Excerpt from the *Item Description* of the *Download* tool:

Parameter	Explanation	Data Type
CLDMSK (Optional)	**Dialog Reference** 🔑 License: "Customize" ‣ "Extensions..." ‣ "☑ Spatial Analyst" Reduces the respective L2A cloud probability image to an own binary image (by means of a raster function chain) that highlights those areas where the specified cloud probability is reached/exceeded. Might be useful in assessing the effect of different mask thresholds (see threshold slider below, parameter CLDTHR). ⚙ Tip 1: To change the mask color of an existing mask layer, the Symbology tab from its Layer Properties dialog box doesn't help (for this kind of raster layer). Instead, from the expanded mask layer (within Table Of Contents, TOC), identify the color indicator (box symbol left to its value label), single-click on it (opens the Color Selector), and change the color to your liking. ⚙ Tip 2: To retroactively change the threshold value of an existing mask layer, edit the function chain as follows: 1. From the context menu (right-click) on the respective mask layer (within TOC), choose Properties... 2. When prompted to "Build Raster Attribute Table", choose No (important: do not choose Yes). 3. From the Layer Properties dialog box, go to the Functions tab. 4. From the Function Chain, identify and double-click the Local Function (opens its Raster Function Properties dialog box). 5. From the Raster Function Properties dialog box, go to the Local tab, and select the second item from the Input Rasters list (the item that shows the current threshold value as a scalar item). 6. A single click on this selected scalar item makes it editable. Now change the scalar to your liking (value must be between 1 and 100). There is no python reference for this parameter.	Boolean
CLDFLT (Optional)	**Dialog Reference** 🔑 License: "Customize" ‣ "Extensions..." ‣ "☑ Spatial Analyst" * From the list of available indices (see respective parameters below), each index whose name ends with an asterisk "*" is filterable. Filter rationale: Occasionally, an index misleadingly indicates water at bright locations where actually no water is present (e.g. bright rooftops, or also bright fields), in coincidence with (to some degree) a likewise misleading high value of the respective local L2A cloud probability. This provides the opportunity to reduce the amount of false positives by masking out index pixels where the cloud probability reaches/exceeds the specified threshold (see threshold slider below, parameter CLDTHR). 📓 Note: The outlined filter functionality introduces additional raster functions into the function chain. Therefore, to keep the computational load reasonable, use this filter option with care. ⚙ Tip 1: To retroactively remove the entire filter from an existing index layer, modify the function chain as follows: 1. From the Layer Properties dialog box of the respective index layer, go to the Functions tab. 2. From the Function Chain, identify and right-click the topmost Local Function (opens its context menu). 3. From this Local Function's context menu, choose Remove (prompts to Resolve Dataset).	Boolean

	4. From the Resolve Dataset dialog box, switch the Datasets input to <Resample Function.OutputRaster>, and click OK. ☼ Tip 2: To retroactively change the filter threshold value, edit the function chain as follows: 1. From the Layer Properties dialog box of the respective index layer, go to the Functions tab. 2. From the Function Chain, identify and double-click the Local Function closest to the "CLD" raster dataset (opens the Raster Function Properties dialog). 3. From the Raster Function Properties dialog box, go to the Local tab, and select the second item from the Input Rasters list (the item that shows the current threshold value as a scalar item). 4. A single click on this selected scalar item makes it editable. Now change the scalar to your liking (value must be between 1 and 100). There is no python reference for this parameter.	
CLDTHR (Optional)	**Dialog Reference** Used for creating a cloud mask, as well as for adding a filter to selected filterable* indices (see the previous two options). There is no python reference for this parameter.	Long
SNWMSK (Optional)	There is no explanation for this parameter.	Boolean
SNWFLT (Optional)	There is no explanation for this parameter.	Boolean
SNWTHR (Optional)	There is no explanation for this parameter.	Long
NDWI (Optional)	**Dialog Reference** **N**ormalized **D**ifference **W**ater **I**ndex McFeeters S.K. (1996) [not to be confused with NDWI(Gao)] Separatrix manifold: $(\rho_3 - \rho_8) / (\rho_3 + \rho_8) = \theta$ (typically $\theta=0$) $\Leftrightarrow$ $(1-\theta)\cdot\rho_3 - (1+\theta)\cdot\rho_8 = 0$ (hyperplane that passes through the feature space origin) ☼ General Tip (also applies to other indices): Try out different thresholds (θ value) to find the most appropriate one with respect to the scene's specific circumstances. All indices are more or less sensitive to the variability of certain conditions like seasonal changes (notably shadow), water turbidity, content of phytoplankton, and so on. General click path to change the threshold (or other coefficients of the index Expression): 1. From the Layer Properties dialog box of the respective index layer, go to the Functions tab. 2. From the Function Chain, identify and double-click the topmost Band Arithmetic Function (opens its Raster Function Properties dialog). 3. From the Raster Function Properties dialog box, go to the Band Arithmetic tab, and modify the Expression to your liking. 📓 General Notes (also apply to other indices):	Boolean

	• If you need a decimal within the Expression, you can express it by an integer fraction (for example, use "12/100" instead of "0.12" or "0,12"). In this way, the expression becomes locale-independent. Otherwise, you would have to use your locale's specific decimal separator character. • Availability of indices requires ArcGIS version ≥10.5, since with lower ArcGIS versions the Expression parser of the Band Arithmetic Function is too error prone (notably regarding a constant term). There is no python reference for this parameter.	
MNDWI (Optional)	**Dialog Reference** **M**odified **N**ormalised **D**ifference **W**ater **I**ndex Xu H.Q. (2005) Separatrix manifold: $(\rho_3 - \rho_{11}) / (\rho_3 + \rho_{11}) = \theta$ (typically $\theta=0$) ⇔ $(1-\theta)\cdot\rho_3 - (1+\theta)\cdot\rho_{11} = 0$ (hyperplane that passes through the feature space origin) There is no python reference for this parameter.	Boolean
nNDVI (Optional)	**Dialog Reference** (negative) **N**ormalized **D**ifference **V**egetation **I**ndex Rouse J.W., Haas R.H., Schell J.A., Deering, D.W. (1973) Separatrix manifold: $(\rho_4 - \rho_8) / (\rho_4 + \rho_8) = \theta$ (typically $\theta=0$) ⇔ $(1-\theta)\cdot\rho_4 - (1+\theta)\cdot\rho_8 = 0$ (hyperplane that passes through the feature space origin) There is no python reference for this parameter.	Boolean
nNDVI_GREEN (Optional)	**Dialog Reference** (negative) **N**ormalized **D**ifference **V**egetation **I**ndex - **Green** Separatrix manifold: $\rho_3\cdot(\rho_4 - \rho_8) / (\rho_4 + \rho_8) = \theta$ (typically $\theta=0$) ⇔ $(\rho_3-\theta)\cdot\rho_4 - (\rho_3+\theta)\cdot\rho_8 = 0$ (non-planar hypersurface that passes through the feature space origin) There is no python reference for this parameter.	Boolean
SWI (Optional)	**Dialog Reference** **S**uperfine **W**ater **I**ndex Sharma R.C., Tateishi R., Hara K., Nguyen L.V. (2015) Separatrix manifold: $(S - 7\cdot\rho_8) / (S + 7\cdot\rho_8) = \theta$	Boolean

	(typically $\theta=0$) where S is the saturation component of the HSV representation (as converted from RGB composite) There is no python reference for this parameter.	
WRI (Optional)	**Dialog Reference** **W**ater **R**atio **I**ndex Shen L., Li C. (2010) Separatrix manifold: $(\rho_3 + \rho_4) / (\rho_8 + \rho_{11}) = \theta$ (typically $\theta=1$) ⇔ $\rho_3 + \rho_4 - \theta \cdot (\rho_8 + \rho_{11}) = 0$ (hyperplane that passes through the feature space origin) There is no python reference for this parameter.	Boolean
NWIgreen (Optional)	**Dialog Reference** **N**ew **W**ater **I**ndex Ding F. (2009) Separatrix manifold: $(\rho_3 - (\rho_8+\rho_{11}+\rho_{12})) / (\rho_3 + (\rho_8+\rho_{11}+\rho_{12})) = \theta$ (typically $\theta=0$) ⇔ $(1-\theta) \cdot \rho_3 - (1+\theta) \cdot (\rho_8+\rho_{11}+\rho_{12}) = 0$ (hyperplane that passes through the feature space origin) There is no python reference for this parameter.	Boolean
NWIblue (Optional)	**Dialog Reference** **N**ew **W**ater **I**ndex Yang H.B., Wang Z.M., Zhao H.L., Guo Y. (2011) Separatrix manifold: $(\rho_2 - (\rho_8+\rho_{11}+\rho_{12})) / (\rho_2 + (\rho_8+\rho_{11}+\rho_{12})) = \theta$ (typically $\theta=0$) ⇔ $(1-\theta) \cdot \rho_2 - (1+\theta) \cdot (\rho_8+\rho_{11}+\rho_{12}) = 0$ (hyperplane that passes through the feature space origin) There is no python reference for this parameter.	Boolean
MBWI (Optional)	**Dialog Reference** **M**ulti-**B**and **W**ater **I**ndex Wang X., Xie S., Du J. (2018) Separatrix manifold: $2 \cdot \rho_3 - \rho_4 - \rho_8 - \rho_{11} - \rho_{12} = \theta$ (typically $\theta=0$; hyperplane, with distance to the feature space origin if $\theta \neq 0$) ⛭ Tip: Adjust the threshold in dependence on the shadow length. For example, in case of a winter scene with significant shadow, a value around $\theta=-5/100$ might be reasonable to limit the amount of false positives. On the other hand, in case of a summer scene	Boolean

	with minor shadow, the threshold can be set to a lower value around $\theta=-15/100$, what minimizes the loss of details, i.e. minimizes the amount of false negatives. There is no python reference for this parameter.	
WI2015 (Optional)	**Dialog Reference** **W**ater **I**ndex **2015** Fisher A., Flood N., Danaher T. (2016) Separatrix manifold: $1.7204 + 171\cdot\rho_3 + 3\cdot\rho_4 - 70\cdot\rho_8 - 45\cdot\rho_{11} - 71\cdot\rho_{12} = 0$ (hyperplane with distance to the feature space origin) There is no python reference for this parameter.	Boolean
AWEInsh (Optional)	**Dialog Reference** **A**utomated **W**ater **E**xtraction **I**ndex (**n**on-**sh**adow scene) Feyisa G.L., Meilby H., Fensholt R., Proud S.R. (2014) Separatrix manifold: $4\cdot(\rho_3 - \rho_{11}) - (0.25\cdot\rho_8 + 2.75\cdot\rho_{12}) = 0$ (hyperplane that passes through the feature space origin) There is no python reference for this parameter.	Boolean
AWEIsh (Optional)	**Dialog Reference** **A**utomated **W**ater **E**xtraction **I**ndex (scene with **sh**adow) Feyisa G.L., Meilby H., Fensholt R., Proud S.R. (2014) Separatrix manifold: $\rho_2 + 2.5\cdot\rho_3 - 1.5\cdot(\rho_8 + \rho_{11}) - 0.25\cdot\rho_{12} = 0$ (hyperplane that passes through the feature space origin) There is no python reference for this parameter.	Boolean
SBM2m3_6p2m8p6m11p6m12p2 (Optional)	**Dialog Reference** **S**imple **B**and **M**ultiplication (variant's working title herein: *Pine*) (Experimental index by the author, 2018) General notation: $\mathrm{SBM}(\cdots) = C\cdot\Pi\rho_i\uparrow x_i$ (C=const) Notation convention of "⋯" (that identifies the respective variant): • The letter "ρ" of each band's reflectance identifier is left out, i.e. only the respective band number is noted (e.g. "ρ_8" is abbreviated to "8"). • Factors that carry a negative exponent are grouped to the right side of the fraction line symbol "—", whereupon the respective negative exponent sign becomes inverted (cp. $\rho^{-2}/1 = 1/\rho^2$). Separatrix manifold: $\mathrm{SBM}(\cdots) - 1 = 0$ (non-planar hypersurface that passes through the feature space origin) ☼ Tip: Adjust the constant C in dependence on the shadow length. The aim is to balance the multiplier in a way that a reasonable trade-off between minimizing the amout of false positives (at higher C values) and minimizing the amount of false negatives (at lower C values) is reached:	Boolean

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1. From the Layer Properties dialog box of the respective index layer, go to the Functions tab.
2. From the Function Chain, identify and double-click the topmost Band Arithmetic Function (opens its Raster Function Properties dialog box).
3. From the Raster Function Properties dialog box, go to the Band Arithmetic tab, and vary the multiplier (placed at the beginning of the Expression), typically by powers of ten. For example, if the inital value reads 50000, try 5000 or 500 (or even less) in case of a winter scene (with significant shadow), whereas higher values like 500000 or 5000000 (or even higher) might fit better in case of a summer scene (with minor shadow).

☼ Additional tips:

- Incorporating a 10m band (e.g. ρ_8) as multiplier of a resampled 20m band should improve sharpness (cp. multiplicative sharpening).
- A higher exponent might emphasize the respective band's significance (note: a change of any exponent value requires the constant C to be readjusted accordingly).

There is no python reference for this parameter.

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<td>SCL (Optional)</td>
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Dialog Reference
Unique pixel values (stored as 8-bit integers), along with their respective display color and label (in compliance with L2A Product Definition Document S2-PDGS-MPC-L2A-PDD-V14.2, Issue: 4.6, Date: 2017-06-23):

1. Saturated or defective pixel (red).
2. Dark features / Shadows (very dark grey).
3. Cloud shadows (dark brown).
4. Vegetation (green).
5. Not-vegetated (dark yellow).
6. Water (dark and bright) (blue).
7. Unclassified (dark grey).
8. Cloud medium probability (grey).
9. Cloud high probability (white).
10. Thin cirrus (very bright blue).
11. Snow or ice (very bright pink).

☼ Tip: The click path to change the color of a specific class to full transparency is as follows:

1. From the expanded SCL layer (within Table Of Contents), single-click on the color indicator of the respective class (opens the Color Selector).
2. From the Color Selector dialog box, go to the Properties tab.
3. Within the Properties tab, from the Other Options section, tick "☑ Color is Null".

There is no python reference for this parameter.

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