

# Package ‘cmpprocess’

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**Type** Package

**Title** Flexible Modeling of Count Processes

**Version** 1.0

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**Description**

A toolkit for flexible modeling of count processes where data (over- or under-) dispersion exists. Estimations can be obtained under two data constructs where one has:  
(1) data on number of events in an s-unit time interval, or (2) only wait-time data.  
This package is supplementary to the work set forth in Zhu et al. (2016) <doi:10.1080/00031305.2016.1234976>.

**Imports** compoisson, numDeriv

**URL** <http://amstat.tandfonline.com/doi/full/10.1080/00031305.2016.1234976#.WKfOdPkrJPY>

**BugReports** <https://github.com/diagdavenport/cmpprocess/issues>

**License** GPL-3

**LazyData** TRUE

**RoxygenNote** 6.0.0

**NeedsCompilation** no

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**Repository** CRAN

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cmpproc	<i>COM Poisson Process Parameter Estimation.</i>
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## Description

cmpproc computes the maximum likelihood estimates of a COM-Poisson process for given count data.

## Usage

```
cmpproc(counts, s = 1, h.out = FALSE)
```

## Arguments

counts	A vector (-like object) of counts.
s	The time interval corresponding to the levels of the counts vector.
h.out	A boolean indicating if the information matrix and associated standard errors are returned. This can have a significant impact on processing time and should be left at the default unless needed

## Value

cmpproc will return a list of seven elements: [1] se (Standard errors), [2] H (Information matrix), [3] lambda, [4] nu, [5] Z, [6] ll (Log likelihood), and [7] aic.

## Examples

```
## Standard usage
data(floodcount)
cmpproc(floodcount$Counts)
```

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 cmpprocwt

*COM Poisson Process Parameter Estimation*


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**Description**

cmpprocwt computes the maximum likelihood estimates of a COM-Poisson process for given wait time data

**Usage**

```
cmpprocwt(dispersion, t)
```

**Arguments**

dispersion	Ratio between the mean and variance of the process
t	A vector (like object) of wait times

**Value**

cmpprocwt will return a list of three elements: [1] lambda, [2] nu, and [3] convergence

**Examples**

```
## Standard use
data(floodcount)
cmpprocwt(.8 , mean(floodwait$WT))
```

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 fetalcount

*Fetal lamb movements*


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**Description**

Number of movements by a fetal lamb observed by ultrasound and counted in successive 5-second intervals

**Usage**

```
fetalcount
```

**Format**

A dataframe with 224 rows and 1 variable

**Counts** Number of movements, note that the variance is 0.693 and the mean is 0.382

**Source**

(Guttorp , 1995)

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fetalwait	<i>Fetal lamb movement wait times</i>
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**Description**

Time between movements by a fetal lamb observed by ultrasound

**Usage**

fetalwait

**Format**

A dataframe with 58 rows and 1 variable

**WT** Number of 5-second intervals between fetal movements

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floodcount	<i>Rio Negro floods</i>
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**Description**

Years of major floods between 1892-1992 (inclusive) on the Rio Negro River in Brazil description

**Usage**

floodcount

**Format**

A dataframe with 101 rows and 2 variables:

**Year** Year of reference

**Counts** Count of floods in a given year, note that the variance is 0.166 and the mean is 0.208

**Source**

(Guttorp, 1995) See Brillinger, 1995 for full dataset.

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floodwait

*Rio Negro flood wait times*

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**Description**

Time between major floods between 1892-1992 (inclusive) on the Rio Negro River in Brazil

**Usage**

floodwait

**Format**

A dataframe with 20 rows and 1 variable:

**WT** Number of years between floods

**Source**

Wait time data were derived from Guttorp, 1995.

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