SATELLITE SPECTRAL BANDS - CONVERSION TABLE

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Version:02
This whole table is under work / verification

SATELLITE		SENTINEL-2-MSI Swath:100km;Revisit:5d.;Resolution:10-60m							SkyMap50-SOAR Swath:12km; Revisit:2d. Resolution:PAN 0.5m / MS 2m				INPE-CBERS Orbit H: 628,6 km					LANDSAT-8-OLI Swath:185km;Revisit:16d. Resolution:15-60m				Sentinel-3-OLCI Swath:1270km;Revisit:4d Resolution:300m			Sentinel-3-SLSTR Swath:1400km;Revisit:2d Resolution:500/1000m				COMMENTS: Purposes (S2/L8/S3):
WaveLenght		#order	Sentinel-2A (2015-06-23+)			Sentinel-2B (2017-03-07+)			(2013-05-30+)				4A			3e4		(2013-05-30+)				(2016-01-16+)						
(nm)		BAND	Min.	Central Wave L.	Max.	Min.	Central W.L.	Max.	Sp. Res	BAND*	Min.	Max.	Sp. Res	WPM 31d	MUX 31d	WFI 5dias		Min.	Max	BAND*	Min.	Central Wave L.	Max.	Sp. Res	BAND	Min.	Central Wave L.	Max.	BAND	Min. Wave L. Max.	MULTIPLIER	
400	Aerosol													2-8m	17m	55m	40-80m								B01	392,5	400	407,5				//Coastal aerosol, correction
420	Aerosol													92Km	95Km	684Km	120km								B02	407,5	412,5	417,5				//Yellow subs.,detrital pig. (turbidity)
440	Aerosol	#12-B01	432,2	442,7	453,2	431,7	442,2	452,7	60	B0-P	450	890	0,5	B0-P			IDEM	450	900	#3-B01	433	443	453	30	B03	437,5	442,5	447,5				Aerosol//Chlorophyll abs., vegetation
460	*BLUE*	#1-B02	459,4	492,4		459,1	492,1		10	B1	450		2	B1	B05	B13		450		#2-B02	450	482,5	515	30	B04	485	490	495	reflect			SoilxVeg.,water/Bathym./Chlorophyll MAX.
530					525,4			525,1				520							520	#1-B08	500	PAN	680	15	B05	505	510	515	500m			//Chlorophyll, sedim., turbid., red tide
560	*GREEN*	#3-B03	541,8	559,8		541	559		10	B2	520		2	B2	B06	B14		520		#6-B03	525	562,5	600	30	B06	555	560	565	S1	554,27	1	Turbidity,oil//Chlorophyll MIN.
590					577,8			577				590							590													L-8 Panchromatic //
600																									B07	615	620	625				//Sediment loading
630	*RED*	#5-B04	649,1			649,4			10	B3	630		2	B3	B07	B15		630		#5-B04	630	655	680	30	B08	660	665	670	S2	659,47	1	Soil,veg//2nd Chl.MAX,sedim.,yellow subs.
670				664,6			664,9																		B09	670	673,75	677,5				//Improved fluorescence,Surface Mix.Layer
690					680,1			680,4				690							690						B10	677,5	681,25	685				//Chlorophyll fluorescence peak
700	RedEdge	#6-B05	696,6	704,1	711,6	695,8	703,8	711,8	20																B11	703,75	708,75	713,75				Vegetation//Chl.fl.basel.
740	RedEdge	#8-B06	733	740,5	748	731,6	739,1	746,6	20																B12	750	753,75	757,5				Vegetation//O2 abs.,clouds,veg.
760	RedEdge																								B13	760	761,25	762,5				//O2 abs.,clouds,veg.;aerosol corr.
765	RedEdge																								B14	762,5	764,38	766,25				//Atmospheric correction
767	RedEdge																								B15	766,25	767,5	768,75				//Cloud top press.,fluore.over land
780	NIR	#9-B07	772,8	782,8	792,8	769,7	779,7	789,7	20	B4	770		2	B4	B08	B16		770							B16	771,25	778,75	786,25				Vegetation//Atmos.corr.
830	NIR	#2-B08	779,8	832,8	885,8	779,9	832,9	885,9	10	NIR				NIR																		Vegetation
860	NarrNIR	#10-B8A	854,2	864,7	875,2	853	864	875	20											#4-B05	845	865		30	B17	855	865	875	S3	868	1	Vegetation//Atmos.aeros.corr.,clouds
880												890							890			885		B18	880	885	890				Vegetation//Water vapour reference; SLSTR
900																									B19	895	900	905				//Water vapour abs.,Veg.(max.reflect.)
940	SWIR	#13-B09	935,1	945,1	955,1	932,7	943,2	953,7	60																B20	930	940	950				//Water vapour abs.,Atmos.aeros.corr.
1300	SWIR	#4-B10	1358	1373,5	1389	1361,9	1376,9	1391,9	60											#9-B09	1360	1375	1390	30	B21	1000	1020	1040	S4	1374,8	3	Cirrus cloud detection//Atmos.aeros.corr.
1600	SWIR	#7-B11	1568,2	1613,7	1659,2	1563,4	1610,4	1657,4	20								SWIR1	1550	1750	#8-B06	1560	1610	1660	30					S5	1613,4	3	Snow/ice/cloud disc>0.025;moist.soil-veg.//
2200	SWIR	#11-B12	2114,9	2202,4	2289,9	2093,2	2185,7	2278,2	20								SWIR2	2080	2350	#7-B07	2100	2200	2300	60					S6	2250,7	3	Fire/Snow/ice/cloud>0.015;moist.soil-veg.//
																														1km/IR		
																													S7/F1	3742	.001	
																	TH	10400		#10-B10	TIRS1			100					S8/F2	10850	.001	/Thermal map, soil moist/
																			12500	B11	TIRS2			100					S9	12020,5	.001	/Improved thermal map/

BAND OFFSET TIME:	B02 to B12: 2.09s / 12 tracks				0.96s / 14 tracks (FPM)		

INDICES CONVERSION:						Description:	Note: under testings
NDVI	(B08-B04)/(B08+B04)		B4/B3	B4/B3	(B05-B04)/(B05+B04)	(B17-B08)/(B17+B08)	
NDWI1	(B08-B11)/(B08+B11)	: Leaves			(B03-B05)/(B03+B05)	(B06-B17)/(B06+B17)	: Leaves
NDWI2	(B03-B08)/(B03+B08)	: Water bodies	B2/B4	B2/B4	(B03-B05)/(B03+B05)	(B06-B17)/(B06+B17)	: Water bodies
NDSI	(B03-B11)/(B03+B11)				(B03-B06)/(B03+B06)		(S2NDSI>0.2 & B03>0.15) OPT:SOFT=(S2NDSI<0.55 & B03<0.4)
	(S2NDSI>0.2 & B03>0.15) OPT:SOFT=(S2NDSI<0.55 & B03<0.4)						
GEOAlteration	B11/B12				B06/B07	B20/B21	
FeOx	B11/B08				B06/B05	B20/B17	
IOx (R/B)	B05/B01	Alternative: B04/B02	B3/B1	B3/B1	B04/B02	B08/B04	
Brovey	Br1;2;3: B04; B03; B02 / (B04+B03+B02)		B3;B2;B1(B3+B2+B1)	B3;B2;B1(B3+B2+B1)			NIR;RED;GREEN/(NIR+RED+GREEN)
Burn Ratio	(B08-B12)/(B08+B12)				(B05-B07)/(B05+B07)	(B08-S6)/(B8+S6)	
Clouds	(B02>.3) OR (B10>0.01) ~ ANY CLOUDS						
	(B02>.1 & B10>0.02) ~CIRRUS						

BASIC BAND COMBINATIONS AND CONVERSIONS - Note: for each new image may have to adjust values and/or set additional bands for better results					Sources:
AFTER S-2 SENTINEL-HUB ORIGINAL COMBINATIONS:		**SkyMap50 (B,G,R,NIR)**	**CBERS04A - INPE**	**LANDSAT-8-OLI**	**Sentinel-3-OLCI**	
NATURAL	B04*3, B03*3, B02*3	B3, B2, B1	B3, B2, B1	B04*3, B03*3, B02*3	(B08+B09+B10)*1, B06*3, (B04+B05)*1.5	https://www.usgs.gov/faqs/what-are-best-lan
NAT.ENH.(MARKUSE)	B04*2+B05*.2,B03*2+B08*.4,B02*4		=SkyMap50 (B,G,R,NIR)	B04*3,B03*2+B05*.5,B02*3	(B08+B09+B10)*1+B11*.3, B06*2+(B16+B18)*.5, (B04+B05)*1.5	https://en.wikipedia.org/wiki/Sentinel-2
FALSE NIR (RED VEG)	B08*2,B04*3,B03*3	B4, B3, B2	B4, B3, B2	B05*2,B04*3,B03*3	B17*2, (B08+B09+B10)*1, (B04+B05)*1.5	https://sentinel.esa.int/web/sentinel/technical
FALSE SWIR (URBAN)	B12*2,B11*3,B04*3			B07*2,B06*3,B04*3		https://www.sentinel-hub.com/develop/docun
F.SWIR-NIR (SWIR)	B12*3,B8A*3,B04*3			B07*3,B05*3,B04*3		https://sentinel.esa.int/web/sentinel/user-guid
FALSE COL.GEOLOGY	B12*3,B04*3,B02*3			B07*3,B04*3,B02*3		*L8:The along-track spectral band separation
BATHYMETRIC	B04*3,B03*3,B01*3			B04*3,B03*3,B01*3	(B08+B09+B10)*1, B06*3, (B02+B03)*1.5	This time delay creates a small but significan
AGRICULTURE	B11*3,B08*3,B02*3			B06*3,B05*3,B02*3		https://earth.esa.int/web/eoportal/satellite-mis
GEOLOGY ENHANCED	B12*1.5+B04*1,B05*1.5+B08*0.5,B02*2.8			B07*2,B04*1.5+B05*0.5,B02*2.8	B20*.15+B08*1.7,B06*1.6+B17*.2,B04*2-B21*.1	http://www.cbers.inpe.br/sobre/cameras/cbe
						http://www2.dgi.inpe.br/catalogo/explore