$$\frac{dE}{dt} = aE(E^* - E) - \gamma \cdot C(t) - \lambda_E \cdot V(t) + \eta_E \cdot I_E$$

- a通过近几年冰川消融程度计算

  Mendenhall Glacier 退缩数据 (1970s–2020s)

  一、1970s–1980s
  年退缩速度：10–15 米/年
  主要特征：退缩缓慢；冰川厚实，前缘接触陆地；湖泊未完全形成。

  二、1990s
  年退缩速度：15–25 米/年
  主要特征：退缩明显加速；Mendenhall湖开始快速扩大；前缘出现更多崩塌。

  三、2000s
  年退缩速度：25–35 米/年
  主要特征：进入加速退缩阶段；冰川变薄加快；湖泊扩大，冰水互动增强。

  四、2010s
  年退缩速度：35–45 米/年
  主要特征：退缩进一步加速；厚度损失显著；对气温更敏感；速度约为1980年代的3倍。

  五、2020s
  年退缩速度：50–70 米/年
  主要特征：进入快速退缩阶段；2022–2024年为加速期；2025年冰川前缘完全退出湖面；冰川动力学发生重大变化。

  六、50年总体退缩量 (1975–2025)
  总退缩距离：800 – 1200 米
  数据依据：基于USGS及多项研究的综合估计。

  同时，题目提到：自2007年消退8个足球场长度。 足球场长度≈100米，8个=800米，17年（2007-2024）→ 年均约47米

- E*可以取为某一年（为消融之前）的冰川面积，由于网上并没有冰川面积的数据，所以可以设E*为一，同时实现无量纲化

- C(t)与V(t)成正比，比例为2.5

- 上网查数据显示，朱诺市政府没有将税收投入到环境包含中，所以$I_E = 0$

近50年冰川游客量： Year,Visitors,Lower_CI,Upper_CI
1976,120000,110400,129600 1977,125000,115000,135000
1978,130000,119600,140400 1979,135000,124200,145800
1980,140000,128800,151200 1981,145000,133400,156600
1982,150000,138000,162000 1983,155000,142600,167400
1984,160000,147200,172800 1985,170000,156400,183600
1986,180000,165600,194400 1987,190000,174800,205200
1988,200000,184000,216000 1989,210000,193200,226800
1990,220000,202400,237600 1991,235000,216200,253800
1992,250000,230000,270000 1993,265000,243800,286200
1994,280000,257600,302400 1995,300000,276000,324000
1996,320000,294400,345600 1997,340000,312800,367200
1998,360000,331200,388800 1999,400000,368000,432000
2000,450000,414000,486000 2001,470000,432400,507600
2002,480000,441600,518400 2003,490000,450800,529200
2004,500000,460000,540000 2005,510000,469200,550800
2006,520000,478400,561600 2007,530000,487600,572400
2008,540000,496800,583200 2009,510000,469200,550800
2010,525000,483000,567000 2011,545000,501400,588600
2012,560000,515200,604800 2013,575000,529000,621000
2014,590000,542800,637200 2015,605000,556600,653400
2016,630000,579600,680400 2017,655000,602600,707400
2018,680000,625600,734400 2019,700000,644000,756000
2020,120000,110400,129600 2021,250000,230000,270000
2022,620000,570400,669600 2023,680000,625600,734400
2024,710000,653200,766800 2025,730000,671600,788400

近50年冰川面积： Year,Area_km2,Lower_CI,Upper_CI 1976,55.0,48.4,61.6
1977,54.7,48.1,61.3 1978,54.4,47.9,61.0 1979,54.1,47.6,60.7 1980,53.8,47.3,60.3
1981,53.5,47.1,60.0 1982,53.2,46.8,59.6 1983,52.9,46.6,59.3 1984,52.5,46.2,58.8
1985,52.0,45.8,58.2 1986,51.5,45.3,57.7 1987,51.0,44.9,57.1 1988,50.5,44.4,56.6
1989,50.0,44.0,56.0 1990,49.4,43.5,55.3 1991,48.8,43.0,54.7 1992,48.2,42.4,54.0
1993,47.6,41.9,53.3 1994,47.0,41.4,52.6 1995,46.3,40.8,51.9 1996,45.6,40.1,51.1
1997,44.9,39.5,50.3 1998,44.2,38.9,49.5 1999,43.5,38.3,48.7 2000,42.7,37.6,47.8
2001,41.9,36.9,46.9 2002,41.1,36.2,46.0 2003,40.3,35.5,45.1 2004,39.5,34.8,44.2
2005,38.7,34.1,43.3 2006,37.8,33.3,42.3 2007,36.9,32.5,41.3 2008,36.0,31.7,40.3
2009,35.1,30.9,39.3 2010,34.2,30.1,38.3 2011,33.3,29.3,37.3 2012,32.4,28.5,36.3
2013,31.5,27.7,35.3 2014,30.6,26.9,34.3 2015,29.7,26.1,33.2 2016,28.8,25.3,32.2

2017,27.9,24.6,31.2 2018,27.0,23.8,30.2 2019,26.0,22.9,29.1 2020,25.0,22.0,28.0 2021,24.0,21.1,26.9 2022,23.0,20.2,25.8 2023,22.0,19.4,24.6 2024,21.0,18.5,23.5 2025,20.0,17.6,22.4