Manual for Package: ecohydrology
Revision 2:3M

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Contents

1 @Klausmeier

1.1 Klausmeier

1.2 dy_dt

1.3 dy_dx

1.4 dy_dx_lin

1.5 extract

1.6 homogeneous_state

1.7 init

2 @Rietkerk

2.1 Rietkerk

```
c.f. Rietkerk et al. 2002, Self-Organization of Vegetation in Arid
    Ecosystems
```

2.2 celerity

```
migration celerity of the pattern
```

2.3 critical_rainfall_depth

2.4 diffusion_rate

2.5 dlogz_dx

```
Rietkerk pde transformed to set of odes through assuming wave-
    equations
```

2.6 dz_dt

time-derivative of the Rietkerk-pde

2.7 dz_dt_coefficient

time-derivative of the Rietkerk-pde

2.8 dz_dx

2.9 extract1

extract biomass, soil water and surface water from the combined vector

2.10 extract2

2.11 growth_rate

migration celerity of the pattern

2.12 homogeneous_state

homogeneous (not necessarily stable) states of the Rietkerk system

2.13 infiltration_enhancement

infiltration enhancement of the Rietkerk model

2.14 init

```
initialize all variables
```

2.15 initial_condition_from_central_frequency

```
extract dominant frequeny from a previous model run and generate a
    new
initial condition with only this frequency
for faster generation of asymptotic patterns
```

2.16 jacobian

```
jacobian of the Rietkerk model
```

2.17 make_symbolic

```
make model parameters symbolic
```

2.18 random_state

```
generate random initial state
```

2.19 reaction_matrix

2.20 solve

```
solve the Rietkerk model
```

2.21 solve_split

2.22 solve_stationary

```
solve until stationary state is reached
```

2.23 solve_trapezoidal

```
trapezoidal time stepping with fixed time step
```

2.24 stationary_step

```
quasi-stationary time-step
```

3 @Rietkerk_Map

3.1 Rietkerk_Map

```
database for Rietkerk model runs
```

3.2 hash

```
has the model parameters for filename generation
```

3.3 run

```
run the Rietkerk model with parameters specified by varargin,
or retrieve the saved results, when the model was already run
```

3.4 write_table

```
write hashtable as human readable csv
```

4 ecohydrology

4.1 migration_celerity_1d

```
estimate migration celerity of a travelling wave
```

5 test

5.1 test_rietkerk_asymptote

5.2 test_rietkerk_celerity

5.3 test_rietkerk_convergence

5.4 test_rietkerk_homogeneous

5.5 test_rietkerk_implicit_1d

5.6 test_rietkerk_implicit_2d

5.7 test_rietkerk_zero_inertia