

# Use of Bibliometrics in Peer Review

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**NIFU**

# Overview of this presentation

1. The role of bibliometrics in peer review
2. Bibliometric data sources
3. Citation indicators
4. *Journal Impact Factors* and the *H-index*
5. Peer review versus bibliometrics in overall funding models for universities

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## The **European Peer Review Guide** shortly recommends:

- “Care should be taken when applying these quantitative measures; these must be used as complementary information and not as sole determining factors in valuing publication track records.”

## Most **bibliometricians** will agree

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- Bibliometrics may **inform**, but **not replace** peer review

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- The outcome of peer review is often **correlated** with bibliometric indicators, but **seldom strongly**, and **sometimes weakly**,
- indicating that the **combination** of them is advisable in most instances,
- But this depends on the **purpose** and level of **analysis**



## Levels of analysis

- Countries
- Institutions or Organizations
- Departments
- Research Groups
- Individuals

## An example of **discussion and disagreement**

- “Empirical evidence shows that for the natural and formal sciences, the bibliometric methodology is **by far preferable to peer-review**. Setting up national databases of publications by individual authors, derived from Web of Science or Scopus databases, would allow **much better, cheaper and more frequent national research assessments.**”
  - Giovanni Abramo & Ciriaco Andrea D’Angelo: Evaluating research: from informed peer review to bibliometrics, *Scientometrics* (2011) 87:499–514.

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  - Giovanni Abramo & Ciriaco Andrea D’Angelo: Evaluating research: from informed peer review to bibliometrics, *Scientometrics* (2011) 87:499–514.
- “Bibliometrics are not independent of peer review assessment. The correlation between peer assessment and bibliometric indicators is significant but not perfect. **Peer review should be integrated with bibliometric indicators in national assessment exercises.**”
  - Massimo Franceschet and Antonio Costantini. The first Italian research assessment exercise: a bibliometric perspective. *Journal of Informetrics* (2011) 5(2): 275-291.

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2. Title: **THE MEASUREMENT OF INTERNATIONAL SCIENTIFIC COLLABORATION**  
 Author(s): LUUKKONEN T; TIJSSEN RJW; PERSSON O; et al.  
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3. Title: **The effect of highly cited papers on national citation indicators**  
 Author(s): Aksnes DW; **Sivertsen G**  
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 Source: EUROPEAN JOURNAL OF NEUROLOGY Volume: 17 Issue: 1 Pages: 147-151 DOI: 10.1111/j.1468-1331.2009.02768.x Published: JAN 2010  
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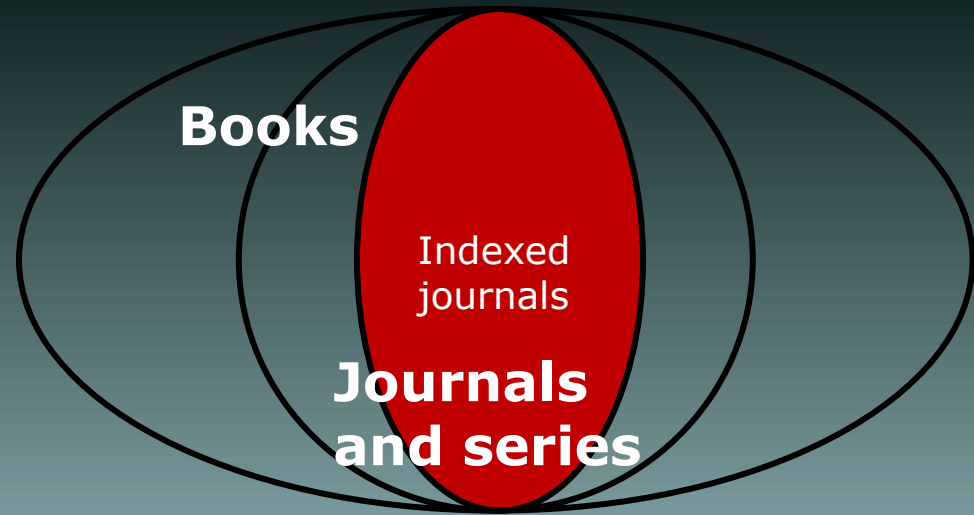
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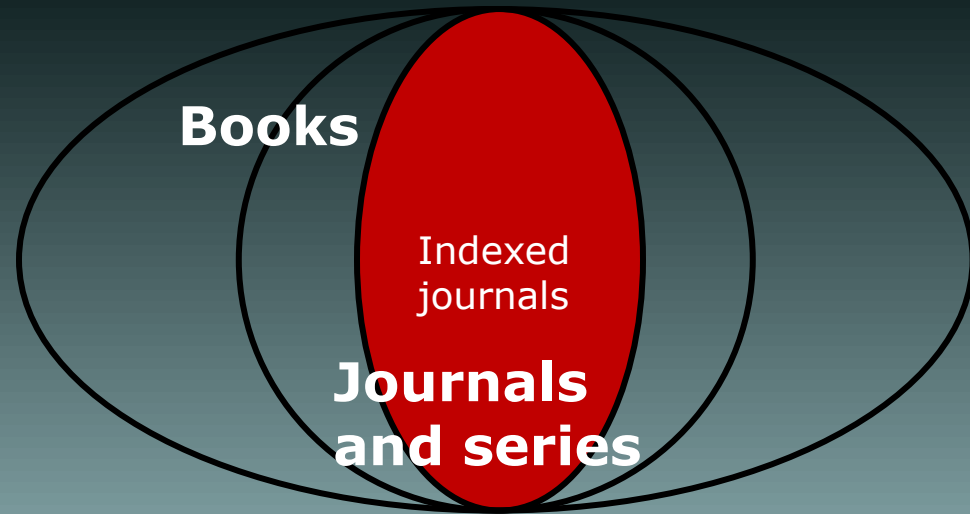
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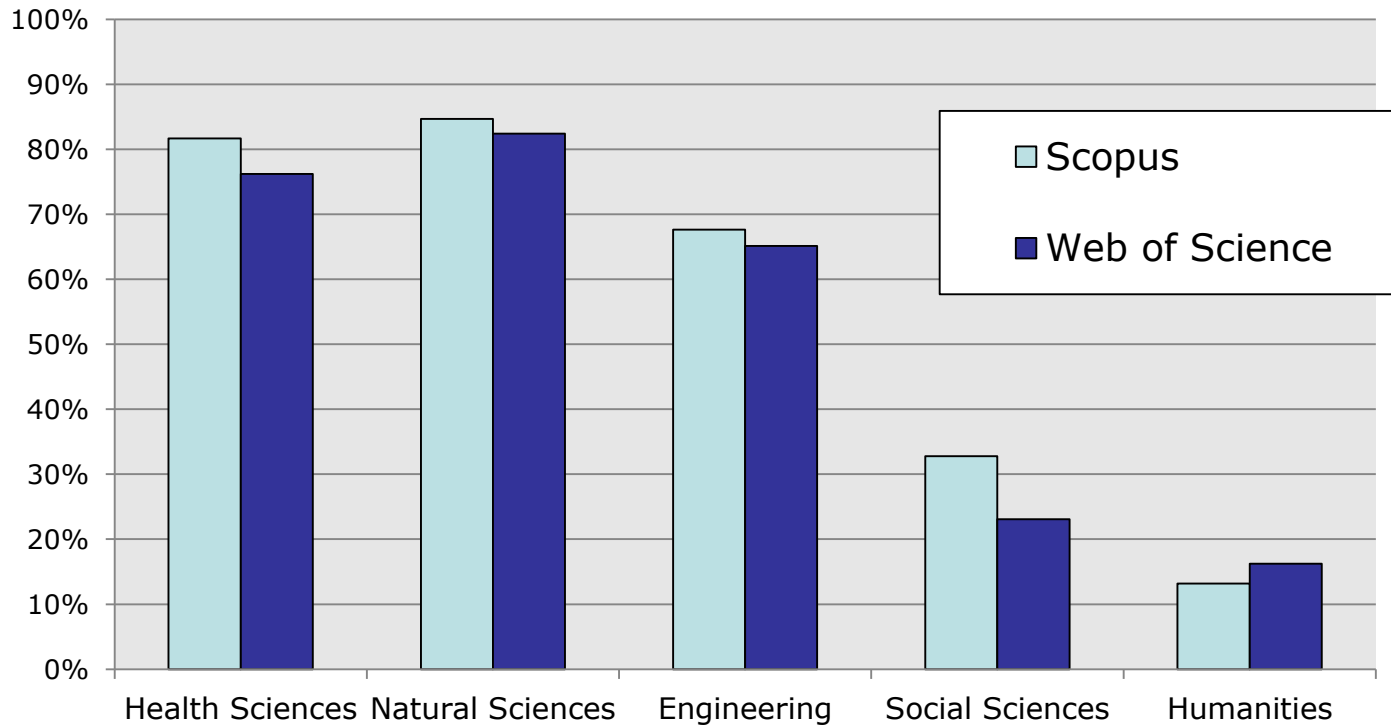
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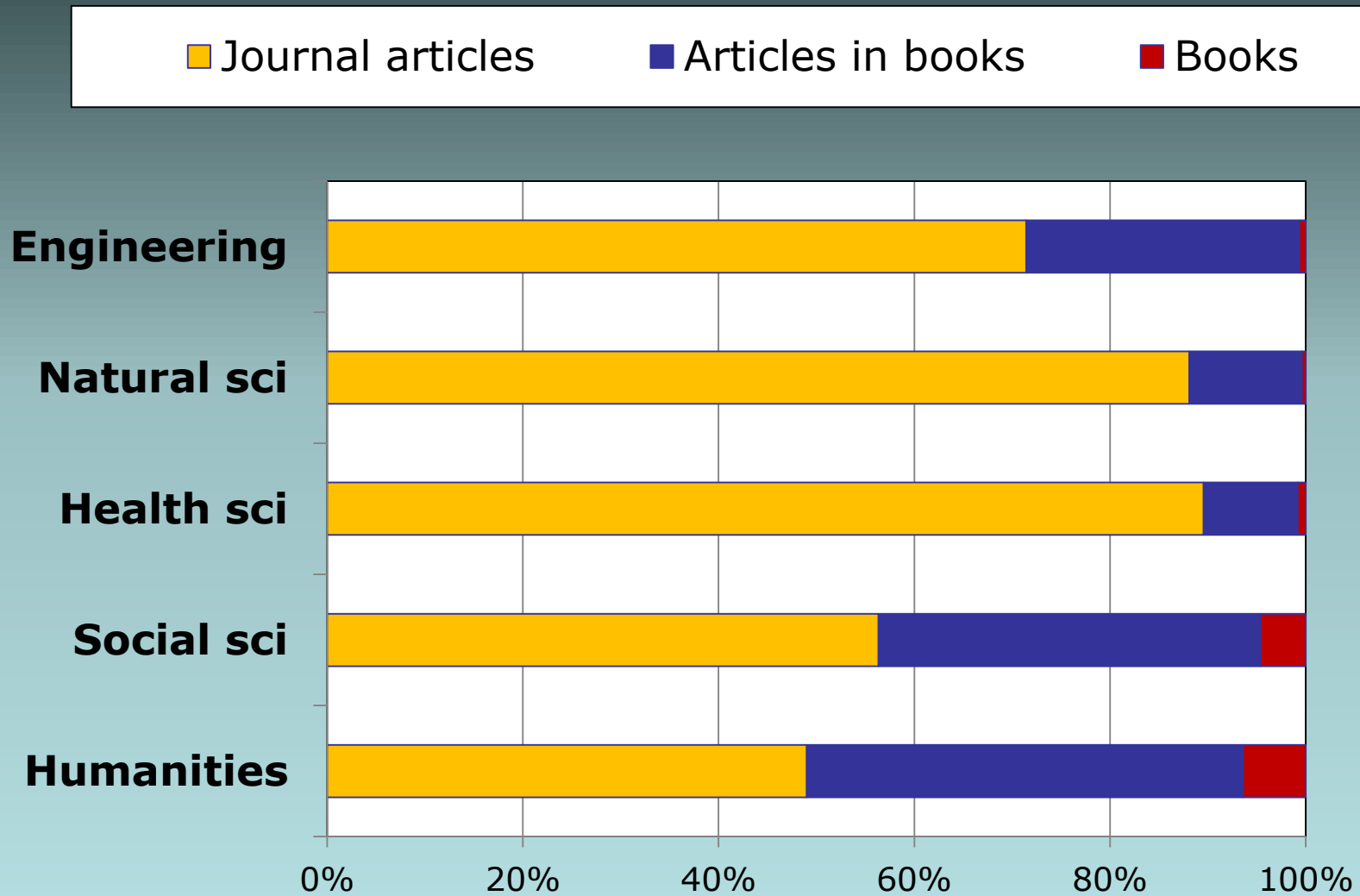
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## Publication types

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### [Understanding patterns of international scientific collaboration](#)

..., O Persson, G Sivertsen - Science, Technology & ..., 1992 - sth.sagepub.com

Abstract International scientific collaboration has increased both in volume and importance. In this article, the authors study the interpretation of macro-level data on international co authorship collaboration. They address such questions as how one might explain country- ...

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### [The measurement of international scientific collaboration](#)

..., RJW Tijssen, O Persson, G Sivertsen - Scientometrics, 1993 - akademiai.com

Abstract A growing science policy interest in international scientific collaboration has brought about a multitude of studies which attempt to measure the extent of international scientific collaboration between countries and to explore intercountry collaborative ...

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### [The effect of highly cited papers on national citation indicators](#)

..., G Sivertsen - Scientometrics, 2004 - akademiai.com

Abstract Citation distributions are extremely skewed. This paper addresses the following question: To what extent are national citation indicators influenced by a small minority of highly cited articles? This question has not been studied before at the level of national ...

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### **[CITATION]** A bibliometric model for performance based budgeting of research institutions

G Sivertsen - Proceedings of the 9th International Conference on ..., 2006

[Cited by 10](#) - [Related articles](#)

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G Sivertsen - 1992 - Nordic Council of Ministers [ ...

[Cited by 7](#) - [Related articles](#)

### **[CITATION]** Nordic Collaboration in Science: A Bibliometric Study

T Luukkonen, G Sivertsen... - 1991 - Nordic Council of Ministers [ ...

[Cited by 6](#) - [Related articles](#)

### **[CITATION]** A performance indicator based on complete data for the scientific publication output at research institutions

G Sivertsen - ISSI Newsletter, 2010

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- Author impact analysis
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Exclude these names:

Year of publication between:  and:

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Papers:	40	Cites/paper:	13.65	h-index:	6	AWCR:	35.80
Citations:	546	Cites/author:	205.00	g-index:	23	AW-index:	5.98
Years:	40	Papers/author:	29.75	hc-index:	5	AWCRpA:	15.50
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Source: SCIENTOMETRICS Volume: 28 Issue: 1 Pages: 15-36 DOI: 10.1007/BF02016282 Published: SEP 1993

Times Cited: 81 (from Web of Science)

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**Abstract:** A growing science policy interest in international scientific collaboration has brought about a multitude of studies which attempt to measure the countries and to explore intercountry collaborative networks. This paper attempts to clarify the methodology that is being used or can be used for this purpose. The paper concludes that, in an analysis of collaborative links, it is essential to use both absolute and relative measures. The latter normalize difference information. Absolute measures yield an answer to questions such as which countries are central in the international network of science, whether collaborative and which countries are the most important collaborative partners of another country. Relative measures provide answers to questions of the intensity of

**Document Type:** Article

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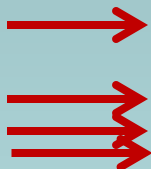
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IDS Number: LW521

ISSN: 0138-9130





# Data for a citation database: 5. Accumulated citations!

## Web of Science<sup>SM</sup>

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### THE MEASUREMENT OF INTERNATIONAL SCIENTIFIC COLLABORATION

Author(s): LUUKKONEN, T (LUUKKONEN, T); TIJSSEN, RJW (TIJSSEN, RJW); PERSSON, O (PERSSON, O); SIVERTSEN, G (SIVERTSEN, G)

Source: SCIENTOMETRICS Volume: 28 Issue: 1 Pages: 15-36 DOI: 10.1007/BF02016282 Published: SEP 1993

Times Cited: 81 (from Web of Science)

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**Abstract:** A growing science policy interest in international scientific collaboration has brought about a multitude of studies which attempt to measure the countries and to explore intercountry collaborative networks. This paper attempts to clarify the methodology that is being used or can be used for this purpose. The paper concludes that, in an analysis of collaborative links, it is essential to use both absolute and relative measures. The latter normalize difference information. Absolute measures yield an answer to questions such as which countries are central in the international network of science, whether collaborative and which countries are the most important collaborative partners of another country. Relative measures provide answers to questions of the intensity of

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**Language:** English

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**IDS Number:** LW521

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# But what do they mean? Quality? Impact?

## Web of Science<sup>SM</sup>

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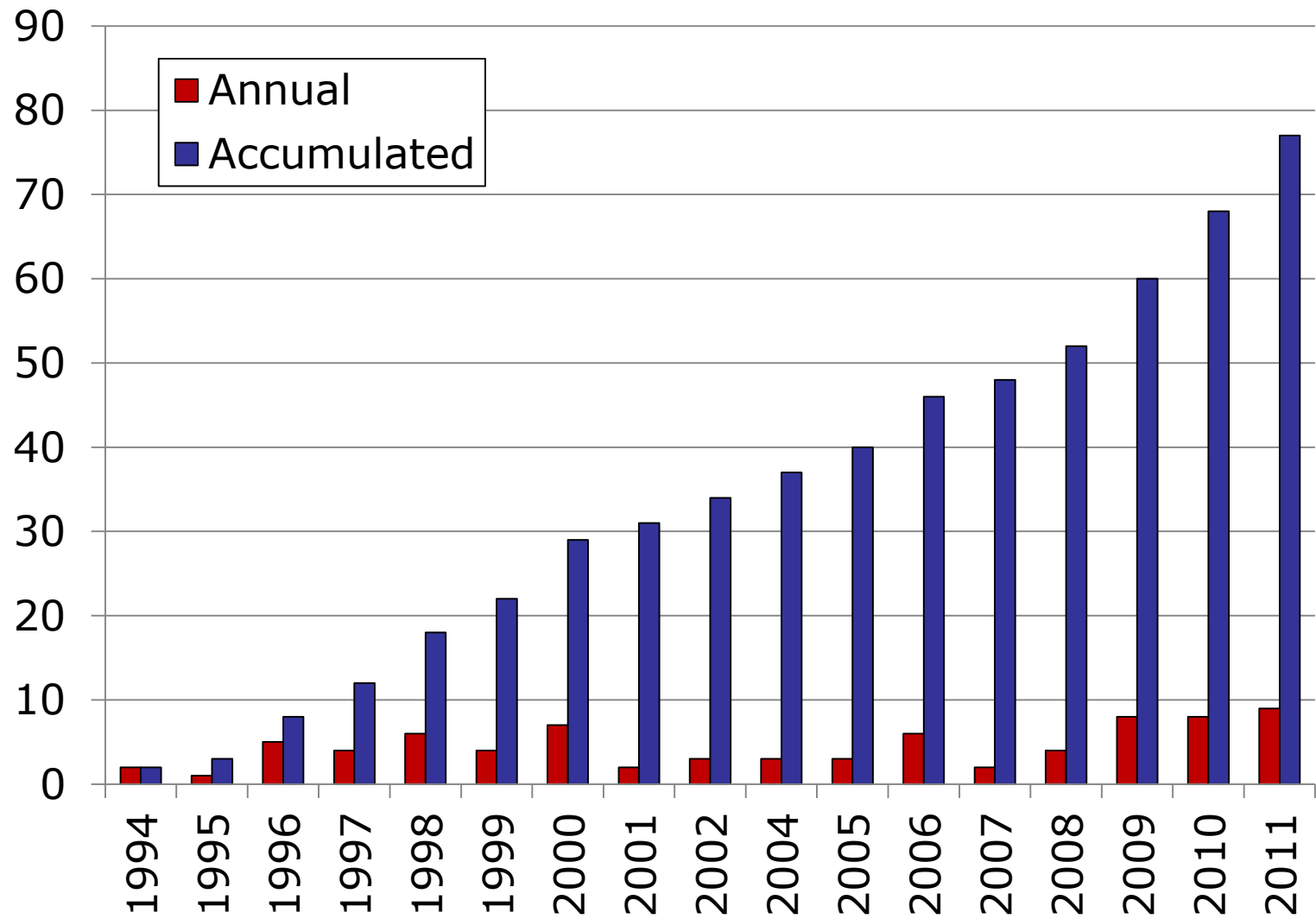
**Subject Category:** Computer Science; Information Science & Library Science

**IDS Number:** LW521

**ISSN:** 0138-9130

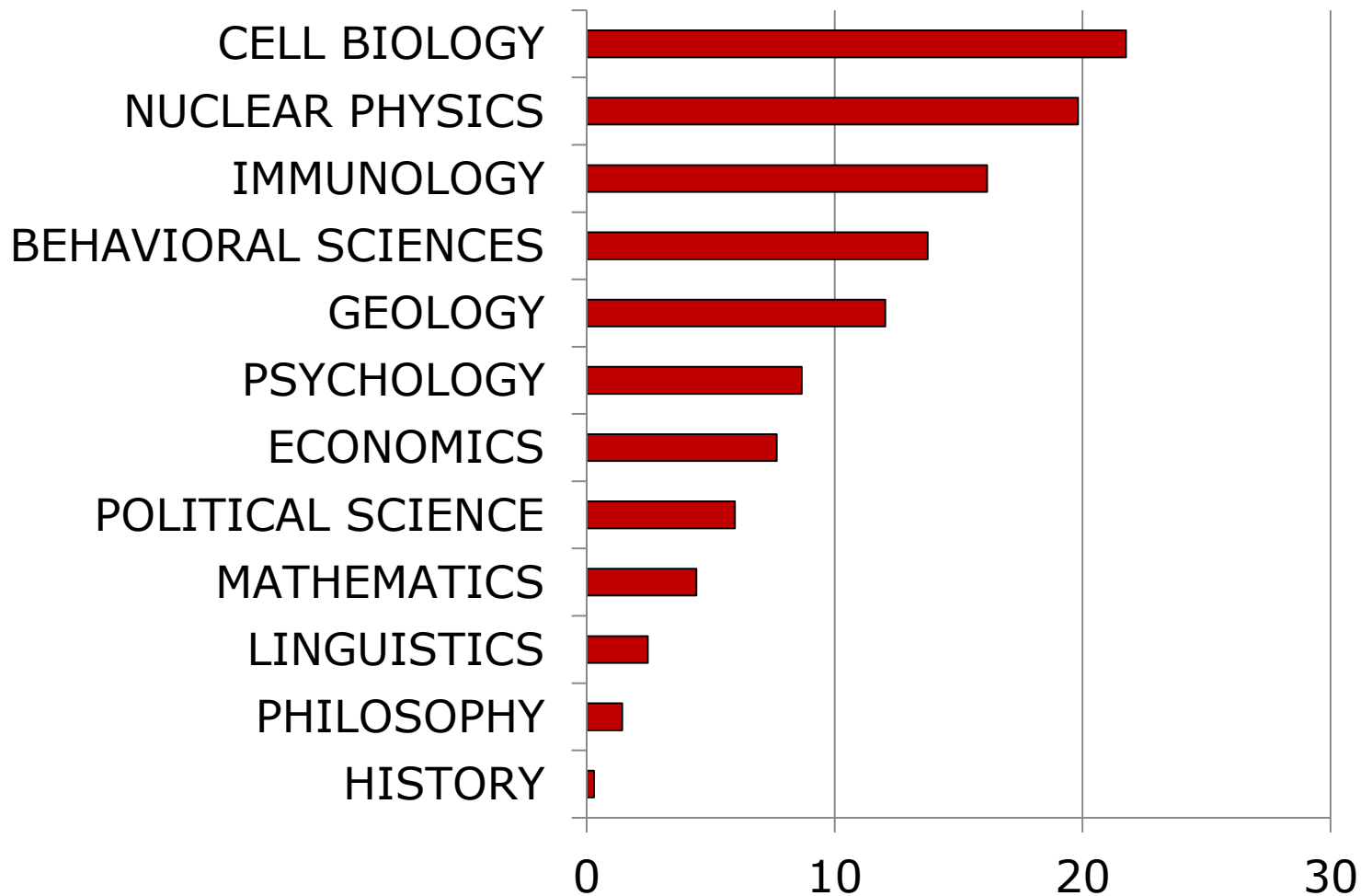
# The need for normalization: **time**

Citedness in year after publication



# The need for normalization: **discipline or subfield**

Average number of citations after 5 years

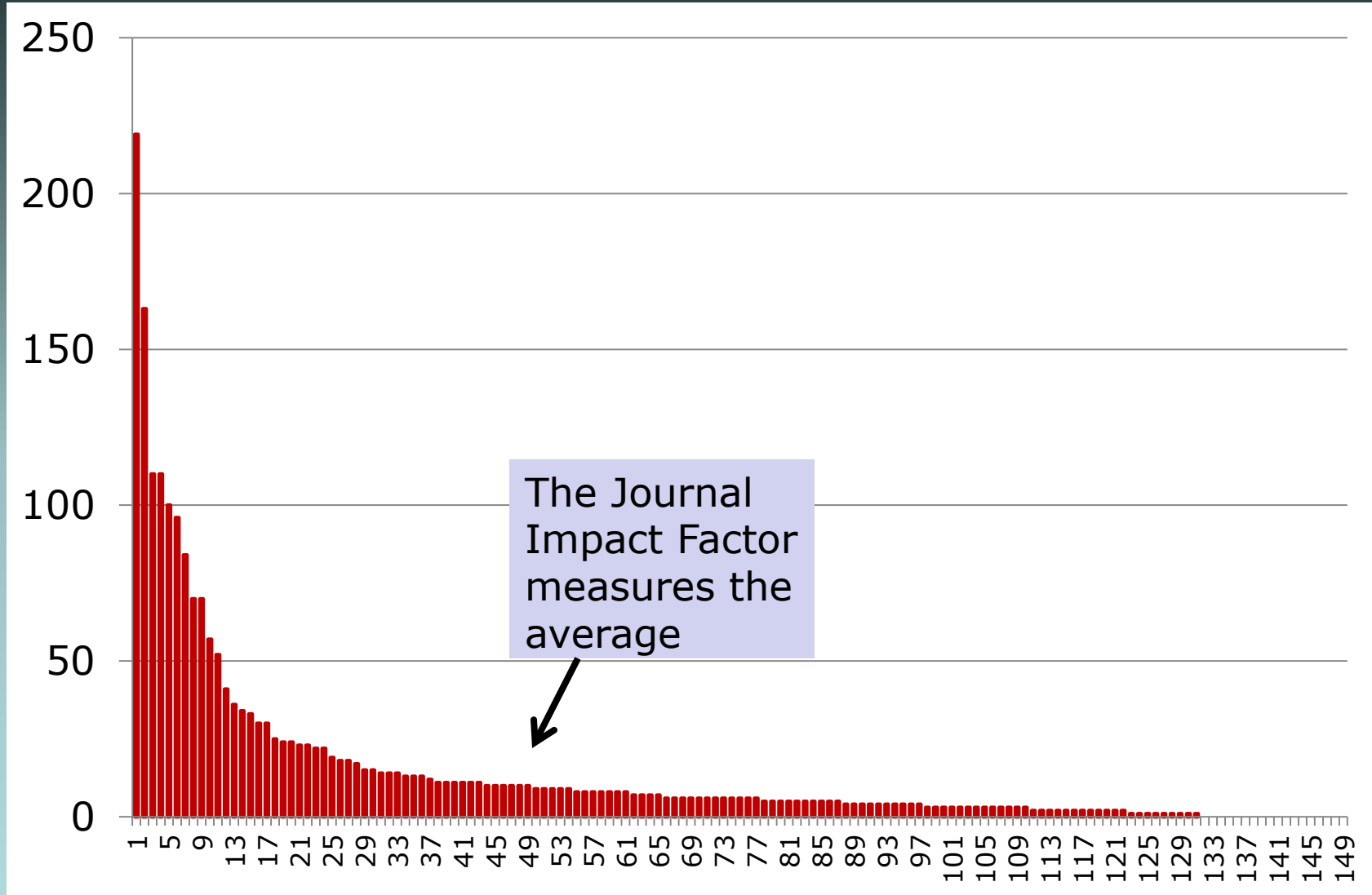


# Overview of this presentation

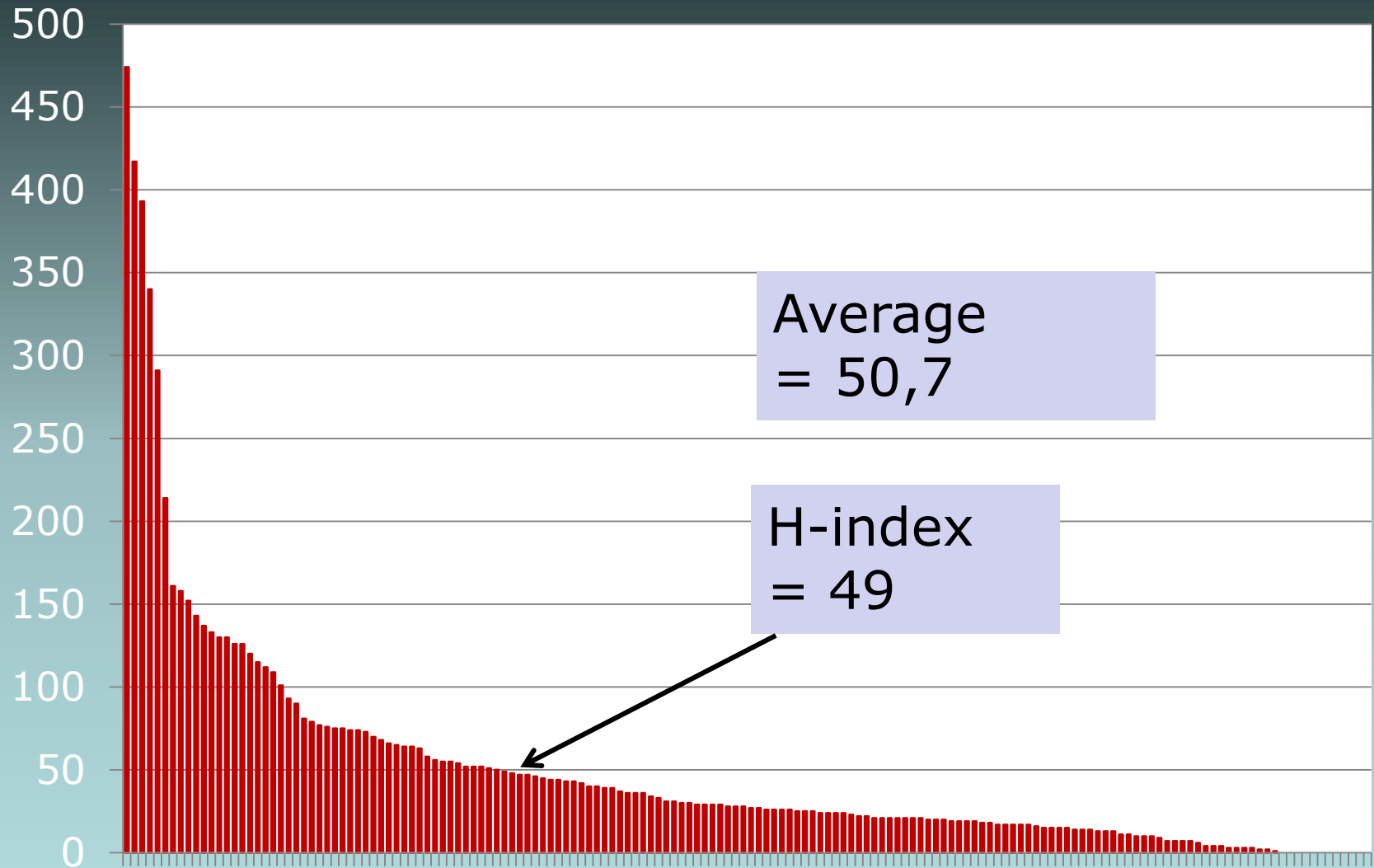
1. The role of bibliometrics in peer review
2. Bibliometric data sources
3. Citation indicators
- 4. *Journal Impact Factors and the H-index***
5. Peer review versus bibliometrics in overall funding models for universities

# The **skewness** of citation distributions:

Citations to 149 articles published in **Scientometrics** in 2006

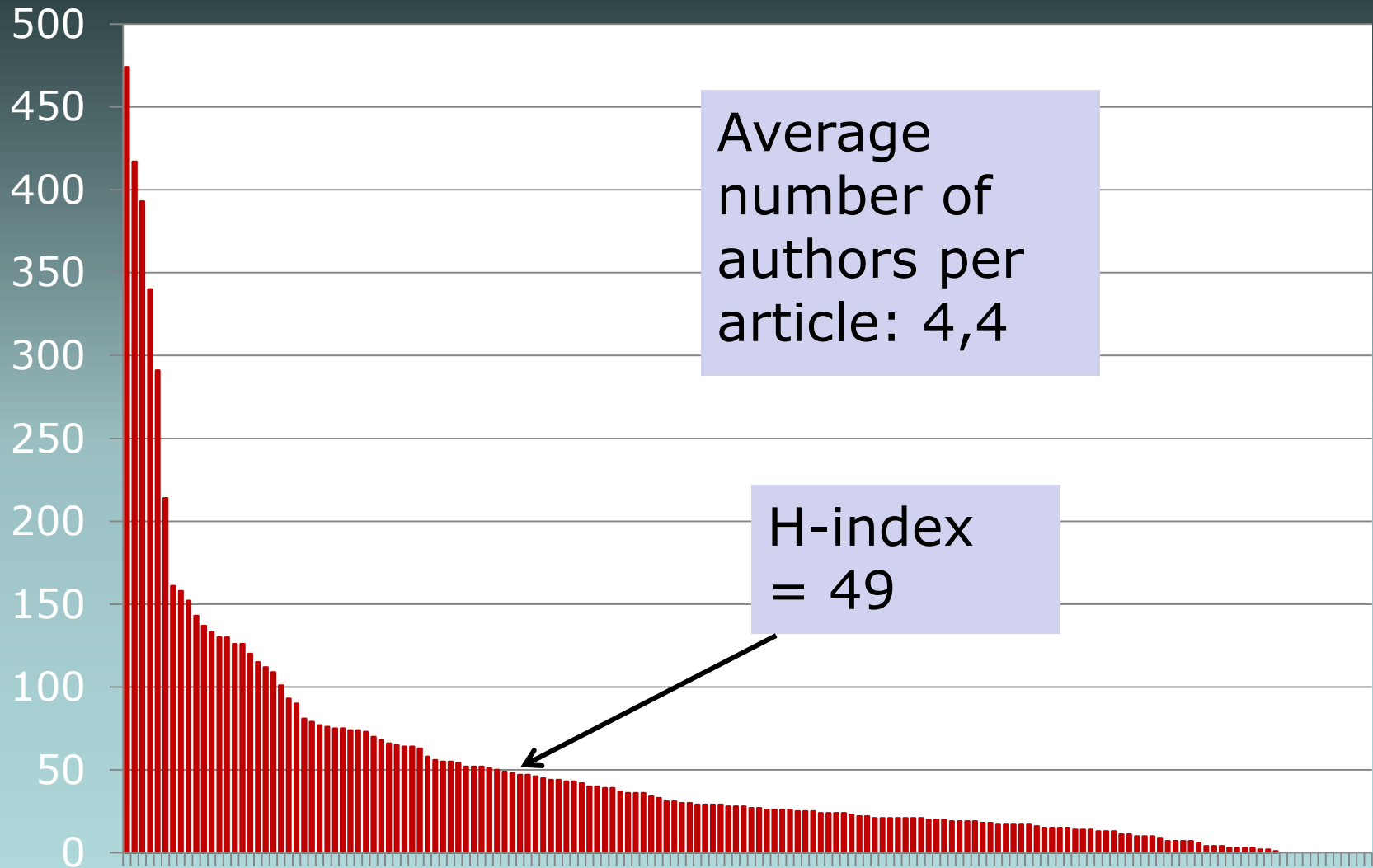


The **skewness** of citation distributions:  
Citations to 162 articles by a highly cited **biochemist** born in **1945**





The **skewness** of citation distributions:  
Citations to 162 articles by a highly cited **biochemist** born in **1945**



# Overview of this presentation

1. The role of bibliometrics in peer review
2. Bibliometric data sources
3. Citation indicators
4. *Journal Impact Factors and the H-index*
5. **Peer review versus bibliometrics in overall funding models for universities**

# "The dual funding system"

(A simplified model excluding international sources, etc.)

Government

## Research Councils

Projects and Programmes  
Competition  
Research Evaluation

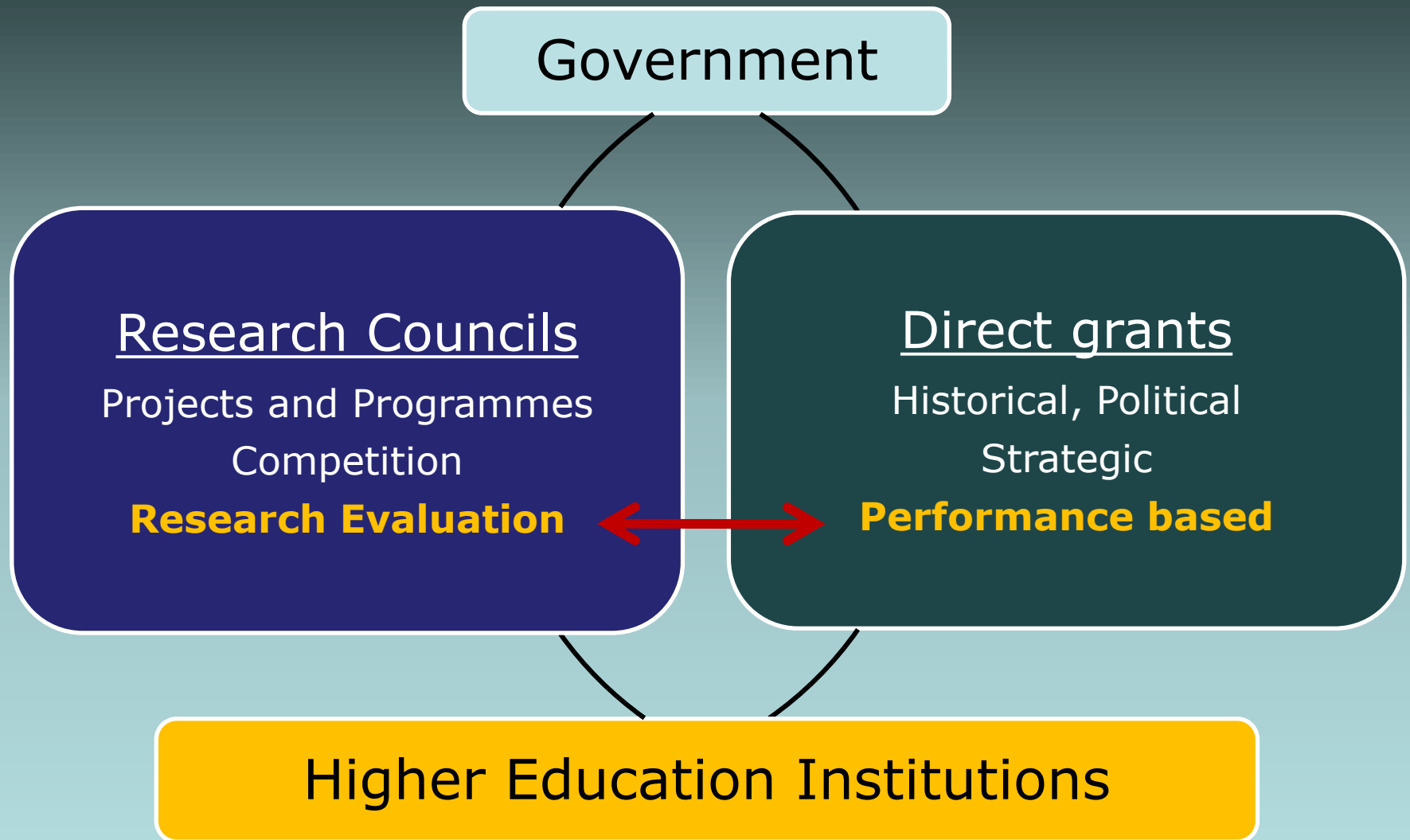
## Direct grants

Historical, Political  
Strategic

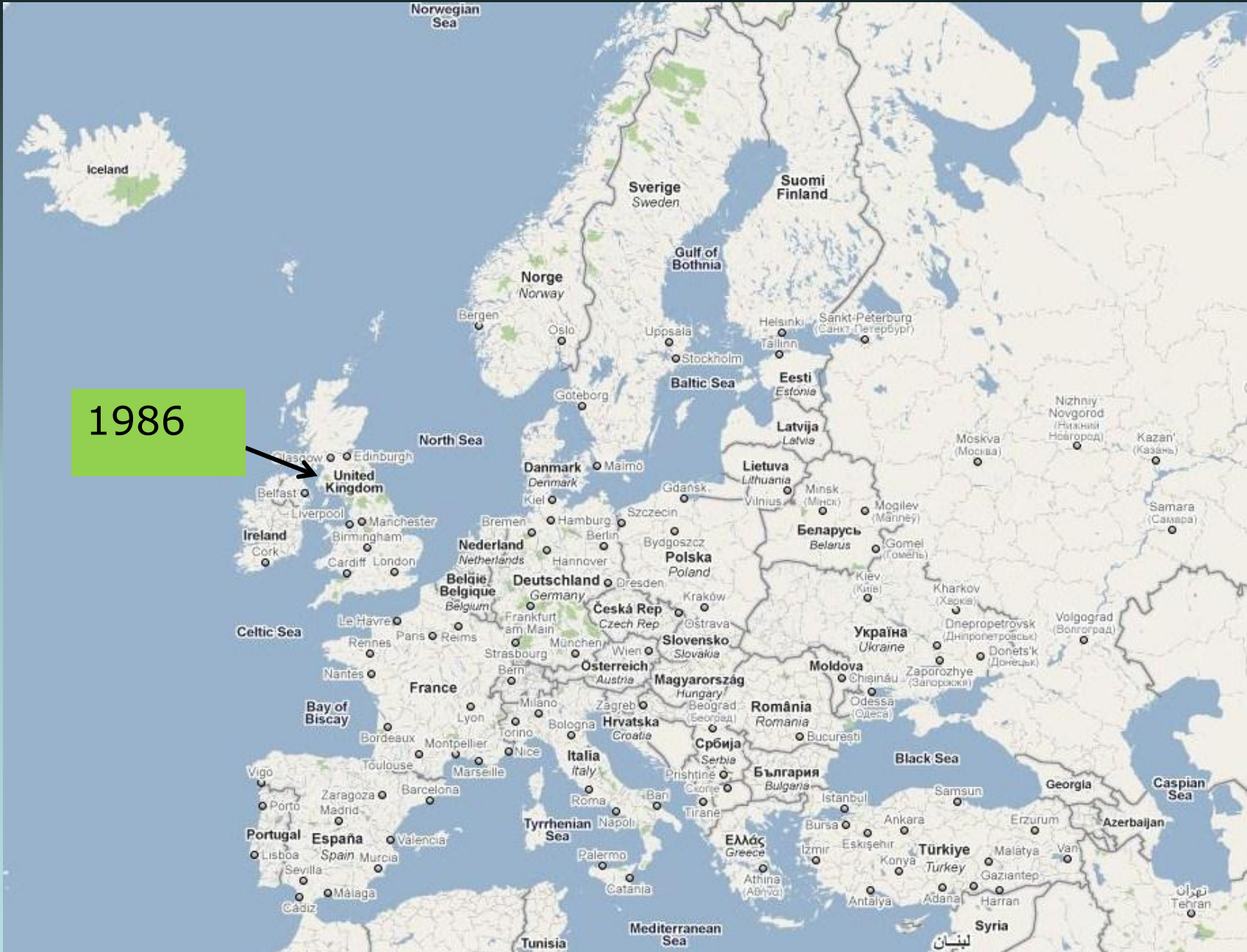
**Performance based**

Higher Education Institutions

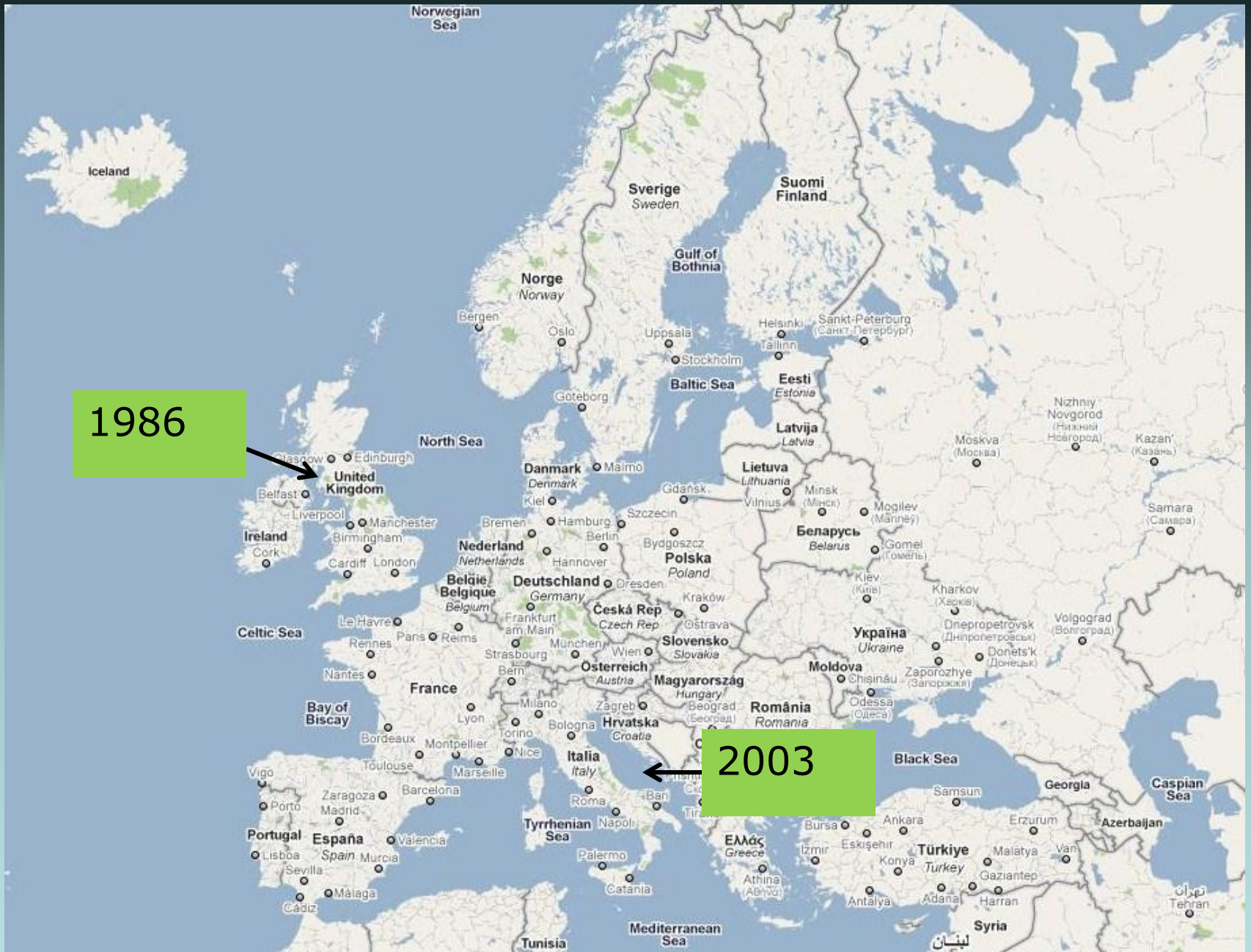
# Same aims, methods, and effects?



1986

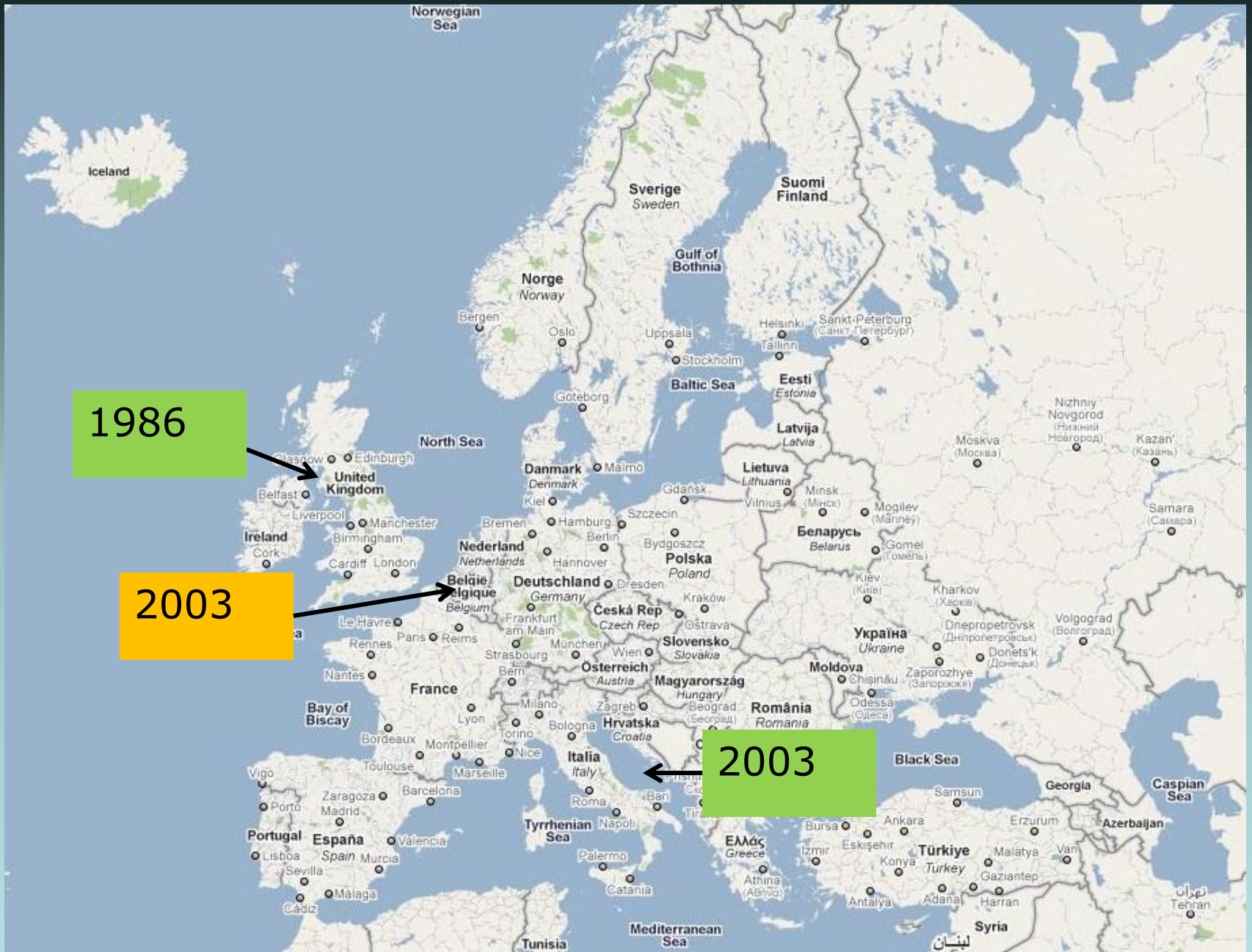






1986

2003

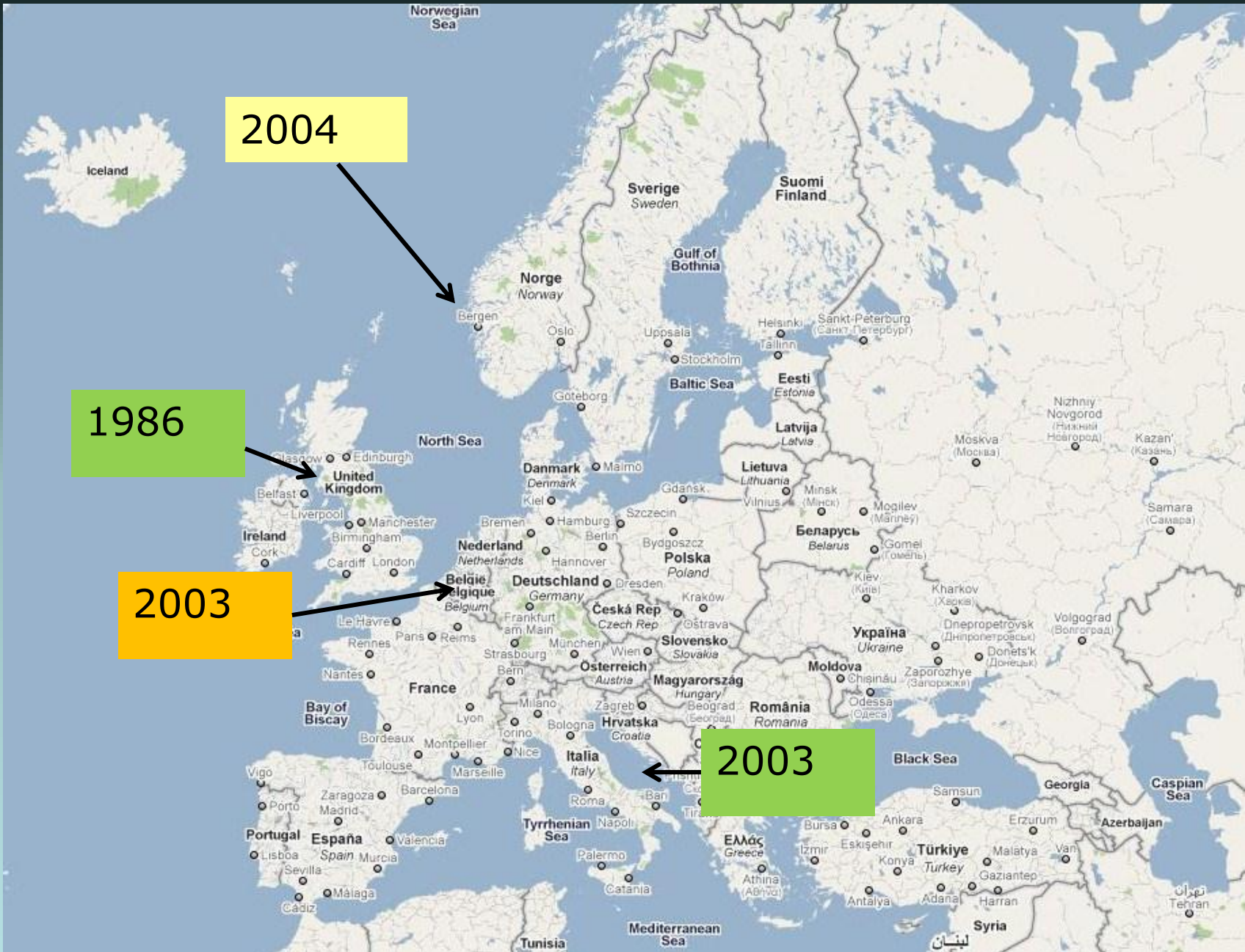


1986

2003

2003





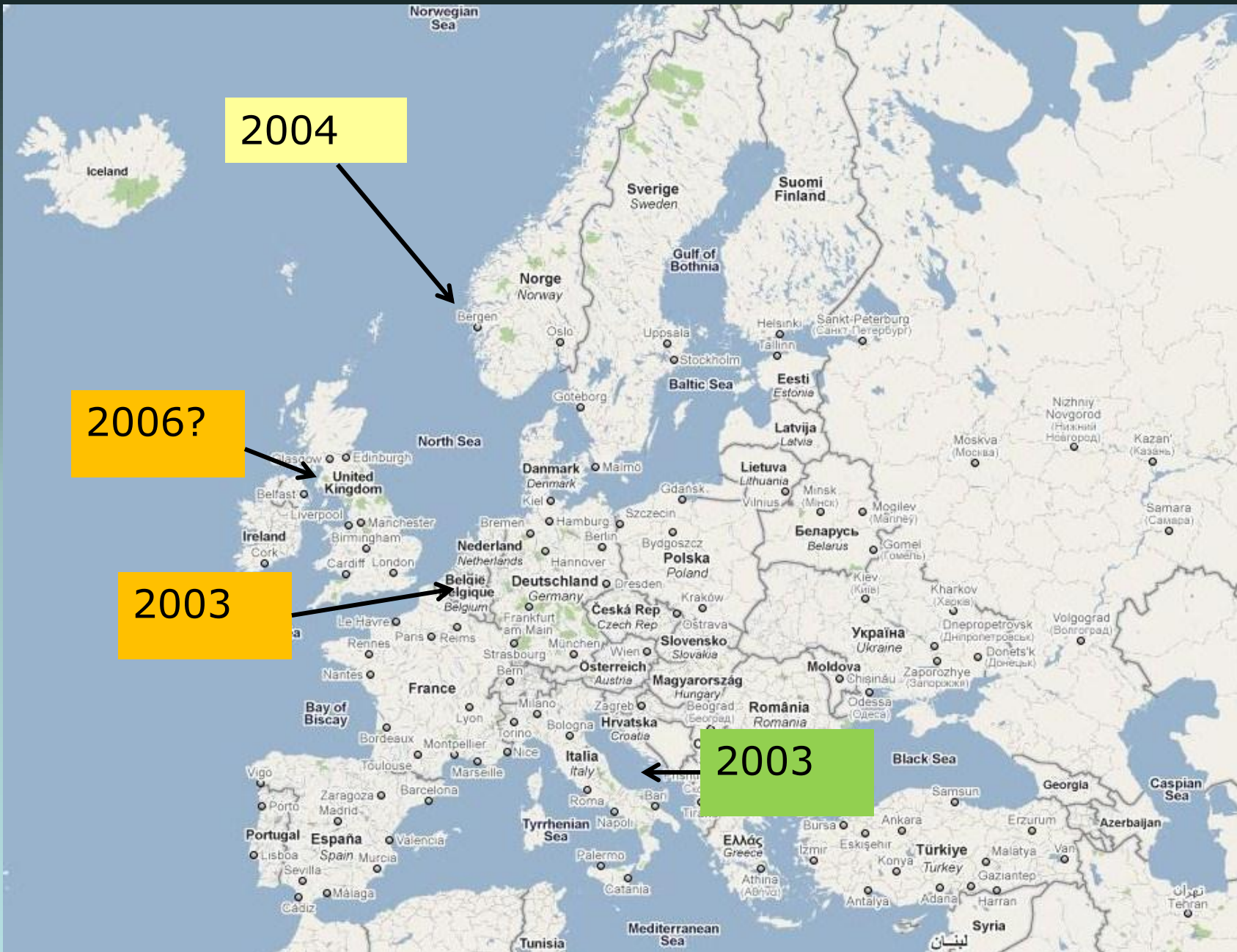
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2003

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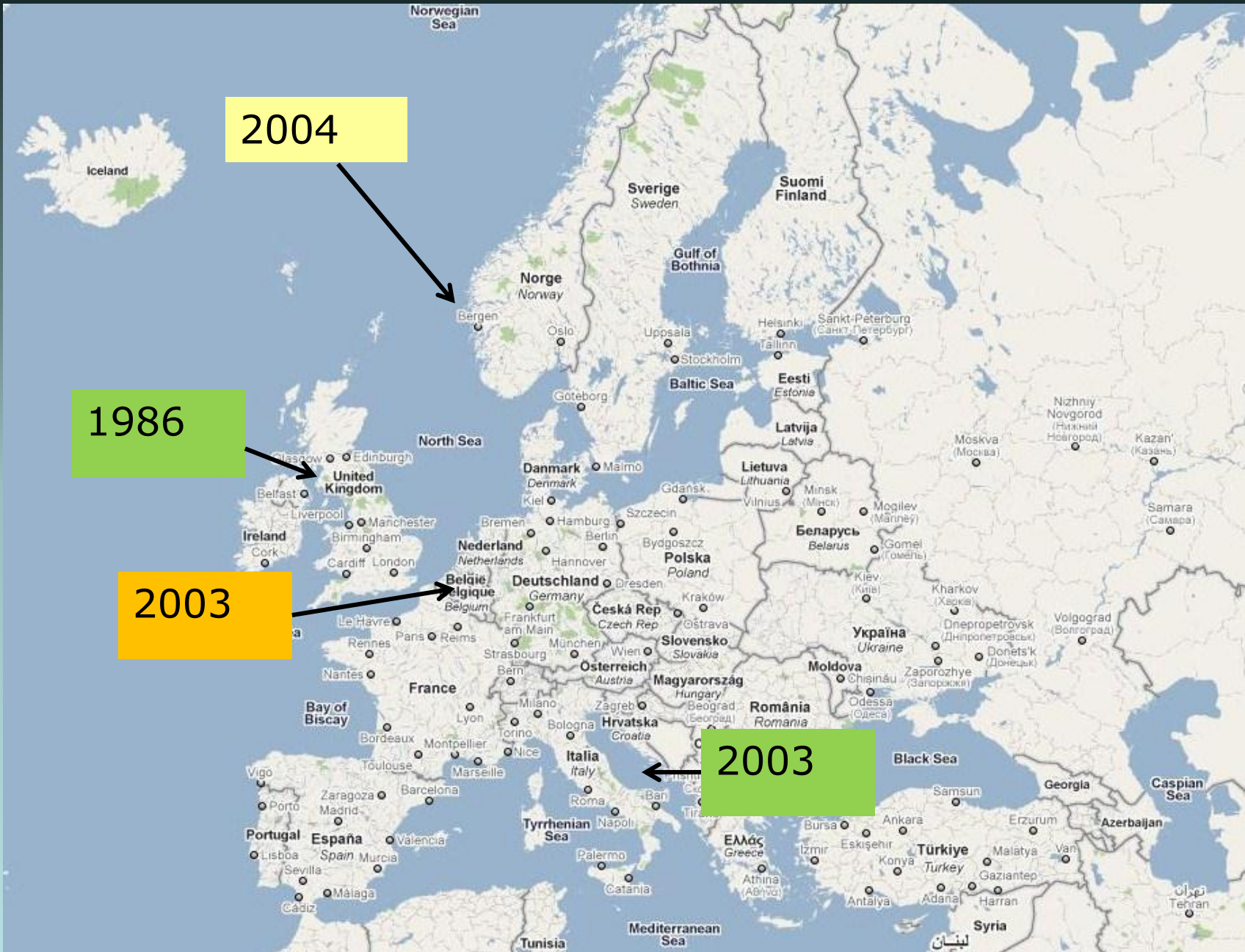


2004

2006?

2003

2003



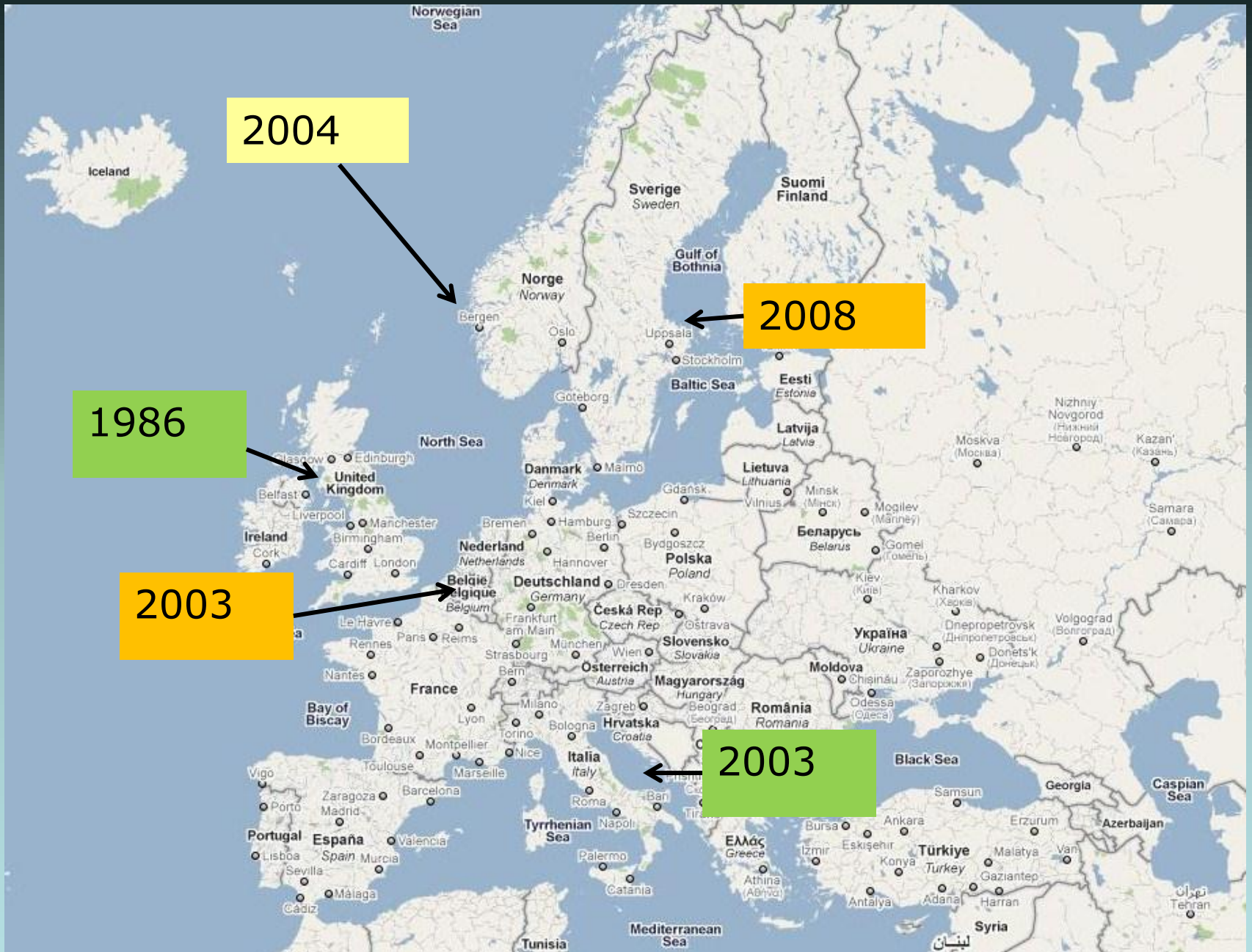
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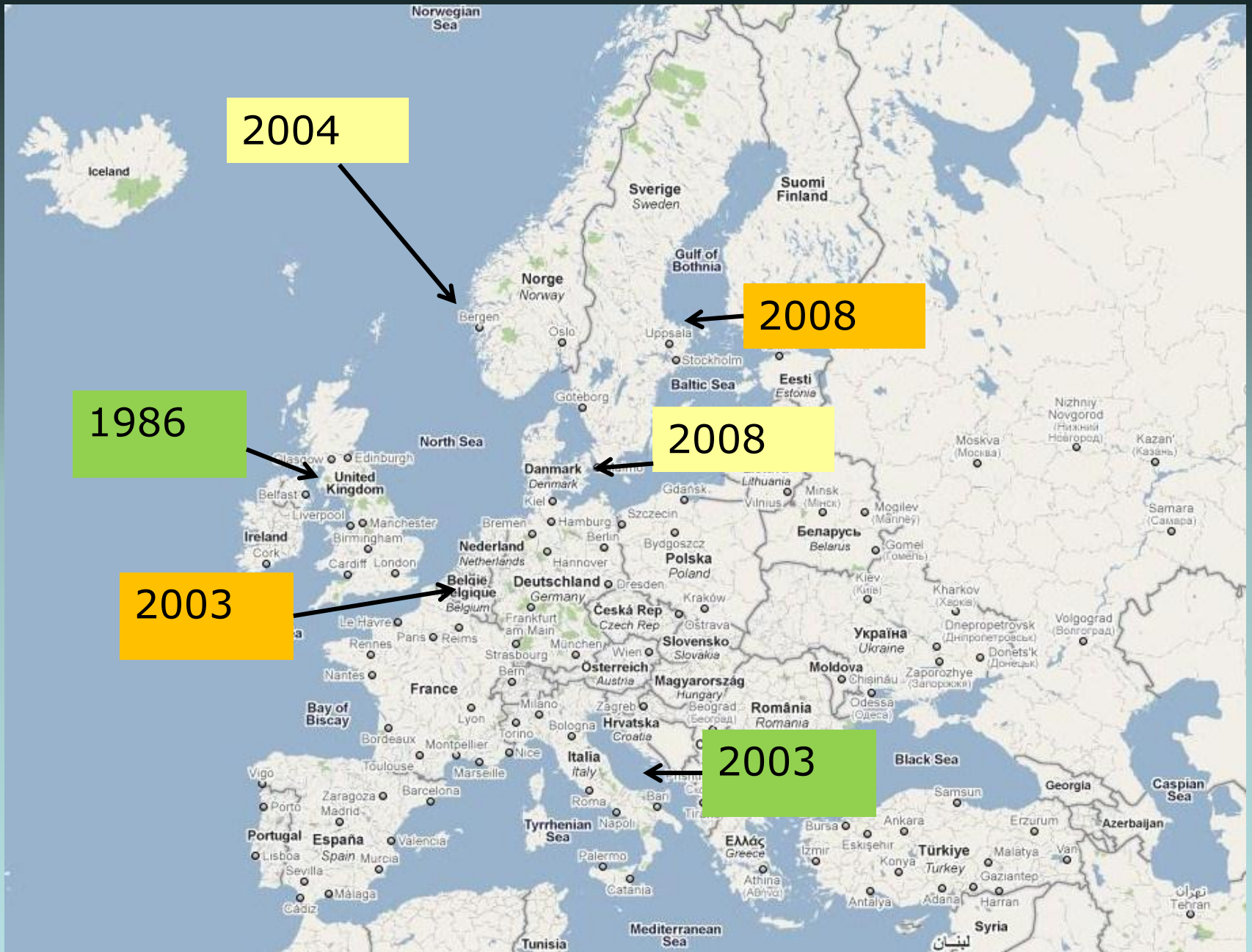
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2008

1986

2003

2003



2004

2008

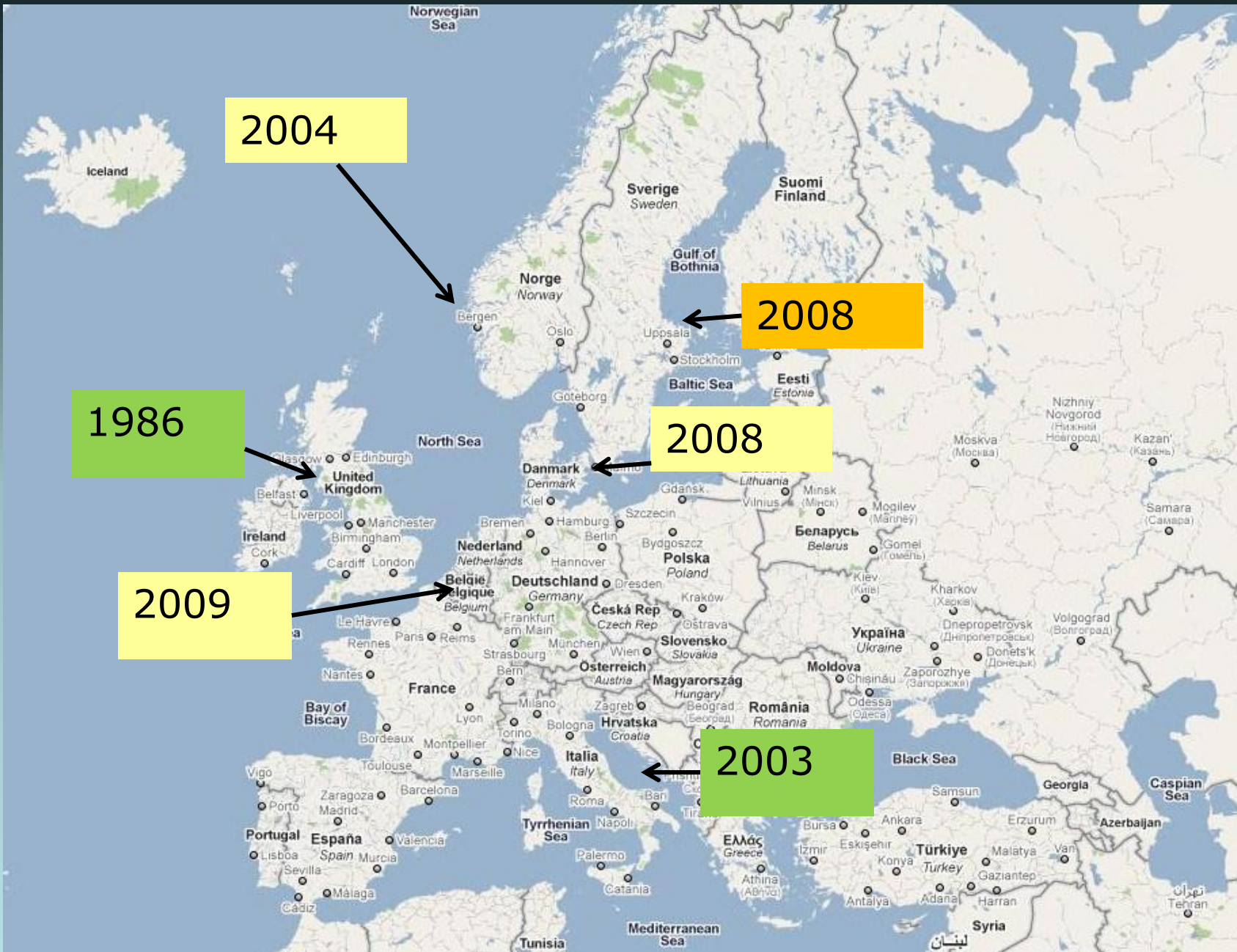
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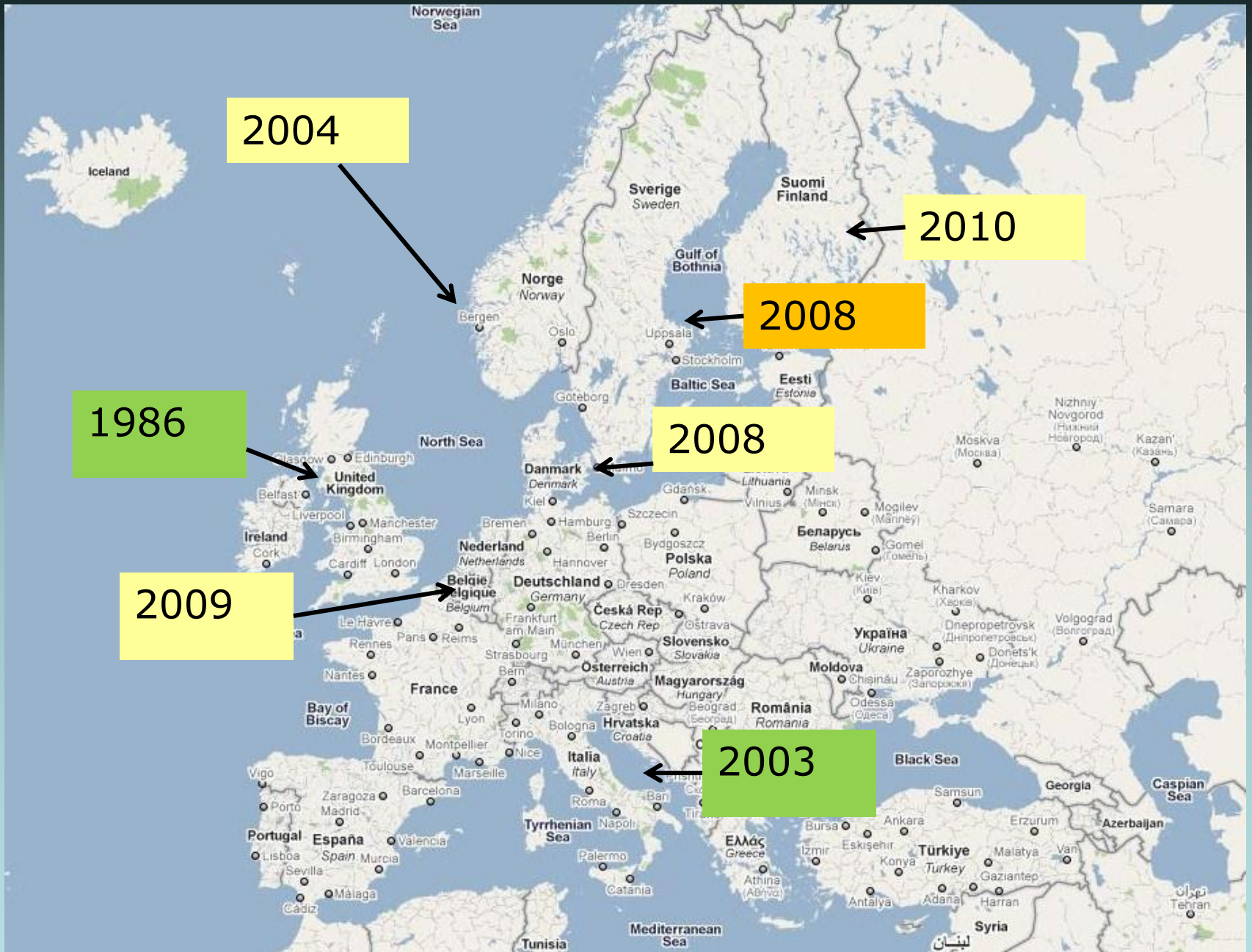
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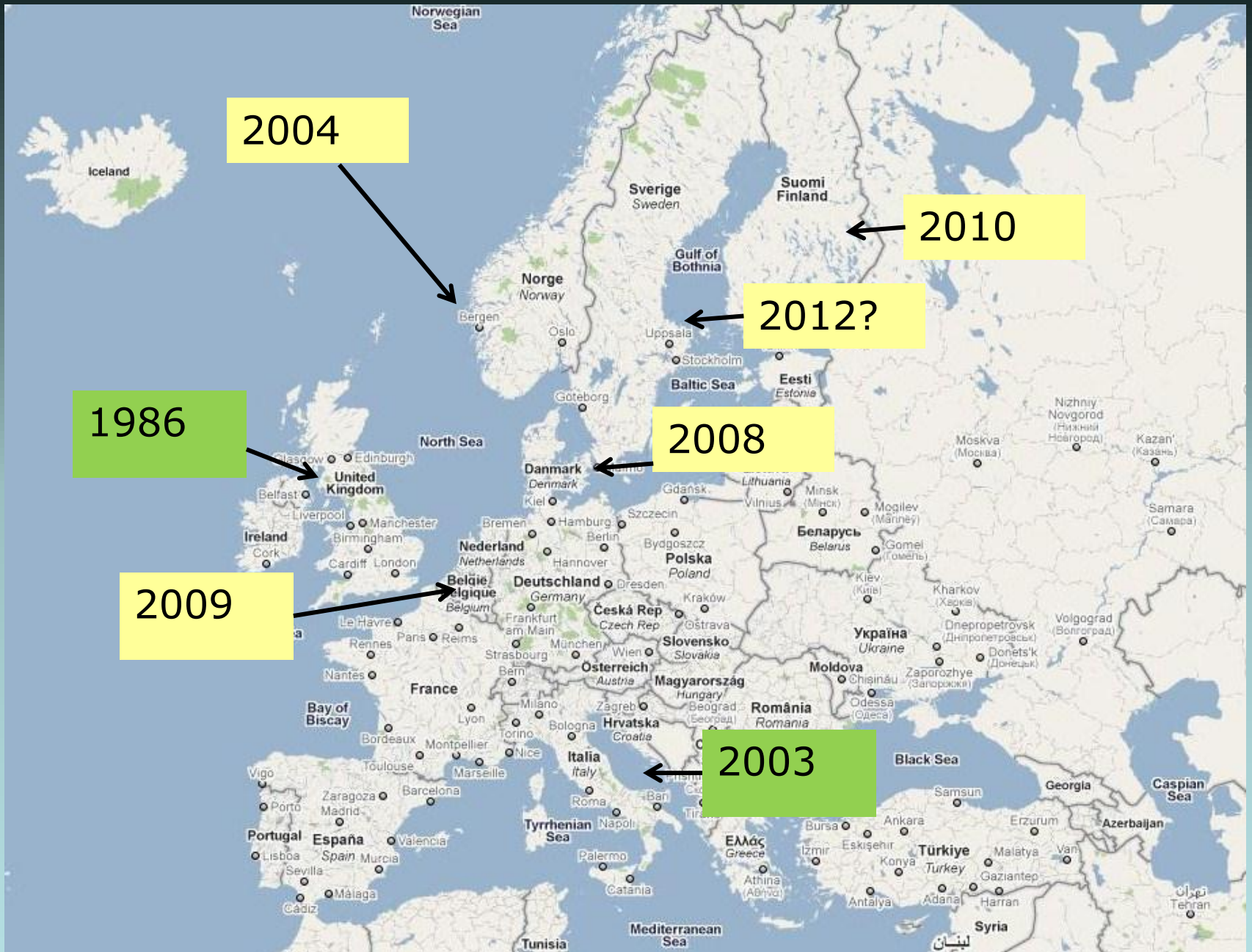
2003











2004

2010

2012?

1986

2008

2009

2003