bad_weather__conditions(t) = bad_weather__conditions(t - dt) + (increasing_precipitation - decreasing_precipitation) * dt

INIT bad_weather__conditions = 0

INFLOWS:
- increasing_precipitation = precipitation/10

OUTFLOWS:
- decreasing_precipitation = delay(increasing_precipitation, 1, 0)

evacuated_people(t) = evacuated_people(t - dt) + (conducting_measures_evacuation) * dt

INIT evacuated_people = 0

INFLOWS:
- conducting_measures_evacuation = (SMTH1(number_of_relief_units_conducting_evacuation * performance_per_hour_and_person_evak, delay_due_to_lacking_cooperation_population + delay_due_to_lacking_cooperation_mobility + delay_due_to_lacking_cooperation_relief_2, 0))

number_of_relief_units_conducting_evacuation(t) = number_of_relief_units_conducting_evacuation(t - dt) + (relief_units_allocated_to_evacuation - back_to_stock_from_evacuation) * dt

INIT number_of_relief_units_conducting_evacuation = 0

INFLOWS:
- relief_units_allocated_to_evacuation = (SMTH1(discrepancy/performance_per_hour_and_person_evak, (time_needed_for_decision_evacuation + delay_due_to_transportation), 0))

OUTFLOWS:
- back_to_stock_from_evacuation = number_of_relief_units_conducting_evacuation/12

number_of_relief_units_mobile_protection_measures(t) = number_of_relief_units_mobile_protection_measures(t - dt) + (relief_units_allocated_to_mobile_protection - back_to_stock_from_mobile_protection) * dt

INIT number_of_relief_units_mobile_protection_measures = 0

INFLOWS:
- relief_units_allocated_to_mobile_protection = (SMTH1(gap/performance_per_hour_and_person_mobile_protection, (time_needed_for_decision_mobile_protection + delay_due_to_transportation), 0))

OUTFLOWS:
- back_to_stock_from_mobile_protection = number_of_relief_units_mobile_protection_measures/12

relief_units_stock(t) = relief_units_stock(t - dt) + (back_to_stock_from_mobile_protection + back_to_stock_from_evacuation - relief_units_allocated_to_mobile_protection - relief_units_allocated_to_evacuation) * dt

INIT relief_units_stock = initial_relief_stock

INFLOWS:
- back_to_stock_from_mobile_protection = number_of_relief_units_mobile_protection_measures/12

back_to_stock_from_evacuation = number_of_relief_units_conducting_evacuation/12

OUTFLOWS:
- relief_units_allocated_to_mobile_protection = (SMTH1(gap/performance_per_hour_and_person_mobile_protection, (time_needed_for_decision_mobile_protection + delay_due_to_transportation), 0))

- relief_units_allocated_to_evacuation = (SMTH1(discrepancy/performance_per_hour_and_person_evak, (time_needed_for_decision_evacuation + delay_due_to_transportation), 0))

water_level_stock(t) = water_level_stock(t - dt) + (inflow_water_level - outflow_water_level) * dt

INIT water_level_stock = 0

INFLOWS:
- inflow_water_level = water_level*(0.5+increase_of_water_level)

OUTFLOWS:
- outflow_water_level = delay(inflow_water_level, 1, 0)

cooperation_within_the_relief_units = GRAPH(number_of_relief_units_mobile_protection_measures)

(0.00, 0.00), (50.0, 0.105), (100, 0.225), (150, 0.32), (200, 0.425), (250, 0.555), (300, 0.67), (350, 0.74), (400, 0.81), (450, 0.88), (500, 1.00)

cooperation_within_the_relief_units_2 = GRAPH(number_of_relief_units_conducting_evacuation)

(0.00, 0.00), (50.0, 0.18), (100, 0.5), (150, 0.98), (200, 1.30), (250, 1.60), (300, 1.92), (350, 2.28), (400, 2.70), (450, 3.26), (500, 3.94)
\[ \text{delay due to lacking mobility} = \text{GRAPH}(\text{mobility of the population}) \]
\[ \text{delay due to flooded road} = \text{GRAPH}(\text{flooded road}) \]
\[ \text{delay due to flooded cooperation population} = \text{GRAPH}(\text{not cooperative share of population}) \]
\[ \text{delay due to flooded cooperation relief} = \text{GRAPH}(\text{cooperation within the relief units}) \]
\[ \text{delay due to lacking cooperation population} = \text{GRAPH}(\text{not cooperative share of population}) \]
\[ \text{delay due to lacking cooperation relief} = \text{GRAPH}(\text{cooperation within the relief units}) \]
\[ \text{delay due to road condition} = \text{GRAPH}(\text{road condition}) \]
\[ \text{delay due to transportation} = (\text{delay due to flooded road} \times \text{Threshold}_1 + \text{delay due to flooded road} \times \text{Threshold}_2) + (\text{delay due to road condition}) \]
\[ \text{discrepancy} = \text{if} \text{ water level stock} > 700 \text{ then } (\text{number of people that have to be evacuated} - \text{evacuated people}) \text{ else } 0 \]
\[ \text{flooded road} = \text{GRAPH}(\text{water level stock}) \]
\[ \text{gap} = \text{if} \text{ water level stock} > 500 \text{ then } (\text{mobile protection needed} - \text{mobile protection installed}) \text{ else } 0 \]
\[ \text{increase of water level} = 0.5 \]
\[ \text{initial need mobile protection} = 1000 \]
\[ \text{initial need evacuation} = 1000 \]
\[ \text{initial relief stock} = 50 \]
\[ \text{mobility of the population} = \text{random}(0,1) \]
\[ \text{not cooperative share of population} = \text{random}(5,10) \]
\[ \text{performance per hour and person evac} = \text{LOGNORMAL}(10,10^0.2) \]
\[ \text{performance per hour and person mobile protection} = \text{LOGNORMAL}(4.5,4.5^0.2) \]
\[ \text{precipitation} = \text{GRAPH}(\text{TIME}) \]
\[ \text{road condition} = \text{GRAPH}(\text{bad weather conditions}) \]
\[ \text{Threshold}_1 = \text{IF} \text{ water level stock} < 700 \text{ then } 0 \text{ else } 1 \]
\[ \text{Threshold}_2 = \text{IF} \text{ water level stock} > 1200 \text{ THEN } 1 \text{ ELSE } 0 \]
\[ \text{time needed for decision mobile protection} = \text{random}(0.5,2) \]
\[ \text{time needed for decision evacuation} = \text{random}(0.5,2) \]
\[ \text{water level} = \text{GRAPH}(\text{TIME}) \]