

Projeto 1 – Dinâmica Populacional

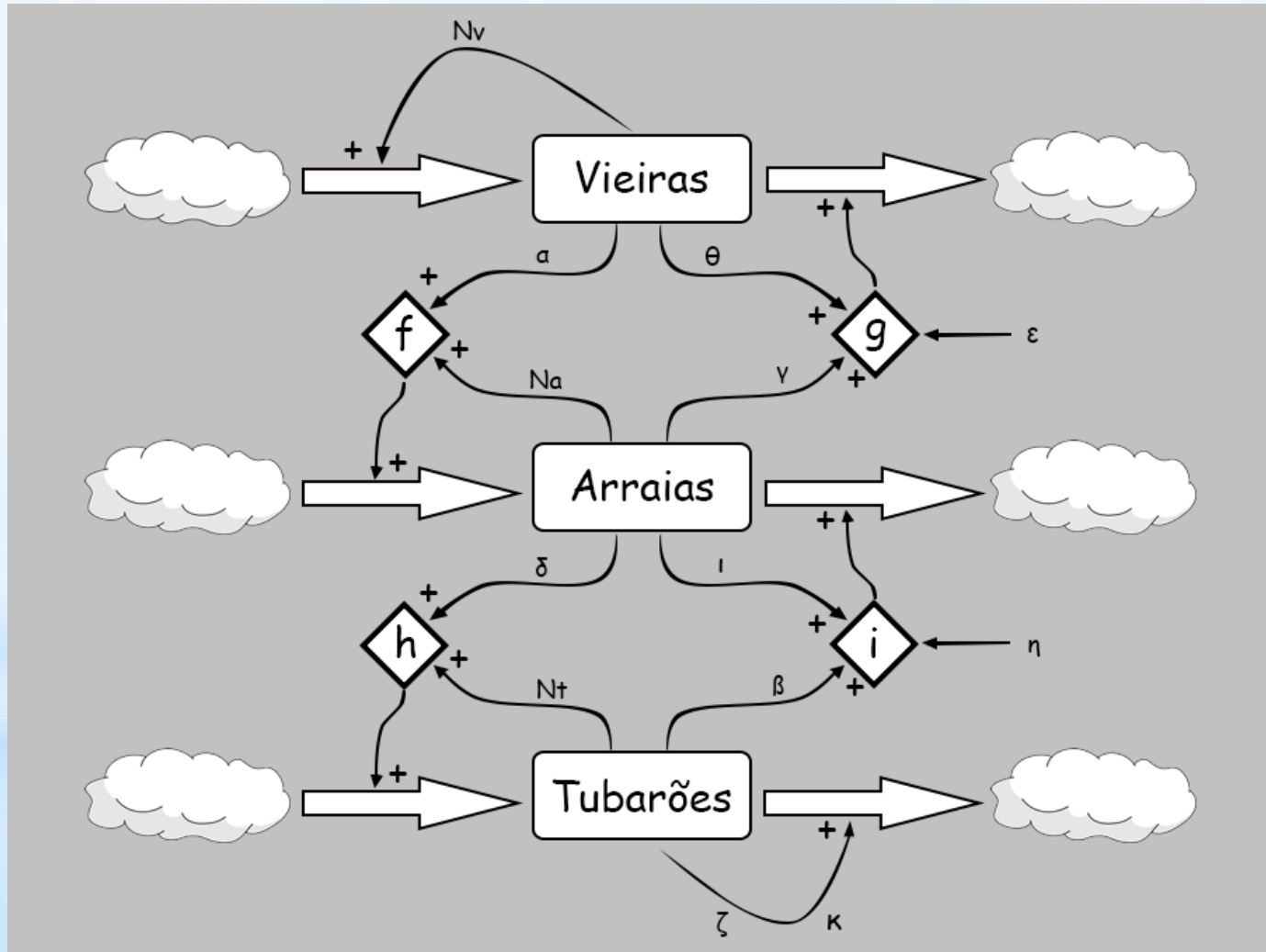
Vieiras, Arrais e Tubarões

Como o aumento da caça de vieiras influencia
a relação entre arraias e tubarões?

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2017

Modelo



Parâmetros e equações à diferenças

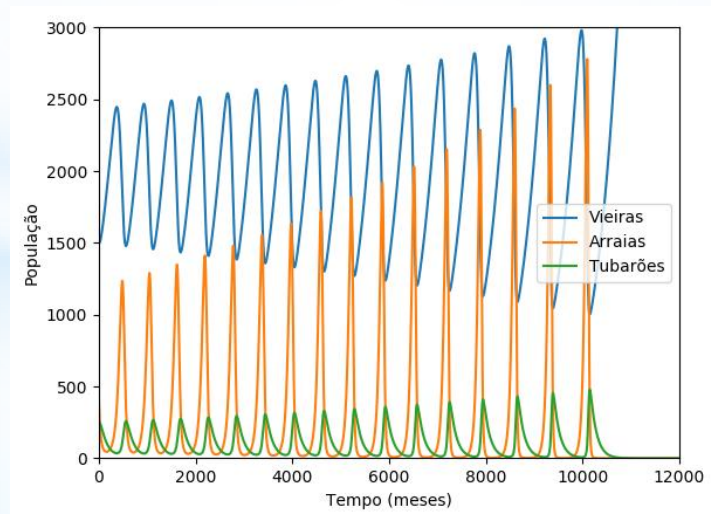
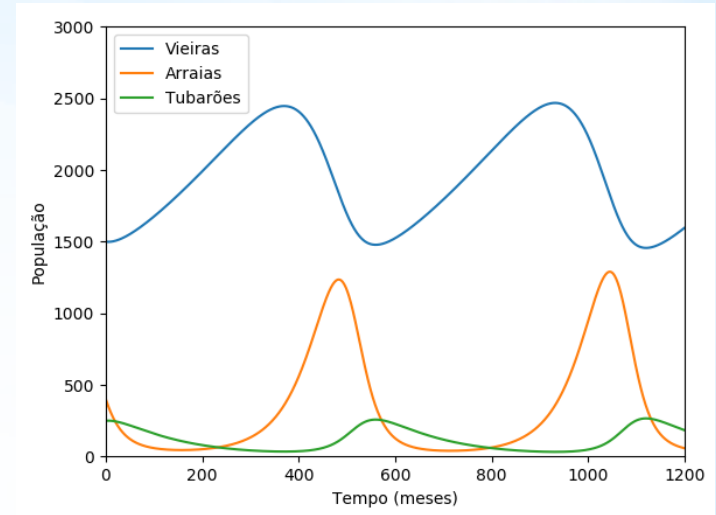
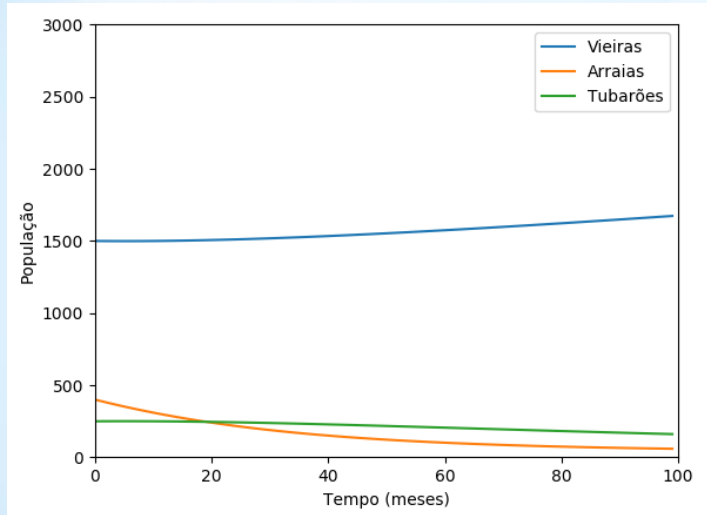
Nv: Taxa de crescimento vegetativo de vieiras	Nv = 0,45
Na: Taxa de crescimento vegetativo de arraia	Na = 0,2
Nt: Taxa de crescimento vegetativo de tubarões	Nt = 0,14
α : Coeficiente de influência de vieiras na população de arraia	$\alpha = 0,009$
β : Coeficiente de influência de tubarões na população de arraia	$\beta = 0,05$
γ : Coeficiente de influência de arraia na população de vieiras	$\gamma = 0,0045$
δ : Coeficiente de influência de arraia na população de tubarões	$\delta = 0,018$
ε : Taxa de caça de vieiras	$\varepsilon = 0,35$
ζ : Taxa de caça de tubarões	$\zeta = 0,12$
η : Taxa de caça de arraia	$\eta = 0,05$
θ : Coeficiente de limitação do meio para vieiras	$\theta = 205$
ι : Coeficiente de limitação do meio para arraia	$\iota = 145$
κ : Coeficiente de limitação do meio para tubarões	$\kappa = 3$
Lv: Quantidade limite de vieiras no meio	Lv: 2000
La: Quantidade limite de arraia no meio	La: 800
Lt: Quantidade limite de tubarões no meio	Lt: 300

$$V(t+1) = V(t) + V(t) * Nv - \gamma * \left(\frac{A(t)}{La} - 1 \right) * V(t) - \varepsilon * V(t) - \theta * \frac{V(t)}{Lv}$$

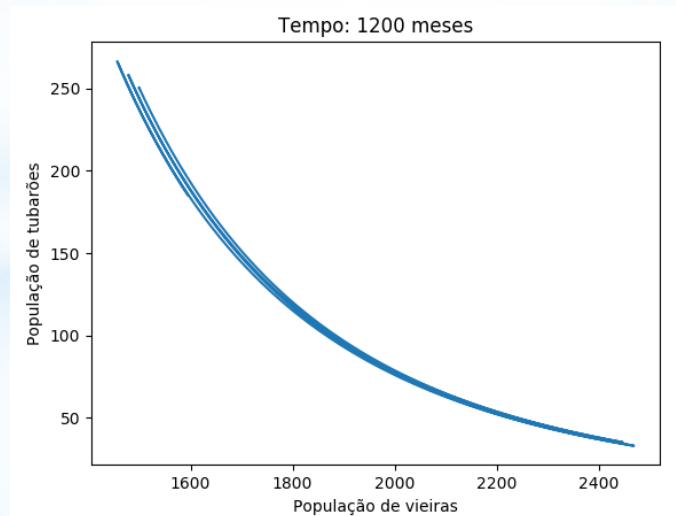
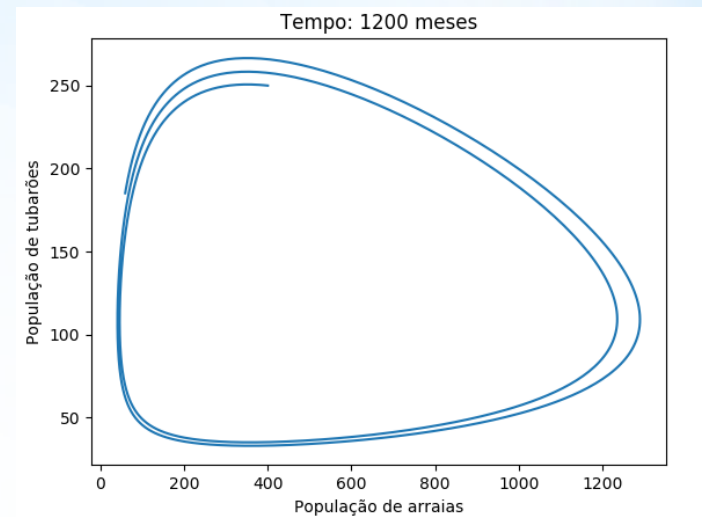
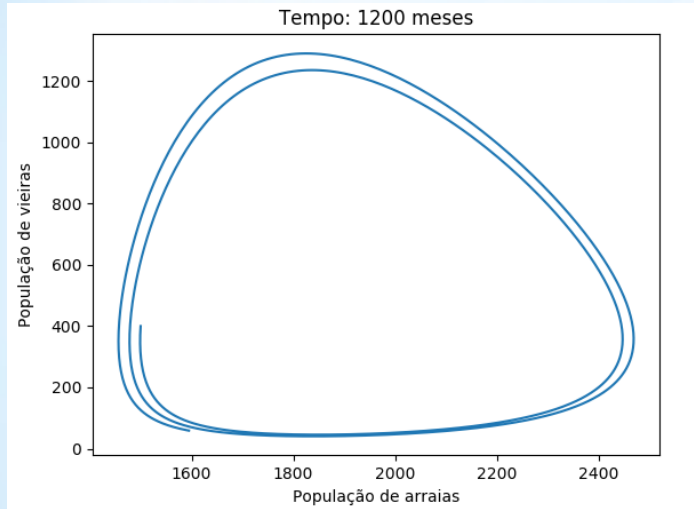
$$A(t+1) = A(t) + A(t) * Nv + \alpha * \left(\frac{V(t)}{Lv} - 1 \right) * A(t) - \beta * \left(\frac{V(t)}{Lv} - 1 \right) * A(t) - \eta * A(t) - \iota * \frac{V(t)}{Lv}$$

$$T(t+1) = T(t) + T(t) * Nt + \delta * \left(\frac{A(t)}{La} - 1 \right) * T(t) - \zeta * T(t) - \kappa * \frac{T(t)}{Lt}$$

Resultados

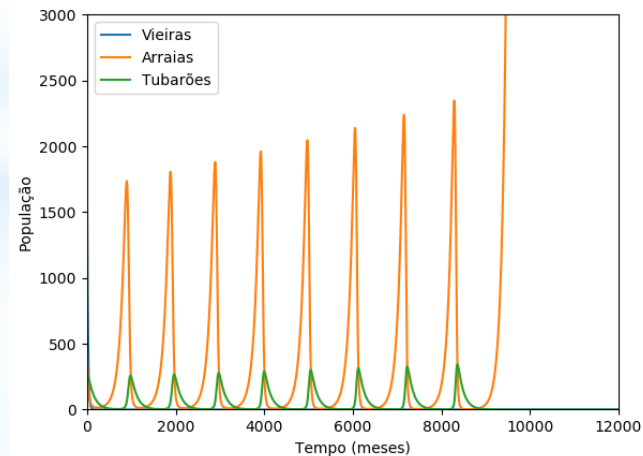
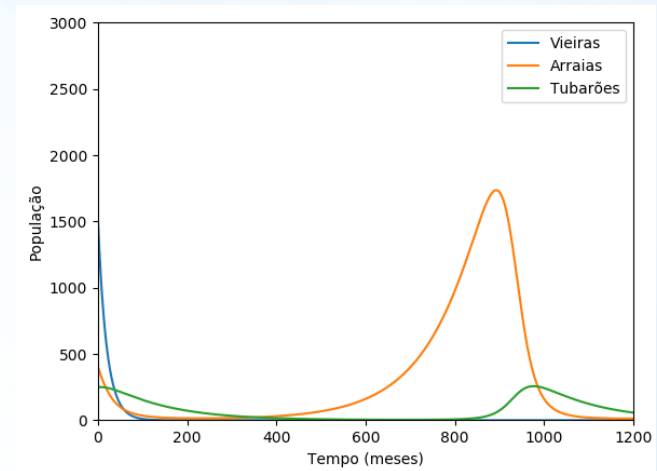
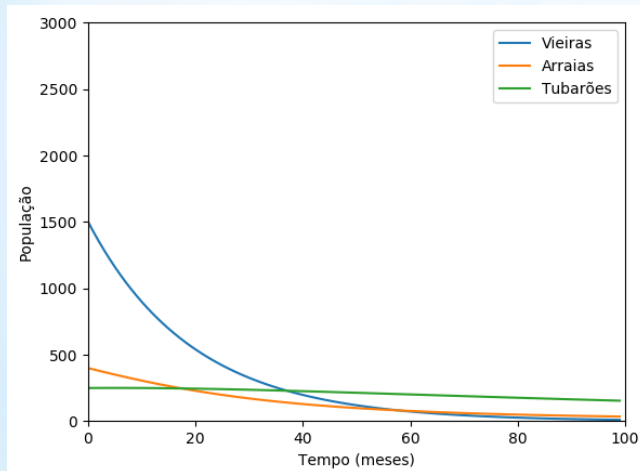


Resultados



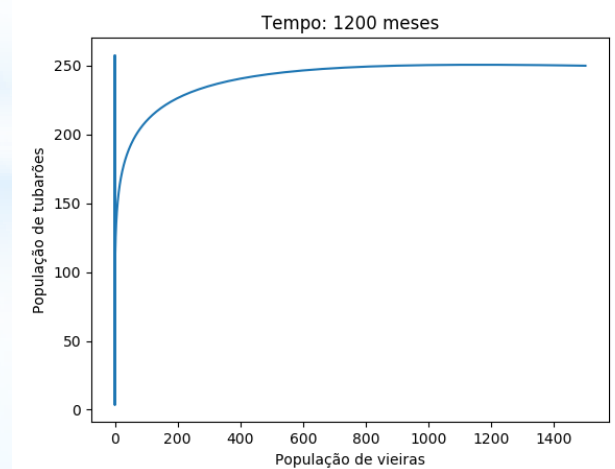
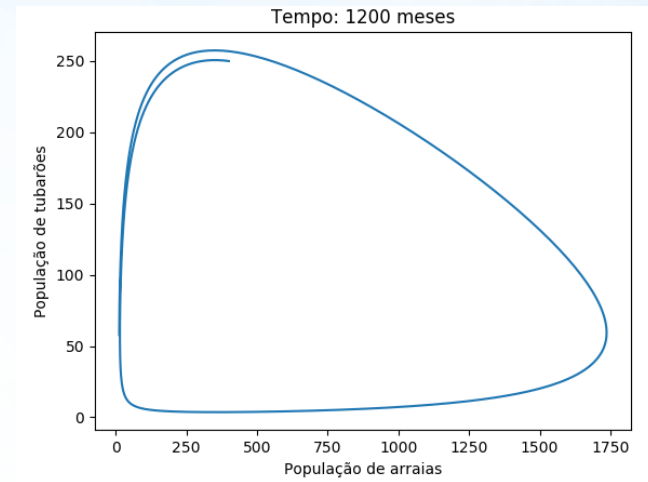
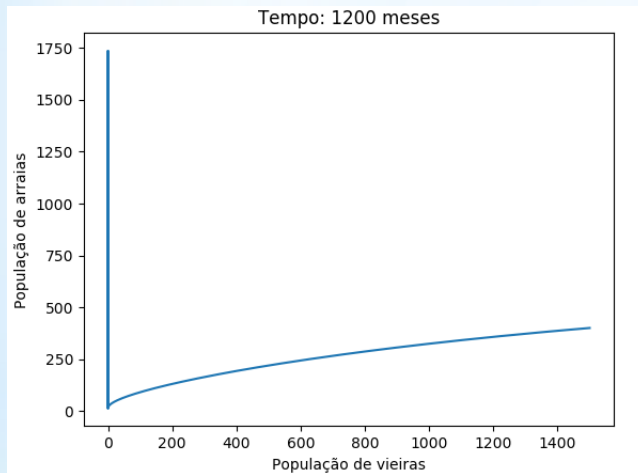
Resultados

Sistema se a caça de vieiras aumentar ($\varepsilon = 0,35 \rightarrow 0,40$)

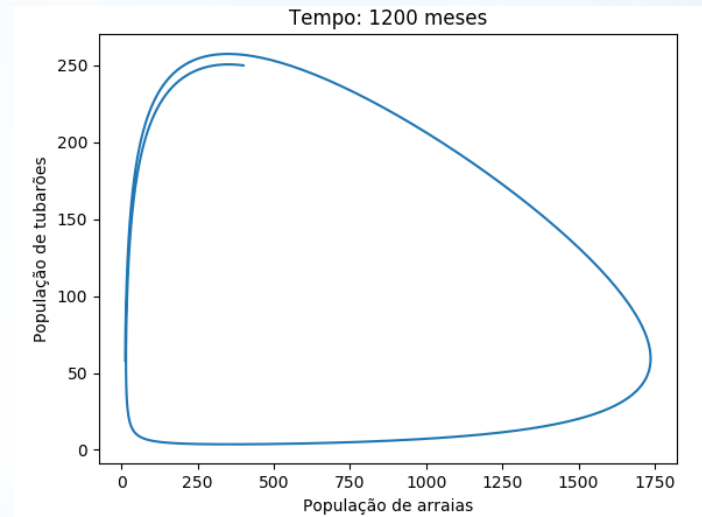
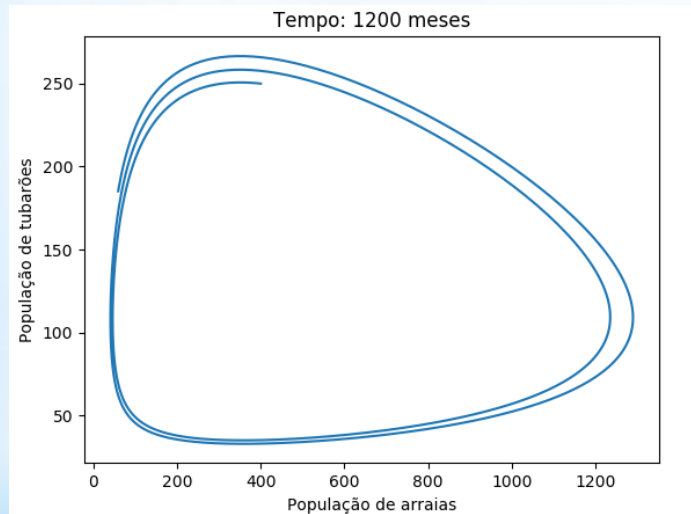


Resultados

Sistema se a caça de vieiras aumentar ($\varepsilon = 0,35 \rightarrow 0,40$)



Resultados



Fontes

Basin-scale coherence of population dynamics of an exploited marine invertebrate, the bay scallop: implications of recruitment limitation

<http://www.int-res.com/articles/meps/90/m090p257.pdf>

Characteristics of a manta ray *Manta alfredi* population off Maui, Hawaii, and implications for management

<http://www.int-res.com/articles/meps2011/429/m429p245.pdf>

Critical assessment and ramifications of a purported marine trophic cascade

<http://www.nature.com/articles/srep20970>

Ongoing Collapse of Coral-Reef Shark Populations

[http://www.cell.com/current-biology/pdf/S0960-9822\(06\)02276-7.pdf](http://www.cell.com/current-biology/pdf/S0960-9822(06)02276-7.pdf)