

# Monthly Weather Bulletin

No. 233

SEPTEMBER 2005



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**More hurricane  
damage in US- page 2**

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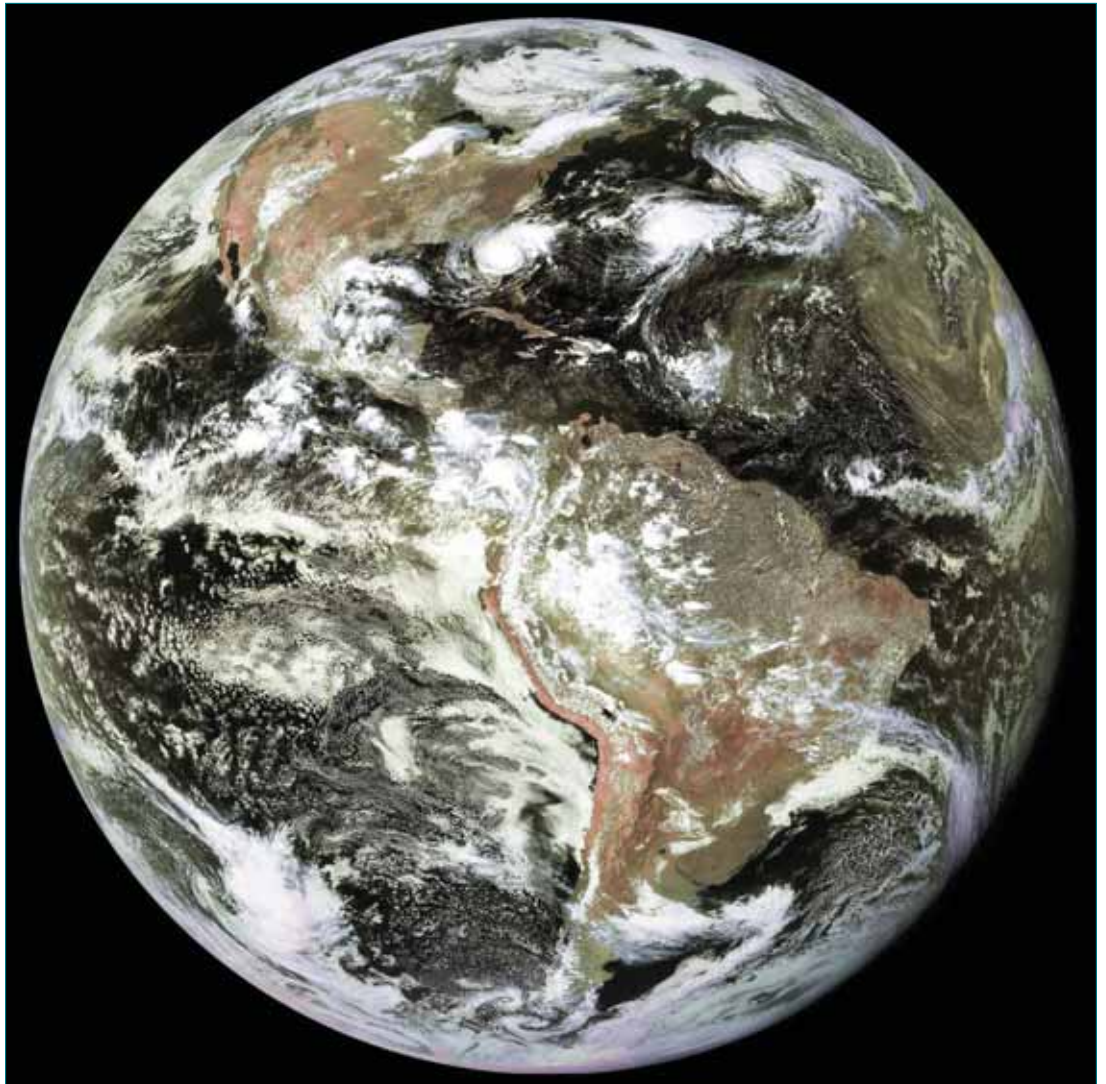
**Europe's seas  
under threat**

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Notes on the tables and map  
showing location of stations  
appear in each January issue



*A GOES-12 global satellite image taken at 1800UTC on the 12th shows three hurricanes or former hurricanes over the north Atlantic- Ophelia, Nate and Maria. The effects of these storms were felt over Ireland during the second half of the month.  
(picture courtesy NASA/NOAA, US Department of Commerce)*

## VERY WARM FIRST HALF OF MONTH; MAINLY DRY BUT DULL

**Summary:** Despite some cold nights towards the end of the month, mean air temperatures overall were well above normal generally. It was the warmest September for between 6 and 11 years at many stations and the warmest since 1971 at Malin Head. The first half of the month was very warm, with both daytime and nighttime temperatures around three

degrees higher than normal for the period. Maxima rose above 20°C on each day between the 2nd and 8th and reached close to 25°C on the 3rd and 4th in the west. In contrast, there were between 3 and 5 ground frosts recorded at inland stations during the second half of the month, with air temperatures falling close to freezing on the 24th; many stations measured

their lowest September air and ground temperatures for between 10 and 20 years on this day. Rainfall totals were above normal in coastal counties of the west and south, but it was a relatively dry month generally, with only around three quarters of the normal September rainfall recorded in parts of the east and midlands. The number of wetdays during the month (days with 1mm or more rainfall) ranged widely across the country, from 9 or 10 wetdays in the Dublin area to 21 at Valentia Observatory. Sunshine totals for the

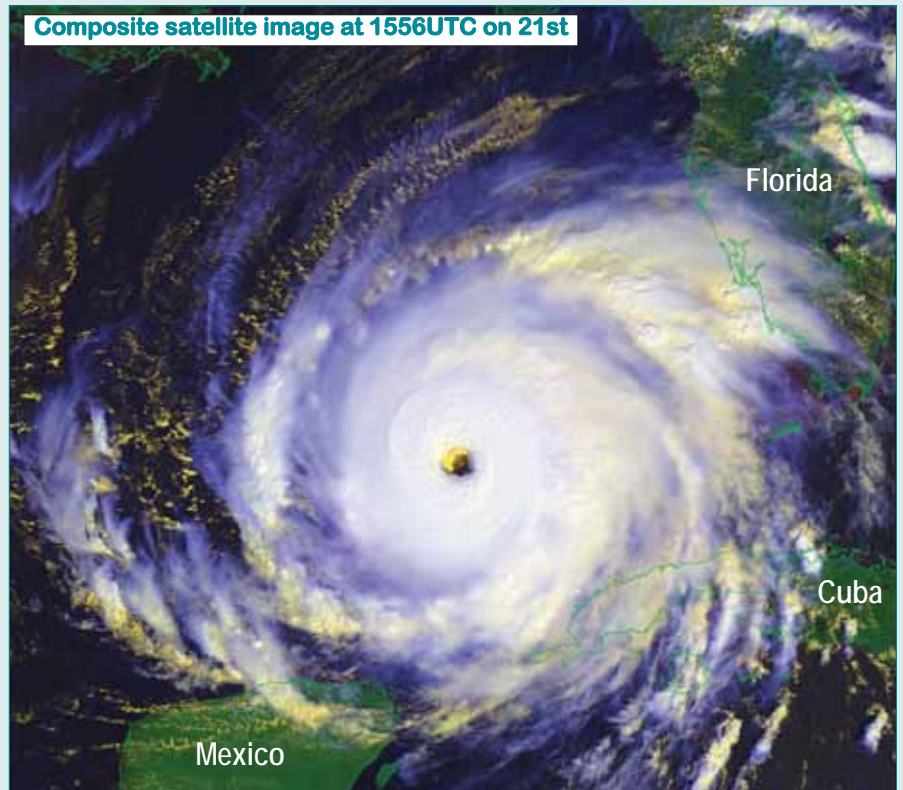
month were a little below normal at almost all stations, despite a very sunny first week; it was the dullest September generally for between 5 and 8 years.

**1st to 7th:** Weak frontal systems over or to the west of the country gave some light rain at times, but pressure over Ireland was relatively high and this period was mainly dry, warm and sunny with light south to southeasterly winds.

**8th to 9th:** Fronts associated with an area of low pressure to the southwest of Ireland moved northwards over the country, bringing a sharp drop in

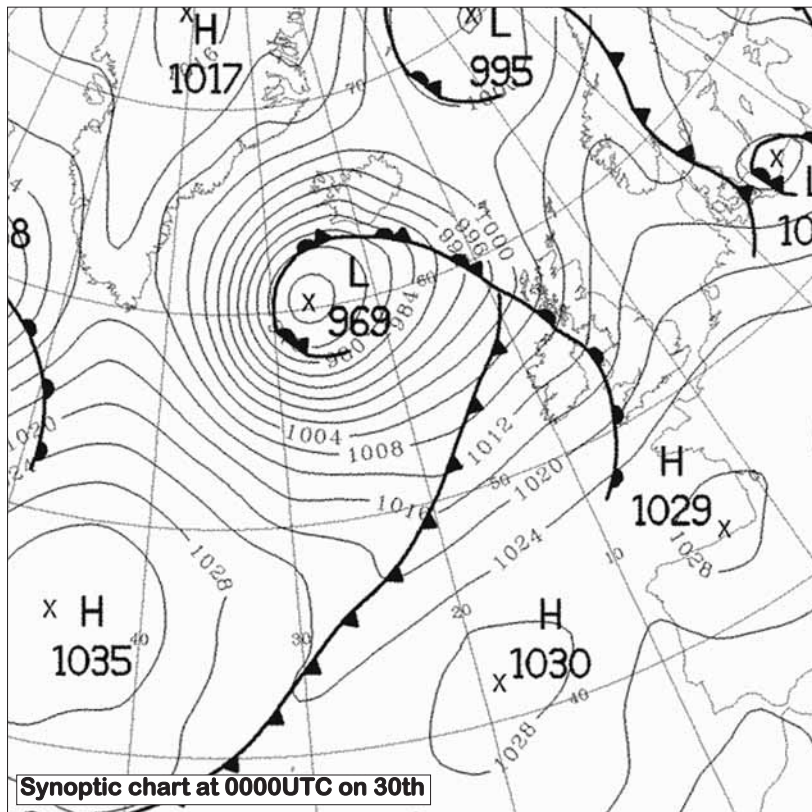
*Hurricane Rita developed as a depression just east of the Turks and Caicos islands on the 18th, reaching tropical storm strength later on the same day. Hurricane intensity was measured on the 20th as Rita tracked through the Florida Straits and just south of the Florida Keys. Winds were sustained at tropical storm force at Key West, where peak winds gusted to 66 knots (122km/hour). Rita emerged into the Gulf of Mexico on the 21st, undergoing a period of rapid intensification. By 0300GMT on the 22nd, the pressure dropped to 897hPa, becoming the third lowest pressure on record in the Atlantic, after hurricane Gilbert in 1988 (888hPa) and the so-called Labour Day hurricane of 1935 (892hPa). Rita continued to the northwest and weakened, but reached the Texas/Louisiana border area near Sabine Pass early on the 24th as a category three hurricane with maximum sustained winds of almost 105 knots (194km/hour). A storm surge of at least 4.5 metres flooded parts*

Composite satellite image at 1556UTC on 21st



*of this coastline, where sugar cane crop losses were estimated at around \$300 million. A 2.5 metre storm surge in New Orleans overtopped the provisionally-repaired levees (from Hurricane Katrina damage) and caused additional flooding. A total of 10 fatalities were reported, while preliminary damage estimates ranged between four and five billion dollars. As Rita came ashore, rainfall exceeded 150mm across a large area of the Texas and Louisiana coast. Earlier in the month, three other named storms - Maria, Nate and Ophelia reached hurricane status, but their tracks did not take them over any land areas.*

*(images courtesy NOAA, U.S. Dept. of Commerce)*



temperatures and a spell of heavy rain to all except extreme northern areas.

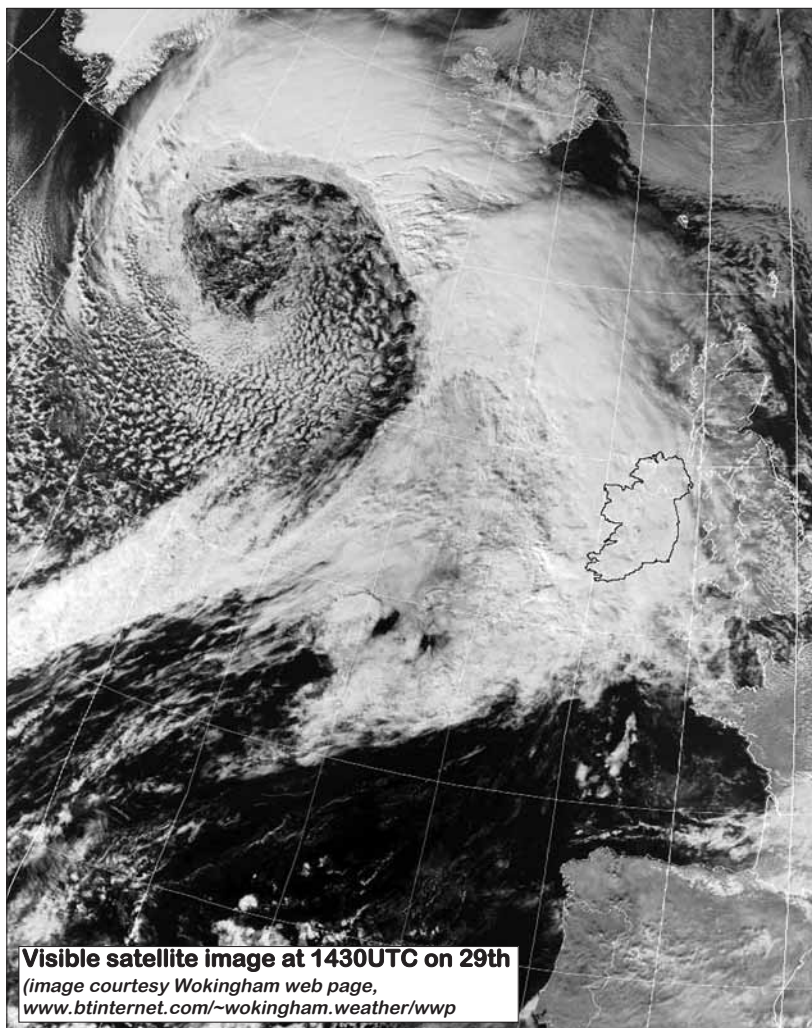
**10th to 13th:** Pressure rose over the country, bringing a return to dry, warm and sunny conditions with mostly light winds, becoming strong southwesterly later in the period.

**14th to 15th:** Another spell of wet weather affected all areas as a deep area of low pressure- the remnants of former hurricane **Maria**- moved to the north of Scotland; temperatures again dropped to normal values or below.

**16th to 18th:** A large Atlantic anticyclone extended a ridge over Ireland. The weather was dry and mostly sunny, although temperatures were below normal in a north to northwesterly airstream.

**19th to 30th:** A spell of unsettled weather everywhere as Atlantic depressions became the dominant influence, some of which owed their origins to former hurricanes. Rain or showers were recorded each day, with heaviest falls over the western half of the country. Southwest to westerly winds were strong at times, especially on the 26th. Sunshine amounts were low on most days, while temperatures were around normal. Minimum temperatures dipped well below normal on the 23rd and 24th, however, to give widespread ground frost in inland areas.

**Wind and elements:** Mean windspeeds for the month of between 7 and 13 knots (13 and 24 km/hour) were near normal everywhere. After relatively light winds during the first half of September, they were much stronger during the second half of the month, with the highest gust, 51 knots (94 km/hour), measured at Belmullet on both the 26th and 30th. Thunder was infrequent, recorded only in the period 4th/5th and on the 26th. Hail was observed on the 27th and 28th. Fog was most frequent in the period 5th to 6th and on the 12th.



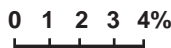
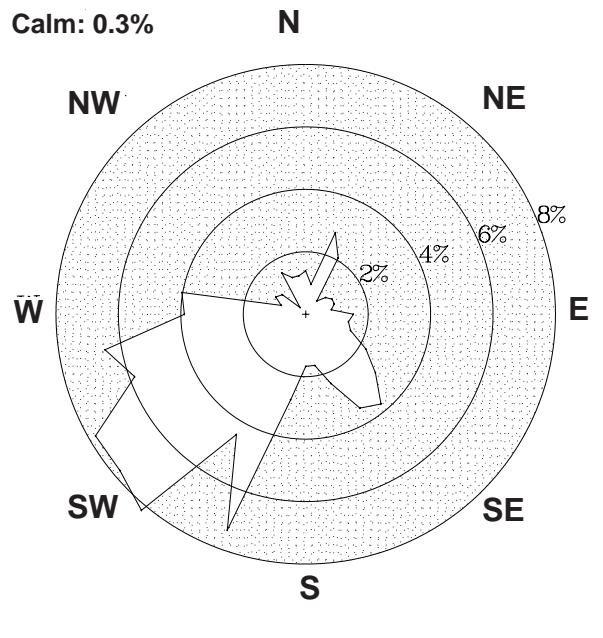
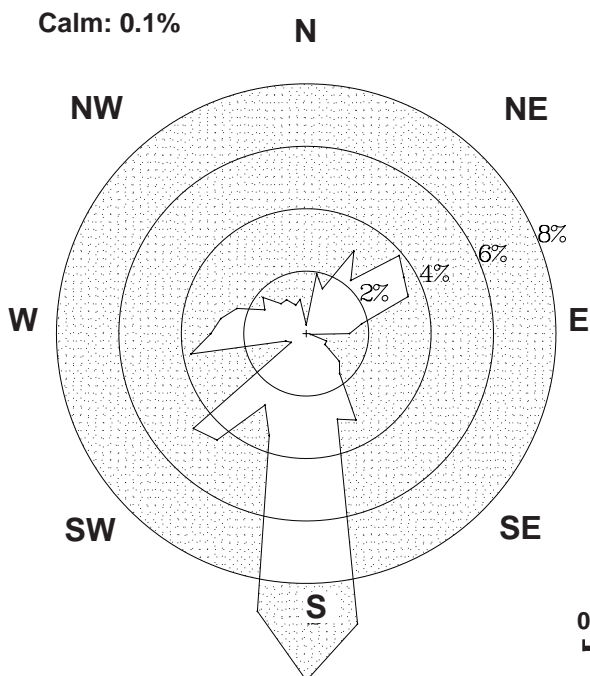
Above

Much of the second half of September was wet with strong to gale force southwesterlies. The end of the month brought another deep depression to the west of Ireland, bringing heaviest rainfall in the west, with winds gusting over 50 knots at Belmullet.

County / Station	WIND (KNOTS)									ELEMENTS					
	Mean speed	Max. 10-min. mean dir.	Max. 10-min. mean speed	Max. 10-min. mean date/hour	Max. Gust dir.	Max. Gust speed	Max. Gust date/time	Days with gales	Days with gale gusts	Hours with gale gusts	Snow	Snow Lying	Hail	Thunder	Fog
CO. CLARE SHANNON AIRPORT	9.1	160°	27	24/14	250°	43	26/1156	0	5	9	0	0	0	1	3
CO. CORK CORK AIRPORT	9.1	200°	25	26/14	200°	42	26/1344	0	5	10	0	0	0	0	9
CO. DONEGAL MALIN HEAD	13.0	190°	35	13/18	180°	50	26/1141	1	13	114	0	0	0	0	1
CO. DUBLIN CASEMENT AERODROME	10.2	190°	31	26/14	200°	45	26/1416	0	8	29	0	0	0	0	2
DUBLIN AIRPORT	10.8	200°	26	26/12	200°	41	26/1349	0	5	18	0	0	0	1	4
		260°	26	30/13											
CO. KERRY VALENTIA OBSERVATORY	9.1	250°	27	27/03	190°	39	26/0943	0	7	26	0	0	0	0	1
		260°	27	30/18											
CO. KILKENNY KILKENNY	6.8	200°	22	26/11	200°	36	26/1201	0	1	2	n/a	0	----	n/a	----
CO. MAYO BELMULLET	12.9	190°	35	26/07	190°	51	26/0611	1	15	116	0	0	1	0	0
					230°	51	30/1458								
KNOCK AIRPORT	9.7	200°	32	13/13	210°	48	13/1249	0	6	27	0	0	1	0	11
CO. MONAGHAN CLONES	7.8	310°	22	23/12	180°	37	26/1233	0	1	1	n/a	0	----	n/a	----
		190°	22	26/13											
CO. OFFALY BIRR	7.1	180°	22	26/13	180°	34	26/1129	0	1	1	n/a	0	----	n/a	----
CO. WESTMEATH MULLINGAR II	6.7	180°	20	26/12	220°	33	28/1303	0	0	0	n/a	0	----	n/a	----
CO. WEXFORD ROSSLARE	10.2	020°	26	10/18	200°	46	26/1508	0	10	33	0	0	0	0	2
		020°	26	15/18											

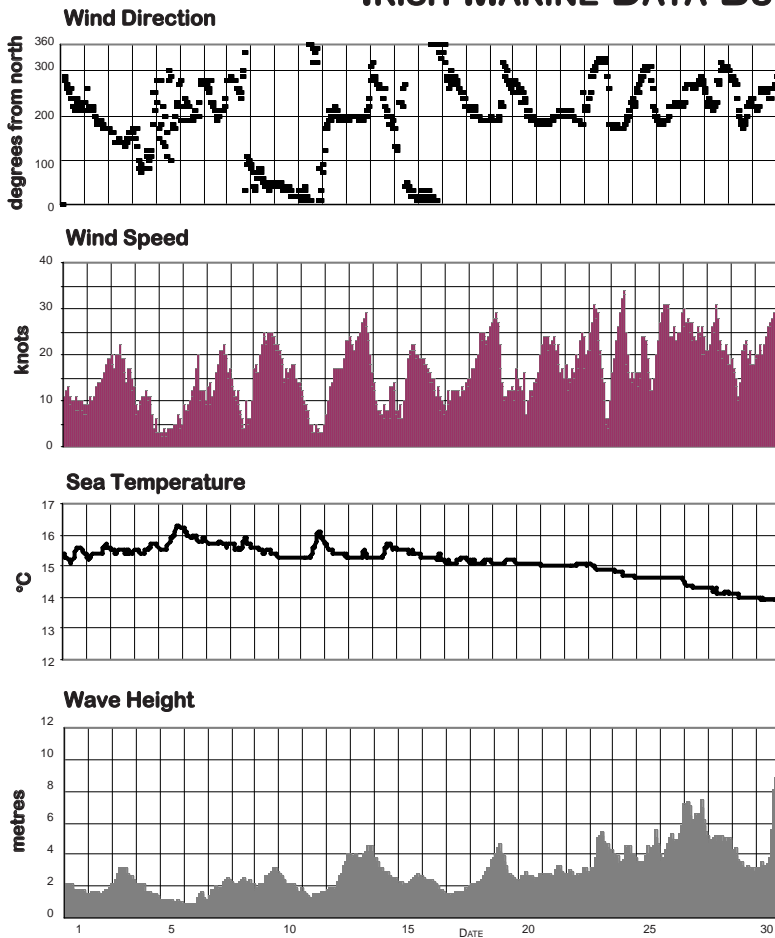
Valentia Observatory

Dublin Airport



FREQUENCY OF WIND DIRECTION

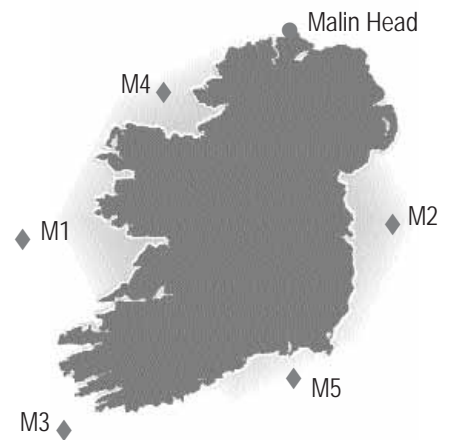
### MARINE OBSERVATIONS FROM IRISH MARINE DATA BUOY NETWORK



Hourly wind and wave conditions at M1 (53°07'N, 11°12'W)

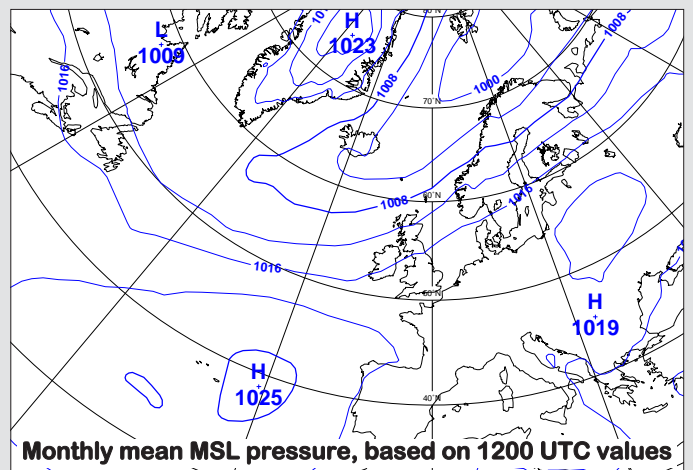
Buoy	Sea surface temp. (°C)	Mean wind speed (knots)	Max. 10-min wind (knots)	Mean wave height (m.)	Max. wave height (m.)
M1	15.1	16.0	34	2.8	8.8
M2	14.3	14.7	30	1.1	3.3
M3	16.5	15.4	30	2.6	8.0
M4	15.2	16.6	32	2.5	8.4
M5	15.8	14.7	29	1.2	2.8
Malin Head	15.4 (1.3°C above normal)				

#### Summary of Mean Monthly Values

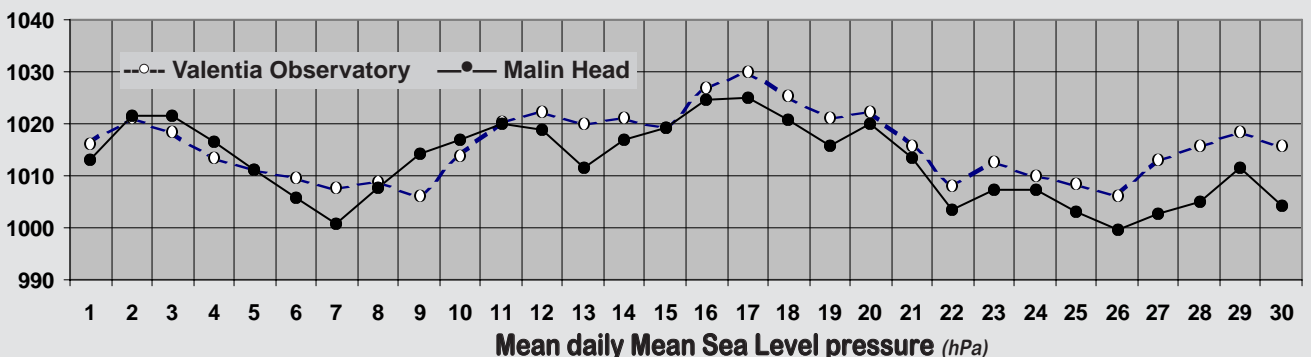


### MEAN ATMOSPHERIC PRESSURE

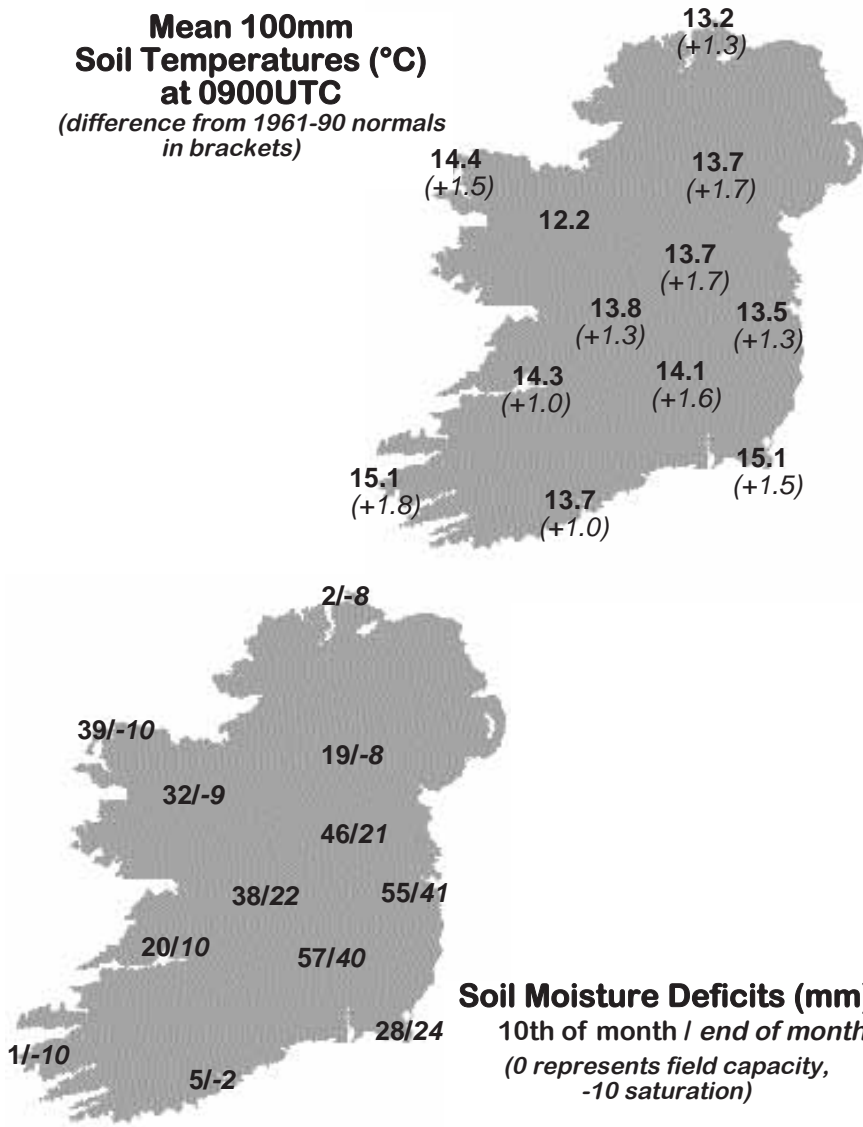
Mean sea level pressure values for the month ranged from 1013hPa in the north to almost 1017hPa in the southeast, near or a little higher than normal everywhere. Pressure varied little during most of the month. An anticyclone near Ireland just after mid-month brought the highest pressure of the month, with the highest value, 1031.2hPa, measured at Valentia Observatory on the 17th. Pressure fell steadily thereafter until the 26th, when the month's lowest value, 994.1hPa, was recorded at Malin Head.



Monthly mean MSL pressure, based on 1200 UTC values



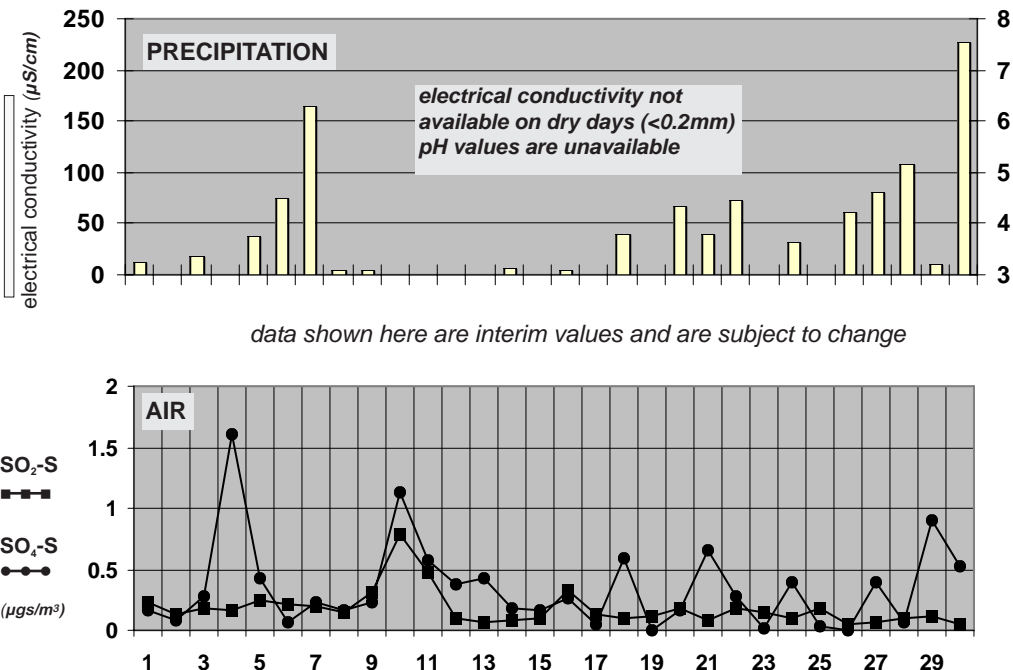
**Mean 100mm  
Soil Temperatures (°C)  
at 0900UTC**  
*(difference from 1961-90 normals  
in brackets)*



**Soil Temperatures at 0900UTC**

County/ Station	°C		
	100mm	200mm	300mm
CO. CLARE			
SHANNON AIRPORT	14.6	14.8	14.9
CARRON	14.6		15.4
CO. CORK			
FERMOY (MOORE PARK)	15.3	15.2	15.6
CORK AIRPORT	13.9	13.9	14.6
SHERKIN ISLAND	15.2		15.7
CO. DONEGAL			
MALIN HEAD	12.9	13.6	14.6
CO. DUBLIN			
DUBLIN AIRPORT	13.6	13.9	14.6
CASEMENT AERODROME	13.3	14.0	14.5
CO. KERRY			
VALENTIA OBSERVATORY	14.8	15.2	16.2
CO. KILKENNY			
KILKENNY	14.4	14.9	15.8
CO. LEITRIM			
BALLINAMORE	14.5	14.5	14.9
CO. LIMERICK			
MOUNT RUSSELL	13.3	14.1	
CO. LOUTH			
ARDEE (BOHARNAMOE)	13.9	14.3	14.5
CO. MAYO			
BELMULLET	14.3	15.0	15.9
STRAIDE	13.9		
KNOCK AIRPORT	12.3	13.0	13.8
CO. MEATH			
WARRENTOWN	13.8	14.7	15.4
CO. MONAGHAN			
CLONES	13.4	13.8	14.4
CO. OFFALY			
BIRR	13.7	14.6	15.4
CO. TIPPERARY			
FETHARD (PARSONSHILL)	13.5	14.4	
CO. WATERFORD			
DUNGARVAN (CARRIGLEA)		15.2	15.9
CO. WESTMEATH			
MULLINGAR II	14.2	14.9	15.9
CO. WEXFORD			
JOHNSTOWN CASTLE	14.5	14.8	15.0
ROSSLARE	14.4	14.7	15.9
JOHN F. KENNEDY PARK	14.2	14.9	15.9
CLONROCHE (KNOXTOWN)	13.2	14.2	14.8

**Chemical Analysis of Precipitation and Air Samples  
at Valentia Observatory**



Acid rain occurs when pollutants combine with moisture in the air to form sulphuric or nitric acid. pH is the simplest way of measuring the acidity of precipitation. Usually pH of 7.00 is considered neutral but this is not the case in rainfall samples. Pure water in the atmosphere has an equilibrium pH value of 5.65 at 20°C owing to carbon dioxide in the air dissolving to form carbonic acid. Any value below pH 5.65 is considered acid while any value above is considered alkaline.

Sulphur dioxide and sulphate in air contribute to the formation of sulphuric acid; nitrate in air contributes to the formation of nitric acid.

Conductivity measures the total ion activity in the rainfall, i.e. the higher the conductivity the greater the number of ions present.

10-DAY VALUES FOR SELECTED AGROMETEOROLOGICAL STATIONS		RAINFALL				TEMPERATURE										SUNSHINE		P.E. (Penman) (mm)					
Station	period	amount	% of average	rain days	wet days	mean max.	mean min.	mean daily	diff. from average	lowest min.	date	days with air frost	degree days > 4.4°C	degree days > 10.0°C	lowest "grass-min."	date	days with ground frost	mean 10cm at 0900h	mean 30cm at 0900h	total no. of hours	% of average	mean wind speed (ms) 2m a.g.l.	P.E. (Penman) (mm)
Co. Cork Fermoy	1-10	55.9	-	6	5	19.4	11.8	15.6	-	8.0	6	0	112	57	4.4	2	0	16.6	17.0	33.0	-	0.8	-
	11-20	5.7	-	3	1	18.1	9.7	13.9	-	2.4	17	0	96	45	-3.1	17	1	15.7	16.4	40.0	-	0.9	-
	21-end	43.0	-	8	8	16.6	8.2	12.4	-	2.6	24	0	81	31	-3.2	24	3	14.1	14.6	24.7	-	2.1	-
	month	104.6	132	17	14	18.0	9.9	14.0	1.2	2.4	17	0	288	133	-3.2	24	4	15.5	16.0	97.7	89	1.2	32
Co. Donegal Glenties	1-10	17.9	-	6	4	19.3	11.4	15.4	-	7.8	6	0	110	55	5.7	1	0	-	-	-	-	-	-
	11-20	20.7	-	9	6	17.2	9.4	13.3	-	4.9	17	0	89	37	4.0	17	0	-	-	-	-	-	-
	21-end	93.4	-	10	9	15.5	9.4	12.5	-	3.0	24	0	81	29	3.0	24	0	-	-	-	-	-	-
	month	132.0	91	25	19	17.3	10.1	13.7	1.4	3.0	24	0	279	121	3.0	24	0	-	-	-	-	-	-
Co. Kerry Ardfert	1-10	36.7	-	6	4	19.9	12.1	16.0	-	9.7	1	0	116	60	4.2	1	0	-	-	40.9	-	-	-
	11-20	4.1	-	4	2	18.9	10.6	14.8	-	6.9	17	0	104	50	2.0	17	0	-	-	44.0	-	-	-
	21-end	49.6	-	9	8	17.1	10.5	13.8	-	5.6	24	0	94	39	0.3	24	0	-	-	30.5	-	-	-
	month	90.4	-	19	14	18.6	11.1	14.9	1.6	5.6	24	0	313	149	0.3	24	0	-	-	115.4	-	-	-
Co. Leitrim Ballinamore	1-10	11.0	-	5	3	19.6	10.5	15.1	-	5.0	2	0	107	53	-0.4	2	1	15.7	15.8	40.1	-	-	-
	11-20	23.3	-	7	5	16.8	9.7	13.3	-	4.5	17	0	89	37	-3.5	17	1	14.3	15.0	28.2	-	-	-
	21-end	83.6	-	10	9	15.5	8.8	12.2	-	0.5	24	0	79	29	-4.5	24	2	13.1	13.8	25.0	-	-	-
	month	117.9	113	22	17	17.3	9.7	13.5	1.3	0.5	24	0	274	119	-4.5	24	4	14.4	14.9	93.3	97	-	-
Co. Louth Ardee	1-10	27.5	-	5	3	20.7	12.0	16.4	-	6.3	2	0	120	65	5.2	2	0	16.0	16.5	-	-	-	-
	11-20	16.3	-	7	3	17.6	10.6	14.1	-	3.7	17	0	97	44	0.4	17	0	13.9	14.9	-	-	-	-
	21-end	22.6	-	10	5	16.7	10.0	13.4	-	2.4	24	0	90	37	1.2	24	0	12.7	13.3	-	-	-	-
	month	66.4	95	22	11	18.3	10.8	14.6	2.2	2.4	24	0	307	147	0.4	17	0	14.2	14.9	-	-	-	-
Co. Waterford Dungarvan	1-10	30.2	-	5	3	19.8	12.1	16.0	-	5.8	2	0	115	61	3.2	2	0	-	17.0	47.2	-	0.6	-
	11-20	6.3	-	4	3	19.0	10.1	14.6	-	3.0	17	0	102	49	0.5	17	0	-	16.2	53.9	-	1.1	-
	21-end	40.6	-	7	7	17.4	8.8	13.1	-	2.1	24	0	87	37	0.5	24	0	-	14.7	29.4	-	2.3	-
	month	77.1	-	16	13	18.7	10.3	14.5	1.1	2.1	24	0	304	147	0.5	17	0	-	16.0	130.5	106	1.3	37
Co. Wexford Johnstown Castle	1-10	41.5	-	3	2	19.3	13.1	16.2	-	10.6	2	0	118	62	6.1	2	0	16.1	16.5	39.0	-	-	-
	11-20	13.3	-	4	4	18.2	11.2	14.7	-	7.7	17	0	103	48	2.9	17	0	14.5	15.2	48.8	-	-	-
	21-end	30.7	-	8	7	16.6	9.8	13.2	-	5.7	24	0	88	35	-0.2	24	2	13.1	13.7	26.1	-	-	-
	month	85.5	101	15	13	18.0	11.3	14.7	1.7	5.7	24	0	308	145	-0.2	24	2	14.6	15.2	113.9	88	-	-

**MEASURED POTENTIAL EVAPOTRANSPIRATION (P.E.) AND SOIL MOISTURE**

SEE BACK PAGE OF JANUARY ISSUE FOR NOTES ON THE DATA

County/Station	Period	P.E. (mm) Amount	Soil Moisture (mm) Deficit	Accumulated Deficit	Surplus
Co. Kerry Valentia Obs.	1-10	31.2	-	7	15
	11-20	11.5	-	0	14
	21-end	23.8	-	0	51
	month	66.5			
Co. Leitrim Ballinamore	1-10	16.6	5	29	-
	11-20	11.8	-	17	12
	21-end		not available		
	month				
Co. Wexford Johnstown Castle	1-10	32.1	-	35	20
	11-20	16.6	5	40	-
	21-end	26.4	-	31	9
	month	75.1			

County/Station	GLOBAL SOLAR RADIATION (MJ/sq. m.)				P.E. (Penman) total for month(mm)
	10-day totals 1-10	11-20	21-end	total for month	
Co. Donegal Malin Head	105.19	85.36	66.95	257.50	50
	Co. Dublin Dublin Airport				51
108.39	108.85	82.36	299.60		
Co. Kerry Valentia Obs.	114.79	94.90	59.89	269.58	48
	Co. Kilkenny Kilkenny				42
110.37	106.41	66.49	283.27		
Co. Mayo Belmullet	115.50	89.90	69.93	275.33	46
	Co. Monaghan Clones				43
102.12	92.49	65.78	260.39		
Co. Offaly Birr	107.88	104.16	65.26	277.30	42

**Thursday 1st:** Mainly dry during the night with just occasional showers in western areas. Dry in most parts during the day, apart from the west which had showers of rain and drizzle. Long sunny periods with temperatures near or above normal. Some mist or fog patches forming in inland areas. Winds were light northwesterly initially, backing west to southwesterly or southerly by evening.

**Rainfall:** nil to 8mm, heaviest at Knock Airport, 6mm at Valentia  
**Temperature:** max. 15°C to 19°C, min. 7°C to 12°C, no ground frost  
**Sunshine:** 6 to 11 hours, sunniest at Belmullet, 6 hours at Knock Airport

**Friday 2nd:** A few showers or outbreaks of rain in western areas during the night, but otherwise dry. A fine dry day generally with sunny spells in all areas and isolated light showers. Warm with temperatures well above normal. Continuing mild and dry during the evening. Light southeast to southerly winds throughout.

**Rainfall:** nil to <1mm, heaviest at Mullingar  
**Temperature:** max. 19°C to 21°C, min. 5°C to 13°C, no ground frost  
**Sunshine:** 6 to 12 hours, sunniest at Rosslare, 6 hours at Mullingar

**Saturday 3rd:** A mild night with some fog inland and isolated showers in the southwest, but otherwise dry. Dry everywhere for the rest of the day. Sunny spells in most parts with the exception of the extreme south, which remained dull for most of the day. Warm. Winds were southeasterly, light at first but becoming moderate in the east for a while during the afternoon.

**Rainfall:** nil to trace  
**Temperature:** max. 18°C to 24°C, min. 9°C to 16°C, no ground frost  
**Sunshine:** trace to 8 hours, sunniest at Casement Aerodrome, trace at Cork Airport

**Sunday 4th:** Dry and mild during the night with light winds. Rain in the southwest, light initially but becoming extensive during the afternoon and evening. Rain was thundery in some places, while other areas remained dry. Very warm with temperatures well above normal. Some hazy sunshine, although amounts were small overall. Winds were light to moderate, variable in direction.

**Rainfall:** nil to 6mm, heaviest at Cork Airport  
**Temperature:** max. 17°C to 25°C, min. 11°C to 16°C, no ground frost  
**Sunshine:** trace to 4 hours, sunniest at Malin Head, trace at Kilkenny and Birr

**Monday 5th:** Mild during the night with mist or fog in many areas, dense in places. A fine day with sunshine in most areas, but cloudier in northwestern areas. Very warm with temperatures above normal. Occasional light showers, but rainfall amounts were small. Continuing very mild during the evening with mist or fog returning again after dark. Winds were light, variable in direction.

**Rainfall:** nil to 2 mm, heaviest at Valentia  
**Temperature:** max. 19°C to 23°C, min. 9°C to 15°C, no ground frost  
**Sunshine:** 4 to 11 hours, sunniest at Belmullet, 4 hours at Malin Head

**Tuesday 6th:** Overnight fog in places cleared during the morning to give a mostly dry day. Warm with long spells of sunshine in most areas; however it was duller in the west. A spell of light rain spread into the west and northwest during the evening. Winds were light, southerly in direction, occasionally moderate in the west during the afternoon.

**Rainfall:** nil to 1mm, heaviest at Valentia  
**Temperature:** max. 19°C to 24°C, min. 8°C to 14°C, no ground frost  
**Sunshine:** 3 to 11 hours, sunniest at Rosslare, 3 hours at Belmullet

**Wednesday 7th:** Outbreaks of rain and drizzle in the west at first with clear spells in the east. The rain, which was heaviest in the midwest during the morning and early afternoon, spread northwards by late afternoon to give some heavy falls in the extreme north. Elsewhere there were sunny spells, particularly in the east and southeast. A very mild day everywhere. Southwesterly winds were light to moderate in strength.

**Rainfall:** trace to 10mm, heaviest at Malin Head, trace at Rosslare and Kilkenny  
**Temperature:** max. 17°C to 21°C, min. 12°C to 15°C, no ground frost  
**Sunshine:** nil to 4 hours, sunniest at Rosslare

**Thursday 8th:** A dry start in most parts, apart from the extreme south of the country. During the late morning, heavy and thundery rain moved into the extreme southwest and spread across southern counties. By the time it cleared the southeast coast, another large and very intense band of rain approached the southwest and moved gradually eastwards, losing some intensity as it

progressed. A few sunny spells, although generally overcast. Winds were light and variable, but a little stronger in the south by evening.

**Rainfall:** trace to 10mm, heaviest at Cork Airport, trace at Malin Head  
**Temperature:** max. 16°C to 20°C, min. 11°C to 15°C, no ground frost  
**Sunshine:** trace to 4 hours, sunniest at Kilkenny, trace at Knock Airport

**Friday 9th:** Rain in most areas overnight, with heavy outbreaks in places. The rain continued countrywide during the morning and early afternoon. A clearance reached the southwest coast by mid-afternoon, but rain continued in the rest of the country during the evening, again with some heavy outbreaks in places. Mist formed in places late in the night. Winds were light to moderate, northeasterly or variable in direction.

**Rainfall:** 1 to 34mm, heaviest at Rosslare, 1mm at Malin Head  
**Temperature:** max. 12°C to 19°C, min. 11°C to 15°C, no ground frost  
**Sunshine:** nil to trace generally, 2 hours at Valentia, 1 hour at Cork Airport

**Saturday 10th:** A band of showers over the south of the country moved eastwards, clearing the east coast by late morning. Generally dry for the rest of the day while staying overcast in most parts. Sunny spells in the southwest and to a lesser extent the west. Winds were northerly in direction, generally light, but stronger off the southeast coast.

**Rainfall:** nil to <1mm generally, 4mm at Cork Airport  
**Temperature:** max. 15°C to 19°C, min. 10°C to 15°C, no ground frost  
**Sunshine:** nil to 6 hours, sunniest at Valentia

**Sunday 11th:** Dry during the night with mist or fog patches in many areas. Remaining dry throughout the period with mist or fog returning after dark. Temperatures were near or above normal with periods of sunshine in most areas. Winds were mainly light northerly.

**Rainfall:** nil  
**Temperature:** max. 16°C to 19°C, min. 8°C to 14°C, no ground frost  
**Sunshine:** 5 to 10 hours, sunniest at Valentia, 5 hours at Casement Aerodrome

**Monday 12th:** Mist and fog patches overnight cleared slowly during the morning. The eastern half of the country had a dry, sunny day with temperatures well above normal. Cloudier in the western half with occasional light rain or drizzle. Light variable winds became southwesterly during the day and were moderate to fresh and gusty at times, particularly on northwestern coasts.

**Rainfall:** nil to 1mm, heaviest at Belmullet  
**Temperature:** max. 17°C to 22°C, min. 6°C to 13°C, no ground frost  
**Sunshine:** trace to 10 hours, sunniest in the east, trace at Valentia

**Tuesday 13th:** Generally dry during the day. Some falls of rain or showers in western regions, although amounts were quite small. A frontal trough approached the west coast during the evening, bringing rain or drizzle to the western half of the country, heavy in places. Warm with afternoon temperatures well above normal. Long sunny periods also in most areas. Winds were light, westerly or variable.

**Rainfall:** nil to 16mm, heaviest at Belmullet  
**Temperature:** max. 18°C to 22°C, min. 12°C to 16°C, no ground frost  
**Sunshine:** nil to 6 hours, sunniest at Dublin Airport, nil at Malin Head

**Wednesday 14th:** A dry start in all areas with sunny spells in places. The day continued dry until the late evening, when rain arrived on the west coast and spread eastwards. Heavy falls in the southwest. Sunny spells in all areas, particularly in the southeast. Light to moderate winds, west or southwesterly in direction.

**Rainfall:** nil to 1mm generally, 7mm at Valentia  
**Temperature:** max. 16°C to 21°C, min. 10°C to 15°C, no ground frost  
**Sunshine:** 2 to 8 hours, sunniest at Rosslare, 2 hours at Belmullet

**Thursday 15th:** Rain and drizzle in the west early in the period spread across the country to give a wet morning everywhere. Rain and drizzle continued during the afternoon, but a clearance in the west by mid-afternoon. Some sunny spells also, but remaining overcast in the east. The clearance spread slowly eastwards later in the afternoon and evening. During the evening some showers developed in western areas. Dry everywhere by late evening apart from isolated showers. Light to moderate northerly winds.

**Rainfall:** 2 to 16mm, heaviest at Casement Aerodrome, 2mm at Kilkenny  
**Temperature:** max. 13°C to 20°C, min. 8°C to 13°C, no ground frost  
**Sunshine:** nil to 5 hours, sunniest at Cork Airport, nil at Dublin Airport



**Friday 16th:** Mostly dry with clear spells overnight and just a few showers in eastern areas. A generally dry morning and afternoon with some sunny spells, however a few showers developed, mainly in southwestern areas. The evening and night were dry with clear spells. Cool throughout. Winds were light, north to northwesterly in direction.

**Rainfall:** nil to >1mm, heaviest at Dublin Airport

**Temperature:** max. 11°C to 15°C, min. 5°C to 10°C, ground temperatures down to -3°C at Birr

**Sunshine:** <1 to 8 hours, sunniest at Cork Airport, <1 hour at Knock Airport

**Saturday 17th:** Cold overnight with ground frost developing in some inland areas. Mostly dry throughout with isolated light showers in the north and northwest. It remained dull all day in the northern half of the country but becoming clearer further south, with prolonged spells of sunshine in the southeast. Winds were light, occasionally moderate, between northwesterly and southwesterly in direction.

**Rainfall:** nil

**Temperature:** max. 14°C to 16°C, min. 2°C to 10°C, ground temperatures down to -4°C at Kilkenny

**Sunshine:** nil to 10 hours, sunniest at Rosslare, nil at Belmullet

**Sunday 18th:** A southerly airflow covered Ireland. Dry with clear spells overnight. A dry, mild day over all of the country with varying amounts of sunshine; it was most prolonged in the southeast and east, while the northwest and west were more overcast. Winds were southwest or southerly, light to moderate with occasional gusts.

**Rainfall:** nil to trace

**Temperature:** max. 15°C to 19°C, min. 9°C to 12°C, no ground frost

**Sunshine:** trace to 10 hours, sunniest at Rosslare, trace at Knock Airport

**Monday 19th:** Mild overnight with some rain or drizzle along Atlantic coasts. Most areas had a cloudy, damp day with outbreaks of rain or drizzle and very little sunshine. Clearer weather with scattered showers and sunny spells moved in from the Atlantic in the afternoon and evening and moved slowly across the country. Southerly winds increased moderate to fresh and gusty during the day before veering southwesterly and easing during the afternoon and evening.

**Rainfall:** <1 to 12mm, heaviest at Belmullet, <1mm at Rosslare

**Temperature:** max. 15°C to 18°C, min. 9°C to 13°C, no ground frost

**Sunshine:** nil to 2 hours, sunniest at Belmullet

**Tuesday 20th:** Some patches of mist in the east overnight. After daybreak some very isolated showers affected western and southern areas. Becoming cloudy in the west during the afternoon with some light rain in the extreme northwest during the evening. Sunny spells elsewhere during the day and clear intervals after dark. Winds were light, southwesterly in direction.

**Rainfall:** nil to trace

**Temperature:** max. 16°C to 18°C, min. 8°C to 13°C, no ground frost

**Sunshine:** trace to 3 hours, sunniest at Clones

**Wednesday 21st:** Mostly dry during the night with patches of light rain in places. More extensive rain moved into western areas during the day. Remaining wet in western regions through the evening. Mostly overcast with just a few sunny spells. Temperatures above normal throughout. Winds from a south to southwesterly direction, moderate to fresh, up to gale force at times, strongest in coastal areas.

**Rainfall:** nil to 9mm, heaviest at Knock Airport

**Temperature:** max. 17°C to 21°C, min. 10°C to 14°C, no ground frost

**Sunshine:** nil to 2 hours, sunniest at Malin Head

**Thursday 22nd:** Early rain and drizzle in the western half of the country spread to all parts. It was a mild and mostly cloudy day with short sunny spells in places. The rain was heaviest in the south and west, while parts of the east remained dry. More rain moved in from the Atlantic in the evening. Southerly winds, light to moderate, increased moderate to fresh and gusty during the day.

**Rainfall:** nil to 22mm, heaviest at Cork Airport, nil at Dublin Airport

**Temperature:** max. 16°C to 21°C, min. 12°C to 15°C, no ground frost

**Sunshine:** nil to 4 hours, sunniest at Casement Aerodrome

**Friday 23rd:** A band of rain crossed the country overnight, clearing the east coast around dawn and was followed by showers. The showers died out during the early afternoon and there were sunny spells in all areas. Winds were moderate southerly, veering southwesterly with the clearance and decreasing before veering northwesterly later and increasing again.

**Rainfall:** trace to 5mm, heaviest at Malin Head, trace at Cork Airport

**Temperature:** max. 13°C to 18°C, min. 2°C to 11°C, ground temperatures down to -4°C at Kilkenny

**Sunshine:** 5 to 8 hours, sunniest at Cork Airport, 5 hours at Valentia

**Saturday 24th:** Dry and clear in many parts during the night with slight to sharp frost in many inland areas. Cloud and rain during the morning in western regions moved slowly eastwards, reaching most areas by late afternoon. A clearance to showers followed in western areas by evening. The rain was heaviest and most persistent in western and southern regions, but much lighter in the east. Winds were light initially, becoming south to southwesterly and freshening during the period, up to gale force in many areas with stronger gusts.

**Rainfall:** 3 to 26mm, heaviest at Valentia, 3mm at Casement Aerodrome

**Temperature:** max. 12°C to 16°C, min. 0°C to 9°C, ground temperatures below zero at most inland stations, down to -5°C at Kilkenny

**Sunshine:** nil to 1 hour generally, 2 hours at Dublin Airport

**Sunday 25th:** Rain in eastern areas early in the period cleared quickly and the night was mainly dry. Isolated showers in western areas during the morning, while in eastern areas it remained dry. A few showers continued during the afternoon and evening but with some sunny spells also. Dry by late evening and night. Winds were light to moderate, generally southerly in direction.

**Rainfall:** nil to 2mm, heaviest in west and north, nil at Rosslare

**Temperature:** max. 13°C to 18°C, min. 7°C to 11°C, no ground frost

**Sunshine:** 3 to 10 hours, sunniest at Cork Airport, 3 hours at Valentia

**Monday 26th:** Rain in the west moved gradually across the country during the night and morning. A clearance followed during the afternoon, reaching the east coast by early evening, while scattered showers developed near northwestern coasts. Mostly cloudy with some sunny breaks in the west. Winds were southerly, light inland at first, but stronger around the coasts, later becoming strong everywhere with gale gusts, before decreasing.

**Rainfall:** 3 to 25mm, heaviest at Belmullet, 3mm at Rosslare

**Temperature:** max. 15°C to 19°C, min. 8°C to 13°C, no ground frost

**Sunshine:** nil to 4 hours, sunniest at Belmullet, nil at Dublin Airport and Clones

**Tuesday 27th:** Showers, mainly affecting western areas during the early part of the day, spread quickly eastwards in a strong westerly airflow. By midday the showers were widespread and moving swiftly in the strong westerly winds. Sunny spells also in most areas. The showers tended to die out in eastern areas after dark but remained in western areas till the end of the day. Winds were westerly, moderate with occasional gusts.

**Rainfall:** nil to 7mm, heaviest at Belmullet, nil at Cork Airport

**Temperature:** max. 13°C to 17°C, min. 5°C to 10°C, no ground frost

**Sunshine:** 5 to 9 hours, sunniest at Mullingar, 5 hours at Malin Head

**Wednesday 28th:** Cloudy, wet weather moved in from the Atlantic in the morning and moved eastwards across the country. Some of the rain was heavy at times. Clearer weather with scattered showers and sunny spells followed in the afternoon. The showers died out during the evening and became confined to Atlantic coasts. Light to moderate southwesterly winds, increasing fresh to strong and gusty, veering northwesterly later in the day and easing.

**Rainfall:** 3 to 17mm, heaviest at Knock Airport, 3mm at Kilkenny

**Temperature:** max. 12°C to 16°C, min. 4°C to 11°C, ground temperatures down to -1°C at Kilkenny

**Sunshine:** 1 to 3 hours, sunniest at Belmullet, 1 hour at Rosslare

**Thursday 29th:** Dry and cloudy at first apart from a few showers on western coasts. By midday, more persistent rain began to move eastwards across the country, bringing dull and wet conditions to all areas for the rest of the period. Mainly dull. Winds were southerly, moderate to fresh and gusty at times.

**Rainfall:** 1 to 15mm, heaviest at Valentia, 1mm at Casement Aerodrome

**Temperature:** max. 15°C to 17°C, min. 6°C to 12°C, no ground frost

**Sunshine:** nil to 2 hours, sunniest at Malin Head

**Friday 30th:** Mild and humid overnight. A cold front moved across the country during the day, bringing cool and damp weather to all areas. Clearer weather with scattered showers followed in the afternoon. Light to moderate southwesterly winds veered westerly and increased to strong and gusty.

**Rainfall:** 1 to 4mm, heaviest at Belmullet, 1mm at Cork Airport

**Temperature:** max. 15°C to 20°C, min. 8°C to 11°C, no ground frost

**Sunshine:** nil to 4 hours, sunniest at Dublin Airport, nil at Rosslare

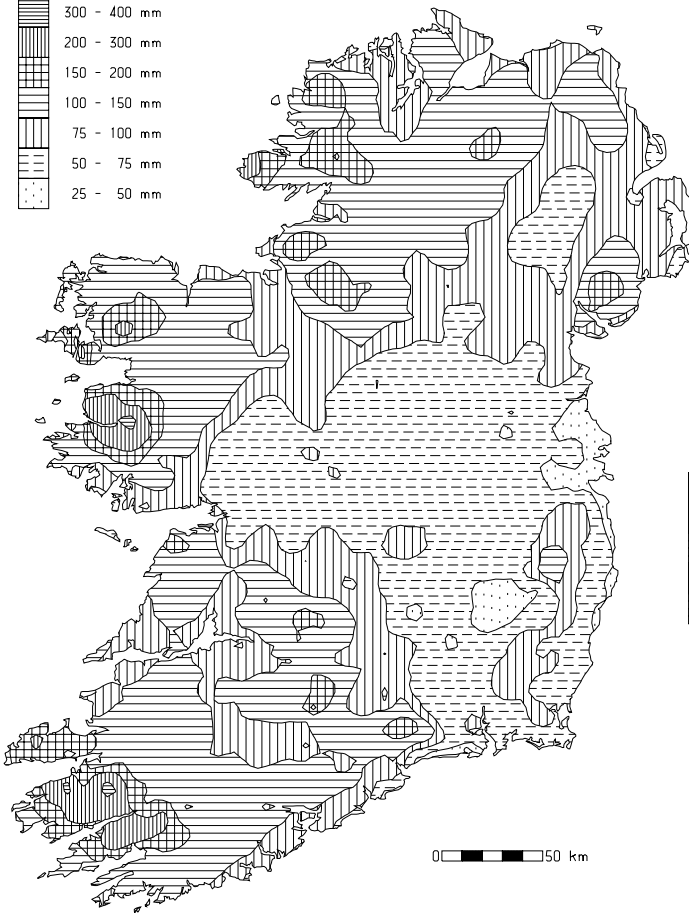
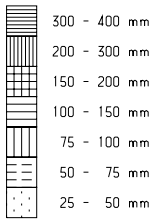
## Drier than normal over eastern half, but wet in parts of south and west

Rainfall totals were near or a little below normal at the majority of stations, but it was a relatively wet month over parts of Munster and Connacht. Totals were very variable across the country, ranging from 45mm at Dublin (Merrion Square) to 233mm at Maam Valley, Co. Galway, with percentage of normal values between 62% at Waterford (Tycor) and 132% at both Fermoy (Moorepark), Co. Cork and Belmullet, where it was the wettest September since 1992.

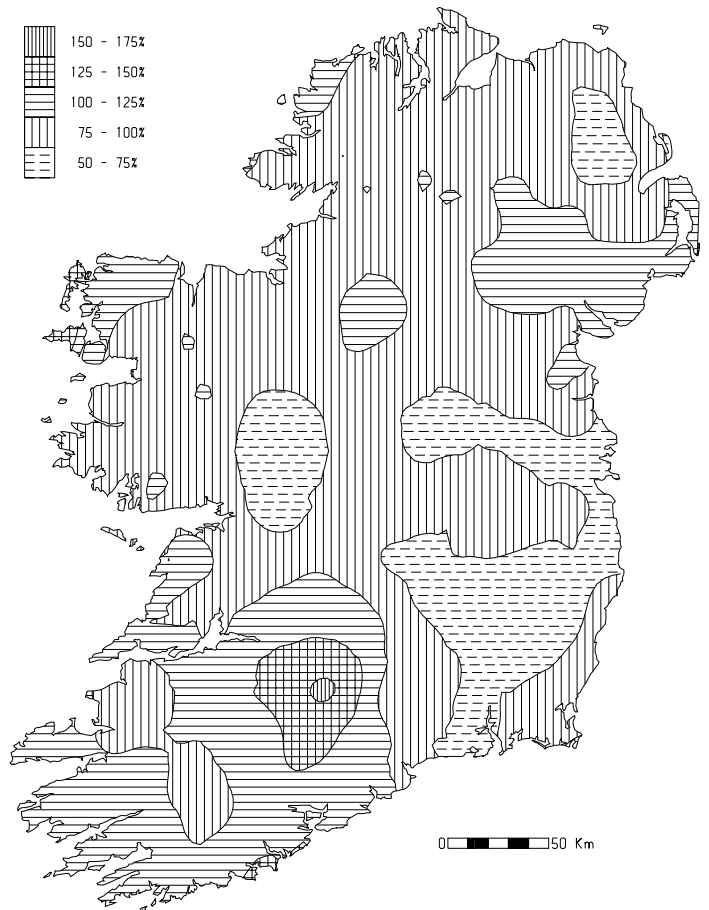
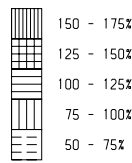
There was a similar variation across the country in the number of wetdays measured during the month (*days with 1mm or more rainfall*). There were between 10 or 14 wetdays at most stations in the south and east, but between 18 and 20 wetdays were recorded in parts of the north and west. The heaviest falls of the month were in the periods 8th/9th and 24th/26th. Over 50mm of rain was measured in parts of the south between the 8th and 9th. The highest daily fall of the month, 45.5mm, was recorded at Ballincurrig (Peafield), Co. Cork, on the 9th.

County/ Station	Total Amount (mm)	% of 1961-90 average	Most in		Number of	
			a day /	date	Raindays (≥0.2mm)	Wetdays (≥1mm)
<b>CO. CLARE</b>						
SHANNON AIRPORT	81.0	99	21.7	9	18	13
CARRON	148.8	105	22.7	9	22	18
<b>CO. CORK</b>						
FERMOY (MOORE PARK)	104.6	132	22.7	9	17	14
CORK AIRPORT	111.3	115	20.2	8	20	14
SHERKIN ISLAND	107.4	112	33.2	8	18	15
BALLINCURRIG (PEAFIELD)	140.4		45.5	9	19	14
<b>CO. DONEGAL</b>						
MALIN HEAD	94.0	92	18.5	26	18	13
BALLYSHANNON (CATHLEEN'S FALL)	92.8	90	15.1	26	23	18
GLENTIES	132.0	91	23.9	24	25	19
<b>CO. DUBLIN</b>						
DUBLIN (PHOENIX PARK)	48.7	72	8.7	9	15	11
DUBLIN AIRPORT	55.8		13.4	9	13	10
CASEMENT AERODROME	50.2	80	10.1	14	14	10
DUBLIN (MERRION SQUARE)	45.3	73	11.2	15	13	10
<b>CO. GALWAY</b>						
GALWAY (UNIV. COLL.)	95.7	88	14.8	26	18	17
MAAM VALLEY	232.6		26.1	21	23	19
CONNEMARA NATIONAL PARK	135.6	87	21.5	24	22	20
BALLYGAR	63.5	68	12.5	24	17	13
<b>CO. KERRY</b>						
VALENTIA OBSERVATORY	148.3	119	27.4	24	24	19
ARDFERT (LISCAHANE)	90.4		25.8	8	19	14
<b>CO. KILKENNY</b>						
KILKENNY	54.0	74	12.6	24	14	11
<b>CO. LEITRIM</b>						
BALLINAMORE	117.9	113	19.3	28	22	17
<b>CO. LIMERICK</b>						
MOUNT RUSSELL	121.2		26.7	9	23	18
<b>CO. LOUTH</b>						
ARDEE (BOHARNAMOE)	66.4	95	10.4	4	22	11
<b>CO. MAYO</b>						
BELMULLET	144.4	132	20.4	24	21	19
STRAIDE	105.1	100	21.1	26	20	17
KNOCK AIRPORT	123.1		17.3	26	21	18
<b>CO. MEATH</b>						
WARRENTOWN	54.4	71	11.3	24	16	11
<b>CO. MONAGHAN</b>						
CLONES	72.9	88	12.4	28	21	19
<b>CO. OFFALY</b>						
BIRR	58.0	82	9.9	9	18	14
DERRYGREENAGH	61.6	77	11.7	24	18	12
<b>CO. SLIGO</b>						
ARDTARMON	87.5		11.4	9	21	17
<b>CO. TIPPERARY</b>						
FETHARD (PARSONSHILL)	82.1		21.7	9	16	12
<b>CO. WATERFORD</b>						
WATERFORD (TYCOR)	53.3	62	13.5	24	20	11
DUNGARVAN (CARRIGLEA)	77.1		17.5	24	16	13
<b>CO. WESTMEATH</b>						
MULLINGAR II	59.5	70	8.9	24	21	15
<b>CO. WEXFORD</b>						
JOHNSTOWN CASTLE	85.5	101	21.8	9	15	13
ROSSLARE	69.7	97	19.0	8	15	12
JOHN F. KENNEDY PARK	61.9	71	14.0	9	17	12
CLONROCHE (KNOXTOWN)	85.2		27.4	9	17	11

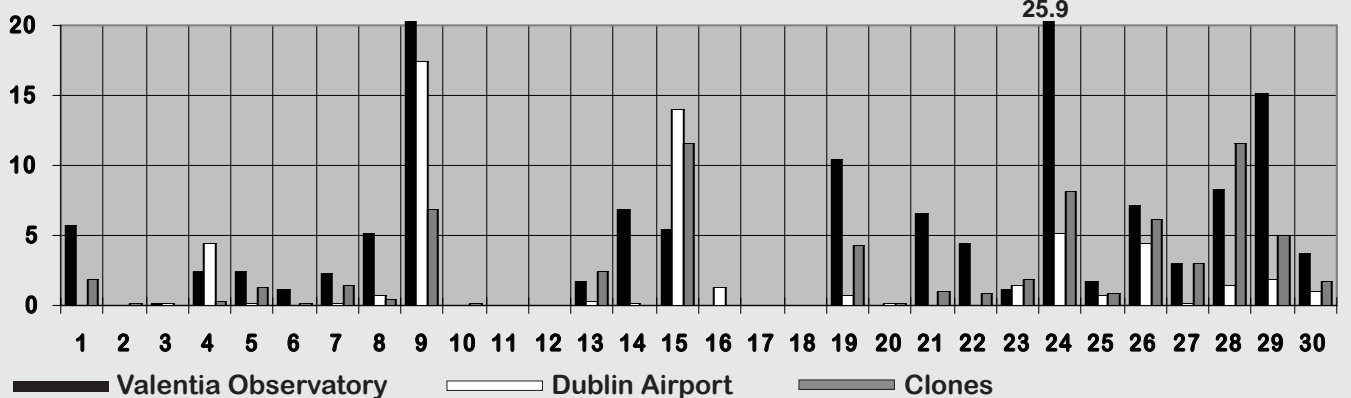
## Total rainfall (mm)



## Percentage of normal rainfall



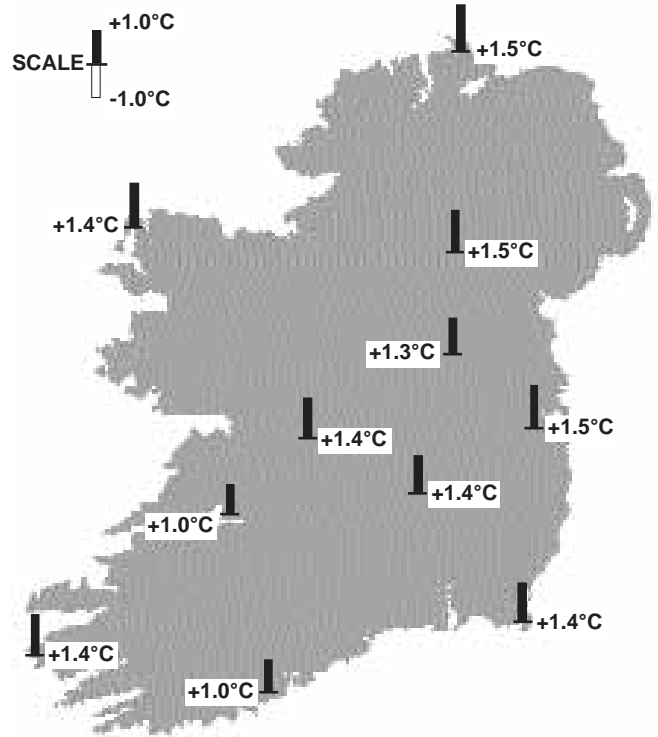
## Daily 0-24h rainfall values (mm)



# Warmer than normal everywhere

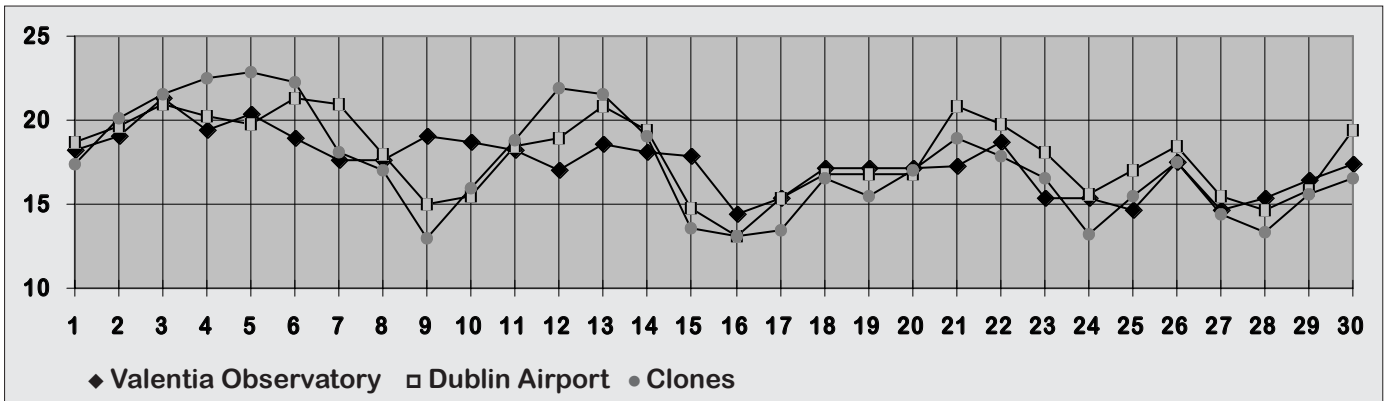
Mean air temperatures for September were between one and two degrees above normal almost everywhere. They ranged from 12.6°C at Knock Airport to 15.5°C at Sherkin Island, Co. Cork. It was the warmest September for 6 years at several stations and the warmest since 1971 at Malin Head.

As seen from the graphs of daily values below, the first half of September was exceptionally warm, with maxima higher than 20°C on most days while minimum values were generally above 12°C, around three degrees higher than normal. The warmest weather of the month was in the period 3rd to 6th, when temperatures approached 25°C in parts of the west and northwest. The highest temperature of the month, 24.8°C, was recorded at Glenties, Co. Donegal, on the 4th; this was the second highest September value at the station in over 80 years of record, just below the value of 25.0°C measured there in September 1999. There were spells of much colder weather during the second half of the month, in the periods 16th/17th and 24th/25th. The lowest air temperature of the month, 0.1°C, was recorded at Mullingar on the 24th, while the lowest grass minimum temperature, -5.2°C, was recorded at Kilkenny, also on the 24th.

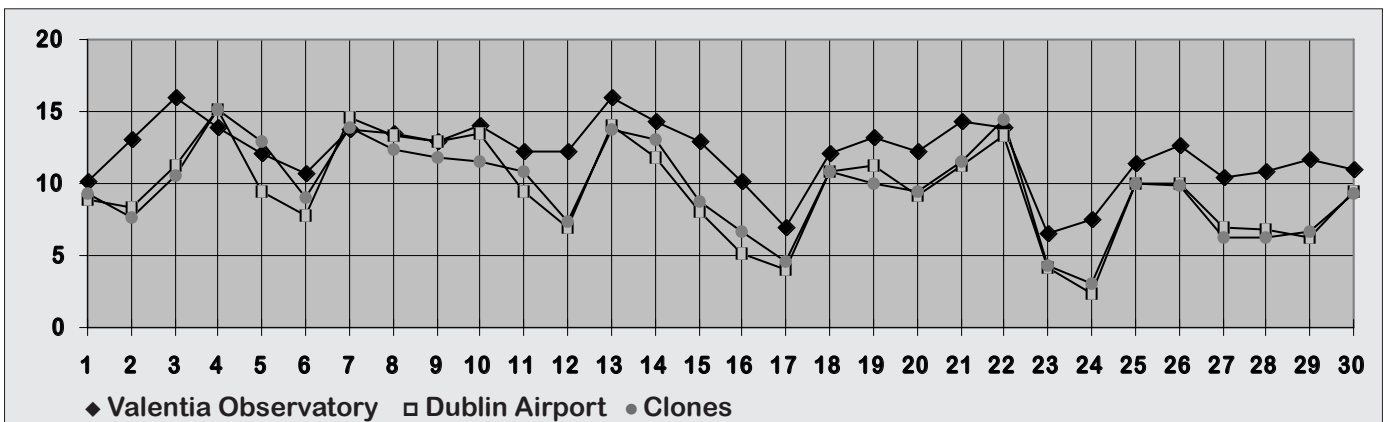


**Mean Temperature**  
(difference from 1961-90 normals)

## Daily 0-24h maximum temperatures (°C)



## Daily 0-24h minimum temperatures (°C)



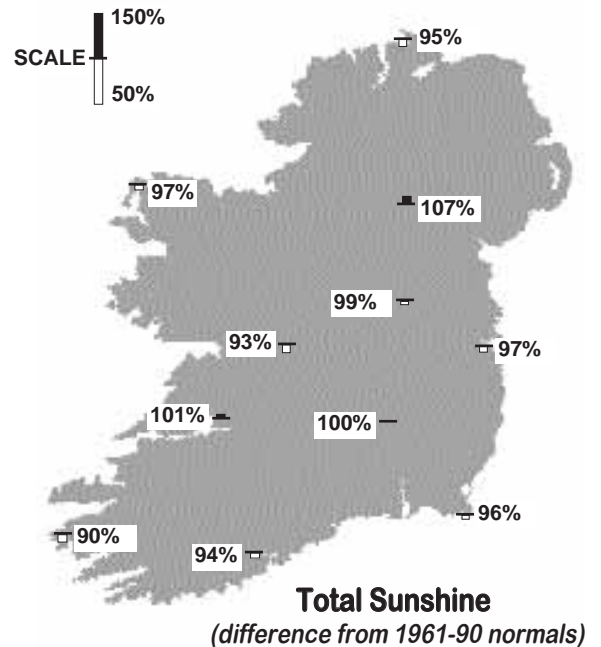
County/ Station	°C											
	Mean max.	Mean min.	Mean/ deviation from 1961-90 average		Highest max./date		Lowest min./date		Lowest grass min./date		Days with air frost ground frost	
<b>CO. CLARE</b>												
SHANNON AIRPORT	18.1	11.3	14.7	1.0	21.7	5	4.0	17	-0.1	17	0	1
CARRON	17.2	10.2	13.7	1.4	21.4	4	3.2	17	-1.8	17	0	2
<b>CO. CORK</b>												
FERMOY (MOORE PARK)	18.0	9.9	14.0	1.2	21.2	14	2.4	17	-3.2	24	0	4
CORK AIRPORT	16.8	10.8	13.8	1.0	19.8	14 15	5.0	28	-0.7	17	0	2
SHERKIN ISLAND	17.9	13.0	15.5	1.8	20.5	9	7.0	24	3.5	24	0	0
BALLINCURRIG (PEAFIELD)	17.6	9.4	13.5		22.0	14	3.0	24	-0.5	17	0	1
<b>CO. DONEGAL</b>												
MALIN HEAD	16.7	11.8	14.3	1.5	23.4	4	7.0	24	5.1	24	0	0
BALLYSHANNON (CATHLEEN'S FALL)	17.2	11.4	14.3	1.6	21.9	3 4	7.0	24			0	
GLENTIES	17.3	10.1	13.7	1.4	24.8	4	3.0	24	3.0	24	0	0
<b>CO. DUBLIN</b>												
DUBLIN (PHOENIX PARK)	18.6	10.5	14.6	1.6	23.7	6	2.0	24	-1.6	24	0	2
DUBLIN AIRPORT	17.8	10.4	14.1		21.3	6	2.3	24	-1.8	24	0	1
CASEMENT AERODROME	18.4	10.3	14.4	1.5	23.7	6	2.2	24	-2.6	24	0	1
DUBLIN (MERRION SQUARE)	18.3	12.5	15.4	1.3	22.7	6	6.8	24			0	
<b>CO. GALWAY</b>												
GALWAY (UNIV.COLL.)	18.4	10.9	14.7	1.3	22.5	5	2.9	17	-0.4	17	0	1
MAAM VALLEY	17.8	10.7	14.3		23.0	3	4.4	24	0.7	24	0	0
CONNEMARA NATIONAL PARK	17.4	10.2	13.8		24.0	4	5.3	24			0	
BALLYGAR	18.0	9.9	14.0		23.0	13	2.5	24	0.3	24	0	0
<b>CO. KERRY</b>												
VALENTIA OBSERVATORY	17.5	12.6	15.1	1.4	21.3	3	6.5	24	2.2	24	0	0
ARDFERT (LISCAHANE)	18.6	11.1	14.9	1.6	23.4	3	5.6	24	0.3	24	0	0
<b>CO. KILKENNY</b>												
KILKENNY	18.6	9.8	14.2	1.4	23.3	5	0.2	24	-5.2	24	0	3
<b>CO. LEITRIM</b>												
BALLINAMORE	17.3	9.7	13.5	1.3	22.8	3	0.5	24	-4.5	24	0	4
<b>CO. LIMERICK</b>												
MOUNT RUSSELL	17.0	10.7	13.9		21.2	6	4.5	24	1.0	24	0	0
<b>CO. LOUTH</b>												
ARDEE (BOHARNAMOE)	18.3	10.8	14.6	2.2	23.9	5 6	2.4	24	0.4	17	0	0
<b>CO. MAYO</b>												
BELMULLET	17.1	11.7	14.4	1.4	24.5	4	6.2	24	2.6	24	0	0
STRAIDE	17.5	10.0	13.8	1.3	22.5	3 5	2.0	24	-2.5	24	0	3
KNOCK AIRPORT	15.8	9.4	12.6		21.5	4	3.7	24	1.3	24	0	0
<b>CO. MEATH</b>												
WARRENSTOWN	18.2	10.2	14.2	1.6	23.5	3	0.8	24	-1.3	24	0	1
<b>CO. MONAGHAN</b>												
CLONES	17.3	10.3	13.8	1.5	22.8	5	3.0	24	-2.7	24	0	2
<b>CO. OFFALY</b>												
BIRR	17.9	10.5	14.2	1.4	22.3	6	2.3	24	-3.4	17	0	3
DERRYGREENAGH	18.2	9.5	13.9	1.7	23.8	5	2.2	24	-4.4	24	0	2
<b>CO. SLIGO</b>												
ARDTARMON	17.6	11.3	14.5		23.6	4	6.5	24	4.7	24	0	0
<b>CO. TIPPERARY</b>												
FETHARD (PARSONSHILL)	17.3	9.6	13.5		22.0	6	3.7	24	1.8	17	0	0
<b>CO. WATERFORD</b>												
WATERFORD (TYCOR)	18.5	11.1	14.8	1.5	21.6	6	4.9	24			0	
DUNGARVAN (CARRIGLEA)	18.7	10.3	14.5	1.1	22.0	6	2.1	24	0.5	17 24	0	0
<b>CO. WESTMEATH</b>												
MULLINGAR II	17.5	9.6	13.6	1.3	22.9	4	0.1	24	-2.9	24	0	2
<b>CO. WEXFORD</b>												
JOHNSTOWN CASTLE	18.0	11.3	14.7	1.7	21.5	9	5.7	24 29	-0.2	24	0	2
ROSSLARE	17.6	12.6	15.1	1.4	20.4	15	7.6	29	3.3	24	0	0
JOHN F. KENNEDY PARK	17.7	10.6	14.2	1.2	20.6	6	3.0	24	1.2	24	0	0
CLONROCHE (KNOXTOWN)	17.5	9.0	13.3		21.3	6	0.5	24	-3.4	24	0	4

County/ Station	Daily mean (hours/day)	% of average	% of possible	Most in a day/date	
<b>CO. CLARE</b>					
SHANNON AIRPORT	3.72	101	29	9.8	5
<b>CO. CORK</b>					
FERMOY (MOORE PARK)	3.26	89	26	8.9	2
CORK AIRPORT	3.89	94	31	9.5	25
SHERKIN ISLAND	4.11	93	32	10.1	6
BALLINCURRIG (PEAFIELD)	3.79			9.8	2
<b>CO. DONEGAL</b>					
MALIN HEAD	3.32	96	26	10.9	1
BALLYSHANNON (CATHLEEN'S FALL)	2.93	89	23	10.3	2
<b>CO. DUBLIN</b>					
DUBLIN AIRPORT	4.18	98	33	10.8	5
CASEMENT AERODROME	3.94	97	31	10.1	12
<b>CO. GALWAY</b>					
GALWAY (UNIV. COLL.)	3.64	99	29	11.1	1
<b>CO. KERRY</b>					
VALENTIA OBSERVATORY	3.25	90	26	11.0	2
ARDFERT (LISCAHANE)	3.85		30	11.2	2
<b>CO. KILKENNY</b>					
KILKENNY	3.81	100	30	10.4	2
<b>CO. LEITRIM</b>					
BALLINAMORE	3.11	97	24	9.0	5
<b>CO. MAYO</b>					
BELMULLET	3.54	97	28	11.4	1 5
STRAIDE	3.48			11.2	2
KNOCK AIRPORT	2.75			10.6	5
<b>CO. MONAGHAN</b>					
CLONES	3.55	107	28	9.9	5
<b>CO. OFFALY</b>					
BIRR	3.33	93	26	9.7	6
<b>CO. WATERFORD</b>					
DUNGARVAN (CARRIGLEA)	4.35	106	34	11.8	12
<b>CO. WESTMEATH</b>					
MULLINGAR II	3.65	99	29	10.3	6
<b>CO. WEXFORD</b>					
JOHNSTOWN CASTLE	3.80	88	30	12.0	2
ROSSLARE	4.59	96	36	12.2	2
JOHN F. KENNEDY PARK	4.03	105	32	11.7	12
CLONROCHE (KNOXTOWN)	3.90			11.1	6

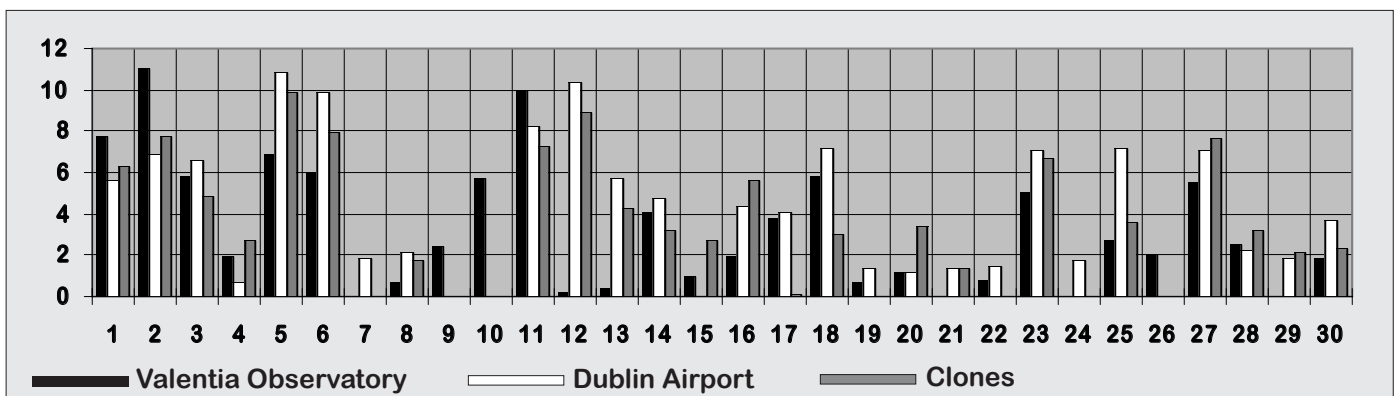
## Sunshine totals near normal

September sunshine totals were near or a little below normal over most of the country. They ranged from 83 hours at Knock Airport to 138 hours at Rosslare, with percentage of normal values between 88% at Johnstown Castle, Co. Wexford and 107% at Clones. It was the the dullest September for between 5 and 8 years at several stations.

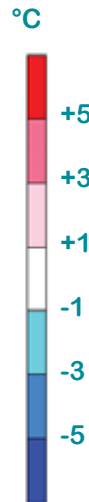
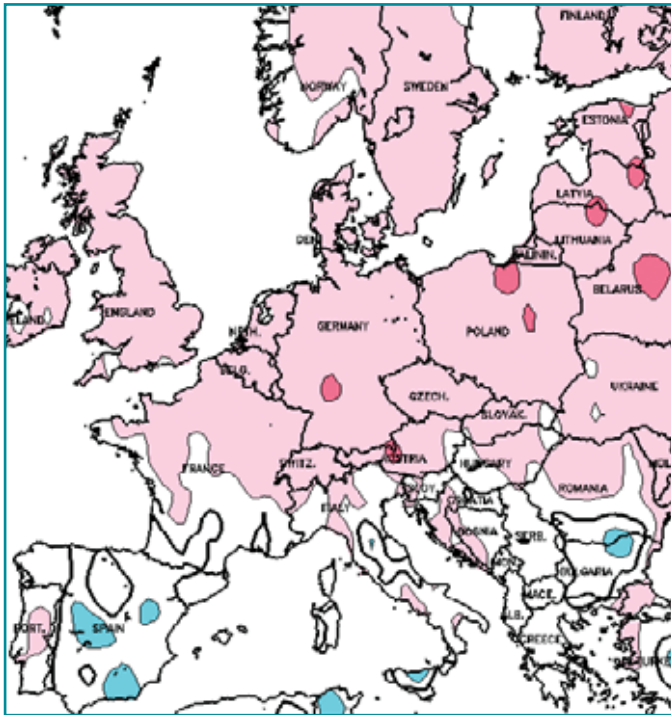
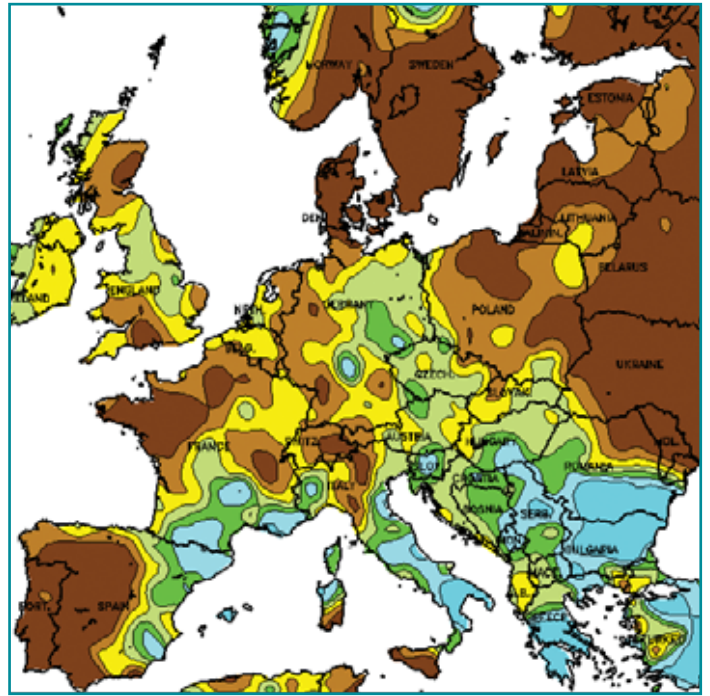
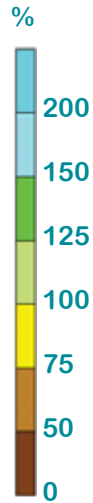
The first half of September was considerably sunnier than the second, with very sunny conditions during the first week in particular. The highest daily value of the month, 12.2 hours, was measured at Rosslare on the 2nd, its sunniest September day since 1993. Global solar radiation totals were below normal generally, ranging from 86% of normal at Valentia Observatory to 105% at Dublin Airport.



### Daily sunshine values (hours)



**SEPTEMBER RAINFALL**  
(percentage of 1961-1990 normal)



**SEPTEMBER MEAN TEMPERATURE**  
(difference from 1961-1990 normal)

Data supplied by NOAA  
Climate Prediction Centre,  
US Department of Commerce

Across the United States, moderate to severe long-term drought persisted throughout parts of the Pacific Northwest and northern Rockies. Meanwhile, severe to extreme drought affected areas of the Mississippi Valley, where some of the worst conditions were observed in northwestern Illinois.

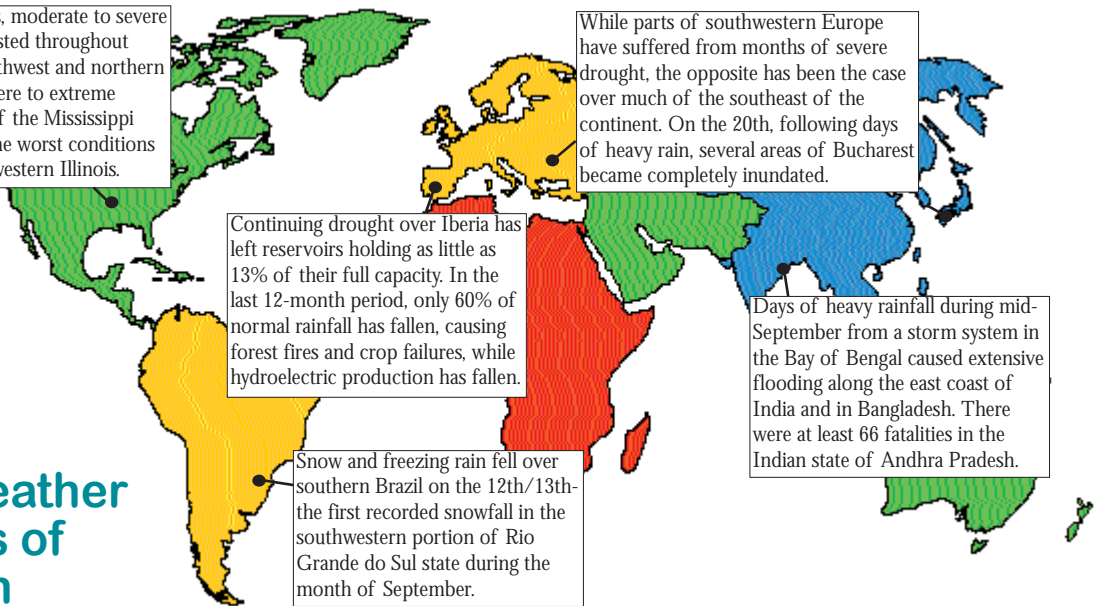
Continuing drought over Iberia has left reservoirs holding as little as 13% of their full capacity. In the last 12-month period, only 60% of normal rainfall has fallen, causing forest fires and crop failures, while hydroelectric production has fallen.

While parts of southwestern Europe have suffered from months of severe drought, the opposite has been the case over much of the southeast of the continent. On the 20th, following days of heavy rain, several areas of Bucharest became completely inundated.

Days of heavy rainfall during mid-September from a storm system in the Bay of Bengal caused extensive flooding along the east coast of India and in Bangladesh. There were at least 66 fatalities in the Indian state of Andhra Pradesh.

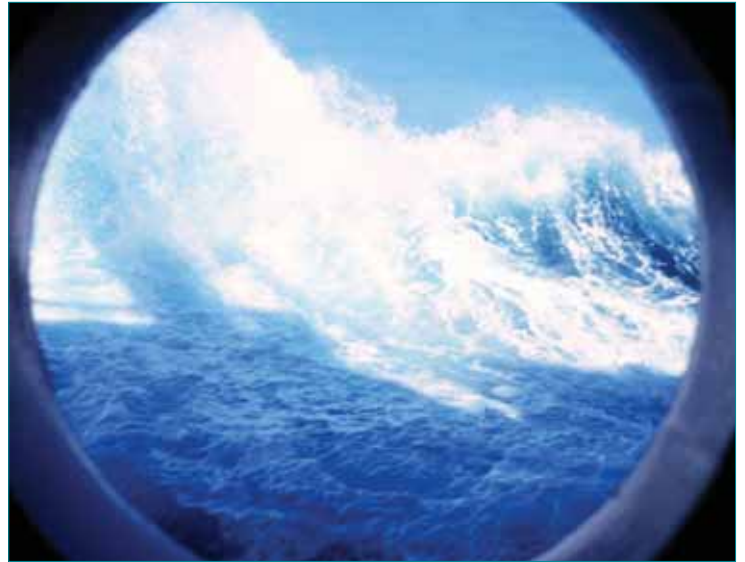
Snow and freezing rain fell over southern Brazil on the 12th/13th—the first recorded snowfall in the southwestern portion of Rio Grande do Sul state during the month of September.

**Global weather highlights of the month**

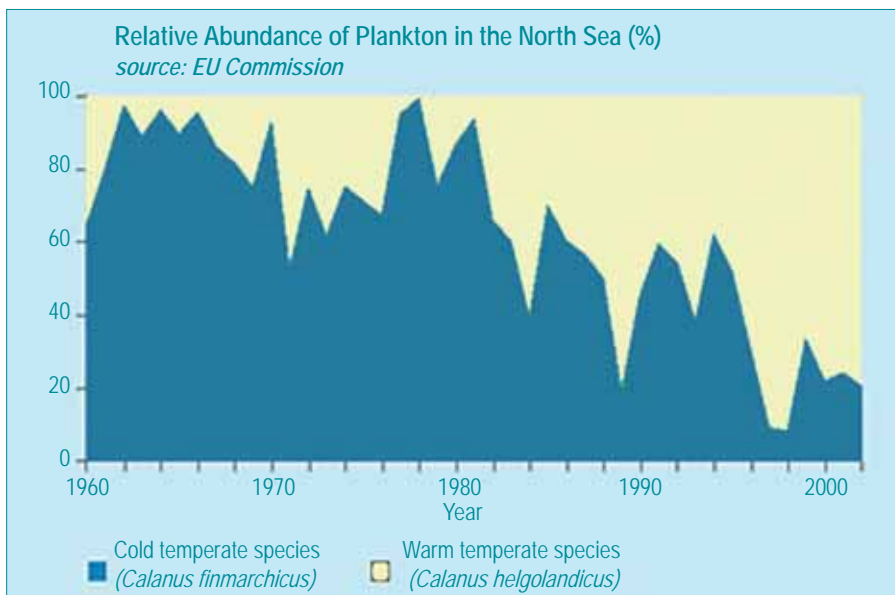


## Europe's marine environment under threat

Oceans and seas cover 71% of the Earth's surface and are the greatest source of biodiversity, containing 90% of the biosphere. Marine ecosystems make a significant contribution to economic prosperity, social well-being and quality of life; they also play a key role in climate and weather patterns. The overall state of the marine environment has been deteriorating far faster than expected in recent decades. Europe's oceans and seas are now under serious threat as they face challenges from pollution, overfishing and climate change. The pace of degradation of biodiversity and habitats, the level of contamination by dangerous substances and the emerging consequences of climate change are some of the most visible warning signals. The northeast Atlantic, the Mediterranean Sea and the Black Sea are three of the seven world marine regions where fish stocks are in greatest need of recovery, while the marine ecology of the Baltic region is estimated to have suffered near-irretrievable damage.



Examples of the alarming impact of climate change on the seas and oceans around Europe have been emerging over the last few years. As revealed by recent research carried out by the Royal Society in the U.K., oceans are becoming increasingly acidic as they absorb more carbon dioxide from the atmosphere. This makes it harder for corals and other organisms to form their shells, while lack of oxygen creates breathing difficulties for fish. The connection between climate change and the abundance of the different species of *Calanus* zooplankton in the North Sea is now well established. Many of the hitherto abundant fish stocks such as cod, herring and salmon feed intensively on the cold water *Calanus finmarchicus* species, whose numbers have been in steady decline at the expense of the warmer water *Calanus helgolandicus*- see chart below. This in turn has led to changes in the balance of fish and mammal that feed upon it, with significant consequences for the fishing industry. Semitropical species such as tuna, for example, are extending their range northwards, but they are far less commercially viable than the traditionally-fished species. These changes have come about as a result of relatively minor changes in sea temperatures and fluctuations in weather patterns associated with the state of the North Atlantic Oscillation. Much greater changes predicted in models of global warming and consequent melting of Arctic sea ice may produce much more profound changes over the next 50 years.



To address the threat to the marine environment, a detailed strategy has recently been drawn up by the European Commission, to be implemented at the level of marine regions; these will be defined on the basis of ecological criteria as opposed to administrative borders. The overall aim is to ensure that current and future generations may benefit from biologically diverse and dynamic seas that are safe, clean, healthy and productive.

**More information on the website:**  
[europa.eu.int/comm/environment](http://europa.eu.int/comm/environment)