Web Service for toxicant trigger valuation

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Outline

• Introduction
• Background
• Model
• Technology
• Method
Task Introduction

• 1) Literature review
• 2) Develop, implement, and test some new methods on determining trigger values in ecotoxicology
• 3) Web service for the new approach, as a possible extension to BurrliOZ
• 4) Improve the overall appearance of graphical outputs and the ability to edit them for publication purposes
Background

“Environmental regulatory agencies often wish to determine the level of a toxicant concentration at which a substantial proportion of the biological species are protected.”

Model

- Burr type III
- Log Logistic
- Inverse weibull
- Naïve Bayesian
Model

- Burr type Ⅲ
- Log Logistic
- Inverse weibull
- Naïve Bayesian
Technology

R Language

“Shiny”

BUGS (Bayesian inference Using Gibbs Sampling)

Welcome to RStudio
Software, education, and services for the R community
Method

File Upload

Choose CSV File
- NitratesToxicity.csv

Table:

<table>
<thead>
<tr>
<th>Concentration</th>
<th>TaxonomicGroup</th>
<th>CommonName</th>
<th>ScientificName</th>
<th>LifeStage</th>
<th>Duration</th>
<th>ToxicityMeasure</th>
<th>ToxicityValueCens</th>
<th>ToxicityValue</th>
<th>Censored</th>
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<tbody>
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<td>Water flea</td>
<td>Astacus astacus</td>
<td>Embryonic</td>
<td>10 d 5</td>
<td>NOAEL: 1</td>
<td>&gt; 103: 1</td>
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<td>Amphibian .4</td>
<td>African clawed frog</td>
<td>Bato americanus</td>
<td>Fry 3</td>
<td>30 d 5</td>
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<td>&gt; 14: 1</td>
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<tr>
<td>Median</td>
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<td>American loaf</td>
<td>Ceriodaphnia dubia</td>
<td>Larvae 5</td>
<td>7 d 3</td>
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<td>Mean</td>
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<td>Chrononiscus dinitis</td>
<td>Juvenile 2</td>
<td>11 d 1</td>
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<tr>
<td>Max</td>
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<td>Coho salmon</td>
<td>Daphnia magna</td>
<td>Adult 1</td>
<td>14 d 1</td>
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Method

Model Selection

Burr type III
Log Logistic
Inverse weibull
# Method

## Data Summary

<table>
<thead>
<tr>
<th>Concentration</th>
<th>TaxonomicGroup</th>
<th>CommonName</th>
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<th>LifeStage</th>
<th>Duration</th>
<th>ToxicityMeasure</th>
<th>ToxicityValueCens</th>
<th>ToxicityValue</th>
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<td>Bato americanus</td>
<td>Fry 3</td>
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<td>&gt; 14.0 : 1</td>
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<tr>
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<td>American toad 1</td>
<td>Ceriodaphnia dubia</td>
<td>Larvae 5</td>
<td>7 d 3</td>
<td>NOE 8</td>
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</tr>
<tr>
<td>Mean 90.616</td>
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<td>Chironomus dilutus</td>
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</tr>
</tbody>
</table>
Method

Plot output
Method

Naïve Bayesian

Distribution Selection
Gibbs Sampling
MCMC
Thank you for listening