

Name: Laurent BERTINO

Born: 05 June 1975

Nationality: French

Present position: Research Director, NERSC, Bergen, Norway.

(CV updated 26 January 2018)

Academic degrees: Doctor in Geostatistics, Ecole des Mines de Paris, France, 2001.

Work experience:

LB holds a PhD in sequential data assimilation methods. He has reformulated them based on the concepts of geostatistics and opened new theoretical developments. He has since then applied the Ensemble Kalman Filter to the primitive equations HYCOM model and has been responsible for the development and operations of the TOPAZ ice-ocean forecasting system since January 2003. LB is leading the Arctic element of the Copernicus Marine Environment Monitoring Service (budget 8.6 MEUR, 2015-2021), co-leading a Nordic Center of Excellence on ensemble-based methods for environmental monitoring and prediction, awarded by NordForsk (2 MEUR for the period 2014-2018). LB is managing the FP7 SWARP project ("Ships and waves reaching polar regions", 2 MEUR). He has also managed industry-driven modelling studies in the South China Sea, in the Gulf of Mexico and in the Barents and Kara Seas. He is also regularly invited at the Institute of Atmospheric Physics of the Chinese Academy of Science, P.R. China.

Fields of interest and present research activities

LB's fields of interest are data assimilation methods, ice-ocean modelling and more generally statistics applied to environmental and climate problems.

Membership in academic and professional committees, scientific review work:

- Member of the CLIVAR/CliC Northern Oceans Region Panel (NORP): 2018-2020.
- Member of GODAE-OceanView Science Team 2009-present.
- Co-organizer of the yearly international EnKF workshop (<http://enkf.iris.no>)
- Member of the Bjerknes Center's RG2 "Climate predictions and regional scenarios".
- Project evaluator for the US National Science Foundation and French ANR.

Supervision

Present PhD students: Abhishek Shah (NERSC, UiB). J. Blyverket (NILU, UiB), K. Aalstad (UiO)

Previous students:

- PhDs of F. Counillon (NERSC, 2008) and I. Kechouche (NERSC, 2010), Patrick Raanes (NERSC, Uni. Oxford, UK, 2016), external adviser for C. Hansen (NERSC, 2008), B. Backeberg (Uni. Cape Town, SA, 2010), G. Nondal (NERSC, 2010), L. Srikanth (Uni. Chennai, India, 2013), M. S. George (NERSC, 2015).
- MSc of K. Dale (2006), B. Backeberg (2007), G. Zangana (2009), all three at UiB, V. Vionnet (2009, Ecole des Ponts et Chaussées, Paris).

Selected academic and professional publications 2013-present (peer-reviewed, total 50)

Bertino L. and M. M. Holland (2018): Coupled ice-ocean modeling and predictions. *J. Marine Res.* Special Issue "The Sea". in press.

Aalstad, K., Westermann, S., Schuler, T. V., Boike, J., and **Bertino, L.** (2018): Ensemble-based assimilation of fractional snow-covered area satellite retrievals to estimate the snow distribution at Arctic sites, *The Cryosphere*, 12, 247-270, <https://doi.org/10.5194/tc-12-247-2018>

- Xie, J., **Bertino, L.**, Counillon, F., Lisæter, K. A., & Sakov, P. (2017). Quality assessment of the TOPAZ4 reanalysis in the Arctic over the period 1991–2013. *Ocean Science*, 13(1), 123–144.
<http://doi.org/10.5194/os-13-123-2017>
- Gharamti, M. E., Samuelsen, A., **Bertino, L.**, Simon, E., Korosov, A., & Daewel, U. (2017). Online tuning of ocean biogeochemical model parameters using ensemble estimation techniques: Application to a one-dimensional model in the North Atlantic. *Journal of Marine Systems*, 168, 1–16.
<http://doi.org/10.1016/j.jmarsys.2016.12.003>
- Xie, J., Counillon, F., **Bertino, L.**, Tian-Kunze, X., & Kaleschke, L. (2016). Benefits of assimilating thin sea-ice thickness from SMOS into the TOPAZ system. *The Cryosphere*, 10(November), 2745–2761.
<http://doi.org/10.5194/tc-10-2745-2016>
- Lien, V. S., Hjøllø, S. S., Skogen, M. D., Svendsen, E., Wehde, H., **Bertino, L.**, Counillon, F., Chevallier, M., Garric, G. (2016). An assessment of the added value from data assimilation on modelled Nordic Seas hydrography and ocean transports. *Ocean Modelling*, 99, 43–59.
<http://doi.org/10.1016/j.ocemod.2015.12.010>
- Wang, Y., F. Counillon and **L. Bertino**. Alleviating the bias induced by the linear analysis update with an isopycnal ocean model. (2016) *Q. J. Roy. Met. Soc.* 142(695), 1064-1074. DOI: 10.1002/qj.2709
- Simon E., Samuelsen, A., **Bertino, L.**, Mouysset, S., (2015) Experiences in multiyear combined state-parameter estimation with an ecosystem model of the North Atlantic and Arctic Oceans using the Ensemble Kalman Filter. *Journal of Marine Systems*, 152, 1-17. [doi:10.1016/j.jmarsys.2015.07.004](https://doi.org/10.1016/j.jmarsys.2015.07.004)
- Raanes, P.N., Carrassi, A., **Bertino, L.** (2015) Extending the square root method to account for additive forecast noise in ensemble methods. *Monthly Weather Review*, 143(10), 3857-3873.
[10.1175/MWR-D-14-00375.1](https://doi.org/10.1175/MWR-D-14-00375.1)
- Tonani M. et al. (2015) Status and future of global and regional ocean prediction systems. *Journal of Operational Oceanography*, 8(2). DOI:10.1080/1755876X.2015.1049892
- Gehlen M., Barciela R., **Bertino L.**, Brasseur P., Butenschön M., Chai F., Crise A., Drillet Y., Ford D., Lavoie D., Lehodey P., Perruche C., Samuelsen A. and E. Simon. Building the capacity for forecasting marine biogeochemistry and ecosystems: recent advances and future developments. *Journal of Operational Oceanography*, 8(1), 2015.
- Martin M., Balsaseda M., **Bertino L.**, Brasseur P., Brassington G., Cummings J., Fujii Y., Lea D., Lellouche J.-M., Morgensen K., Oke P., Smith G., Testut C.-E., Waagbo G., Waters J. and Weaver A. Status and future of data assimilation in operational oceanography. *Journal of Operational Oceanography*, 8(2), 2015.
- Xie, J., Zhu, J., **Bertino, L.**, & Counillon, F. (2015). *Analysis of the northern South China Sea counter-wind current in winter using a data assimilation model*. *Ocean Dynamics*, 65(4), 523–538.
<http://doi.org/10.1007/s10236-015-0817-y>
- Counillon, F., Bethke, I., Keenlyside, N., Bentsen, M., **Bertino, L.**, & Zheng, F. (2014). *Seasonal-to-decadal predictions with the ensemble Kalman filter and the Norwegian Earth System Model: a twin experiment*. *Tellus A*, 66. doi:10.3402/tellusa.v66.21074
- Grey, M; C. Petit, S. Rodionov, M. Boquet, **L. Bertino**, M. Ferrari, T. Fusco (2014). *Local ensemble transform Kalman filter, a fast non-stationary control law for adaptive optics on ELTs: theoretical aspects and first simulation results*. *Optics Express*. 22.(17) pp. 20894-20913
- Williams, TD, Bennetts, LG, Squire, VA, Dumont, D, **Bertino, L** (2013). *Wave-ice interactions in the marginal ice zone. Part 1: Theoretical foundations*. *Ocean Modelling* 71, 81-91.