

## 1 **Model Belief versus Scientific Truth**

2 Belief in *models* is sufficiently advanced that they are *used to change scientific ground truth*  
3 *observations*. Science is based on experimental verification of models, theories and statistical  
4 assumptions. Zealous belief in models is the reverse of good science. Therefore, science has  
5 been abandoned in favour of non-science or nonsense.

## 6 **Aerosols and precipitation**

7 Recent statements in support of aerosol/precipitation model runs are a good example  
8 (Osborne and Lambert, 2014). The authors say in a promotional website “Climate models can  
9 *show observations to be wrong*, University of Exeter” (<http://theconversation.com/>, 7 April  
10 2014; [www.skepticalscience.com](http://www.skepticalscience.com), 8 April 2014). The authors propose altering mid-century  
11 precipitation data to match model-computed values! This absurd suggestion is completely  
12 contrary to basic cloud physics. The connection between aerosols and precipitation is very  
13 tenuous. There are no models that can capture the relationship. Another posting on 20 March  
14 2014 suggests that climate modelling of Arctic and Antarctic sea ice warming is “science at  
15 its best”. Models are not science. They are tools just like pencils. Garbage in, Garbage out is  
16 the rule. Belief that models are science is wrong.

17 Aerosols from sea salt or desert sand form condensation nuclei. Particulates shield incoming  
18 radiation as shown during USA 11 September 2001 3-day aircraft ban. While evaporation is  
19 uniform over large isothermal areas, precipitation is highly variable. Cloud seeding and  
20 aerosol experiments showed precipitation is complex and unpredictable. The work of friends  
21 and colleagues Louis Battan (C193), Peter Hobbs (instrumented aircraft), and of our mentor  
22 B. J Mason (1950s England) are all examples of experimental ground truth experiments. To  
23 ignore hard-won ground truth data and actually alter raw data is completely inexcusably  
24 wrong. It is bad science at its worst.

## 25 **Altered ground truth data removes important physical processes**

26 Two Wrongs do not add up to a Right. Osborne and Lambert (2014) cite the alteration of mid-  
27 century Pacific sea surface temperature data to fit statistics as precedent for altering raw data  
28 to fit models. It ignores our experimental verification that *mid-century mid-Pacific sea*  
29 *surface temperature datasets are demonstrably wrong* (Matthews and Matthews, doi:  
30 10.5194/os-9-695-2013, 2013; <http://www.ocean-sci.net/9/695/2013/os-9-695-2013.html>). It  
31 is completely unscientific and absurd to alter raw observational data. The three phases of  
32 global warming reported here were completely removed from the record.

33 Models prove nothing as we stated in our earlier author response to an anonymous reviewer  
34 (<http://www.ocean-sci-discuss.net/11/C54/2014/osd-11-C54-2014-supplement.pdf>).

35 Observations may be inaccurate. That suggests the need for better-calibrated instruments and  
36 measurement by well-qualified scientific observers as Keeling (1998) found. We pointed out  
37 that the mistaken belief in models in complete disregard of actual observations and the use of  
38 calibrated peer-reviews was the major problem ([http://www.ocean-sci-](http://www.ocean-sci-discuss.net/11/C193/2014/osd-11-C193-2014-supplement.pdf)  
39 [discuss.net/11/C193/2014/osd-11-C193-2014-supplement.pdf](http://www.ocean-sci-discuss.net/11/C193/2014/osd-11-C193-2014-supplement.pdf)).

## 40 **Evaporation is the key to understanding precipitation**

41 Our unique mid-Pacific ground truth experiment, Editor-withheld companion paper,  
42 established that evaporation depends only on temperature (through the Clausius-Clapeyron  
43 relation) and not relative humidity or windspeed (See also C54). No models discovered this  
44 scientific truth. It was found by in situ observations by highly qualified scientists with  
45 calibrated instruments.

1 The top 2m of the ocean should now be the focus of climate change studies. All the essential  
2 processes of global warming and ocean acidification are in this layer. Yet it is almost  
3 completely unstudied. Our finding that warming is accelerating from its current rate of more  
4 than 1°C in twenty years makes further research vitally important.

### 5 **Trust ocean observations. Ignore models**

6 Our papers serve as a warning to the ocean science community they must avoid following  
7 climate research down the blind alley of altering data to fit models. The only truly scientific  
8 approach is to find more high quality scientific observation data. In the ocean we have much  
9 better tracers of processes than aerosols. Global warming studies have concentrated on  
10 temperature to the exclusion of salinity. However, we are blessed with other chemical and  
11 biological tracers for ocean near-surface processes. We present some further supplementary  
12 ground truth data in support of the processes reported in the discussion paper (MP).

### 13 **Scientific tracers for Ocean Surface Processes**

#### 14 **1 Biological**

15 Don Williamson (1956) was able to trace specific water masses in western Irish Sea fjord by  
16 unique plankton as we discussed (MP). The species grew in the brackish waters of the eastern  
17 Irish Sea and was distinct from species from the southern St George's Channel or North  
18 Channel. It was found 120 miles (145km) to the north in Loch Fynne, the last 30 miles  
19 (48km) of which is a cul-de-sac, and also 200 miles north in the Minches open sea channel.  
20 Williamson states "Only a sudden and temporary increase in the rate of flow from the Isle of  
21 Man area could have produced a marked and simultaneous increase in the numbers of all three  
22 species in the north-going water by producing a faster moving body of water which would  
23 mix less with surrounding water in a given distance and so *maintain its planktonic character*  
24 for a greater distance." Furthermore, "In both cases the Irish Sea origin of the water seems  
25 highly improbable if the rate of transport were only of the order of Bowden's figure (about ¼  
26 mile (400 m) per day), but much more probable if the water were transported in pulses  
27 travelling at many times this rate." We believe this proves the value of observations of  
28 planktonic character in tracing Lagrangian wind-driven coherent surface water masses. Highly  
29 qualified scientists can only do this from the surface. There is no possibility of doing this  
30 work from satellites or even worse by application of statistics or models.

#### 31 **2 Chemical Tracers**

32 Salinity and nutrients have been totally neglected in tracing surface water masses for climate  
33 change purposes but are essential to understanding processes. This is especially vital for  
34 ocean acidification processes. John Slinn, who routinely collected daily Port Erin sea surface  
35 samples, did extensive studies of temperature, salinity and nutrients. He states, "The salinity  
36 pattern in June 1955 may be interpreted in support of Williamson's (1956) suggestion that the  
37 flow through the Irish Sea is irregular. There is evidence that Atlantic water, although  
38 considerably diluted by fresh water run-off, penetrates southwards off the Irish coast" (Slinn,  
39 1974). Indeed he reports an unusually high salinity of 34.5‰ in May 1959, at the height of the  
40 solar maximum water that we reported in the reviewed paper (MP). Indeed he reports annual  
41 high salinity intrusions of North Atlantic from the North Channel occur in the western fjord  
42 "biased towards the Isle of Man". They occur in March and November and follow that pattern  
43 shown in our Figure 5b (MP). It is clear therefore, that intrusions of Gulf Stream and  
44 Labrador surface water follow an annual cycle.

1 We believe it is entirely consistent with its tropical origins that unusually high salinity surface  
2 water first became apparent in routine samples at Port Erin in March 1959. That was during  
3 the peak of the 400-year solar maximum irradiance/sunspot cycles.

4 Slinn provides further confirmation of our 1959/1963 hot/cold tropical heating/polar cooling  
5 processes. He also notes “In March 1966, when the winter state of vertical homogeneity might  
6 have been expected to prevail, conditions were unusual in that there was a well defined  
7 temperature discontinuity over much of the section with the colder water at the surface. This  
8 colder water was markedly less saline than that below, with a salinity difference of almost 1‰  
9 between surface and bottom in mid-section.” Furthermore, “It may also be noted that  
10 salinities of over 34.9‰, at the bottom of the deep trough are the *highest values ever recorded*  
11 for this part of the Irish Sea.” We suggest the high salinity bottom water is remnant of the  
12 earlier years record warm salty intrusions. The fjord sills trap them in the deep channel off  
13 Port Erin. Surface waters are from the ongoing polar icemelt. Slinn goes on to associate  
14 nutrient depletion in the upper 30m water column with the observed stratification.

### 15 **Gulf Stream High Salinity Intrusions**

16 Tropical high salinity seawater had been observed in studies of tide pools on the southeast of  
17 the Isle of Man (Naylor and Slinn, 1958). These intrusions were reported to be due to  
18 sustained strong onshore winds. For example, on 12 May 1953 seawater, of salinity 34.3‰,  
19 entered the lowest pool but had little effect on the upper pool where the water was shallower.  
20 There, during neap tides, the “salinity rose from 36 0‰ to 38.6‰ in the six hours after high  
21 water, which occurred at 1100h GMT”. A temperature rise from 15.5°C to 22.2°C over a  
22 period of six hours was recorded. This is a clear demonstration of temperature dependent  
23 evaporation producing high salinity water in a shallow evaporative basin. We observed  
24 similar high evaporation in high salinity (>35.5‰) high temperature (>28°C) water in the  
25 north Pacific in the first part of these companion papers. It is clear proof of the Clausius-  
26 Clapeyron evaporation temperature dependence rather than the usual wrong assumption of  
27 windspeed and relative humidity.

### 28 **Ocean Surface Science**

29 Failure to publish the two companion papers suggests ocean scientists endorse the bad  
30 practices of climatologists. Copernicus *Ocean Science* has a great opportunity to the world’s  
31 leading forum for honest open discussion for scientific verification studies of the top two  
32 metres of oceans. We believe they should be without anonymity and with vested interests  
33 fully disclosed. Without this science will become nothing more than a political pawn.

34 Please stop discussing models and statistics as science. They are tools, nothing more. They  
35 are subservient to scientific method that fundamentally depends on experimental ground truth.  
36 This can only be gathered in situ because satellites cannot provide subsurface data on  
37 physical, chemical or biological tracers. It requires a completely new focus on the top 2m.

### 38 **References**

- 39 Naylor, E., and Slinn, D. J.: Observations on the Ecology of Some Brackish Water Organisms  
40 in Pools at Scarlett Point, Isle of Man, *Journal of Animal Ecology*, 27(1), 15-25, 1958.
- 41 Osborne, J., and Lambert, H.: The missing aerosol response in twentieth century mid-latitude  
42 precipitation observations, *Nature Climate Change*, doi: 10.1038/nclimate2173, 2014.
- 43 Slinn, D. J. Water circulation and nutrients in the northwest Irish Sea, *Est. Coastal Mar. Sci.*  
44 2, 1-25, doi: 10.1016/0302-3524(74)90024-3, 1974.