Resource optimization in a habitat

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In this work, we are interested in the analysis of optimal resources configurations (typically foodstuff) necessary for a species to survive. For that purpose, we use a logistic equation to model the evolution of population density involving a term standing for the heterogeneous spreading (in space) of resources.
The principal issue investigated in this talk writes:

How to spread in an optimal way resources in a closed habitat?

This problem can be recast in many ways, for instance as the one of minimizing the principal eigenvalue of an operator with respect to the domain occupied by resources, under a volume constraint. In this presentation, we will present new results that complete the analysis of these problems (existence of optimal configurations, qualitative properties, numerical illustrations).