How can contemporary climate research help understand epidemic dynamics?

An ensemble approach and snapshot attractors

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EGU GA 2022

SEIR – stationary model

$$\frac{dS}{dt} = m - bSI - mS,$$

$$\frac{dE}{dt} = bSI - (m + a)E,$$

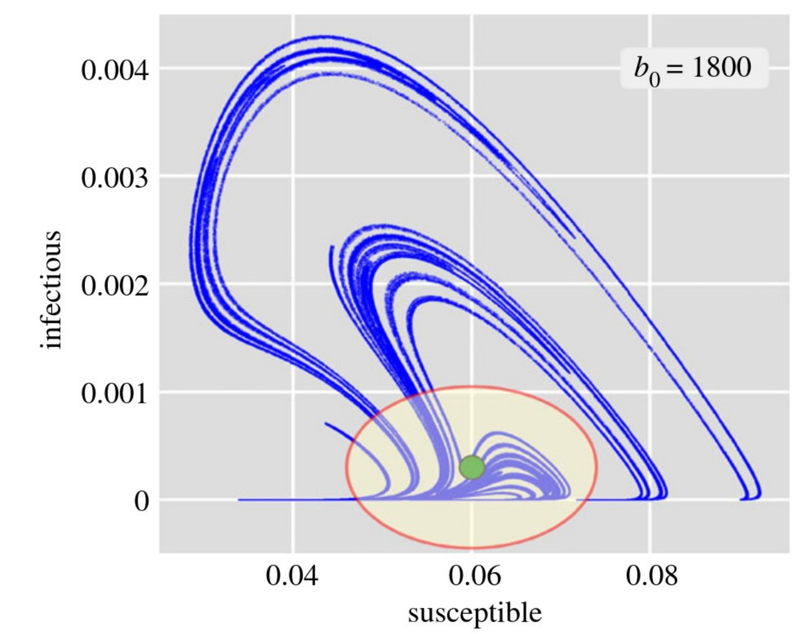
$$\frac{dI}{dt} = aE - (m + g)I,$$

$$\frac{dR}{dt} = gI - mR,$$

Ludwig D, Cooke KL. 1975.

$$b(t) = b_0(t)[1 + b_1 \cos(2\pi t)],$$

$$\sigma_A = (\langle A^2 \rangle - \langle A \rangle^2)^{1/2},$$



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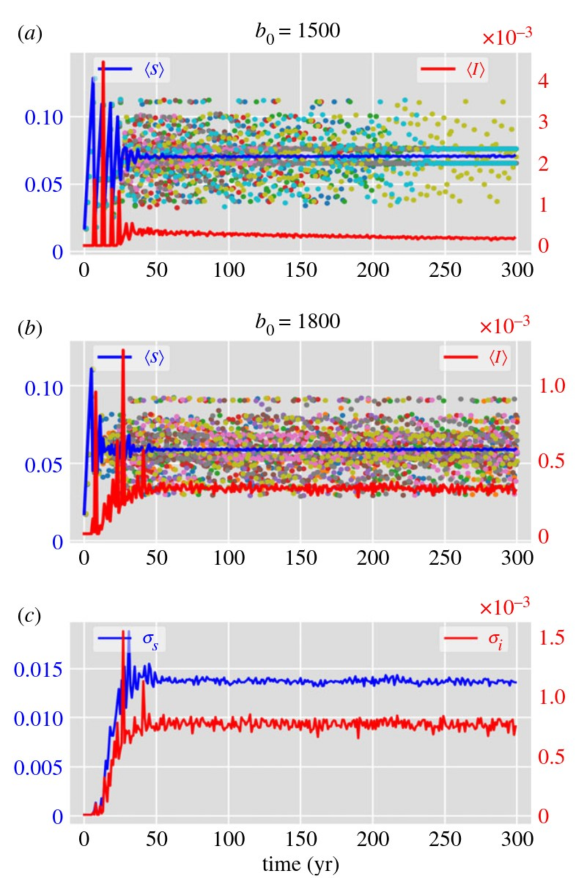

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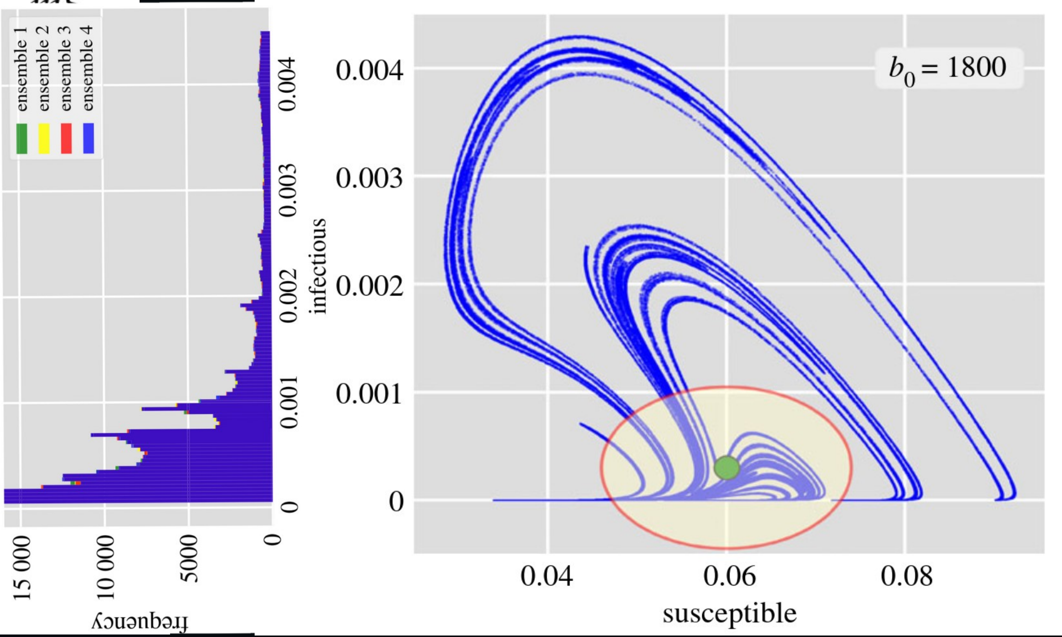

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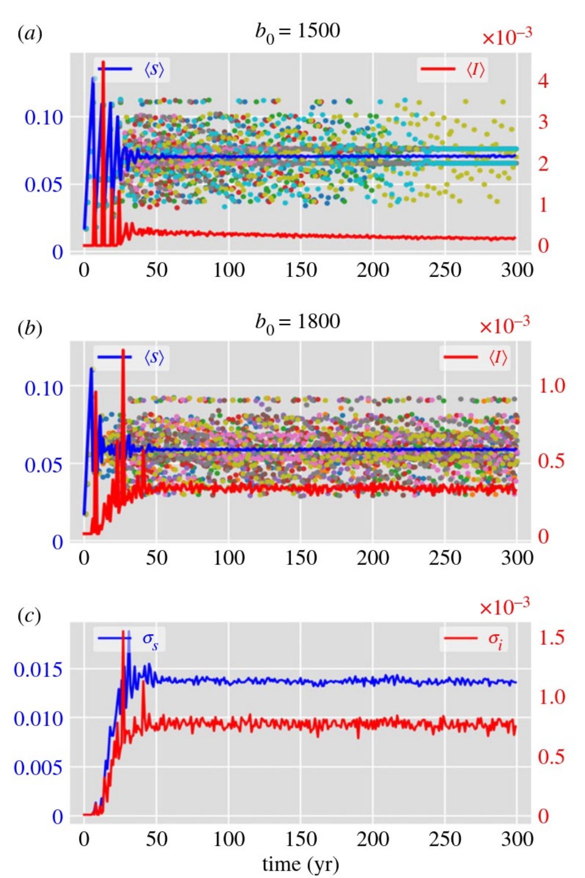

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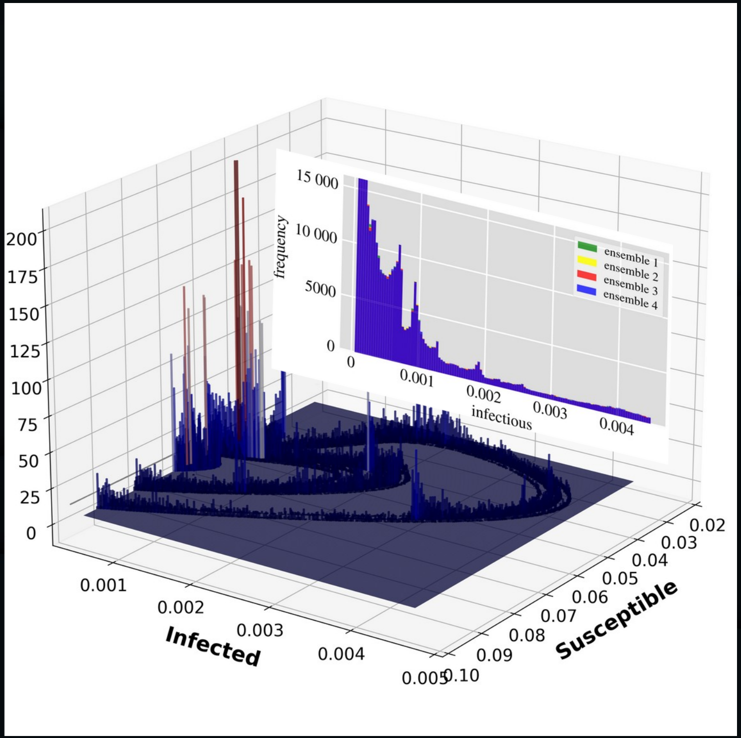

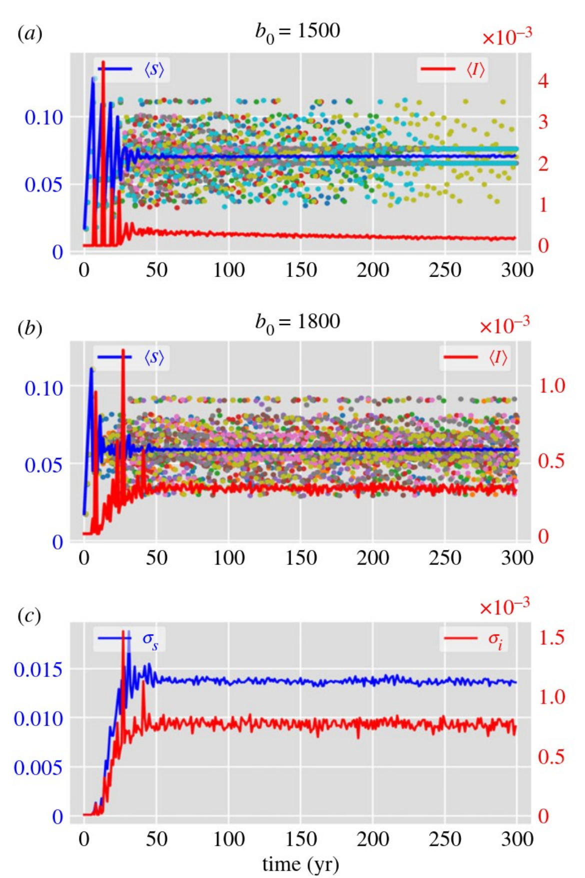

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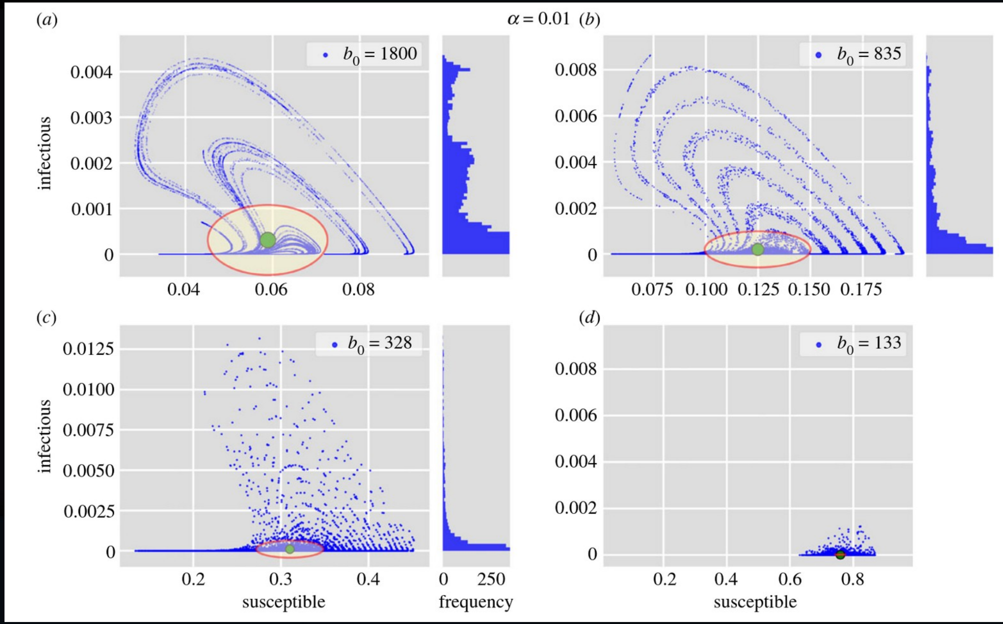
SEIR – ensemble approach & pullback attractor

Ghil 2019; Ghil & Lucarini 2020; Pierini et al. 2016; Tél et al. 2019



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$$b_0(t) = \begin{cases} 1800 & \text{if } t \le t_{st} \\ 1710e^{-\alpha(t-t_{st})} + 90 & \text{if } t > t_{st}. \end{cases}$$

SEIR – ensemble approach & pullback attractor

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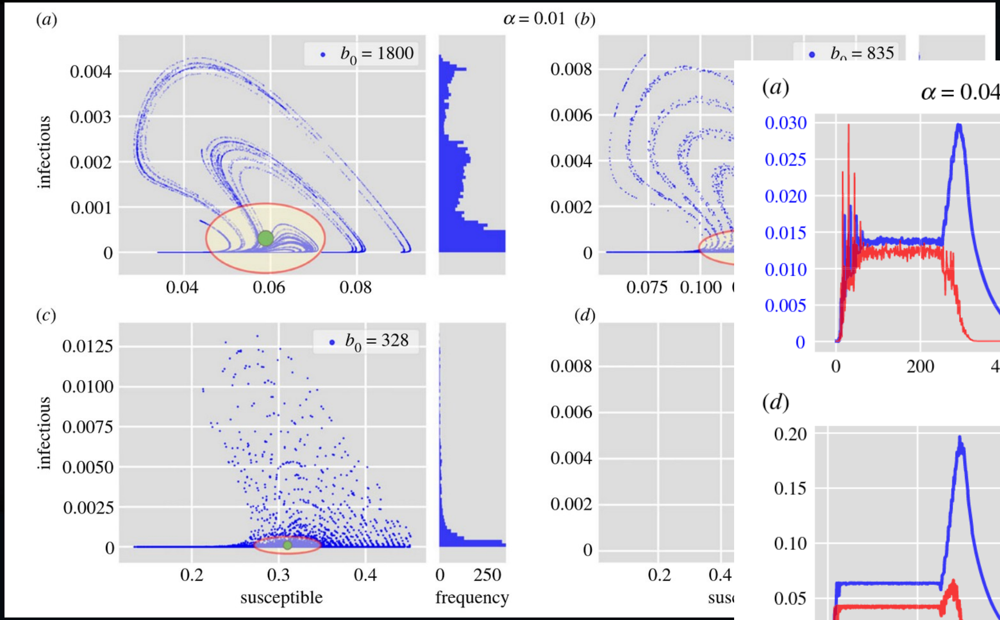

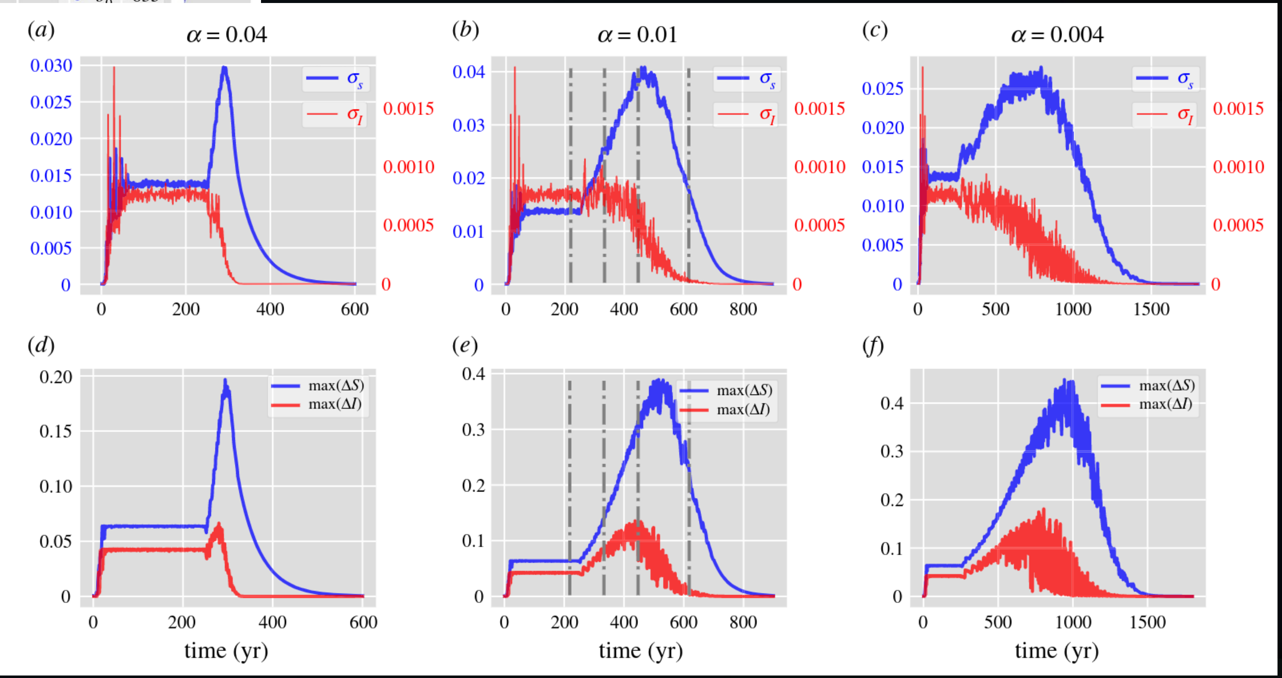

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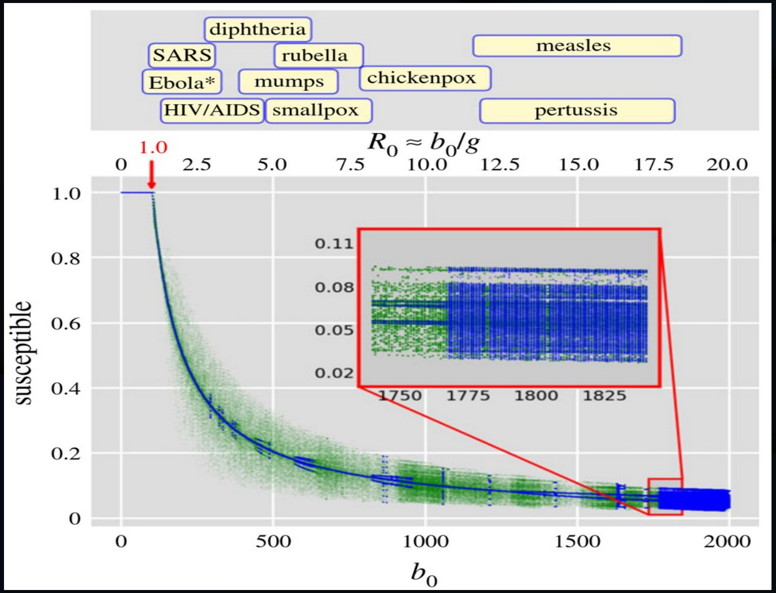

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