  Examples include:  Hourly, daily, monthly, yearly (annually), climatology | Value**:** Daily |
| **spatial\_extent**  Can include the spatial extent of the event for which the dataset covers, can include large regions, or other scenarios.  Examples include:  Huntsville, AL; California; Northern Plains; United States; Southern Hemisphere; Global | Value: Alaska |
| spatial\_resolution  Can be in meters, kilometers, or degrees, etc. Whatever string is passed will be placed within the .data.mdx | Value: 0.03° x 0.03° |
| **data\_type**  Can include values such as Research. | Value: Research |
| **data\_units**  Describes the measurement values such as Percentage (%), Kelvin (K), Celsius (C), m2, etc. | Value: Percentage (%) |
| **data\_latency**  This is more related to remote sensing products, assimilated model output, or forecasts. | Value: Daily |

**Introduction paragraph**

The NASA Short-term Prediction Research and Transition (SPoRT) Center runs the Alaska LIS (LIS-AK), a near-real-time version of the Noah land surface model at 0.03 degree resolution utilizing the NASA Land Information System (LIS) software. The model input is the Global Data Assimilation (GDAS) forcing dataset, which is a near-real-time analysis of various observational data (ground, radar, satellite) consisting of surface meteorology (temperature, humidity, pressure, winds, precipitation) and downwelling long- and short-wave radiation.

Within LIS, the Noah Land Surface Model (LSM) is forced by this input data and produces analyses of soil temperature and moisture in 4 layers plus the snow state and fluxes of energy and water at the surface. The Noah LSM accounts for snow accumulation based on the current LIS snow values in the continuous run and the forcing data from the atmospheric model. Forcing variables influencing the snow depth in LIS include precipitation, air temperature, solar radiation. Relevant modeled processes include compaction of snow, sublimation, and melting.

**Source Data Product Citation**

Kumar, S.V., C.D. Peters-Lidard, Y. Tian, P.R. Houser, J. Geiger, S. Olden, L. Lighty, J.L. Eastman, B. Doty, P. Dirmeyer, J. Adams, K. Mitchell, E. F. Wood, and J. Sheffield. (2006). Land Information System - An interoperable framework for high resolution land surface modeling. Environ. *Modeling & Software*, 21, 1402-1415, doi:10.1016/j.envsoft.2005.07.00

NASA Land Information System model configuration and information can be found in this [peer-reviewed article](doi:10.1016/j.envsoft.2005.07.00).

**Scientific Details**

Relative soil moisture (RSM) provides a measure of the soil saturation without having to consider the variation in soil type. RSM is analogous to relative humidity for air saturation. Thus, RSM provides an easy measure of the level of saturation as opposed to a volumetric value where the differing amounts of space between soil particles causes inconsistent volumetric maxima per soil type. The water in the soil can be in liquid or frozen form.

The near-surface layer responds quickly to heavy rainfall and indicates near-saturated conditions conducive to significant runoff and river flooding, while the deeper column layers represent longer-term water storage via infiltration from upper layers. These values can also be used as fire risk indicators since vegetation water is dependent on soil moisture, and the near-surface layer can be a proxy for moisture in surface fuels (duff or litter).

Green Vegetation Fraction (GVF) is typically a static input to the land surface model based on monthly climatological values for a given location. The GVF particularly impacts soil moisture due to the accounting in the model of evapotranspiration by photosynthetically active vegetation. Compared to the assumed climatological GVF, the use of the daily VIIRS GVF composite provides a more realistic impact to soil moisture, especially in extreme or atypical conditions.

**Key Publications**

Aaron, J. and Peursem, K.V. Utilizing Remote Sensing & NASA SPoRT Land Information System-Alaska To Improve Flood & Landslide Situational Awareness From Heavy Precipitation. 104th AMS Annual Meeting. AMS, 2024. [https://ams.confex.com/ams/104ANNUAL/mediafile/Handout/Paper435177/AMS\_2024\_AK-LIS%202020%20event.pptx.pdf](https://ams.confex.com/ams/104ANNUAL/mediafile/Handout/Paper435177/AMS\_2024\_AK-LIS%202020%20event.pptx.pdf)

Tavakol, A., Rahmani, V., Quiring, S.M., Kumar, S.V. (2019). Evaluation analysis of NASA SMAP L3 and L4 and SPoRT-LIS soil moisture data in the United States. Remote Sensing of Environment, (229), 234-246, [https://doi.org/10.1016/j.rse.2019.05.006](https://doi.org/10.1016/j.rse.2019.05.006).

McDonough, K.R., Hutchinson, S.L., Hutchinson, J.M.S., Case, J.L., Rahmani, V. (2018). Validation and assessment of SPoRT-LIS surface soil moisture estimates for water resources management applications. Journal of Hydrology, (566), 43-54, [https://doi.org/10.1016/j.jhydrol.2018.09.007](https://doi.org/10.1016/j.jhydrol.2018.09.007).

Hoylman, Z. H., Holden, Z., Bocinsky, R. K., Ketchum, D., Swanson, A., & Jencso, K. (2024). Optimizing drought assessment for soil moisture deficits. Water Resources Research, (60), [https://doi.org/10.1029/2023WR036087](https://doi.org/10.1029/2023WR036087).

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| **Optional\_1** Adding additional information. This will be included in their own prose blocks. Headers have included:Data Limitations, Data Stories Using this dataset, Importance of Heat Stress Datasets, Disclaimer, Dataset Accuracy | Header: **Soil Moisture Limitations**  Value: The SPoRT-LIS is as good as the input forcing analyses, so occasional soil moisture artifacts may appear in the horizontal maps related to quality-control issues of the input datasets. These can be manifested with unusually low or high percentiles, especially along international borders, coastlines, and isolated dry “bulls-eyes” at rain gauge with quality issues. |
| **Optional\_2** | Header:  Value: |
| **Optional\_3** | Header:  Value: |
| **Optional\_4** | Header:  Value: |

**The information below *likely* shouldn’t change between datasets.**

**Limitations of Use**

NASA data and products are freely available to federal, state, public, non-profit and commercial users. This information can be experimental- or research-grade data products and may not be appropriate for operational use. These NASA data products, services, and the Disasters Mapping Portal are intended to aid decision makers and enhance situational awareness, but these data are not guaranteed to be consistently available or routinely updated. Please cite the information according to the direction provided in the metadata.

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