Package 'ssddata'

August 4, 2026

Title Species Sensitivity Distribution Data

Version 2.0.0

Description Reference data sets of species sensitivities to compare the results of fitting species sensitivity distributions using software such as 'ssdtools' and 'Burrlioz'. It consists of curated data sets for individual chemicals from Australian, New Zealand and Canadian organizations, several data sets from anonymous sources, and larger uncurated compilations drawn from the ANZTOX, WQBench and EnviroTox databases. It also includes a data set of the results of fitting various distributions using different software.

URL https://open-aims.github.io/ssddata/, https://github.com/open-AIMS/ssddata

License Apache License (== 2.0)

Depends R (>= 3.5)

Imports chk, dplyr, Rdpack, utils

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`aims_aluminium_marine` *Species Sensitivity Data for aluminium_marine*

Description

Species Sensitivity Data provided by the Australian Institute of Marine Science for ***aluminium*** in marine water.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 20 rows and 10 columns.

Details

These data were sourced from: van Dam JW, Trenfield MA, Streten C, Harford AJ, Parry D, van Dam RA (2018). "Water quality guideline values for aluminium, gallium and molybdenum in marine environments." *Environmental Science and Pollution Research*, **25**(26), 26592–26602. ISSN 16147499. https://link.springer.com/article/10.1007/s11356-018-2702-y.

The columns are as follows:

Common The species common name (chr).

Conc The chemical concentration in micrograms per Litre (dbl).

Domain Tropical, temperate or other filter (chr).

Life_stage Life stage of the test organism (chr).

Phylum The Phylum name (chr).

Source The endpoint primary data source (chr).

Species The species names name (chr).

Test_endpoint Endpoint statistic, EC10, NEC etc (chr).

Toxicity_measure Type of toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Examples

```
data(aims_aluminium_marine)
print(aims_aluminium_marine, n=Inf)
```

`aims_data` *Species Sensitivity Data provided by AIMS*

Description

Species Sensitivity Data provided by the Australian Institute of Marine Science.

Usage

```
aims_data
```

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 40 rows and 12 columns.

Details

Additional information may be available from the primary source for each chemical:

aluminium_marine van Dam JW, Trenfield MA, Streten C, Harford AJ, Parry D, van Dam RA (2018). "Water quality guideline values for aluminium, gallium and molybdenum in marine environments." *Environmental Science and Pollution Research*, **25**(26), 26592–26602. ISSN 16147499. https://link.springer.com/article/10.1007/s11356-018-2702-y.

gallium_marine van Dam JW, Trenfield MA, Streten C, Harford AJ, Parry D, van Dam RA (2018). "Water quality guideline values for aluminium, gallium and molybdenum in marine environments." *Environmental Science and Pollution Research*, **25**(26), 26592–26602. ISSN 16147499. https://link.springer.com/article/10.1007/s11356-018-2702-y.

molybdenum_marine van Dam JW, Trenfield MA, Streten C, Harford AJ, Parry D, van Dam RA (2018). "Water quality guideline values for aluminium, gallium and molybdenum in marine environments." *Environmental Science and Pollution Research*, **25**(26), 26592–26602. ISSN 16147499. https://link.springer.com/article/10.1007/s11356-018-2702-y.

The columns are as follows, noting that all information may not be available for all chemicals:

Chemical The chemical name (chr).

Common The species common name (chr).

Conc The chemical concentration in micrograms per Litre (dbl).

Domain Tropical, temperate or other filter (chr).

Life_stage Life stage of the test organism (chr).

Medium The test medium: "Marine" (chr).

Phylum The Phylum name (chr).

Source The endpoint primary data source (chr).

Species The species names name (chr).

Test_endpoint Endpoint statistic, EC10, NEC etc (chr).

Toxicity_measure Type of toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Examples

```
head(aims_data)
```

`aims_gallium_marine` *Species Sensitivity Data for gallium_marine*

Description

Species Sensitivity Data provided by the Australian Institute of Marine Science for ***gallium*** in marine water.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 6 rows and 10 columns.

Details

These data were sourced from: van Dam JW, Trenfield MA, Streten C, Harford AJ, Parry D, van Dam RA (2018). "Water quality guideline values for aluminium, gallium and molybdenum in marine environments." *Environmental Science and Pollution Research*, **25**(26), 26592–26602. ISSN 16147499. https://link.springer.com/article/10.1007/s11356-018-2702-y.

The columns are as follows:

Common The species common name (chr).

Conc The chemical concentration in micrograms per Litre (dbl).

Domain Tropical, temperate or other filter (chr).

Life_stage Life stage of the test organism (chr).

Phylum The Phylum name (chr).

Source The endpoint primary data source (chr).

Species The species names name (chr).

Test_endpoint Endpoint statistic, EC10, NEC etc (chr).

Toxicity_measure Type of toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Examples

```
data(aims_gallium_marine)
print(aims_gallium_marine, n=Inf)
```

`aims_molybdenum_marine`

Species Sensitivity Data for molybdenum_marine

Description

Species Sensitivity Data provided by the Australian Institute of Marine Science for ***molybdenum*** in marine water.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 14 rows and 10 columns.

Details

These data were sourced from: van Dam JW, Trenfield MA, Streten C, Harford AJ, Parry D, van Dam RA (2018). "Water quality guideline values for aluminium, gallium and molybdenum in marine environments." *Environmental Science and Pollution Research*, **25**(26), 26592–26602. ISSN 16147499. https://link.springer.com/article/10.1007/s11356-018-2702-y.

The columns are as follows:

Common The species common name (chr).

Conc The chemical concentration in micrograms per Litre (dbl).

Domain Tropical, temperate or other filter (chr).

Life_stage Life stage of the test organism (chr).

Phylum The Phylum name (chr).

Source The endpoint primary data source (chr).

Species The species names name (chr).

Test_endpoint Endpoint statistic, EC10, NEC etc (chr).

Toxicity_measure Type of toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Examples

```
data(aims_molybdenum_marine)
print(aims_molybdenum_marine, n=Inf)
```

---

anon_a *Anonymous Species Sensitivity Data anon_a*

Description

Species Sensitivity Data from anonymous sources.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 18 rows and 3 columns.

Details

This example data were sourced from:

DAWE (2021). "Unpublished data, anonymous information supplied by Department of Agriculture Water and the Environment, Australia." April 20.

The columns are as follows:

Chemical The chemical name (chr).

Conc The chemical concentration (dbl).

Medium The medium (freshwater, marine, or unknown) (chr).

Examples

```
print(anon_a, n=Inf)
```

---

anon_b *Anonymous Species Sensitivity Data anon_b*

Description

Species Sensitivity Data from anonymous sources.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 10 rows and 3 columns.

Details

This example data were sourced from:

DAWE (2021). "Unpublished data, anonymous information supplied by Department of Agriculture Water and the Environment, Australia." April 20.

The columns are as follows:

Chemical The chemical name (chr).

Conc The chemical concentration (dbl).

Medium The medium (freshwater, marine, or unknown) (chr).

Examples

```
print(anon_b, n=Inf)
```

---

anon_c *Anonymous Species Sensitivity Data anon_c*

Description

Species Sensitivity Data from anonymous sources.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 16 rows and 3 columns.

Details

This example data were sourced from:

DAWE (2021). "Unpublished data, anonymous information supplied by Department of Agriculture Water and the Environment, Australia." April 20.

The columns are as follows:

Chemical The chemical name (chr).

Conc The chemical concentration (dbl).

Medium The medium (freshwater, marine, or unknown) (chr).

Examples

```
print(anon_c, n=Inf)
```

---

anon_d *Anonymous Species Sensitivity Data anon_d*

Description

Species Sensitivity Data from anonymous sources.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 12 rows and 3 columns.

Details

This example data were sourced from:

DAWE (2021). "Unpublished data, anonymous information supplied by Department of Agriculture Water and the Environment, Australia." April 20.

The columns are as follows:

Chemical The chemical name (chr).

Conc The chemical concentration (dbl).

Medium The medium (freshwater, marine, or unknown) (chr).

Examples

```
print(anon_d, n=Inf)
```

anon_data *Anonymous Species Sensitivity Data*

Description

Species Sensitivity Data from Anonymous sources

Usage

```
anon_data
```

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 73 rows and 3 columns.

Details

Additional information on each of the chemicals may be available from their primary source, at:

a DAWE (2021). "Unpublished data, anonymous information supplied by Department of Agriculture Water and the Environment, Australia." April 20.

c DAWE (2021). "Unpublished data, anonymous information supplied by Department of Agriculture Water and the Environment, Australia." April 20.

d DAWE (2021). "Unpublished data, anonymous information supplied by Department of Agriculture Water and the Environment, Australia." April 20.

b DAWE (2021). "Unpublished data, anonymous information supplied by Department of Agriculture Water and the Environment, Australia." April 20.

e Fox DR, van Dam RA, Fisher R, Batley GE, Tillmanns AR, Thorley J, Schwarz CJ, Spry DJ, McTavish K (2021). "Recent developments in Species Sensitivity Distribution Modeling." *Environmental Toxicology and Chemistry*, **40**(2), 293–308. doi:10.1002/etc.4925. https://setac.onlinelibrary.wiley.com/doi/abs/10.1002/etc.4925.

Chemical The chemical (chr), in this case an anonymous unique identifier.

Conc The chemical concentration (dbl).

Examples

```
head(anon_data)
```

anon_e *Anonymous Species Sensitivity Data anon_e*

Description

Species Sensitivity Data from anonymous sources.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 17 rows and 3 columns.

Details

This example data were sourced from:

Fox DR, van Dam RA, Fisher R, Batley GE, Tillmanns AR, Thorley J, Schwarz CJ, Spry DJ, McTavish K (2021). "Recent developments in Species Sensitivity Distribution Modeling." *Environmental Toxicology and Chemistry*, **40**(2), 293–308. doi:10.1002/etc.4925. `https://setac.onlinelibrary.wiley.com/doi/abs/10.1002/etc.4925`.

The columns are as follows:

Chemical The chemical name (chr).

Conc The chemical concentration (dbl).

Medium The medium (freshwater, marine, or unknown) (chr).

Examples

```
print(anon_e, n=Inf)
```

anzg_alpha_cypermethrin_fresh
Species Sensitivity Data for alpha_cypermethrin_fresh

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***alpha_cypermethrin*** in freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 14 rows and 8 columns.

Details

These data are licensed under CC BY 4.0 (summary of terms provided here: https://creativecommons.org/licenses/by/4.0/) Additional information is available from the Water Quality website at https://www.waterquality.gov.au/

Please cite these data as: ANZG (2023). "Toxicant default guideline values for aquatic ecosystem protection: Alpha-cypermethrin in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/alpha-cypermethrin-fresh-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Species The species binomial name (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_alpha_cypermethrin_fresh, n=Inf)
```

---

anzg_aluminium_marine *Species Sensitivity Data for aluminium_marine*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***aluminium*** in marine water.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 18 rows and 7 columns.

Details

These data are licensed under CC BY 4.0 (summary of terms provided here: https://creativecommons.org/licenses/by/4.0/) Additional information is available from the Water Quality website at https://www.waterquality.gov.au/

Please cite these data as: ANZG (2025). "Toxicant default guideline values for aquatic ecosystem protection: Aluminium in marine water." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/aluminium-marine-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Species The species binomial name (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_aluminium_marine, n=Inf)
```

---

anzg_ametryn_fresh *Species Sensitivity Data for ametryn_fresh*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***ametryn*** in freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 8 rows and 7 columns.

Details

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Please cite these data as: ANZG (2025). "Toxicant default guideline values for aquatic ecosystem protection: Ametryn in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/ametryn-fresh-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Species The species binomial name (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_ametryn_fresh, n=Inf)
```

---

anzg_ammonia_fresh *Species Sensitivity Data for ammonia_fresh*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***ammonia*** in freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 40 rows and 7 columns.

Details

These data are licensed under CC BY 4.0 (summary of terms provided here: https://creativecommons.org/licenses/by/4.0/) Additional information is available from the Water Quality website at https://www.waterquality.gov.au/

Please cite these data as: ANZG (2026). "Toxicant default guideline values for aquatic ecosystem protection: Ammonia in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/ammonia-fresh-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Species The species binomial name (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_ammonia_fresh, n=Inf)
```

---

anzg_bisphenol_a_fresh

Species Sensitivity Data for bisphenol_a_fresh

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***bisphenol_a*** in freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 19 rows and 7 columns.

Details

These data are licensed under CC BY 4.0 (summary of terms provided here: https://creativecommons.org/licenses/by/4.0/) Additional information is available from the Water Quality website at https://www.waterquality.gov.au/

Please cite these data as: ANZG (2023). "Toxicant default guideline values for aquatic ecosystem protection: Bisphenol A in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/bisphenol-a-fresh-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Species The species binomial name (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_bisphenol_a_fresh, n=Inf)
```

`anzg_bisphenol_a_marine`

Species Sensitivity Data for bisphenol_a_marine

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***bisphenol_a*** in marine water.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 8 rows and 7 columns.

Details

These data are licensed under CC BY 4.0 (summary of terms provided here: https://creativecommons.org/licenses/by/4.0/) Additional information is available from the Water Quality website at https://www.waterquality.gov.au/

Please cite these data as: ANZG (2023). "Toxicant default guideline values for aquatic ecosystem protection: Bisphenol A in marine water." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/bisphenol-a-marine-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Species The species binomial name (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_bisphenol_a_marine, n=Inf)
```

---

anzg_boron_fresh *Species Sensitivity Data for boron_fresh*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***boron*** in freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 22 rows and 7 columns.

Details

These data are licensed under CC BY 4.0 (summary of terms provided here: https://creativecommons.org/licenses/by/4.0/) Additional information is available from the Water Quality website at https://www.waterquality.gov.au/

Please cite these data as: ANZG (2021). "Toxicant default guideline values for aquatic ecosystem protection: Boron in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/boron_fresh_dgv_technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Species The species binomial name (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_boron_fresh, n=Inf)
```

---

anzg_chlorine_marine *Species Sensitivity Data for chlorine_marine*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***chlorine*** in marine water.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 29 rows and 8 columns.

Details

These data are licensed under CC BY 4.0 (summary of terms provided here: https://creativecommons.org/licenses/by/4.0/) Additional information is available from the Water Quality website at https://www.waterquality.gov.au/

Please cite these data as: ANZG (2026). "Toxicant default guideline values for aquatic ecosystem protection: Chlorine in marine water." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/chlorine-marine-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Species The species binomial name (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_chlorine_marine, n=Inf)
```

---

anzg_chromium_III_fresh

Species Sensitivity Data for chromium_III_fresh

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***chromium_III*** in freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 13 rows and 7 columns.

Details

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Please cite these data as: ANZG (2026). "Toxicant default guideline values for aquatic ecosystem protection: Chromium (III) in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/chromium-III-fresh-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Species The species binomial name (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_chromium_III_fresh, n=Inf)
```

---

anzg_copper_marine *Species Sensitivity Data for copper_marine*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***copper*** in marine water.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 45 rows and 10 columns.

Details

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Please cite these data as: ANZG (2025). "Toxicant default guideline values for aquatic ecosystem protection: Copper in marine water." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/anz-guidelines/guideline-values/default/water-quality-toxicants/toxicants/copper-marine-2025.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Phylum The Phylum name (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_copper_marine, n=Inf)
```

---

anzg_data *ANZG Species Sensitivity Data*

Description

ANZG Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia.

Usage

```
anzg_data
```

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 592 rows and 13 columns.

Details

These data are licensed under CC BY 4.0 (summary of terms provided here: https://creativecommons.org/licenses/by/4.0/).

Additional information is available from the Water Quality website at https://www.waterquality.gov.au/.

Additional information may be available from the primary source for each chemical:

metolachlor_fresh ANZG (2020). "Toxicant default guideline values for aquatic ecosystem protection: Metolachlor in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/anz-guidelines/guideline-values/default/water-quality-toxicants/toxicants/metolachlor-fresh-2020.

alpha_cypermethrin_fresh ANZG (2023). "Toxicant default guideline values for aquatic ecosystem protection: Alpha-cypermethrin in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/alpha-cypermethrin-fresh-dgvs-technical-brief.pdf.

aluminium_marine ANZG (2025). "Toxicant default guideline values for aquatic ecosystem protection: Aluminium in marine water." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/aluminium-marine-dgvs-technical-brief.pdf.

ametryn_fresh ANZG (2025). "Toxicant default guideline values for aquatic ecosystem protection: Ametryn in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/ametryn-fresh-dgvs-technical-brief.pdf.

ammonia_fresh ANZG (2026). "Toxicant default guideline values for aquatic ecosystem protection: Ammonia in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/ammonia-fresh-dgvs-technical-brief.pdf.

bisphenol_a_fresh ANZG (2023). "Toxicant default guideline values for aquatic ecosystem protection: Bisphenol A in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/bisphenol-a-fresh-dgvs-technical-brief.pdf.

bisphenol_a_marine ANZG (2023). "Toxicant default guideline values for aquatic ecosystem protection: Bisphenol A in marine water." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/bisphenol-a-marine-dgvs-technical-brief.pdf.

boron_fresh ANZG (2021). "Toxicant default guideline values for aquatic ecosystem protection: Boron in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/boron_fresh_dgv_technical-brief.pdf.

chromium_III_fresh ANZG (2026). "Toxicant default guideline values for aquatic ecosystem protection: Chromium (III) in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/chromium-III-fresh-dgvs-technical-brief.pdf.

chlorine_marine ANZG (2026). "Toxicant default guideline values for aquatic ecosystem protection: Chlorine in marine water." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/chlorine-marine-dgvs-technical-brief.pdf.

dioxins_fresh ANZG (2021). "Toxicant default guideline values for aquatic ecosystem protection: Dioxins in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/dioxins_fresh_dgv_technical-brief.pdf.

diuron_fresh ANZG (2025). "Toxicant default guideline values for aquatic ecosystem protection: Diuron in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/diuron-fresh-dgvs-technical-brief.pdf.

diuron_marine ANZG (2024). "Toxicant default guideline values for aquatic ecosystem protection: Diuron in marine water." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/diuron-marine-dgvs-technical-brief.pdf.

fipronil_fresh ANZG (2023). "Toxicant default guideline values for aquatic ecosystem protection: Fipronil in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/fipronil-fresh-dgvs-technical-brief.pdf.

fluoride_fresh ANZG (2024). "Toxicant default guideline values for aquatic ecosystem protection: Fluoride in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/fluoride-fresh-dgvs-technical-brief.pdf.

glyphosate_fresh ANZG (2021). "Toxicant default guideline values for aquatic ecosystem protection: Glyphosate in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/glyphosate_fresh_dgv_technical-brief.pdf.

iron_fresh ANZG (2025). "Toxicant default guideline values for aquatic ecosystem protection: Iron in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/iron-fresh-dgvs-technical-brief.pdf.

iron_marine ANZG (2025). "Toxicant default guideline values for aquatic ecosystem protection: Iron in marine water." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/iron-marine-dgvs-technical-brief.pdf.

mancozeb_fresh ANZG (2023). "Toxicant default guideline values for aquatic ecosystem protection: Mancozeb in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/mancozeb-fresh-dgvs-technical-brief.pdf.

manganese_marine ANZG (2026). "Toxicant default guideline values for aquatic ecosystem protection: Manganese in marine water." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/manganese-marine-dgvs-technical-brief.pdf.

mcpa_fresh ANZG (2024). "Toxicant default guideline values for aquatic ecosystem protection: MCPA in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/mcpa-fresh-dgvs-technical-brief.pdf.

nickel_marine ANZG (2026). "Toxicant default guideline values for aquatic ecosystem protection: Nickel in marine water." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/nickel-marine-dgvs-technical-brief.pdf.

paraquat_fresh ANZG (2024). "Toxicant default guideline values for aquatic ecosystem protection: Paraquat in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/paraquat-fresh-dgvs-technical-brief.pdf.

picloram_fresh ANZG (2024). "Toxicant default guideline values for aquatic ecosystem protection: Picloram in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/picloram-fresh-dgvs-technical-brief.pdf.

simazine_fresh ANZG (2024). "Toxicant default guideline values for aquatic ecosystem protection: Simazine in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/simazine-fresh-dgvs-technical-brief.pdf.

simazine_marine ANZG (2026). "Toxicant default guideline values for aquatic ecosystem protection: Simazine in marine water." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/simazine-marine-dgvs-technical-brief.pdf.

sulfometuron_methyl_fresh ANZG (2024). "Toxicant default guideline values for aquatic ecosystem protection: Sulfometuron-methyl in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/sulfometuron-methyl-fresh-dgvs-technical-bri
pdf.

zinc_marine ANZG (2021). "Toxicant default guideline values for aquatic ecosystem protection: Zinc in marine water." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/zinc_marine_dgv_technical-brief.pdf.

copper_marine ANZG (2025). "Toxicant default guideline values for aquatic ecosystem protection: Copper in marine water." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/anz-guidelines/guideline-values/default/water-quality-toxicants/toxicants/copper-marine-2025.

metsulfuron_methyl_fresh ANZG (2021). "Toxicant default guideline values for aquatic ecosystem protection: Metsulfuron-methyl in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.

waterquality.gov.au/sites/default/files/documents/metsulfuron-methyl_fresh_dgv-technical-brief_0.pdf.

perfluorooctane_sulfonate_pfos_fresh ANZG (2026). "Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/pfos-fresh-dgvs-technical-brief.pdf.

nitrate_soft_fresh ANZG (2025). "Toxicant default guideline values for aquatic ecosystem protection: Nitrate in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/nitrate-fresh-dgvs-technical-brief.pdf.

nitrate_moderate_fresh ANZG (2025). "Toxicant default guideline values for aquatic ecosystem protection: Nitrate in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/nitrate-fresh-dgvs-technical-brief.pdf.

nitrate_hard_fresh ANZG (2025). "Toxicant default guideline values for aquatic ecosystem protection: Nitrate in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/nitrate-fresh-dgvs-technical-brief.pdf.

The columns are as follows, noting that some information may not be available for all chemicals:

Chemical The chemical name (chr).

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Medium The test medium: "Freshwater", "Marine", or one of the hardness variants "Soft freshwater", "Moderate freshwater", "Hard freshwater" (chr).

Notes Other notes (chr).

Phylum The Phylum name (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
head(anzg_data)
```

`anzg_dioxins_fresh` *Species Sensitivity Data for dioxins_fresh*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***dioxins*** in freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 8 rows and 10 columns.

Details

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Please cite these data as: ANZG (2021). "Toxicant default guideline values for aquatic ecosystem protection: Dioxins in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/dioxins_fresh_dgv_technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Notes Other notes (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_dioxins_fresh, n=Inf)
```

anzg_diuron_fresh *Species Sensitivity Data for diuron_fresh*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***diuron*** in freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 16 rows and 9 columns.

Details

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Please cite these data as: ANZG (2025). "Toxicant default guideline values for aquatic ecosystem protection: Diuron in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/diuron-fresh-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_diuron_fresh, n=Inf)
```

`anzg_diuron_marine` *Species Sensitivity Data for diuron_marine*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***diuron*** in marine water.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 12 rows and 9 columns.

Details

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Please cite these data as: ANZG (2024). "Toxicant default guideline values for aquatic ecosystem protection: Diuron in marine water." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/diuron-marine-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_diuron_marine, n=Inf)
```

`anzg_fipronil_fresh` *Species Sensitivity Data for fipronil_fresh*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***fipronil*** in freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 13 rows and 11 columns.

Details

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Please cite these data as: ANZG (2023). "Toxicant default guideline values for aquatic ecosystem protection: Fipronil in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/fipronil-fresh-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Notes Other notes (chr).

Phylum The Phylum name (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_fipronil_fresh, n=Inf)
```

anzg_fluoride_fresh *Species Sensitivity Data for fluoride_fresh*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***fluoride*** in freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 22 rows and 10 columns.

Details

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Please cite these data as: ANZG (2024). "Toxicant default guideline values for aquatic ecosystem protection: Fluoride in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/fluoride-fresh-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Notes Other notes (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_fluoride_fresh, n=Inf)
```

anzg_glyphosate_fresh *Species Sensitivity Data for glyphosate_fresh*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***glyphosate*** in freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 15 rows and 10 columns.

Details

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Please cite these data as: ANZG (2021). "Toxicant default guideline values for aquatic ecosystem protection: Glyphosate in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/glyphosate_fresh_dgv_technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Phylum The Phylum name (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_glyphosate_fresh, n=Inf)
```

anzg_iron_fresh *Species Sensitivity Data for iron_fresh*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***iron*** in freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 20 rows and 9 columns.

Details

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Please cite these data as: ANZG (2025). "Toxicant default guideline values for aquatic ecosystem protection: Iron in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/iron-fresh-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_iron_fresh, n=Inf)
```

`anzg_iron_marine` *Species Sensitivity Data for iron_marine*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***iron*** in marine water.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 16 rows and 9 columns.

Details

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Please cite these data as: ANZG (2025). "Toxicant default guideline values for aquatic ecosystem protection: Iron in marine water." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/iron-marine-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_iron_marine, n=Inf)
```

anzg_mancozeb_fresh *Species Sensitivity Data for mancozeb_fresh*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***mancozeb*** in freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 8 rows and 10 columns.

Details

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Please cite these data as: ANZG (2023). "Toxicant default guideline values for aquatic ecosystem protection: Mancozeb in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/mancozeb-fresh-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Phylum The Phylum name (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_mancozeb_fresh, n=Inf)
```

`anzg_manganese_marine` *Species Sensitivity Data for manganese_marine*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***manganese*** in marine water.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 18 rows and 10 columns.

Details

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Please cite these data as: ANZG (2026). "Toxicant default guideline values for aquatic ecosystem protection: Manganese in marine water." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/manganese-marine-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Phylum The Phylum name (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_manganese_marine, n=Inf)
```

`anzg_mcpa_fresh` *Species Sensitivity Data for mcpa_fresh*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***mcpa*** in freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 16 rows and 10 columns.

Details

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Please cite these data as: ANZG (2024). "Toxicant default guideline values for aquatic ecosystem protection: MCPA in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/mcpa-fresh-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Phylum The Phylum name (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_mcpa_fresh, n=Inf)
```

anzg_metolachlor_fresh *Species Sensitivity Data for metolachlor_fresh*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***metolachlor*** in freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 21 rows and 11 columns.

Details

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Please cite these data as: ANZG (2020). "Toxicant default guideline values for aquatic ecosystem protection: Metolachlor in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/anz-guidelines/guideline-values/default/water-quality-toxicants/toxicants/metolachlor-fresh-2020.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Notes Other notes (chr).

Phylum The Phylum name (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_metolachlor_fresh, n=Inf)
```

anzg_metsulfuron_methyl_fresh
Species Sensitivity Data for metsulfuron_methyl_fresh

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***metsulfuron_methyl*** in freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 8 rows and 11 columns.

Details

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Please cite these data as: ANZG (2021). "Toxicant default guideline values for aquatic ecosystem protection: Metsulfuron-methyl in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/metsulfuron-methyl_fresh_dgv-technical-brief_0.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Notes Other notes (chr).

Phylum The Phylum name (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_metsulfuron_methyl_fresh, n=Inf)
```

`anzg_nickel_marine` *Species Sensitivity Data for nickel_marine*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***nickel*** in marine water.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 31 rows and 10 columns.

Details

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Please cite these data as: ANZG (2026). "Toxicant default guideline values for aquatic ecosystem protection: Nickel in marine water." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/nickel-marine-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Phylum The Phylum name (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_nickel_marine, n=Inf)
```

anzg_nitrate_hard_fresh *Species Sensitivity Data for nitrate_hard_fresh*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***nitrate*** in hard freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 12 rows and 10 columns.

Details

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Please cite these data as: ANZG (2025). "Toxicant default guideline values for aquatic ecosystem protection: Nitrate in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/nitrate-fresh-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Phylum The Phylum name (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_nitrate_hard_fresh, n=Inf)
```

`anzg_nitrate_moderate_fresh` *Species Sensitivity Data for nitrate_moderate_fresh*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***nitrate*** in moderately hard freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 11 rows and 10 columns.

Details

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Please cite these data as: ANZG (2025). "Toxicant default guideline values for aquatic ecosystem protection: Nitrate in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/nitrate-fresh-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Phylum The Phylum name (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_nitrate_moderate_fresh, n=Inf)
```

`anzg_nitrate_soft_fresh`

Species Sensitivity Data for nitrate_soft_fresh

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***nitrate*** in soft freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 14 rows and 10 columns.

Details

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Please cite these data as: ANZG (2025). "Toxicant default guideline values for aquatic ecosystem protection: Nitrate in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/nitrate-fresh-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Phylum The Phylum name (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_nitrate_soft_fresh, n=Inf)
```

anzg_paraquat_fresh *Species Sensitivity Data for paraquat_fresh*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***paraquat*** in freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 10 rows and 10 columns.

Details

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Please cite these data as: ANZG (2024). "Toxicant default guideline values for aquatic ecosystem protection: Paraquat in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/paraquat-fresh-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Phylum The Phylum name (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_paraquat_fresh, n=Inf)
```

`anzg_perfluorooctane_sulfonate_pfos_fresh`
Species Sensitivity Data for perfluorooctane_sulfonate_pfos_fresh

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***perfluorooctane_sulfonate_pfos*** in freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 37 rows and 10 columns.

Details

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Please cite these data as: ANZG (2026). "Toxicant default guideline values for aquatic ecosystem protection: Perfluorooctane sulfonate (PFOS) in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/pfos-fresh-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Phylum The Phylum name (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).
Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_perfluorooctane_sulfonate_pfos_fresh, n=Inf)
```

anzg_picloram_fresh *Species Sensitivity Data for picloram_fresh*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***picloram*** in freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 12 rows and 10 columns.

Details

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Please cite these data as: ANZG (2024). "Toxicant default guideline values for aquatic ecosystem protection: Picloram in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/picloram-fresh-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Phylum The Phylum name (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_picloram_fresh, n=Inf)
```

`anzg_simazine_fresh` *Species Sensitivity Data for simazine_fresh*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***simazine*** in freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 20 rows and 10 columns.

Details

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Please cite these data as: ANZG (2024). "Toxicant default guideline values for aquatic ecosystem protection: Simazine in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/simazine-fresh-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Phylum The Phylum name (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_simazine_fresh, n=Inf)
```

`anzg_simazine_marine` *Species Sensitivity Data for simazine_marine*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***simazine*** in marine water.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 14 rows and 10 columns.

Details

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Please cite these data as: ANZG (2026). "Toxicant default guideline values for aquatic ecosystem protection: Simazine in marine water." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/simazine-marine-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Phylum The Phylum name (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_simazine_marine, n=Inf)
```

`anzg_sulfometuron_methyl_fresh` *Species Sensitivity Data for sulfometuron_methyl_fresh*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***sulfometuron_methyl*** in freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 6 rows and 10 columns.

Details

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Please cite these data as: ANZG (2024). "Toxicant default guideline values for aquatic ecosystem protection: Sulfometuron-methyl in freshwater." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/sulfometuron-methyl-fresh-dgvs-technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Phylum The Phylum name (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_sulfometuron_methyl_fresh, n=Inf)
```

anzg_zinc_marine *Species Sensitivity Data for zinc_marine*

Description

Species Sensitivity Data provided by the Department of Agriculture Water and the Environment, Australia. This data underpins the ANZG default guideline for ***zinc*** in marine water.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 16 rows and 10 columns.

Details

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Please cite these data as: ANZG (2021). "Toxicant default guideline values for aquatic ecosystem protection: Zinc in marine water." Australian and New Zealand Governments and Australian State and Territory Governments, Canberra, Australia. https://www.waterquality.gov.au/sites/default/files/documents/zinc_marine_dgv_technical-brief.pdf.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration The duration of the test in days (chr).

Genus The Genus name (chr).

Group The taxonomic group (chr).

Life_stage Life stage of the test organism (chr).

Phylum The Phylum name (chr).

Species The species binomial name (chr).

Test_endpoint The test endpoint measure (chr).

Toxicity_measure The toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

Examples

```
print(anzg_zinc_marine, n=Inf)
```

`anztox_data` *ANZTOX Species Sensitivity Data*

Description

A curated dataset of species-level ecotoxicity data. These data were sourced from the ANZTOX database, originally served by the Qld government and then by SETAC, and now maintained locally.

The data were cleaned and algorithmically (machine) processed for Species Sensitivity Distribution (SSD) analysis using a workflow developed to mimic as closely as possible the principles and decisions documented in (ANZECC and ARMCANZ 2000) and (Warne et al. 2015) and subsequent updates (Warne et al. 2018; Warne et al. 2025).

Data encompass two source tables from the available sql file extracted from the ANZTOX database:

- toxicityvalue2000 (17,755 records), originally sourced from (Sunderam et al. 2000), a Microsoft Access database distributed on CD-ROM with the ANZECC & ARMCANZ Water Quality Guidelines.
- toxicityvalue2016 (2,794 records), which is the data underpinning the subsequent 2015 and 2018 updates to the water quality guidelines (Warne et al. 2015; Warne et al. 2018).

Usage

```
anztox_data
```

Format

A tibble with one row per chemical x mediatype combination and columns:

casnumber_grouped Grouped CAS number (character).

chemicalname_grouped Grouped chemical name (character).

mediatype "Freshwater" or "Marine" (character).

data List-column of nested tibbles containing species-level toxicity data.

Details

The data cleaning and SSD eligibility workflow is fully documented in the accompanying vignette: `vignette("ANZTOX-data-processing", package = "ssddata")`

In brief:

1. **Harmonisation**: The 2000 and 2016 datasets differed in structure and endpoint vocabulary and were de-normalised, cleaned, and combined into a single table. Chemical variants and salts are mapped to parent compounds via a curated CAS parent lookup. Endpoint labels from 2016 are mapped to 2000 effect codes.
2. **Test type priority**: Within each species x chemical x endpoint group, chronic data are preferred over subchronic, and subchronic over acute.

3. **Acute-to-chronic conversion**: Where only acute data are available for a species, acute LC/EC/IC50 values are divided by a default ACR of 10 (Warne et al. 2025, Section 3.4.2.2) to obtain chronic negligible-effect equivalents before SSD fitting.
4. **Aggregation**: Concentration values for the same species x endpoint are geometric-mean averaged. The most sensitive endpoint per species is retained.
5. **Eligibility threshold**: Only chemical x media combinations with >= 5 species from >= 4 distinct major taxonomic groups are retained. These are then nested into a list-column ready for SSD fitting or related functions.

The columns are as follows:

casnumber_grouped The grouped chemical CAS number, mapped to parent compound where applicable (chr).

chemicalname_grouped The grouped chemical name, mapped to parent compound name where applicable (chr).

mediatype Water type: "Freshwater" or "Marine" (chr).

data A list-column containing a tibble of species-level rows for that chemical x media combination. Each row represents a single species and contains columns: `scientificname`, `commonname_species`, `majorgroup`, `minorgroup`, `endpoint`, `endpoint_concentration` (geometric mean concentration in ug/L or mg/L, depending on the chemical), `testtype` (Chronic or Acute), `source_datasets` (comma-separated source: "2000", "2016", or both), and `n_acute_converted` (count of acute records that contributed to the geometric mean after ACR conversion).

References

ANZECC, ARMCANZ (2000). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, Canberra, Australia.

Sunderam RIM, Warne MS, Chapman J, Rose R, Hawkins J, Pablo F (2000). "The ANZECC & ARMCANZ Toxicant Water Quality Guideline Database." Microsoft Access database distributed on CD-ROM with ANZECC & ARMCANZ Water Quality Guidelines.

Warne MS, Batley GE, van Dam RA, Chapman JC, Fox DR, Hickey CW, Stauber JL (2015). "Revised Method for Deriving Australian and New Zealand Water Quality Guideline Values for Toxicants." Department of Science, Information Technology and Innovation, Brisbane, Queensland, Australia. Prepared for the Standing Council on Environment and Water (SCEW).

Warne MS, Batley GE, van Dam RA, Chapman JC, Fox DR, Hickey CW, Stauber JL (2018). "Revised Method for Deriving Australian and New Zealand Water Quality Guideline Values for Toxicants." Australian and New Zealand Governments, Canberra, ACT, Australia. Updated version associated with the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018).

Warne MS, Batley GE, van Dam RA, Chapman JC, Fox DR, Hickey CW, Stauber JL, Fisher R (2025). "Method for Deriving Australian and New Zealand Water Quality Guideline Values for Protecting Aquatic Ecosystems from Toxicants – Update of 2018 Version." Australian and New Zealand Governments, Canberra, ACT, Australia. Prepared for the Australian and New Zealand Guidelines for Fresh and Marine Water Quality.

Examples

```
print(anztox_data)

# Nest structure: each row contains species data ready for ssdtools
head(anztox_data$data[[1]])
```

`ccme_boron` *CCME Species Sensitivity Data for ccme_boron*

Description

Species Sensitivity Data from the Canadian Council of Ministers of the Environment for ***boron***.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 28 rows and 6 columns.

Details

Additional information is available from CCME (2021). "Boron: Water Quality Guidelines for the Protection of Aquatic Life." May 06, https://ccme.ca/en/chemical/16.

The columns are as follows:

Chemical The chemical (chr).

Species The species binomial name (chr).

Conc The chemical concentration (dbl).

Group The taxonomic group (fct).

Units The units of Conc (chr).

Medium The medium (freshwater, marine, etc.) (chr).

Examples

```
print(ccme_boron, n=Inf)
```

ccme_cadmium *CCME Species Sensitivity Data for ccme_cadmium*

Description

Species Sensitivity Data from the Canadian Council of Ministers of the Environment for ***cadmium***.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 36 rows and 6 columns.

Details

Additional information is available from CCME (2021). "Cadmium: Water Quality Guidelines for the Protection of Aquatic Life." May 06, https://ccme.ca/en/chemical/20.

The columns are as follows:

Chemical The chemical (chr).

Species The species binomial name (chr).

Conc The chemical concentration (dbl).

Group The taxonomic group (fct).

Units The units of Conc (chr).

Medium The medium (freshwater, marine, etc.) (chr).

Examples

```
print(ccme_cadmium, n=Inf)
```

ccme_chloride *CCME Species Sensitivity Data for ccme_chloride*

Description

Species Sensitivity Data from the Canadian Council of Ministers of the Environment for ***chloride***.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 28 rows and 6 columns.

Details

Additional information is available from CCME (2021). "Chloride: Water Quality Guidelines for the Protection of Aquatic Life." May 06, https://ccme.ca/en/chemical/28.

The columns are as follows:

Chemical The chemical (chr).

Species The species binomial name (chr).

Conc The chemical concentration (dbl).

Group The taxonomic group (fct).

Units The units of Conc (chr).

Medium The medium (freshwater, marine, etc.) (chr).

Examples

```
print(ccme_chloride, n=Inf)
```

---

ccme_data *CCME Species Sensitivity Data*

Description

Species Sensitivity Data from the Canadian Council of Ministers of the Environment. The taxonomic groups are Amphibian, Fish, Invertebrate and Plant. Plants includes freshwater algae.

Usage

```
ccme_data
```

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 144 rows and 6 columns.

Details

Additional information on each of the chemicals is available from the CCME website.

boron CCME (2021). "Boron: Water Quality Guidelines for the Protection of Aquatic Life." May 06, https://ccme.ca/en/chemical/16.

cadmium CCME (2021). "Cadmium: Water Quality Guidelines for the Protection of Aquatic Life." May 06, https://ccme.ca/en/chemical/20.

chloride CCME (2021). "Chloride: Water Quality Guidelines for the Protection of Aquatic Life." May 06, https://ccme.ca/en/chemical/28.

endosulfan CCME (2021). "Endosulfan: Water Quality Guidelines for the Protection of Aquatic Life." May 06, https://ccme.ca/en/chemical/93.

glyphosate CCME (2021). "Glyphosate: Water Quality Guidelines for the Protection of Aquatic Life." May 06, https://ccme.ca/en/chemical/102.

uranium CCME (2021). "Uranium: Water Quality Guidelines for the Protection of Aquatic Life." May 06, https://ccme.ca/en/chemical/225.

silver CCME (2021). "Silver: Water Quality Guidelines for the Protection of Aquatic Life." May 06, https://ccme.ca/en/chemical/198.

The columns are as follows:

Chemical The chemical (chr).

Species The species binomial name (chr).

Conc The chemical concentration (dbl).

Group The taxonomic group (fct).

Units The units of Conc (chr).

Medium The medium (freshwater, marine, etc.) (chr).

Examples

```
head(ccme_data)
```

`ccme_endosulfan` *CCME Species Sensitivity Data for ccme_endosulfan*

Description

Species Sensitivity Data from the Canadian Council of Ministers of the Environment for ***endosulfan***.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 12 rows and 6 columns.

Details

Additional information is available from CCME (2021). "Endosulfan: Water Quality Guidelines for the Protection of Aquatic Life." May 06, https://ccme.ca/en/chemical/93.

The columns are as follows:

Chemical The chemical (chr).

Species The species binomial name (chr).

Conc The chemical concentration (dbl).

Group The taxonomic group (fct).

Units The units of Conc (chr).

Medium The medium (freshwater, marine, etc.) (chr).

Examples

```
print(ccme_endosulfan, n=Inf)
```

`ccme_glyphosate` *CCME Species Sensitivity Data for ccme_glyphosate*

Description

Species Sensitivity Data from the Canadian Council of Ministers of the Environment for ***glyphosate***.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 18 rows and 6 columns.

Details

Additional information is available from CCME (2021). "Glyphosate: Water Quality Guidelines for the Protection of Aquatic Life." May 06, https://ccme.ca/en/chemical/102.

The columns are as follows:

Chemical The chemical (chr).

Species The species binomial name (chr).

Conc The chemical concentration (dbl).

Group The taxonomic group (fct).

Units The units of Conc (chr).

Medium The medium (freshwater, marine, etc.) (chr).

Examples

```
print(ccme_glyphosate, n=Inf)
```

ccme_silver *CCME Species Sensitivity Data for ccme_silver*

Description

Species Sensitivity Data from the Canadian Council of Ministers of the Environment for ***silver***.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 9 rows and 6 columns.

Details

Additional information is available from CCME (2021). "Silver: Water Quality Guidelines for the Protection of Aquatic Life." May 06, https://ccme.ca/en/chemical/198.

The columns are as follows:

Chemical The chemical (chr).

Species The species binomial name (chr).

Conc The chemical concentration (dbl).

Group The taxonomic group (fct).

Units The units of Conc (chr).

Medium The medium (freshwater, marine, etc.) (chr).

Examples

```
print(ccme_silver, n=Inf)
```

ccme_uranium *CCME Species Sensitivity Data for ccme_uranium*

Description

Species Sensitivity Data from the Canadian Council of Ministers of the Environment for ***uranium***.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 13 rows and 6 columns.

Details

Additional information is available from CCME (2021). "Uranium: Water Quality Guidelines for the Protection of Aquatic Life." May 06, https://ccme.ca/en/chemical/225.

The columns are as follows:

Chemical The chemical (chr).

Species The species binomial name (chr).

Conc The chemical concentration (dbl).

Group The taxonomic group (fct).

Units The units of Conc (chr).

Medium The medium (freshwater, marine, etc.) (chr).

Examples

```
print(ccme_uranium, n=Inf)
```

`csiro_chlorine_marine` *Species Sensitivity Data for chlorine_marine*

Description

Species Sensitivity Data provided by the Commonwealth Scientific and Industrial Research Organisation of Australia for ***chlorine*** in marine water.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 30 rows and 9 columns.

Details

These data were sourced from: Batley GE, Simpson SL (2020). "Short-Term Guideline Values for Chlorine in Marine Waters." *Environmental Toxicology and Chemistry*. ISSN 15528618. https://setac.onlinelibrary.wiley.com/doi/full/10.1002/etc.4661.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration Test duration (chr).

Group Taxonomic grouping information (chr).

Life_stage Life stage of the test organism (chr).

Notes Other notes (chr).

Species The species names name (chr).

Test_endpoint Endpoint statistic, EC10, NEC etc (chr).

Toxicity_measure Type of toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

All concentration data are ug/L unless otherwise stated.

Examples

```
print(csiro_chlorine_marine, n=Inf)
```

`csiro_cobalt_marine` *Species Sensitivity Data for cobalt_marine*

Description

Species Sensitivity Data provided by the Commonwealth Scientific and Industrial Research Organisation of Australia for ***cobalt*** in marine water.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 14 rows and 8 columns.

Details

These data were sourced from: Batley G (2021). "Unpublished data, anonymous information." March 23.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration Test duration (chr).

Group Taxonomic grouping information (chr).

Life_stage Life stage of the test organism (chr).

Species The species names name (chr).

Test_endpoint Endpoint statistic, EC10, NEC etc (chr).

Toxicity_measure Type of toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

All concentration data are ug/L unless otherwise stated.

Examples

```
print(csiro_cobalt_marine, n=Inf)
```

`csiro_data` *Species Sensitivity Data provided by CSIRO*

Description

Species Sensitivity Data provided by the Commonwealth Scientific and Industrial Research Organisation of Australia.

Usage

```
csiro_data
```

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 91 rows and 12 columns.

Details

Additional information may be available from the primary source for each chemical:

chlorine_marine Batley GE, Simpson SL (2020). "Short-Term Guideline Values for Chlorine in Marine Waters." *Environmental Toxicology and Chemistry*. ISSN 15528618. https://setac.onlinelibrary.wiley.com/doi/full/10.1002/etc.4661.

nickel_fresh Stauber J, Golding L, Peters A, Merrington G, Adams M, Binet M, Batley G, Gissi F, Mcknight K, Garman E, Middleton E, Gadd J, Schlekat C (2021). "Environmental Toxicology Application of Bioavailability Models to Derive Chronic Guideline Values for Nickel in Freshwaters of Australia and New Zealand." *Environmental Toxicology and Chemistry*, **40**(1), 100–112. doi:10.1002/etc.4885. https://setac.onlinelibrary.wiley.com/doi/abs/10.1002/etc.4885.

cobalt_marine Batley G (2021). "Unpublished data, anonymous information." March 23.

lead_marine Batley G (2021). "Unpublished data, anonymous information." March 23.

The columns are as follows, noting that not all information are available for all chemicals:

Chemical The chemical name (chr).

Conc The chemical concentration in micrograms per Litre (dbl).

Domain Tropical, temperate or other filter (chr).

Duration Test duration (chr).

Group Taxonomic grouping information (chr).

Life_stage Life stage of the test organism (chr).

Medium The test medium: "Freshwater" or "Marine" (chr).

Notes Other notes (chr).

Species The species names name (chr).

Test_endpoint Endpoint statistic, EC10, NEC etc (chr).

Toxicity_measure Type of toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

All concentration data are ug/L unless otherwise stated.

Examples

```
head(csiro_data)
```

`csiro_lead_marine` *Species Sensitivity Data for lead_marine*

Description

Species Sensitivity Data provided by the Commonwealth Scientific and Industrial Research Organisation of Australia for ***lead*** in marine water.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 16 rows and 8 columns.

Details

These data were sourced from: Batley G (2021). "Unpublished data, anonymous information." March 23.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Duration Test duration (chr).

Group Taxonomic grouping information (chr).

Life_stage Life stage of the test organism (chr).

Species The species names name (chr).

Test_endpoint Endpoint statistic, EC10, NEC etc (chr).

Toxicity_measure Type of toxicity measure used (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

All concentration data are ug/L unless otherwise stated.

Examples

```
print(csiro_lead_marine, n=Inf)
```

`csiro_nickel_fresh` *Species Sensitivity Data for nickel_fresh*

Description

Species Sensitivity Data provided by the Commonwealth Scientific and Industrial Research Organisation of Australia for ***nickel*** in freshwater.

Format

An object of class `tbl_df` (inherits from `tbl`, `data.frame`) with 31 rows and 7 columns.

Details

These data were sourced from: Stauber J, Golding L, Peters A, Merrington G, Adams M, Binet M, Batley G, Gissi F, Mcknight K, Garman E, Middleton E, Gadd J, Schlekat C (2021). "Environmental Toxicology Application of Bioavailability Models to Derive Chronic Guideline Values for Nickel in Freshwaters of Australia and New Zealand." *Environmental Toxicology and Chemistry*, **40**(1), 100–112. doi:10.1002/etc.4885. https://setac.onlinelibrary.wiley.com/doi/abs/10.1002/etc.4885.

The columns are as follows:

Conc The chemical concentration in micrograms per Litre (dbl).

Domain Tropical, temperate or other filter (chr).

Group Taxonomic grouping information (chr).

Notes Other notes (chr).

Species The species names name (chr).

Test_endpoint Endpoint statistic, EC10, NEC etc (chr).

Units The concentration units of Conc (micrograms per Litre, ug/L) (chr).

Where toxicity measure is not a chronic NEC, EC10 or NOEC value, concentration has been converted using the appropriate default ratio, as follows: 10 from acute EC50/LC50 to chronic EC10; 5 from chronic EC50 to EC10; 2.5 from LOEC to EC10. Please see the primary reference material for more information.

All concentration data are ug/L unless otherwise stated.

Examples

```
print(csiro_nickel_fresh, n=Inf)
```

envirotox_data *Species Sensitivity Data from the EnviroTox Database*

Description

A named list containing Species Sensitivity Distribution (SSD) datasets derived from the EnviroTox database 2.0.0 Connors KA, Beasley A, Barron MG, Belanger SE, Bonnell M, Brill JL, de Zwart D, Kienzler A, Krailler J, Otter R, Phillips JL, Embry MR (2019). "Creation of a Curated Aquatic Toxicology Database: EnviroTox." *Environmental Toxicology and Chemistry*, **38**(5), 1062–1073. doi:10.1002/etc.4382..

Usage

```
envirotox_data
```

Format

A named list with three elements:

acute A tibble with 14,949 rows and 6 columns of acute toxicity records (EC50/LC50). See envirotox_acute for full column descriptions.

chronic A tibble with 1,721 rows and 5 columns of chronic toxicity records (NOEC/NOEL). See envirotox_chronic for full column descriptions.

chemical A tibble with 744 rows and 2 columns mapping chemical names to CAS Registry Numbers. See envirotox_chemical for full column descriptions.

Details

The `envirotox` data contains SSD datasets from the EnviroTox database 2.0.0 (Connors et al. 2019). The datasets are provided for assessing general patterns in SSD data and for testing code. The datasets should not be used to draw any conclusions about the toxicity of individual chemicals.

The data are aggregated following the code provided by Yanagihara M, Hiki K, Iwasaki Y (2024). "Which distribution to choose for deriving a species sensitivity distribution? Implications from analysis of acute and chronic ecotoxicity data." *Ecotoxicology and Environmental Safety*, **278**, 116379. doi:10.1016/j.ecoenv.2024.116379. with three exceptions: the datasets also include chemicals with (1) a bimodality coefficient > 0.555, (2) between six and nine species, and (3) two trophic groups.

The logical column `Yanagihara24` in `$acute` and `$chronic` indicates which chemicals meet the original criteria of Yanagihara et al. (2024): bimodality coefficient <= 0.555, at least 10 species, and at least three trophic groups.

The logical column `Iwasaki25` in `$acute` indicates which chemicals were included in the analysis of Iwasaki Y, Yanagihara M (2025). "Comparison of model-averaging and single-distribution approaches to estimating species sensitivity distributions and hazardous concentrations for 5\% of species." *Environmental Toxicology and Chemistry*, **44**(3), 834–840. doi:10.1093/etojnl/vgae060.: more than 50 species and at least three trophic groups, excluding certain metals.

The full reproducible workflow to generate the three component datasets is in `data-raw/envirotox/DATASET.R`.

Source

https://envirotoxdatabase.org/

References

Connors KA, Beasley A, Barron MG, Belanger SE, Bonnell M, Brill JL, de Zwart D, Kienzler A, Krailler J, Otter R, Phillips JL, Embry MR (2019). "Creation of a Curated Aquatic Toxicology Database: EnviroTox." *Environmental Toxicology and Chemistry*, **38**(5), 1062–1073. doi:10.1002/etc.4382.

Yanagihara M, Hiki K, Iwasaki Y (2024). "Which distribution to choose for deriving a species sensitivity distribution? Implications from analysis of acute and chronic ecotoxicity data." *Ecotoxicology and Environmental Safety*, **278**, 116379. doi:10.1016/j.ecoenv.2024.116379.

Iwasaki Y, Yanagihara M (2025). "Comparison of model-averaging and single-distribution approaches to estimating species sensitivity distributions and hazardous concentrations for 5\% of species." *Environmental Toxicology and Chemistry*, **44**(3), 834–840. doi:10.1093/etojnl/vgae060.

See Also

envirotox_acute, envirotox_chronic, envirotox_chemical

Examples

```
data("envirotox_data")
names(envirotox_data)
head(envirotox_data$acute)
head(envirotox_data$chronic)
head(envirotox_data$chemical)
```

---

envirotox_data_sets *List EnviroTox Dataset Names*

Description

Lists the names of the envirotox datasets in ssddata.

Usage

```
envirotox_data_sets()
```

Value

A character vector of envirotox dataset names.

Examples

```
envirotox_data_sets()
```

get_ssddata *Get SSD dataset*

Description

Retrieves a specific SSD dataset, filtering and groups by species and applies a geometric mean in the case of duplicate records.

Usage

```
get_ssddata(
  dataset_name,
  filter_val = NULL,
  use_gmmean = TRUE,
  spp_vec = c("Species", "Genus"),
  conc = "Conc"
)
```

Arguments

dataset_name	The name (chr) of the desired dataset in ssddata.
filter_val	A character string, indicating the filter to be applied (value) (colname) and which column it applies to, separated by "_". Must be in the form colname_value.
use_gmmean	Logical indicating if a geometric mean should be applied.
spp_vec	The group_by columns to use for grouping data and applying a geometric mean.
conc	The name of the concentration (x data) column.

Value

The data.frame for dataset_name with any applied groupings and summary.

Examples

```
get_ssddata("ccme_boron")
```

gm_mean *Calculate geometric mean*

Description

Calculates the geometric mean of a numeric vector

Usage

```
gm_mean(x, na.rm = FALSE, zero.propagate = TRUE)
```

Arguments

x	A numeric vector
na.rm	A flag specifying whether to remove missing values.
zero.propagate	A flag specifying whether to propagate zero values.

Value

A number of the geometric mean.

Examples

```
gm_mean(c(3, 66, 22, 17))
```

---

ssd_data_sets *List SSD Datasets*

Description

Returns a named list of SSD datasets from ssddata.

Usage

```
ssd_data_sets(
  set = "v2",
  split = NULL,
  summarize = "geomean",
  cas_lookup = TRUE
)
```

Arguments

set	A string or character vector controlling which datasets are returned. Options: • "v2" (default): all current individual non-aggregate datasets • "v1": fixed set of 20 datasets from ssddata v1 • one or more prefix strings e.g. c("ccme", "anzg"): filters v2 by prefix • "wqbench": splits wqbench_data by Chemical • "envirotox_acute": splits envirotox_acute by Chemical • "envirotox_chronic": splits envirotox_chronic by Chemical • "anztox": splits anztox_data by chemicalname_grouped x mediatype • "alldata": aggregates all *_data sources and splits by Chemical **Note:** aggregated values ("wqbench", "envirotox_acute", "envirotox_chronic", "anztox", "alldata") must be passed alone - they cannot be combined with each other or with prefix strings (e.g. c("wqbench", "ccme") is not supported and will error).

split	A character vector of column names to further split datasets by before returning. Columns absent from a dataset are silently skipped. Column values are appended to dataset names when the column is present. Default NULL applies no additional splitting.
summarize	A string controlling how duplicate Species rows within a chemical are handled. "geomean" (default) applies a geometric mean and emits a message; "none" returns data as-is and emits a message listing duplicates.
cas_lookup	A flag. When TRUE (default) and set = "alldata", uses data-raw/anztox/cas_parent_lookup.csv to align chemical names/CAS numbers across datasets before splitting (currently a no-op hook).

Value

A named list of tibbles. Every tibble is guaranteed to have Species as the first column and Conc as the second column. Datasets with no species information (anon_*) receive sequential species labels ("sp. A", "sp. B", ...). Additional columns follow in their original order.

Examples

```
ssd_data_sets()
ssd_data_sets(set = "v1")
ssd_data_sets(set = c("ccme", "anzg"))
```

---

ssd_fits *Species Sensitivity Distribution Fit Data*

Description

Species Sensitivity Distribution Fit Data

Usage

```
ssd_fits
```

Format

A tibble with 13 columns.

Dataset The name of the dataset in the ssddata package (chr).

Filter Any filtering applied to the data (chr).

Software The name of the software (chr).

Version The version of the software (chr).

Distribution The name of the distribution (chr)

PC The percent of the community protected (int).

Estimate The estimated concentration, in the units given by Units (dbl).

SE The standard error of the estimated concentration, in the units given by Units (dbl).

Lower The lower 95% CI of the estimated concentration, in the units given by Units (dbl).

Upper The upper 95% CI of the estimated concentration, in the units given by Units (dbl).

Reference The source of the fit (chr).

Notes Additional information on the fitting process (chr).

Units The concentration units of Estimate, SE, Lower and Upper. Each fit is recorded on the scale of the ssddata dataset it was fitted to, so this is not uniform: one of "ug/L", "mg/L" or "ng/L" (for example ccme_boron and ccme_chloride are mg/L, ccme_endosulfan is ng/L), and NA for the anon_* datasets, whose concentrations are deliberately unitless (chr).

Examples

```
head(ssd_fits)
```

`wqbench_data` *Species Sensitivity Data from US EPA ECOTOX Database*

Description

This dataset contains species sensitivity records for multiple chemicals. The data are from the US EPA ECOTOX database but are cleaned and standardized by the `wqbench` package.

Usage

```
wqbench_data
```

Format

A tibble with columns:

Chemical The chemical common name (chr).

cas The chemical cas number (chr).

Species The species latin name (chr).

common_name The species common name (chr).

effect The effect that was being tested (chr).

conc The chemical concentration in micrograms per litre (dbl).

trophic_group Trophic group of species (fct).

ecological_group Identification of salmonids and planktonic invertebrates; otherwise "other" (fct).

species_present_in_bc Whether species is present in British Columbia, Canada (logi).

class The class name (chr).

tax_order The order name (chr).

family The family name (chr).

Details

These data were sourced from: U.S. Environmental Protection Agency (2025). "ECOTOXicology Knowledgebase." Accessed 2025, https://cfpub.epa.gov/ecotox/.

The data cleaning steps closely follow the wqbench processing procedures and the resulting data should be very similar.

In brief, the wqbench processing compiles data from the ECOTOX database by firstly classifying tests as either acute or chronic; converting any acute data to chronic based on published acute to chronic ratios; and finally aggregating data into a single row for each individual species.

Aggregation is achieved by grouping data by life stage; selecting the most sensitive endpoint; selecting the most preferred toxicity estimate(s) in the event that more than one are available; and applying a geometric mean if more than one value for the preferred toxicity metric are available for the most sensitive endpoint.

Some deviations from the wqbench processing steps were applied to generalise the data set beyond a focus on British Columbia (BC), and in part to align with technical guidance from other jurisdictions (for example, Australia and New Zealand, ANZG).

Deviations from the wqbench processing steps include:

1. All chemicals with six or more species are included regardless of whether they contain species present in BC. These would be excluded for wqbench which was designed with the aim of being representative for BC.
2. Only chemicals with representative species for four or more taxonomic classes are included. This was done to align somewhat with the methods for ANZG (https://www.waterquality.gov.au/anz-guidelines/guideline-values/derive/warne-method-derive-2025) which requires guidelines are derived only when there are taxa from four or more "distinct taxa". Using class to define "distinct taxa" only approximates this requirement, because the definition provided in the ANZG is not linked directly to any one taxonomic hierarchical level and therefore cannot be applied in any automated way using the taxonomic hierarchy.

Examples

```
print(wqbench_data)
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