

## EDITORIAL

### 50 Years of the Journal of Physical Oceanography

It has now been 50 years since the start of the *Journal of Physical Oceanography* (JPO), so it is a good time to look back. What were the big things that happened in the field from 1971 on? How did this change the “visibility” of physical oceanography?

The very first article in the very first issue was by O. M. Phillips (Phillips 1971), on how the layered “microstructure” should affect spectra in both space and time, and the last article in the first issue was about satellite oceanography, mapping SST, and surface advection by pattern tracking (Warnecke et al. 1971). After all, there were already footprints on the moon.

My own first issue was in volume 9 (1979), and the list of associate editors is a veritable list of “who’s who” in the field of physical oceanography at the time, as it still is. (One trend: more women, minorities, and non-U.S.-affiliated authors are being included—but too slowly, because it takes time to move mountains.)

While I could easily skip to my own conclusions, I would rather work through it in a way in which the readers can draw their own. Here is my approach: for each decade (1971–80, 1981–90, etc.) I am going to talk about some of the top five cited articles in each decade (citation counts are drawn from the Web of Science). Why not just the top one? These are my suggestions about which papers might better reflect the field as a whole, and also I want to reduce redundant entries. So here is my eclectic selection of top papers in each decade.

#### 1. First decade (1971–80)

The top cited paper is Osborn (1980), on relating turbulent diffusion to dissipation measurements. There is no surprise there, as it is the start of a whole new thing.

However, the second (and very close) is about sea ice dynamics (Hibler 1979). Who would have guessed? This is still an area of active research. This paper was a significant advance in the treatment of sea ice. Are there significant newer thoughts?


The third paper I highlight is Wyrski (1975). This work got people thinking more about the whole ENSO–Pacific Ocean system and its far-reaching effects, such as teleconnections.

#### 2. Second decade (1981–90)

The most cited paper in this decade is actually Gent and McWilliams (1990), but this connects closely with Gent et al. (1995), in the next decade. The only “dual decade most popular hits” was this group. Both papers deal with how to model the “mesoscale eddy contribution” to diffusion, mass transport, and energy–momentum exchange. Submesoscale does not come into consideration until much later.

Aside from that, I recognize Large and Pond (1981), the next most highly cited, relating wind speed to surface wave growth. It is still a good guide and is widely used. Next is WAMDI Group (1988), which is another essential basis for many of the wave-state

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forecasting/hindcasting models, including Wave Modeling (WAM), Simulating Waves Nearshore (SWAN), and quite a few others.

### 3. Third decade (1991–2000)

I fully expected that papers in the 1990s would focus more on internal waves and mixed layer dynamics, but I was wrong, according to the citation counts. Aside from [Gent et al. \(1995\)](#), the next most cited paper was [Chelton et al. \(1998\)](#), again addressing mesoscale eddies, but from an observational point of view that emphasizes satellite data.

Third place was a bit of a surprise: [Hunke and Dukowicz \(1997\)](#), who talk about some improved ideas about how to model sea ice (again). This was, frankly, something we all knew needed some work, so this makes sense.

### 4. Fourth decade (2001–10)

The top citations in this decade cover a somewhat wider range (and the citation counts are within 10%), with the top count going to analysis and modeling of the tropical Pacific surface currents ([Bonjean and Lagerloef 2002](#)), again related to ENSO. I think we are beginning to get a grip on this. . .

Next up is [Janssen \(2003\)](#), describing another way to approximate the four-wave (surface gravity wave) interactions to help improve the wave models, which are also becoming recognized as the intermediary between the wind and the actual momentum transferred to the underlying ocean. This really helped, although there is still much room for improvement.

In third place is [Marchesiello et al. \(2003\)](#), describing the structure and (to some extent) dynamics relevant to the California Current System. As fish stocks decline and fisheries become more stressed, this kind of California Cooperative Oceanic Fisheries Investigations (CalCOFI)-oriented study has resurged. This also marks the beginning of the very contemporary mingling of biophysical oceanography (I hasten to note that this last paper focuses on the physics and so belongs in *JPO*).

### 5. Fifth decade (2011–20)

This decade is not quite over, so the citation counts will no doubt be a bit biased toward the earlier entries. The top cite is [Jenkins \(2011\)](#), returning focus to polar physics, and focusing on the grounding-line problem: what is going on there anyhow?

Next is another study of wind stress and surface wave growth, by [Edson et al. \(2013\)](#), refining our understanding of this air–sea exchange—an obligatory reference for anyone measuring the wind stress over water.

The third entry is [Waterhouse et al. \(2014\)](#), which is one of the first attempts to provide a global map of dissipation throughout the oceanic water column and all over the world (see also [Whalen et al. 2012](#)).

### 6. Final remarks

As this eclectic sample shows, *JPO* has indeed provided a focused forum for discussing the many and varied aspects of the physics involved in the study of the seas. It is my hope, as the present chief editor, to stay out of the way (mostly) and let the field progress wherever it may—but, of course, with the judicious help of our very clever and generous (with their time) editors and reviewers.

I would also like to offer kudos to the 13 chief editors who preceded me! The first, Robert Reid, served for 9 years. Tied for the longest serving was Peter Mueller (2000–08). Next “almost tied” is Eli Katz, who served 4 years as co-chief editor with Peter Gent, and then 5 more years on his own. The next longest is my predecessor Michael Spall (2009–15).

I thank all who have volunteered their time to make *JPO* the premier journal in physical oceanography: editors, reviewers, and especially the readers. My thanks also go to the very competent AMS staff. Without any of these pillars, all would fall.

Jerome A. Smith  
Chief Editor

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