

33rd session of the Working Group on Effects

Critical Loads: Call for Data

***Coordination Centre for Effects (CCE)
ICP Modelling & Mapping***

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Parties agreed at last ICP M&M meeting ...
... to a Call for a updated CL Data... with emphasis on biodiversity ...

Reasons:

1. Some NFCs have updated their CL data (e.g. AT, SE);
2. Biodiversity (in form of plant diversity) should be incorporated into CLs;
3. EMEP depositions are now (also) provided on Lon-Lat grid

Grid system:

- Current CL data base on EMEP 5 km x 5 km grid, compatible with EMEP depositions on 50 x 50 km² grid
 - Since 2013 EMEP depo data (and transfer matrices!) also available on 0.50° x 0.25° Longitude-Latitude (LoLa) grid
 - As of next year EMEP depositions (also) available on 0.1° x 0.1° LoLa grid !
- New/updated CLs asked on 0.10° x 0.05° LoLa grid
(to ensure compatibility with both LoLa grids)

By the way: 0.10° x 0.05° ≈ 5.5 km x 5.5 km (at 60°N)

Thus ... Call for Data 2014/15:

NFCs requested to submit updated/new Critical Loads for ...

- a. N-Eutrophication (SMB)
- b. N-empirical
- c. Acidity (CL function; SMB)
- d. N-S CL function for plant diversity

a-c: 'classical' (existing) CLs

d: new ...

Ad d:

Derive N and S CL function from your (favourite) biodiversity model ...

e.g. Veg, PROPS, BERN, MultiMOVE, ...

... or from empirical data ...

... using the agreed-upon Habitat-Suitability Index

Habitat Suitability (HS) Index:

$$HS = \frac{1}{n} \left(\frac{p_1}{p_{opt,1}} + \frac{p_2}{p_{opt,2}} + \dots + \frac{p_n}{p_{opt,n}} \right)$$

p_j = probability/suitability/possibility of plant j

$p_{opt,j}$ = optima (maximum) prob. of plant j

n = number of plants

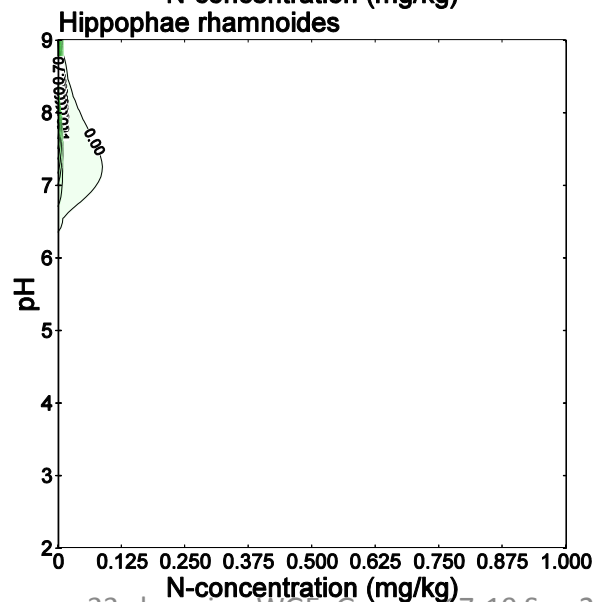
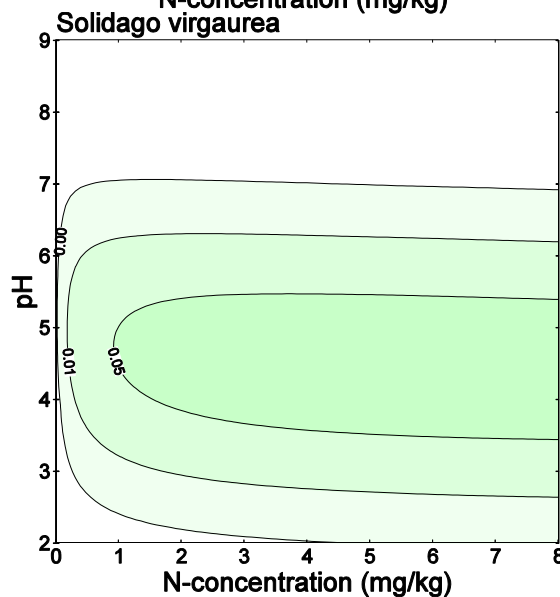
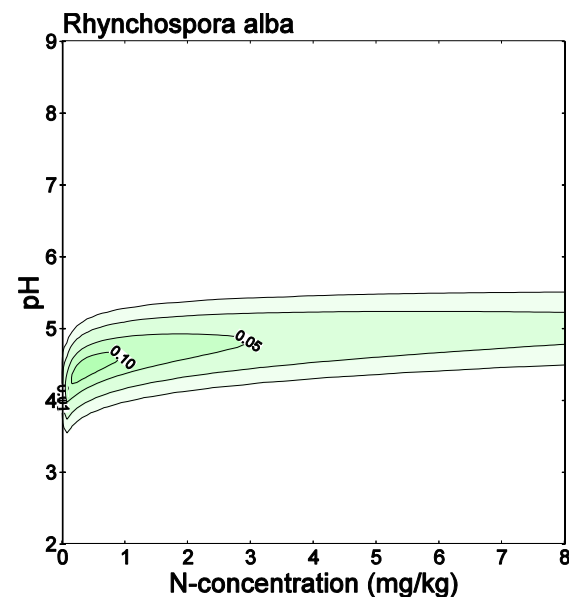
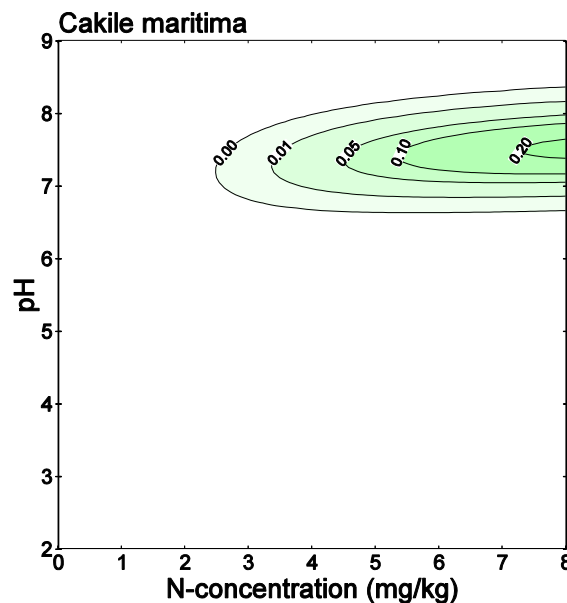
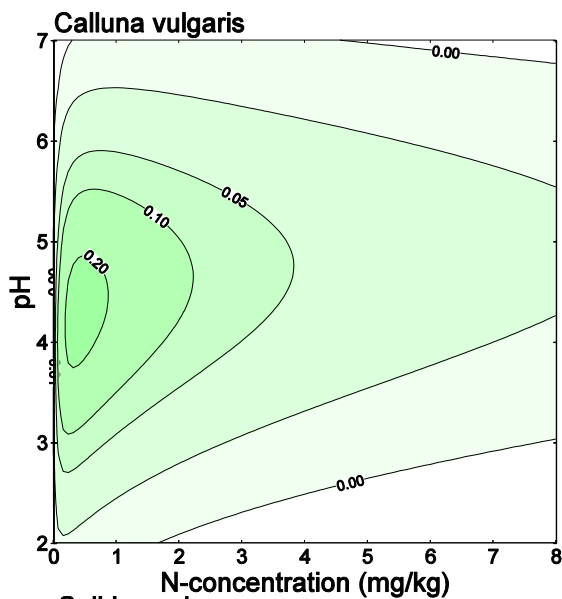
Which species?

Suggestion: n = number of *desired* species

*Derivation of N-S biodiversity CL function, **for example**,
along the following lines (using PROPS) ...*

PROPS DataBase: Occurrence probability for single species

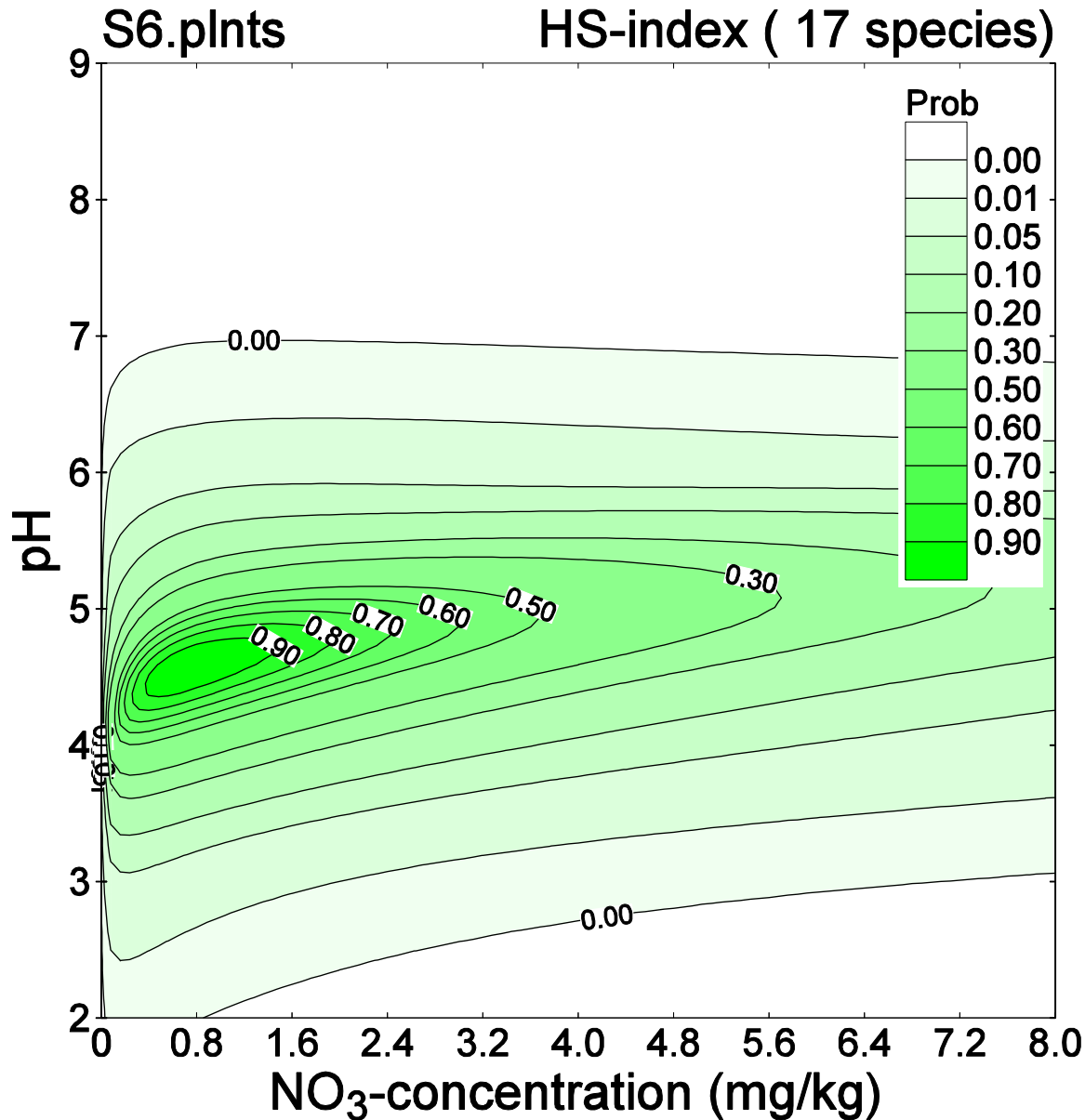
Isolines in [N]-pH plane [could be C:N-Bsat plane, ...]



Temp and Precip
fixed

Single plants
combined into
HS index ...

Example for an EVM vegetation unit

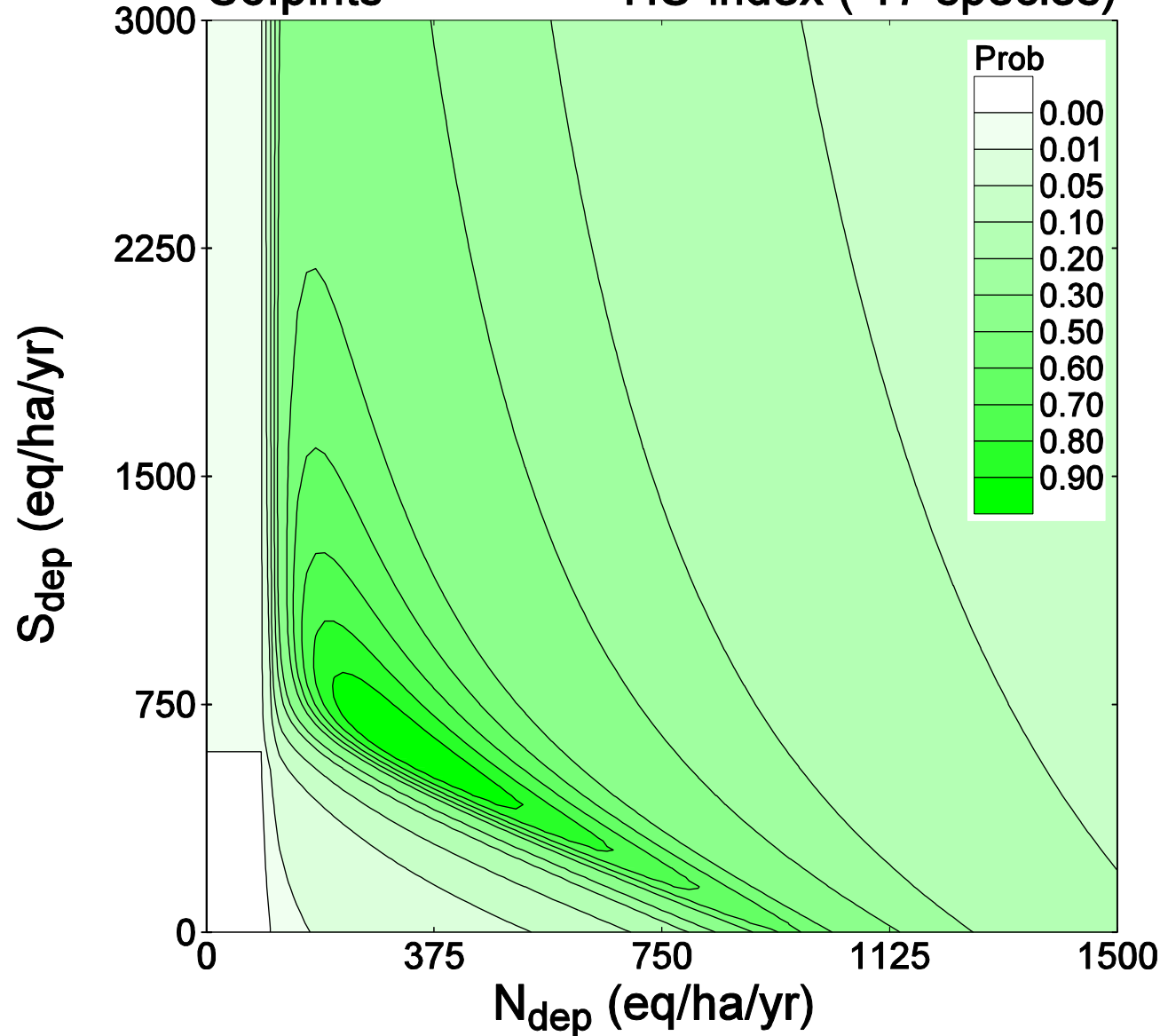


... But we need
relationship with
N_{dep} and S_{dep} →

The same as function of N and S deposition:

S6.plnts

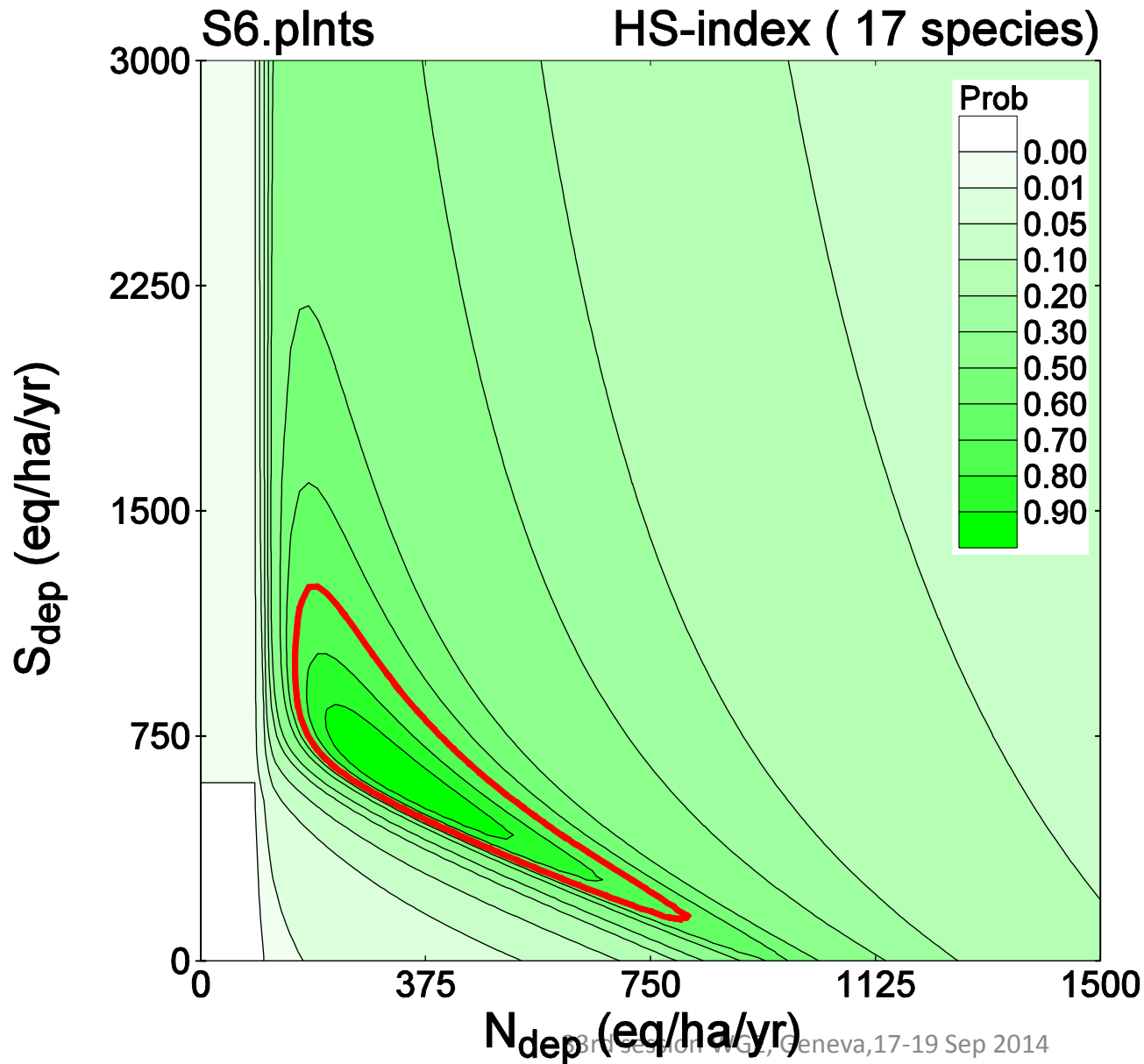
HS-index (17 species)



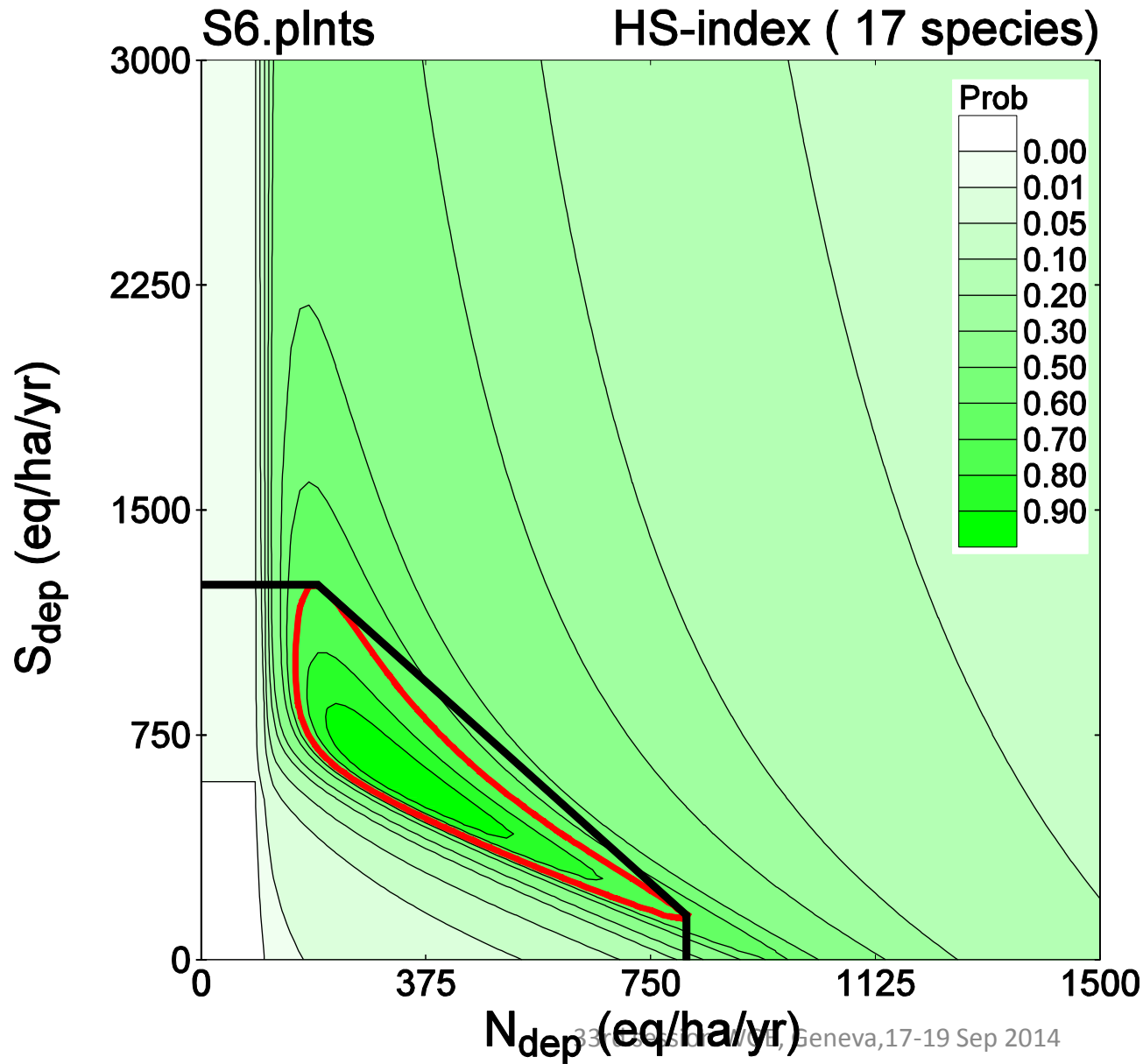
Computed from physico-chemical site characteristics and steady-state model (here: SMB)

Chose a “critical” $N_{\text{dep}}-S_{\text{dep}}$ range →

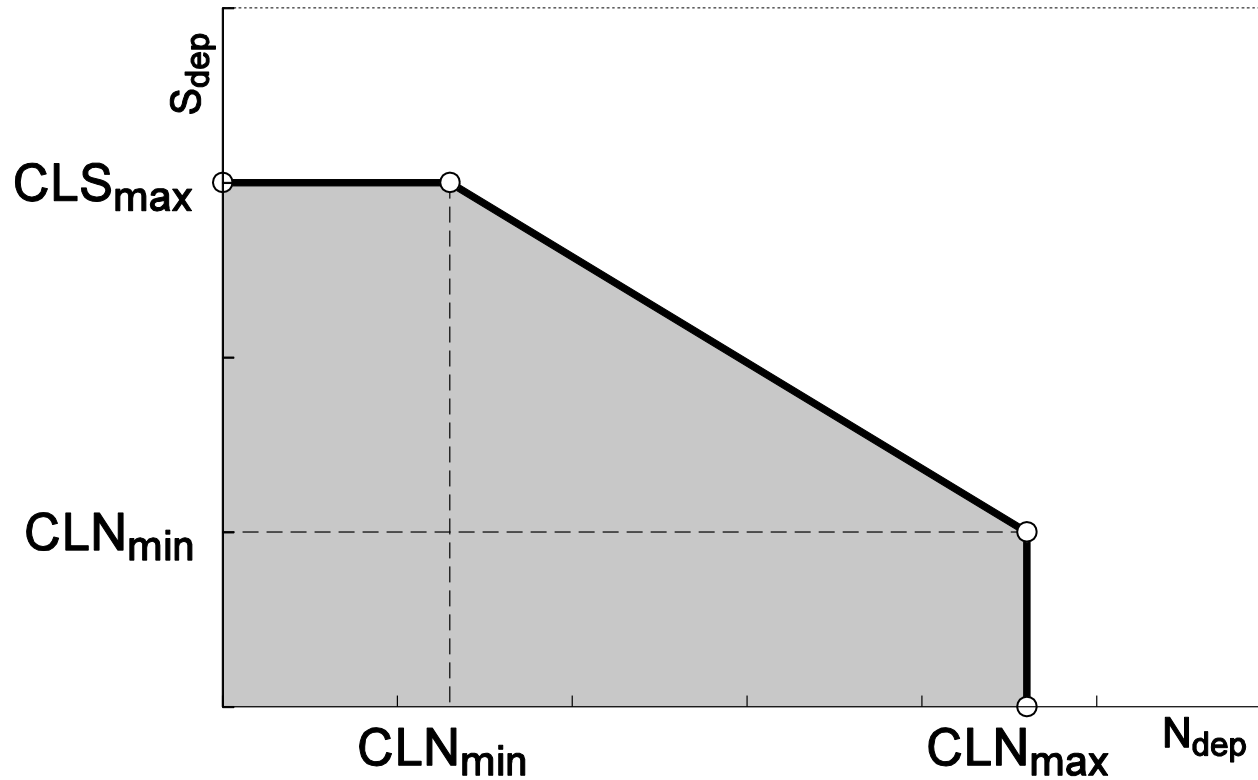
Apply limiting/critical/acceptable value of index, e.g.:



Simplify to N-S Critical Load function:



N-S Critical Load function:



Characterised by 4 numbers: CLN_{min} , CLN_{max} , CLS_{min} , CLS_{max}

Coverage:

(i) As good as possible, but 'extensivity' more important than 'intensity' ... especially:

Don't protect more than the total land area in a grid cell!

(ii) Concentrate on protected areas (Natura2000)

Thank you! 😊

Any questions? 😐