ClearSky API

Web Service for Estimating the Probability of a Clear Sky, Based on Historical MODIS EO Data

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Version: **1.0**

EOproc UG (haftungsbeschränkt)
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Introduction

The ClearSky web service provides information about the probability to have clear sky conditions for a given day in the future, based on historic observations.
It is intended for planning and expectation management of earth observation campaigns.

Coverage:	Global (land and sea), except polar regions -180° to +180° longitude -80° to +80° latitude
Cell size:	10 km x 10 km
Aggregation:	per month
Nominal reference time:	10:30 (local sun time)
API monitoring:	For documentation of SLA compliance, the API is continuously monitored every 10 min by a test query

Base Data and Methodology

Base data are obtained from MODIS (Terra), providing a daily global coverage with 14.7 orbits per day with a swath width of 2300 km.. A rigorous data processing chain has been implemented, using the USGS MODIS Reprojection Tool (MRT), reprojecting the MOD35 data product to UTM zones. The native MODIS resolution of 1 km is then aggregated to 10 km x 10 km cells. In case of multiple coverages per day, the algorithm picks the scene acquired closest to the nominal 10:30 local sun time.
So far MODIS data have been processed for the full year 2015. More years will be processed and added to the API database.

Notes

On request, the API can be extended e.g. by additional query parameters or additional projections for specifying the location. For suggestions and extension of the API, please contact EOproc (mlange@eoproc.com).

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API and URL request parameters

The ClearSky probability is provided via a web API.

Base URL:	https://clearsky.eoproc.com/clearsky/	
Request type:	?req=d01	static URL parameter describing the basic structure of the URL request keep as is, don´t change
Request category:	&category=clearsky	static URL parameter describing the basic type of web service keep as is, don´t change
UTM x:	&x=509	x coordinate in km note: 10 km cells are centered at 5, 15, 25 … km x may be up to 4.5 deg east or west to the central UTM meridian
UTM y:	&y=3953	y coordinate in km negative y are southern hemisphere note: 10 km cells are centered at 5, 15, 25 … km
EPSG code:	&epsg=32632	EPS code for UTM zone 32 note: currently only UTM is supported = EPSG 32601 to 32660
User ID:	&user=secret-key	confidential user identification

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Example from Tunisia (copy URL request into browser)

https://clearsky.eoproc.com/clearsky/?req=d01&category=clearsky&x=509&y=3953&epsg=32632&user=secret-key

Response JSON object:


```
{
   "clearsky": [
      {"month":"jan", "prob":38},
      {"month":"feb", "prob":27},
      {"month":"mar", "prob":47},
      {"month":"apr", "prob":63},
      {"month":"may", "prob":71},
      {"month":"jun", "prob":90},
      {"month":"jul", "prob":95},
      {"month":"aug", "prob":83},
      {"month":"sep", "prob":56},
      {"month":"oct", "prob":42},
      {"month":"nov", "prob":38},
      {"month":"dec", "prob":27}
   ],
   "kmx": 505,
   "kmy": 3955,
   "epsg": 32632,
   "responsestat": "success",
   "message": ""}
```


The response is a JSON object with the probability for a clear sky for every month. Example: a probability number of 90 means that 9 of 10 days in this month are expected to have clear sky conditions, suitable for acquiring an image from space for this location.

Also returned are the exact center coordinate of the cell selected. The parameter “responsestat” indicates for all requests, if the query was successful (“success”) or not (“fail”), combined with a brief explanation what went wrong).

In case of an invalid request an error response is sent.

Example:

https://clearsky.eoproc.com/clearsky/?req=d01&category=clearsky&x=3&y=3953&epsg=32632&user=secret-key

Response:


```
{
   "responsestat": "fail",
   "message": "x out of bounds, only supported -4.5 deg to +4.5 deg off central
   meridian"
}
```


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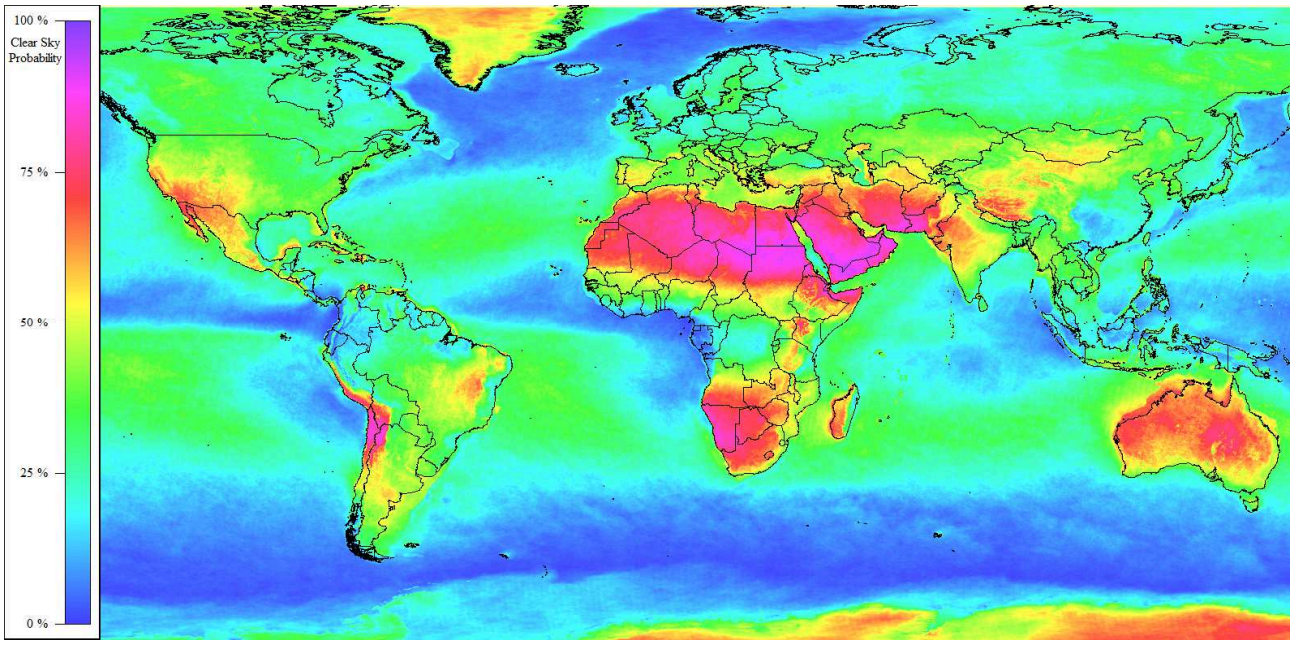
Visualization: ClearSky probability



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