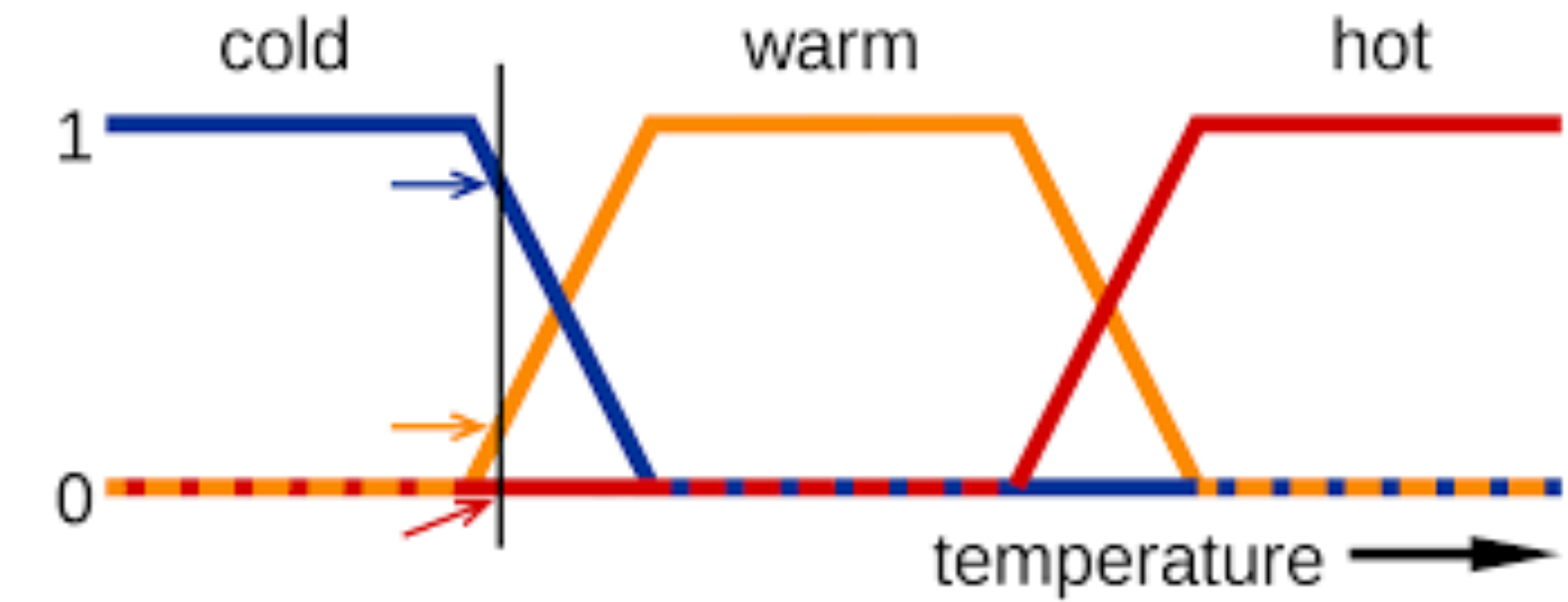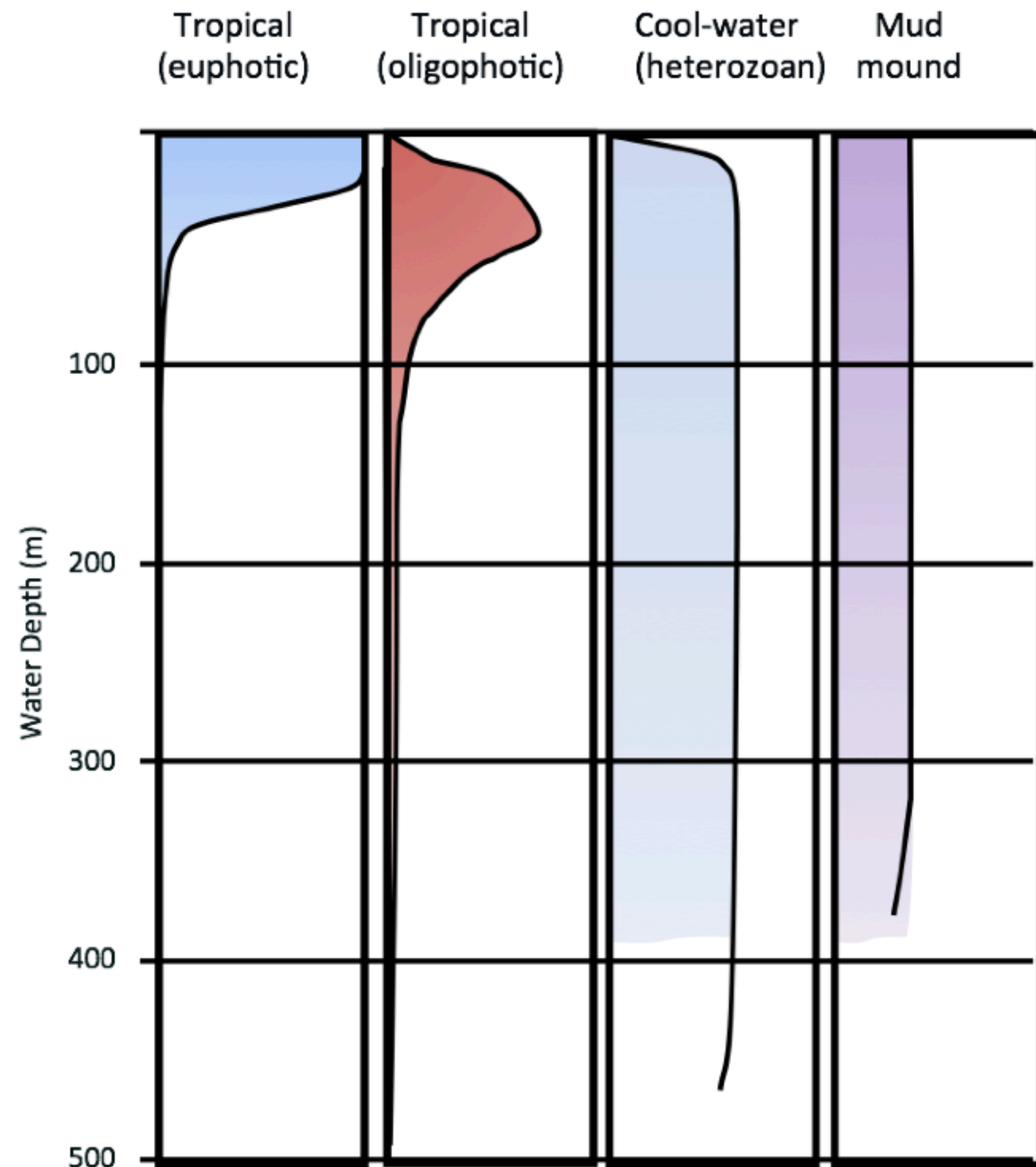# Alternative modelling approaches

Fuzzy logic

Standard paradigm: carbonate factory type, represented by carbonate production profile, controls platform architecture

Rule 1: Rudist reefs will form rapidly when a site is at the surface, very far from a river, exposed to open water, in a hot region, is not on land and has no sediment input.
Rule 2: Pelagic reefs will form rapidly when a site is in the photic zone, very far from a river, far from the shore, not at the surface and has no sediment input.

Alternative modelling approaches

Fuzzy logic

INPUT DATA — average sedimentation rate *sed*=5 m/kyr — water depth *d*=8 m — average orbital velocity u_b=1.5 m/s

FUZZY SETS FROM CONTROL VARIABLES

SEDIMENTATION RATE · WATER DEPTH · WAVE ENERGY

FUZZY RULES: *if-then*

if low sed. rate **and** shallow depth **and** medium velocity **then** high production

if medium sed. rate **and** medium depth **and** high velocity **then** medium production

AGGREGATION METHOD AND DEFUZZIFICATION

overlap · AGGREGA-TION · centroid method · DEFUZZIFI-CATION · FUZZY LOGIC RESULT 1.05 m/kyr

School of Geosciences