To compare SPI and a standardizes EWp we need the same time base line (tamsat, ecmwf, vgt).

For SPI and Standardized EWP we use 1989 01 01 (first ECMWF interim) and stop end of 2013 (safe VGT)

Background: we are setting up this global early warning systems and, making it short, we are considering SPI1 (Standard Precipitation Index) anomalies (<1) as a “sign” of water shortage. After that we look at NDVI negative anomaly (detail omitted) as the result of the “drought”.

Problem: It’s clear that we should better look at some water balance as precipitation alone tells about a meteo drought rather than the agriculture one. But if one goes in this direction will easily end up with a rather complex model (relying on a number of assumptions and ET0 calculations) that also requires soil and crop characterization.

In another framework (the chimera model inversion) I come to define this Exponentially Weighted Precipitation that does not sound completely stupid to me. Basically I make the graph growing degree day (GDD) from today backward (so today is 0, yesterday 25, then 50 etc) on the X axis and precipitation on the Y axis. Then I compute the average precipitation weighted with a backward exponential decay (the closer – in GDD sense - precipitation are weighed more). Here I have to define a GDD value where the exponential goes down to .5 (something like the half-decay time constant). The idea behind this is that the hotter it is, the shorter I will look into the past, or, the hotter it is, the more I need water recently. So it should add a bit an “agronomic” flavour to a standard precipitation index.

Does it make sense? Is it reinventing the wheel?

Build EWP anomaly time series and see if they can better forecast within season NDVI anomaly (better than SPI and how they compare with a simple water balance)

Here we consider NDVI anomaly as the result of the draught. SPI is a meteorological drought, water balance tells about an agromet drought. EWP could be in between.

The palmer drought index is a water balance model

Better to do it over Europe where we have more data (also on crop yield) and wofost is available to compute a full water balance?

Or keep it simple and just try to anticipate NDVI over the Sahel and just compare it with SPI1 and SPI3?

EWP parameters

CAP, Phalf

Probably Phalf has to be optimized

Review indici vedi:

X:\sc papers 4 FOODSEC\Drought monitoring\WATCH+TECHNICAL+REPORT+NUMBER+24+INDICATORS+FOR+DROUGHT+CHARACTERIZATION+ON+A+GLOBAL+SCALE.pdf

Per un test ho bisogno di

VGT time window: 1999-2013 compresi

Tamsat: 30 years 1984 – 2013 compresi

|  |  |
| --- | --- |
| Template area | E:\WA\all sahel\data\as images |
| Mask crop and rangeland + ecoregions | X:\WA corr analyis GIS\masks\New Masks\aaa LAST correct clip |
| AVG Pheno | X:\WA corr analyis GIS\sahel resuts\AVG pheno 4 ARCGIS |
| Precipitation | S:\Actions\FOODSEC\base\_data\meteo\tamsat |
| Resampled Precipitation | E:\WA\EWP\TAMSAT resampled to VGT Sahel |
| SPI1 |  |
| Temperature | S:\Actions\FOODSEC\base\_data\meteo\ECMWF\int\world\tav |
| FAPAR | E:\WA\all sahel\data |
| FAPAR LTA stats |  |
| FAPAR anomalies |  |
| EWP |  |

* Anomalie NDVI (che tipo? Boh.. diff a Zscore?)
* Poi dovrei fare diversi EWP con diversi Half e cercare la correlazione con lag (da inizio stagione a max per evitare senescenza?)

**SPI from SPIRITS**

For any type of composites, so far we used the start date to label it. So, it’s the same for SPI.

Example: the SPI1 (1 month) compute over dekadal data and update at the end of January will be labelled as dek 01 or MMDD0101.

Dear Herman,

The doc was very useful to understand it better.

For your info I made some tests also checking with an IDL implementation of the SPI and I get the same values, great. However, I noticed some minor “behaviours” (mainly labelling) that I am not sure I understand, it’s likely that there is a reason for all of them, but you may want to have look:

1) Flag -11004 “SPI-error”. To my understanding this happens when you have an array of zeros, so you don’t even try to fit the time series. The label suggests an error, which is not the case, I would call it in a different way (SPI cannot be computed?)

2) Falg -11003 “Missing”. I am not getting the difference from the previous. Looking here and there it seems that this happens when you have some positive precipitation but not enough to fit the function. It looks the same as -11004 to me..

3) The two flags -11001 and -11002 (below and above hist min and max) in the file with ordinal output. The meaning is clear (no prediction outside the range used for the fitting) but if ones make an average at some admin level these values will be ignored (while we know that they should at least as the min and max over the hist records). I wonder if one could consider as an option to allow for out of range prediction (as I guess we do when we compute the standard Z-score such as for NDVI).

Thanks and my best regards,

Michele