

# BLM\_DNN

Homepage Guide (Trial version)

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# Login Page

The image shows a login page for EHR&C. On the left, a blue vertical panel contains the EHR&C logo and a description: 'An independent scientific consultancy on the global issues of environmental health and ecosystem'. At the bottom of this panel, it says 'Don't have an account? [Get started!](#)'. A red arrow points from a box labeled 'Register Link' to this link. On the right, a white panel titled 'Account Login' contains two input fields: 'Email address' and 'Password'. A red arrow points from a box labeled 'Input Your email & pw' to the 'Email address' field. Another red arrow points from the same box to the 'Password' field. Below these fields is a blue 'Log in' button. A red arrow points from a box labeled 'Login button' to this button. The background is light blue with faint circular patterns.

**EHR&C**

An independent scientific consultancy on the global issues of environmental health and ecosystem

Don't have an account? [Get started!](#)

**Account Login**

Email address

Password

Log in

Register Link

Input Your email & pw

Login button

# Register Page

**EH R&C**

An independent scientific consultancy on the global issues of environmental health and ecosystem

Have an account?  
[Log In](#)

## Register

Email

Password   
Confirm Password

Affiliation

Country

Sector

☐ By creating an account, I agree the website Disclaimer and Privacy Policy.

[Register](#)

Email

Password & Confirm password

Your affiliation

Your country

Your sector

Consent to provision of personal information

Register button

Back to login screen button

# Main Page

Move to the current main screen, introduction



Introduction

DNN model

Copper-EU

Copper-ASIA

Nickel

Zinc

DNN\_model applied  
EU-species,  
ASIA-species  
movable

Nickel, Zinc will be  
updated later

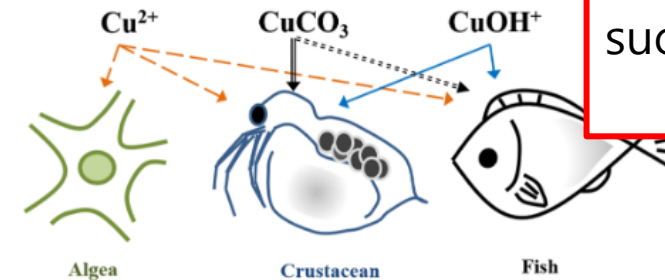
## DNN model for BLM vol.1

Logout

Metals are released into the aquatic environment through the use of many of industrial manufacturing and consumer products. Since the concentration of metals in water bodies that adversely affect aquatic life depends on water quality conditions, the risks to the aquatic environment need to be effectively managed for the sustainable use of metals. A PNEC as single concentration may overestimate or underestimate the risk of a metal to the aquatic environment depending on water quality conditions.

The DNN models with reduced input variables is the tools that predicts BLM-based chronic PNEC and accuracy derived using full-BLM approach (applying three different types of BLMs for each taxonomic group in accordance with EU guidelines)<sup>a</sup>.

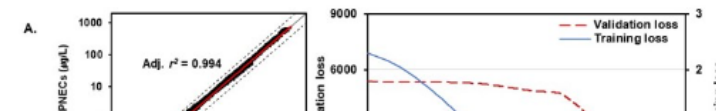
Using the models to quantitatively describe the bioavailability of metals, such as BLM (Biotic ligand model), it is possible to efficiently manage the site-specific risk of metals to the aquatic environment



You can log out by  
clicking on the  
profile icon

It will be added later,  
such as checking the  
profile

The three different types of DNN models for BLM use different of input variables.



# Input variable Page

The screenshot shows the 'Input variable Page' for the EH R&C DNN model. The page has a sidebar with 'Introduction' and 'DNN model' (selected). The main content area has three tabs: 'DNN(A)', 'DNN(B)', and 'DNN(C)'. Below the tabs is the 'Input variables' section. It contains input fields for pH, Mg, Ca, Na, Alkalinity, and DOC, each with a unit and a range. There are also fields for 'Annual Diss-Cu' and 'Individual Diss-Cu'. A 'Calculate' button is present. Below the inputs is a table for 'Water quality conditions for ecological risk assessment' and a 'Results' table. Red arrows point from callout boxes to specific parts of the interface.

You can select the model you want by clicking each tab

The input value must be entered as a number, and each variable has a limit on the number range.

Additionally, Ph, Mg, Ca, Na, Alk, and DOC must be entered without any omission.

Chronic results when only Annul Diss-cu is entered, Acute results when only Individual Diss-Cu is input, If you enter both, both will be calculated.

**Input variables**

pH: float, range [ ]  
Mg: float, range [ ], unit mg/L  
Ca: float, range [ ], unit mg/L  
Na: float, range [ ], unit mg/L  
Alkalinity: float, range [ ], unit mg CaCO<sub>3</sub>/L  
DOC: float, range [ ], unit mg/L

Annual Diss-Cu: float, range [ ], unit µg/L  
Individual Diss-Cu: float, range [ ], unit µg/L

**Calculate**

Water quality conditions for ecological risk assessment

pH	Mg (mg/L)	Ca (mg/L)	Na (mg/L)	Alkalinity (mg CaCO <sub>3</sub> /L)	DOC (mg/L)

**Results**

BLM-based chronic PNEC (µg/L)	Chronic RCR	BLM-based acute HC5 (µg/L)	Acute RCR

# Result and Range Functions in the Input Variables Screen

■ Input variables

pH: 5 (dropdown menu)  
Mg: 10 mg/L  
Ca: 10 mg/L  
Na: 10  
Annual Diss-Cu: 1 µg/L  
Individual Diss-Cu: 1 µg/L

! 값은 6.5 이상이어야 합니다.

If the range of the input variable is wrong, it is displayed as shown in the picture.

If you have entered the input variable correctly case  
You can get the same result as the picture.

Check input values with TABLE  
You can check the result value TABLE

DNN(A) DNN(B) DNN(C)

■ Input variables

pH: float  
Mg: float mg/L  
Ca: float mg/L  
Na: float mg/L  
Alkalinity: float mg CaCO<sub>3</sub>/L  
DOC: float mg/L  
Annual Diss-Cu: float µg/L  
Individual Diss-Cu: float µg/L

Calculate

Water quality conditions for ecological risk assessment

pH	Mg (mg/L)	Ca (mg/L)	Na (mg/L)	Alkalinity (mg CaCO <sub>3</sub> /L)	DOC (mg/L)	Annual Diss-Cu (µg/L)	Individual Diss-Cu (µg/L)
7	10	10	10	100	10	1	1

Results

BLM-based chronic PNEC (µg/L)	Chronic RCR	BLM-based acute HC5 (µg/L)	Acute RCR
4.66e+1	2.15e-2	1.50e+2	6.66e-3

# Calculation Page after CSV upload

EH R&C

Introduction

DNN model ▾

■ Input values as a batch file

Download Template

※ Please download the Template.csv file first. And please fill in the value according to the model.

※ Units are shown in the summary table below.

※ Calculates up to 15 samples.

Upload File

파일 선택 선택된 파일 없음

Submit

Ca (mg/L)	Na (mg/L)	Alkalinity (mg CaCO <sub>3</sub> /L)	DOC (mg/L)	BLM-based PNECs (μg/L)

When clicking the file selection button  
You can upload a csv file with all input values.

Afterwards, if you press the submit button, the data is calculated in the calculation server according to the csv and returned to the table.

When clicking the Template Download button  
You can download the Template.csv file.

The corresponding template has different csv column names depending on each model.

Model A -> template\_a.csv

Model B -> template\_b.csv

Model C -> template\_c.csv

# Template.csv

	A	B	C	D	E	F	G	H	I	J	K
1	source	pH	Na (mg/L)	Mg (mg/L)	Ca (mg/L)	Alkalinity	DOC (mg/L)	Annual dissolved Cu (µg/L)	Individual dissolved Cu (µg/L)		
2		1									
3		2									
4		3									
5		4									
6		5									
7		6									
8		7									
9		8									
10		9									
11		10									
12		11									
13		12									
14		13									
15		14									
16		15									

downloaded  
template\_a.csv is like the picture on  
the left.  
file. B and C files have columns for  
each model.

That part  
You just need to input it  
according to the input value of  
each model.

Calculation is not possible if  
the input is empty.

Ex) Calculation is not possible  
when input values that do not  
fit the model are filled in

This part is the same as before.

Chronic results when only Annul  
Diss-cu is entered,  
Acute results when only Individual  
Diss-Cu is input,  
If you enter both, both will be  
calculated.



# Template.csv Good & Bad Examples

- Good example

	A	B	C	D	E	F	G	H	I
1	source	pH	Na (mg/L)	Mg (mg/L)	Ca (mg/L)	Alkalinity (mg)	DOC (mg/L)	Annual dissolved Cu (µg/L)	Individual dissolved Cu (µg/L)
2	1	7.72	35.5	5.3	31.4	77.3	3.5	1	1
3	2	8.44	20.4	3.7	23.2	62.0	2.1	1	1
4	3	7.96	27.7	6.5	32.0	71.7	2.3	1	1
5	4	7.23	85.0	5.2	56.1	73.3	3.3	1	1
6	5	8.32	10.0	3.7	16.8	43.7	1.4	1	1
7	6	7.44	6.9	8.1	31.2	88.7	1.6	1	1
8	7	7.69	9.4	6.1	27.9	73.3	1.7	1	1
9	8	8.01	9.9	3.2	17.3	45.0	2.3	1	1
10	9	7.64	5.1	2.4	12.4	31.0	1.0	1	1
11	10	7.52	11.2	3.5	17.2	47.3	1.6	1	1
12	11	7.75	7.8	3.5	17.0	40.7	1.2	1	1
13	12	7.86	4.8	1.7	8.7	23.7	1.2	1	1
14	13	7.97	106.5	5.5	36.2	45.0	2.9	1	1
15	14	7.73	112.1	4.9	30.1	104.3	9.3	1	1

- Bad example

	A	B	C	D	E	F	G	H	I
1	source	pH	Na (mg/L)	Mg (mg/L)	Ca (mg/L)	Alkalinity (mg)	DOC (mg/L)	Annual dissolved Cu (µg/L)	Individual dissolved Cu (µg/L)
2	1	7.72	35.5	5.3	31.4	77.3	3.5	1	1
3	2	8.44	20.4	3.7	23.2	62.0	2.1	1	1
4	3	7.96	27.7	6.5	32.0	71.7	2.3	1	1
5	4	7.23	85.0		56.1	73.3	3.3	1	
6	5		10.0		16.8	43.7	1.4		
7	6		6.9		31.2	88.7	1.6		
8	7		9.4		27.9	73.3	1.7		1
9	8		9.9		17.3	45.0	2.3		1
10	9		5.1	2.4	12.4	31.0	1.0		1
11	10		11.2	3.5	17.2	47.3	1.6		1
12	11		7.8	3.5	17.0	40.7	1.2		1
13	12	7.86	4.8	1.7	8.7		1.2		1
14	13	7.97	106.5	5.5	36.2		2.9	1	1
15	14	7.73	112.1	4.9	30.1		9.3	1	1

This input file can cause errors.

Each model uses column values as input values, but calculation is impossible because there is a missing values.

Similarly, other models that use Na and Ca to calculate also have errors in their calculations.

# Calculation result Page after csv upload

## ■ Input values as a batch file

Download Template

- ※ Please download the Template.csv file first. And please fill in the value according to the model and upload it.
- ※ Units are shown in the summary table below.
- ※ Calculates up to 15 samples.

Upload File

파일 선택

선택된 파일 없음

Submit

After uploading the Template.csv file, click the submit button

### Summary

pH	Mg (mg/L)	Ca (mg/L)	Na (mg/L)	Alkalinity (mg CaCO <sub>3</sub> /L)	DOC (mg/L)	BLM-based chronic PNECs (μg/L)	Chronic RCR	BLM-based acute HC5s (μg/L)	Acute RCR
7.72	5.3	31.4	35.5	77.3	3.5	1.15e+1	8.73e-2	3.69e+1	2.71e-2
8.44	3.7	23.2	20.4	62.0	2.1	5.67e+0	1.76e-1	1.82e+1	5.48e-2
7.96	6.5	32.0	27.7	71.7	2.3	5.93e+0	1.69e-1	1.91e+1	5.24e-2
7.23	5.2	56.0	85.0	73.3	3.3	1.38e+1	7.24e-2	4.45e+1	2.25e-2
8.32	3.7	16.8	10.0	43.7	1.4	3.43e+0	2.92e-1	1.10e+1	9.06e-2

# Homepage errors and inquiries

Please send an e-mail to [js.jo@ehrnc.com](mailto:js.jo@ehrnc.com) with a screen capture and a detailed description of the situation in which the error occurred.

We will give you a quick response and kind reply.

Thank you