# Supporting Information for "Tipping elements and climate-economic shocks: Pathways toward integrated assessment"

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1. Text S1

**Text S1. Supporting methods for Figure 2**

The systems shown in Figure 2 are driven by the following equations:

$$y_{eq}(x) = A\Big(1 - 1/\Big[1 + \exp\Big(-\frac{x - x_0}{\sigma}\Big)\Big]\Big) - \beta x + c \quad (1)$$

$$x(y) = F(t) - \gamma(y - y_0) \quad (2)$$

$$\frac{dy}{dt} = \frac{y_{eq} - y}{\tau} \quad (3)$$

where $F(t)$ represents the exogenous forcing as a function of time (Figure 2a), $y_{eq}$ represents the equilibrium response as a function of a state variable x related to forcing (Figure 2b), and $y$ represents the realized response of the system. $A$ scales the non-linear system response, $\sigma$ scales the width of the sigmoidal equilibrium response, $\beta$ is the linear response of the system to the state variable $x$, $\tau$ is the timescale over which the system approaches equilibrium, and $\gamma$ represents the feedback of $y$ onto $x$. In Figure 2c-d, $\gamma = 0$. In Figure 2e-f, $\tau \to 0$ so $y = y_{eq}$.

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