DEVELOPMENT OF AN ONLINE INDICES-DATABASE: MOTIVATION, CONCEPT AND IMPLEMENTATION

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ABSTRACT:
Because of today's wide range of indices, it is often not easy to find the right index for recent research activities. Therefore we developed the idea of a proper index-database. The main aims are to make work, for people working with indices, easier and to spread rarely known and new developed indices over the community quick and efficient.

1. INTRODUCTION

1.1 Motivation

Today many different indices for widespread application are existing. In some publications a few compositions of thematic indices are found, e.g. Strachan et al. (2002), Zarco-Tejada et al. (2004), Sripada et al. (2005). But the indices have not been arranged all together in one document and could not be selected for specific sensors or applications due to an automatic query. An Index-Data-Base (IDB) could be a possibility to find indices, adapted for the required sensor, application and specific region (e.g. landscape type, climatic conditions).
If one gets started to work with indices, it is not easy to get a good overview over all possible indices which are available at the moment and also literature resources are often not easy accessible. More often it is very time consuming,

1.2 Aims

One aim of developing a database supported indices search tool is to make the work of operators who need to work with indices a little bit easier and faster Another important intention of this database is to have the chance to spread new findings easier out in the remote sensing community.
There will be many additional information provides with the indices e.g. specific channel combinations for many different sensors, bibliographical references, area of application.

2. INDEX-DATA-BASE (IDB)

The basic idea of the developed index data base (IDB) is to allow the user to define a remote sensing sensor, an application, a thematic field of research, etc. on a selection screen (see Appendix A). Therefore an Entity Relation Model was build (a simplified version can be seen in Appendix B). The output after the selection is a summary to specify the intended indices.
The user can also download an implementation for a remote sensing-software like ERDAS-Model Maker. A detailed literature research is also included (see Appendix A).
The user should be able to access the database and download data via internet. After creating an individual account it should be also possible to enlarge the database. (These applications are in progress at the moment.)

3. CONCLUSIONS

The developed Index-Data-Base (IDB) is a valuable tool for working with indices. It is possible to define which indices for a specific sensor and a specific topic are useful. There is no such tool available at the moment. But it is urgently necessary to develope a more structured overview on research results dealing with indices. The data base will be ready for the internet in the end of 2009.

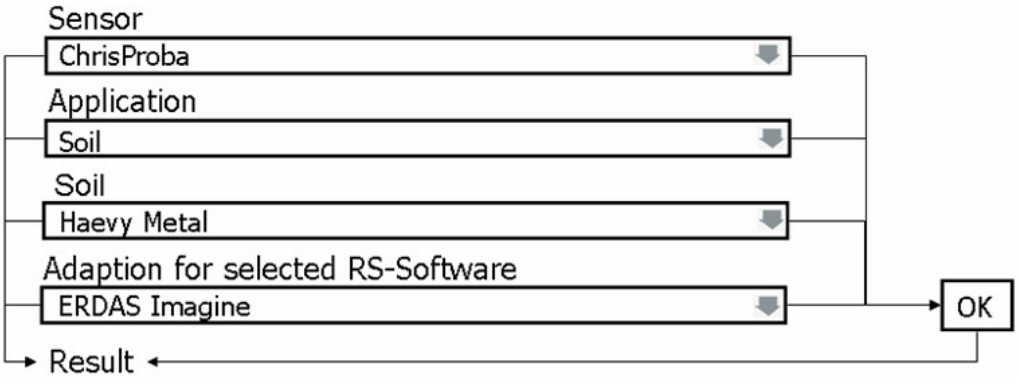
4. REFERENCES

Sripada, R.P., Heiniger, R.W., White, J.G. & R. Weisz, 2005. Aerial Color Infrared Photography for Determining Late-Season Nitrogen Requirements in Corn. In: *Agronomy Journal*, No. 97, pp. 1443–1451.

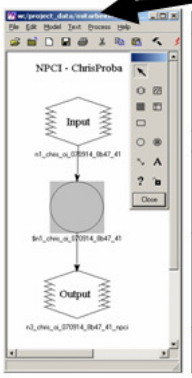
Strachan, I.B., Pattey, E. & J.B. Boisvert, 2002 Impact of nitrogen and environmental conditions on corn as detected by hyperspectral reflectance. In: *Remote Sensing of Environment*, No. 80, pp. 213-224.

Zarco-Tejada, P.J., Berjon, A. & J.R. Miller, 2004 Stress Detection in Crops with Hyperspectral Remote Sensing and Physical Simulation Models. In: *Proceedings of the Airborne Imaging Spectroscopy* Workshop - Bruges, 8 October 2004

APPENDIX A SELECTIONSCREEN AND OUTPUT OF THE INDICES-DATABASE



Index	Formula	Adapted formula for selected sensor	Download of application for RS-Software	Reference literature	Link to literature database
NPCI	(680nm - 430nm) / (680nm + 430nm)	(B8 – B1) / (B8 + B1)		Peñuelas (1993), Peñuelas et al. (1994)	
...	...		...	...	...



Reference	RS-Data	VIS	NIR	SWIR	Region	Object			Parameter	Method	Source	Thematic area
Reference	Sensor, Spectrometer, Wavelength range	VIS	NIR	SWIR	Country, Climate- and Vegetation zone /Greenhouse	Vegetation, Soil, Rock	Vegetations-species, Soil, Rock		Vitality, Light exploitation efficiency, Nitrat, Cellrobe, Lignin, Starch, Pigment, Water content, Pigment rate	VI	PDF, DOC, WWW	Environment, Stress, Exploitation, Contamination ...
Peñuelas et al. 1993	SE590	x	x		USA, California, Mediterranean	Aquatic Crops	Ceratophyllum demersum, Myriophyllum aquaticum, n.a.		Biomass, Physiologic states, Pigment content, Pigment rate, Water content	SR, NDVI, NPCI, WBI, EGFR, EGFN, GCFN, GF, RE, dcRE	Pdf	Physiologic states
Peñuelas et al. 1994	LiCor 1800	x	x		USA, California, Test area	Agricultural Crop	Helianthus annuus L.	Sun flower	Biomass, Physiologic states, Pigment content, Pigment rate, Photosynthetic efficiency, Water content	PRI, NPCI, WBI, dg, dG, GGFN, dRE, dRE, EGFN, ddg, ddRE	Pdf	Water stress, Nitrb stress
Riedell & Blackmer 1999	ASD Personal Spectrometer II, LiCor 1800	x	x		Greenhouse	Agricultural Crop	Triticum aestivum L.	Spring wheat	Physiologic states, Pigment rate, Water content	NPCI, WBI	Pdf	Big stress

APPENDIX B SIMPLIFIED ENTITY RELATION MODEL OF THE INCICES-DATABASE