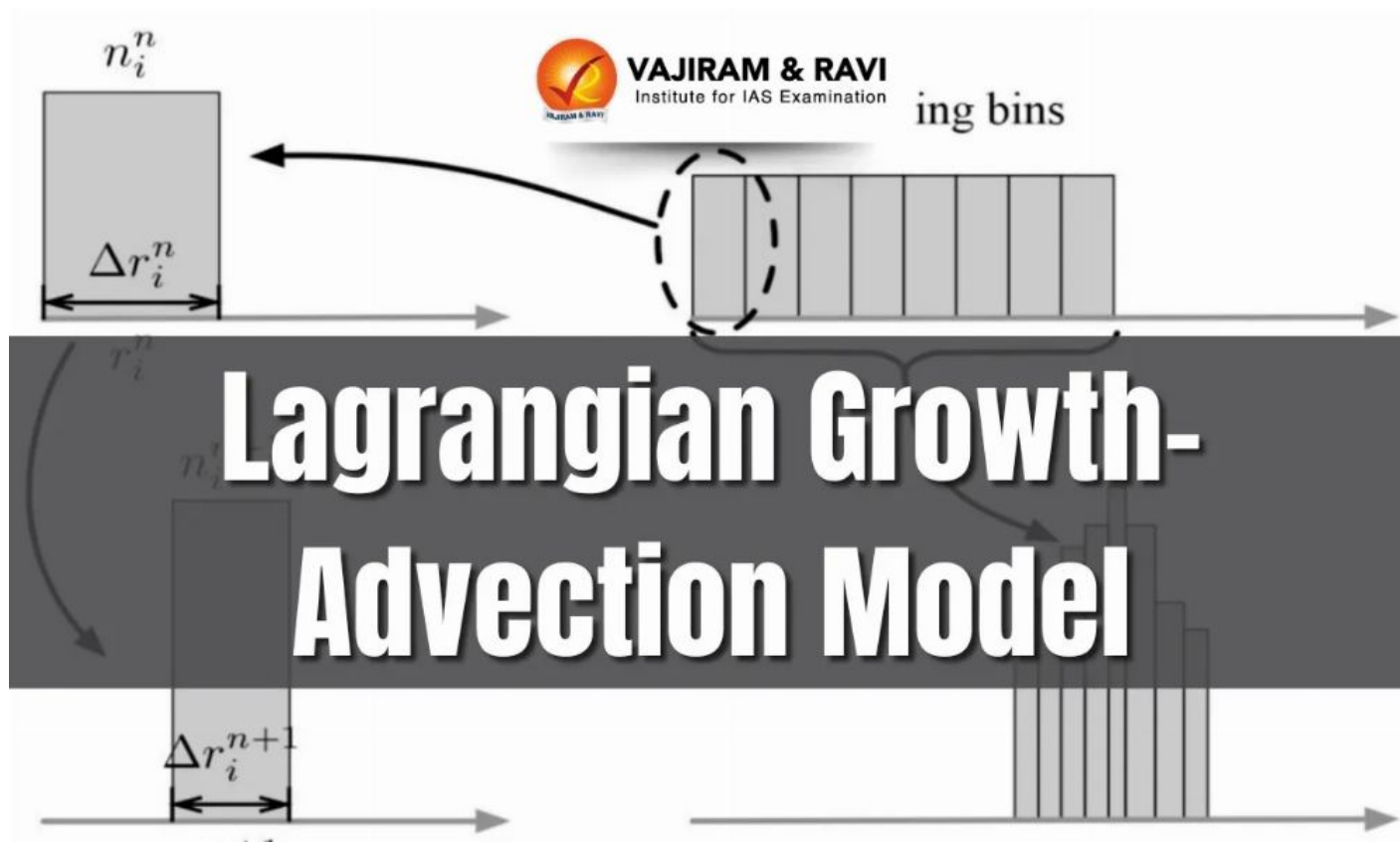


Lagrangian Growth-Advection Model

May 7, 2025 • vajiramandravi.com



Lagrangian Growth Advection Model Latest News

Researchers from the Monterey Bay Aquarium Research Institute (MBARI) and Florida State University have developed a new method to estimate oceanic carbon export using satellite data.

About Lagrangian Growth-Advection Model

- A Lagrangian Growth-Advection Model combines Lagrangian methods, which track individual fluid particles, with the concept of advection (the movement of a fluid) and growth (changes in a particle's properties).
- It maps **phytoplankton succession and carbon export** by following **surface ocean currents**, particularly in **upwelling regions** like the **California Current**.
- **Key Innovations:**

- Incorporates **spatial and temporal lags** between **carbon production and export**.
- Accounts for **zooplankton activity**, ocean **advection (movement of plankton)**, and biological succession.
- **Does not rely solely on ocean color**, providing a **complementary alternative**.
- **Performance and Validation:** The new model's predictions **matched results from deep-sea carbon monitoring**, such as those at **Station M** (a long-term MBARI seafloor observatory).
 - **Pulses of carbon flux** observed previously, unexplained by earlier models, are better captured by this approach.
- The **ocean absorbs a significant portion of atmospheric CO₂**, playing a key role in regulating Earth's climate.
 - Marine organisms convert **dissolved CO₂ into organic carbon**, which eventually sinks to the deep ocean, a process known as **carbon sequestration via the biological pump**.
- Existing **satellite-based models** depend primarily on **ocean colour data**, which measures **phytoplankton productivity** via **surface chlorophyll concentrations**. However, these models **fail to account for subsurface and temporal lags** in carbon transfer.

Lagrangian Growth-Advection Model FAQs

Q1. What is the Lagrangian Growth-Advection Model used for?

Ans. It is used in oceanography and climate modelling to simulate the movement and growth of biological or chemical tracers in ocean currents.

Q2. What does “Lagrangian” refer to in this model?

Ans. “Lagrangian” refers to tracking the movement of individual particles or water parcels as they flow with ocean currents.

Source: [PHY](#)

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