iSAM

Process Description:

@time\_varying type annual\_shift

Author:

*Scott Rasmussen*

*Zaita*

*scott.rasmussen@zaita.com*

# Process Overview

What is the point of this process? What does it offer the that the other processes don't?

Based on the process @time\_varying type annual\_constant, but instead of estimating the values every year, we estimate a shift parameter based on the values every year. The user provides a value each year and then shift parameters that can be estimated. The parameter is then shifted annually by a cubic function times annual values corrected by their mean (or specific value).

Example

@selectivity SlopeSel  
type double\_normal  
mu 8  
sigma\_l 4  
sigma\_r 10  
alpha 1.0

@time\_varying MySlopeSel  
type annual\_shift  
parameter selectivity[SlopeSel].mu  
years 1995-2000  
values 1500 1700 1300 1900 2500 1500  
a 0.5  
b 0   
c 0  
d 0  
scaling\_years 1996-1999

# Example Configuration File Syntax

Please put in a list of all parameters you expect to be able to use in the configuration file, including the type of parameter, is it a list or single value, is it optional or have a default value etc. The more information here the better.

@time\_varying <label ; string>  
type annual\_shift

Parameter: Defines the parameter which will is time varying  
Type: string   
Default: no default  
Value: has to be of suitable format to define an existing parameter

years Define the years when the parameter has a different value from the default value   
Type: Vector of integers or integer range  
Default: No default  
Value: Valid model years

values: time varying values of the parameter  
Type: string vector, of length years (once expanded), not estimable  
Default: no default  
Value: value of the parameter in each year. These are not estimable as estimating the values and shift would be over-parametrisation. If estimable values are required, use @time\_varying with type constant.

a: value of the cubic function (a + b\*x + c\*x^2 + d \* x^3)  
Type: Estimable real number  
Default: no default  
Value: First value of the cubic function

b: value of the cubic function (a + b\*x + c\*x^2 + d \* x^3)  
Type: Estimable real number  
Default: zero  
Value: Second value of the cubic function

c: value of the cubic function (a + b\*x + c\*x^2 + d \* x^3)  
Type: Estimable real number  
Default: zero  
Value: Third value of the cubic function

d: value of the cubic function (a + b\*x + c\*x^2 + d \* x^3)  
Type: Estimable real number  
Default: zero  
Value: Fourth value of the cubic function

scaling\_years: Defines the years to use for scaling the values prior to applying the shift  
Type: Vector of integers or integer range, has to be part of years  
Default: years  
Value: Vector of integers

# Step-by-step

A detailed list of steps the process goes through in order to achieve it's purpose.

1. Calculate the scaled values for the parameter in the model year:

scaled\_values[year] = values[year] – mean(values[scaling\_years])

1. Calculate the value:

parameter[year] = a + b\* scaled\_values[year] + c\* scaled\_values[year]^2 + d \* scaled\_values[year]^3

All other characteristics of @time\_varying such as projections etc apply.