MULTI SATELLITE SPECTRAL BANDS CONVERSION TABLE

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Version:03
This whole table is under tests / verification

SATELLITE		SENTINEL-2-MSI Swath:100km; Revisit:5d.; Res:10-60m					LANDSAT-8-OLI Swath:185km;Revisit:16d. Res:15-60m				RGBN CBERS - INPE Orbit H: 628,6 km						SKYMAP50-SOAR/SV1 Swath:12km; Revisit:2d. Resolution: 0.5m / 2m				HYPERSPECTRAL Sentinel-3-OLCI Swath:1270km;Revisit:4d Resolution:300m			Sentinel-3-SLSTR Swath:1400km;Revisit:2d Resolution:500/1000m			COIMMENTS:
WaveLenght		#order	Sentinel-2A (2015-06-23+)		Sentinel-2B (2017-03-07+)		(2013-05-30+)				4A (2019-12-20+)			Wave Lenght		3 e 4 (2014+)	(2013-05-30+)				(2016-01-16+)						
(nm)		BAND	Min.	Max.	Min.	Max.	RES: m	BAND	Min.	Max.	RES: m	WPM 2 - 8m	MUX 17m	WFI 55m	Min.	Max.	IDEM 5-80m	BAND	Min.	Max.	RES: m	BAND	Min.	Max.	BAND	Central W.L.	MULTIPLIER	Purposes (S2/L8/S3):
400	Aerosol	#order:						#order:				31d	31d	5d			26-5d					B01	392.5	407.5				//Coastal aerosol, correction
420	Aerosol											92Km	95Km	684Km			60-866km		=CBERS			B02	407.5	417.5				//Yellow subs.,detrital pig. (turbidity)
440	Aerosol	#12-B01	432.2	453.2	431.7	452.7	60	#3-B01	433	453	30	B0-PAN			450	900		B0-P	450	890	0.5	B03	437.5	447.5				Aerosol//Chlorophyll abs., vegetation
460	*BLUE*	#1-B02	459.4	525.4	459.1	525.1	10	#2-B02	450	515	30	B1-Blue	B05	B13	450	520		B1	450	520	2	B04	485	495	reflect			SoilxVeg.,water/Bathym./Chlorophyll MAX.
530								#1-B08	500	680	15											B05	505	515	500m			//Chlorophyll, sedim., turbid., red tide
560	*GREEN*	#3-B03	541.8	577.8	541	577	10	#6-B03	525	600	30	B2-Green	B06	B14	520	590		B2	520	590	2	B06	555	565	S1	554.27	1	Turbidity,oil//Chlorophyll MIN.
590																												L-8 Panchromatic //
600																						B07	615	625				//Sediment loading
630	*RED*	#5-B04	649.1	680.1	649.4	680.4	10	#5-B04	630	680	30	B3-Red	B07	B15	630	690		B3	630	690	2	B08	660	670	S2	659.47	1	Soil,veg//2nd Chl.MAX,sedim.,yellow subs.
670																						B09	670	677.5				//Improved fluorescence,Surface Mix.Layer
690																						B10	677.5	685				//Chlorophyll fluorescence peak
700	RedEdge	#6-B05	696.6	711.6	695.8	711.8	20															B11	703.75	713.75				Vegetation//Chl.fl.basel.
740	RedEdge	#8-B06	733	748	731.6	746.6	20															B12	750	757.5				Vegetation//O2 abs.,clouds,veg.
760	RedEdge																					B13	760	762.5				//O2 abs.,clouds,veg.;aerosol corr.
765	RedEdge																					B14	762.5	766.25				//Atmospheric correction
767	RedEdge																					B15	766.25	768.75				//Cloud top press.,fluore.over land
780	NIR	#9-B07	772.8	792.8	769.7	789.7	20					B4-NIR	B08	B16	770	890		B4-NIR	770	890	2	B16	771.25	786.25				Vegetation//Atmos.corr.
830	NIR	#2-B08	779.8	885.8	779.9	885.9	10																					Vegetation
860	NarrNIR	#10-B8A	854.2	875.2	853	875	20	#4-B05	845	885	30											B17	855	875	S3	868	1	Vegetation//Atmos.aeros.corr.,clouds
880																						B18	880	890				Vegetation//Water vapour reference; SLSTR
900																						B19	895	905				//Water vapour abs.,Veg.(max.reflect.)
940	SWIR	#13-B09	935.1	955.1	932.7	953.7	60															B20	930	950				//Water vapour abs.,Atmos.aeros.corr.
1300	SWIR	#4-B10	1358	1389	1361.9	1391.9	60	#9-B09	1360	1390	30											B21	1000	1040	S4	1374.8	3	Cirrus cloud detection//Atmos.aeros.corr.
1600	SWIR	#7-B11	1568.2	1659.2	1563.4	1657.4	20	#8-B06	1560	1660	30				1550	1750	SWIR1								S5	1613.4	3	Snow/ice/cloud disc>0.025;moist.soil-veg.//
2200	SWIR	#11-B12	2114.9	2289.9	2093.2	2278.2	20	#7-B07	2100	2300	60				2080	2350	SWIR2								S6	2250.7	3	Fire/Snow/ice/cloud>0.015;moist.soil-veg.//
																									S7/F1	3742	.001	// IR 1km
								#10-B10	TIRS1		100				10400	12500	TH								S8/F2	10850	.001	/Thermal map, soil moist/
								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:			R,G,B,NIR only:			NOTES:
NDWI1	(B08-B11)/(B08+B11)	(B03-B05)/(B03+B05)			(B06-B17)/(B06+B17)	Water on Leaves
NDSI	(B03-B11)/(B03+B11)	(B03-B06)/(B03+B06)				(S2NDSI>0.2 & B03>0.15) SOFT:S2NDSI<0.55 & B03<0.4)
GEOAlteration	B11/B12	B06/B07			B20/B21	Geology
FeOx	B11/B08	B06/B05			B20/B17	Geology
Burn Ratio	(B08-B12)/(B08+B12)	(B05-B07)/(B05+B07)			(B08-S6)/(B8+S6)	Vegetation
Clouds	(B02>.3) OR (B10>0.01) ~ ANY CLOUDS					
	(B02>.1 & B10>0.02) ~CIRRUS					
NDVI	(B08-B04)/(B08+B04)	(B05-B04)/(B05+B04)	(N-R)/(N+R) = IDEM	= IDEM	(B17-B08)/(B17+B08)	Vegetation
NDWI2	(B03-B08)/(B03+B08)	(B03-B05)/(B03+B05)	G/N		(B06-B17)/(B06+B17)	Water bodies
IOx (R/B)	B04/B02 - Alternative: B05/B01	B04/B02	R/B		B08/B04	Geology
DVI simple N/R			N/R			Vegetation
NDRG			(R-G)/(R+G)			Redness Index
Brovey(Sharp)	Br1;2;3: B04; B03; B02 / (B04+B03+B02)		B (1 to 4) / (B1+B2+B3+B4) // *B0(PAN)			Simple Color Sharpening or Pan-Sharpening

BASIC BAND COMBINATIONS AND CONVERSIONS - Note: for each new image may have to adjust values and/or set additional bands for better results

AFTER S-2 SENTINEL-HUB ORIGINAL COMBINATIONS:		LANDSAT-8-OLI	CBERS04A - INPE: 3 / 4 / 4A	SKYMAP50-SOAR/SV1	Sentinel-3-OLCI	Sources:
NATURAL	B04*3, B03*3, B02*3	B04*3, B03*3, B02*3	R, G, B	= IDEM	(B08+B09+B10)*1, B06*3, (B04+B05)*1.5	
FALSE NIR (RED VEG)	B08*2,B04*3,B03*3	B05*2,B04*3,B03*3	N, R, G (~R, N, G)		B17*2, (B08+B09+B10)*1, (B04+B05)*1.5	
			N, G, B			https://www.usgs.gov/faqs/what-are-best-landsa
			TESTS 4-BANDS:			https://en.wikipedia.org/wiki/Sentinel-2
			OK IOX(R/B), N, G			https://www.sentinel-hub.com/develop/documen
NAT.ENH.(MARKUSE)	B04*2+B05*.2,B03*2+B08*.4,B02*4	B04*3,B03*2+B05*.5,B02*3	OK N, G, IOX(R/B)		(B08+B09+B10)*1+B11*.3, B06*2+(B16+B18)*.5, (B04+B05)*1.5	https://sentinel.esa.int/web/sentinel/technical-gu
FALSE SWIR (URBAN)	B12*2,B11*3,B04*3	B07*2,B06*3,B04*3	OK N, NDRG((R-G)/(R+G)), B			https://sentinel.esa.int/web/sentinel/user-guides
F.SWIR-NIR (SWIR)	B12*3,B8A*3,B04*3	B07*3,B05*3,B04*3	DVI(N/R), G, B			*L8:The along-track spectral band separation le
FALSE COL.GEOLOGY	B12*3,B04*3,B02*3	B07*3,B04*3,B02*3	(R-B)/(R+B)			This time delay creates a small but significant te
BATHYMETRIC	B04*3,B03*3,B01*3	B04*3,B03*3,B01*3			(B08+B09+B10)*1, B06*3, (B02+B03)*1.5	https://earth.esa.int/web/eoportal/satellite-missi
AGRICULTURE	B11*3,B08*3,B02*3	B06*3,B05*3,B02*3				http://www.cbers.inpe.br/sobre/cameras/cbers0
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://www2.dgi.inpe.br/catalogo/explore

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