

We would like to thank the reviewer for his/her thorough review of this manuscript. It will be very helpful to improve the final version of the paper.

## MAJOR COMMENTS

**1) Writing needs improving. Many short paragraphs should be joined with other paragraphs. Other details are listed in specific comments.**

Following the advice of the reviewer, we are not going to submit the final version of the manuscript without a previous checking from a native reader.

**2) Discussion is missing in the article. Only appear to be discussed. Please include other previous works when writing the discussion. I would propose to name section 3 as “Results and discussion”.**

Section 3 is going to be renamed as “Section 3 : Results and discussion.”

The section is going to include the paragraph:

*“Previous works analyzing precipitation from the methodology of the WTs conclude that most of the yearly and winter precipitation is associated to WTs C, SW and W (e.g. Trigo and DaCamara 2000; Lorenzo et al., 2008; Cortesi et al., 2014). Our results are in complete agreement with those obtained by the cited studies adding the idea that ARs are responsible for most of this precipitation.”*

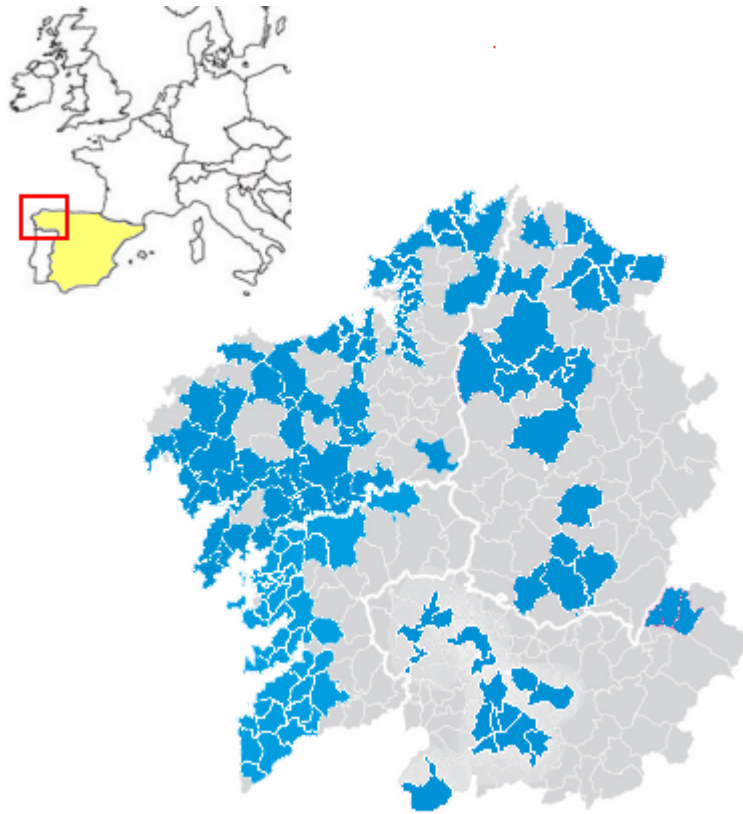
Cortesi, N., Gonzalez-Hidalgo, J. C., Trigo, R. M., & Ramos, A. M. (2014). Weather types and spatial variability of precipitation in the Iberian Peninsula. *International Journal of Climatology*, 34(8), 2661-2677.

Lorenzo, M. N., Taboada, J. J., & Gimeno, L. (2008). Links between circulation weather types and teleconnection patterns and their influence on precipitation patterns in Galicia (NW Spain). *International Journal of Climatology*, 28(11), 1493-1505.

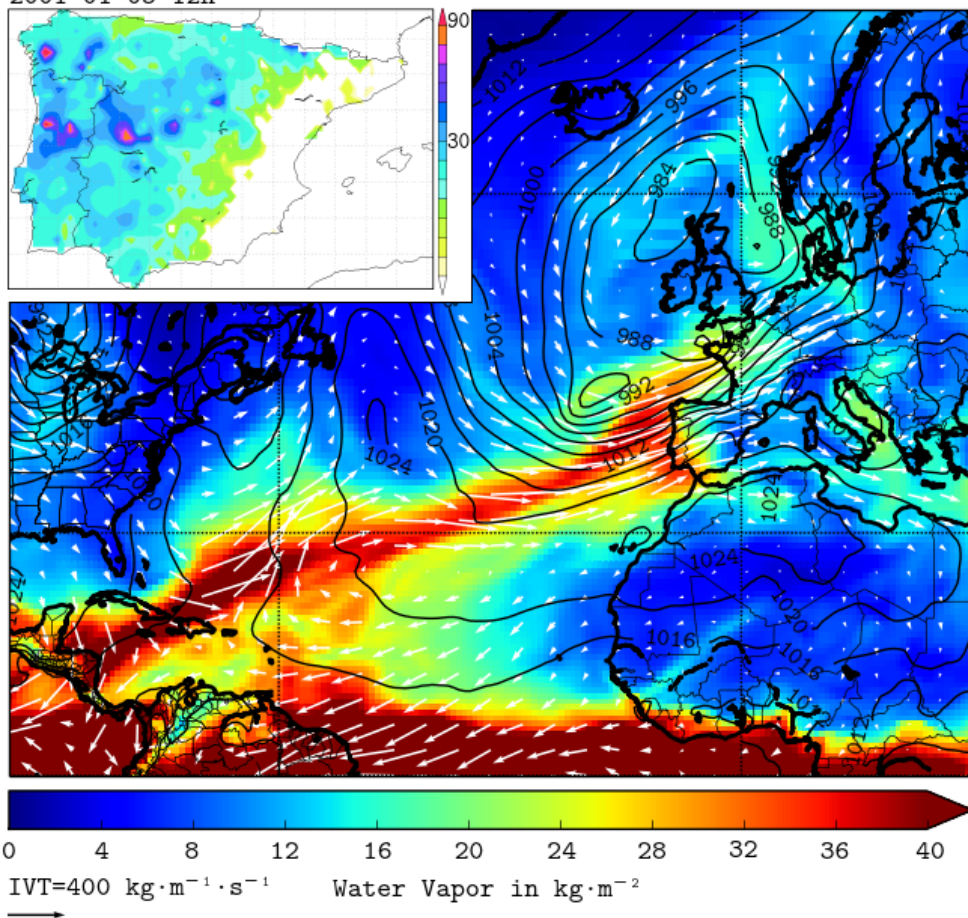
Trigo, R. M., & DaCAMARA, C. C. (2000). Circulation weather types and their influence on the precipitation regime in Portugal. *International Journal of Climatology*, 20(13), 1559-1581.

**3) Several figures must be improved: Figure 2: What do the different colours mean? Please add a legend to the map. Furthermore, an N arrow and a scale bar are missing.**

The different colors in Figure 2 were a political division, which is going to be removed in the final version of the manuscript. The arrow with the scale is going to be added in the final version of the manuscript.



2001-01-05 12h



**Figure 3: It shows 14 WTs, but in the text you talk about 9 WTs in winter and 12 WTs summer. It is important to specify in the text and in Figure 3 which ones are for winter and which are for summer.**

Following the advice of another reviewer, we are going to add a table where this issue is going to be addressed.

<b>WT</b>	<b>Season</b>	<b>Brief description</b>
NE	S	Days characterized by an extended high pressure settled over the west of Ireland and low pressure in the Mediterranean Sea.
E	S	Synoptic situations characterized by high pressure over the British Isles and low pressure dominating in North Africa.
SE	W	Low pressure extending towards Madeira and high pressure over Northern Europe.
S	S,W	Pressure over the British Isles and low pressure established in the North Atlantic (Azores region).
SW	W	Low-pressure system to the west of Ireland with a large anticyclone over the Mediterranean region.
W	S,W	Lowpressure system over the North Atlantic, with a high-pressure system over the Azores.
NW	S,W	Low-pressure system over the British Islands nda n anticyclone system located over Azores.
N	S	Presence of the Azores high pressure near the Azores Islands and a low pressure over southern Europe and the Mediterranean basin.
C	S,W	Lowpressure centre over the NW Iberian Peninsula.
A	S,W	Extended highpressure centre between the Iberian Peninsula and the Azores Islands.

**Figures 4 and 5: The scale units in y axis have to be the same in all 4 plots for comparison.**

In the final version of the manuscript, the scale units in the y axis are going to be the same in all four plots for comparison.

**Figure 4 and 6: Please consider writing (a), (b), etc. at the beginning of the text of each subfigure.**

The reviewer's advice will be followed.

**Figure 5: Precipitation ratio is not mentioned in the caption.**

"Frequency of occurrence" is going to be replaced by "*precipitation ratio*" in the caption of the final version of the manuscript.

**4) Methodology section: Some description about how precipitation ratio is calculated would be welcome. Furthermore, any comment about computing anomaly maps could be also included.**

The precipitation ratio is calculated as follows:

First, the mean precipitation is calculated for each WT, computing the accumulated precipitation during the flooding days in coincidence with the WT under consideration.

Secondly, we have calculated the mean precipitation in flood events with (and without) AR event.

The ratio is the result of the division of the latter by the former.

Even when this procedure is explained in P7L 8-12, this description is going to be added to the final version of the manuscript.

### **SPECIFIC COMMENTS**

**L4P1: Please add “northwestern” to this sentence: “and floods in the northwestern Spanish region.”**

The sentence is going to be rewritten as proposed.

**L16P1: Please rewrite as “3,700 km”.**

The amount is going to be rewritten, but we would rather to do it as “3,700 km”.

**L1P2: Please replace “integrated vapor transport fields (IVT)” with “IVT fields”.**

“integrated vapor transport fields (IVT) is going to be replaced with “IVT fields”.

**L3-4P2: These lines should be included in the next paragraph. It cannot be an only paragraph of two lines.**

We are going to unify both paragraphs in the final version of the manuscript.

**L9-10P2: The following sentence “An example of a well-defined .....; can be found in Figure 1” should be shifted to L2P2, after “surrounding areas”.**

This is going to be done in the final version of the manuscript.

**L13P2: Please replace “fall” with “autumn”.**

“Fall” is going to be replaced by “autumn” in the final version of the manuscript.

**L1P3: Please add “, above all in southern Galicia,” after “variability in precipitation”.**

The proposed sentence is going to be added in the final version of the manuscript.

**L3P3: Please replace “SCA” with “SCAND”.**

“SCA” is going to be replaced by “SCAND” in the final version of the manuscript.

**L4P3: Please exchange the positions between “Bueh and Nakamura (2007)” and “Lorenzo et al. (2006)”.**

The positions are going to be exchanged in the final version of the manuscript.

**L5P3: Please rewrite as follows “Extreme precipitation and anomalous winds are the most frequent**

**...". FEs is somehow already derived from heavy precipitation and strong winds over the coast.**

The sentence is going to read as proposed, in the final version of the manuscript.

**L7P3: "by no means abnormal" sounds weird. Please review it.**

*"by no means abnormal"* is going to be replaced by *"are common"* in the final version of the manuscript.

**L11P3: Please replace "WT" with "WTs".**

"WT" is going to be replaced by "WTs".

**L14P3: Please replace "flood episodes" with "FEs".**

*"flood episodes"* is going to be replaced by *"FEs"*.

**L5-6P4: These two lines should be added to the preceding paragraph.**

Both lines are going to be added to the preceding paragraph in the final version of the manuscript.

**L9P4: Please specify what is "Interior". This is not a family name.**

This is just a citation to:

Interior, M.: Catálogo Nacional de Inundaciones Históricas, Dirección General de Protección Civil y Emergencias. Ministerio del Interior español, 2014.

**L20-21P4: Please join it with the following paragraph.**

This paragraph is going to be joined with the following paragraph.

**L22P4: Please rewrite as "(...) developed in Trigo et al. (2000), which (...)".**

The sentence is going to be rewritten as proposed.

**L28P4: Please replace "nine" with "9".**

"Nine" is going to be replaced with "9".

**L3-4P5: These two lines should be added to the preceding paragraph.**

Both lines are going to be added to the preceding paragraph.

**L4P5: Please replace "The" with "the".**

"The" is going to be replaced with "the".

**L9P5: Please replace "A3" with "A1".**

The order of the tables is going to be fixed in the final version of the manuscript.

**L12-13P5: These two sentences must be deleted. This content corresponds to the caption of Figure 4, where you already explained the colours of the bars.**

The two sentences are going to be deleted.

**L5P6: Please rewrite this sentence. The meaning is not clear.**

The sentence is going to be rewritten as follows:

*“Especially remarkable is the case of the SW, which registers as many floods associated with AR events as floods not associated with AR events.”*

**L5-6P6: Please delete “meaning unclear please clarify”.**

This is going to be removed.

**L10P6: Please replace “floods” with “FEs”.**

“floods” is going to be replaced with its acronym.

**L2P7: Please replace “Table 1” with “Table A2”.**

The order of the tables is going to be fixed in the final version of the manuscript.

**L4P7: Please replace “case” with “region (Table A3)”.**

This change is going to be made in the final version of the manuscript.

**L9P7: Please delete “In other words”.**

“In other words” is going to be deleted.

**L12-13P7: Please rewrite as follows “Especially noteworthy is the case of the ANW type for the SIL and COSTA regions and NW for SIL region, where the expected winter rainfall is five times larger than...”**

We are going to rewrite the text as proposed.

**L14P7: Please rewrite “for types SW, W and C for the winter”.**

We are going to rewrite as proposed.

**L15-16P7: Please rewrite the sentence as follows (for example): “In the summer months, the most outstanding cases are W type in SIL region and AN type in COSTA region”. When you write “the same occurs (...)” is difficult to associate with the “five times larger.”**

We are going to rewrite as proposed.

**L16-18P7: I do not follow the meaning of the “exception” you mention. I do not understand what you mean with the last sentence when I look at Figure 4. Please review these last two sentences.**

Me meant to say that SW weather types with the arrival of oceanic fronts are not common in summer months in Galicia, when N/NE are the norm. For the sake of clarity, the full sentences are going to be rewritten as follows:

*“Even when SW is not a predominant weather type in summer months, the occurrence of this WT in this season represents the few fronts with ARs arriving on the Galician coast. It is uncommon to observe AR precipitation from WTs other than W or SW in summer months.”*

**L34P7: Please rewrite as follows: “detection of an AR in winter months is contingent on the (...)”**

We are going to rewrite as proposed.

**L2P9: Please replace “SW” with “NW”.**

We have to disagree here, we have rechecked Figures 5.c and 4.c, and we find “SW” to be correct.

**L3P9: Please replace “atmospheric rivers” with “atmospheric rivers (ARs)”.**

We are going to rewrite as proposed.

**Equation 2: It needs further explanation of some variables.**

“Equations 1 and 2 represent the methodology for the integration of the IWV and IVT fields, respectively, where  $q$  is the specific humidity,  $g$  is the gravitational force, and the integration covers the whole troposphere.”

is going to be replaced by:

*“Equations 1 and 2 represent the methodology for the integration of the IWV and IVT fields, respectively, where  $q$  is the specific humidity,  $g$  is the gravitational force,  $\mathbf{u}$  is the horizontal wind field and the integration covers the whole troposphere from the first pressure level ( $P_0$ ) to the top ( $P_f$ ).”*

**Figure 1: Please rewrite the first sentence of the caption as follows “Example of an atmospheric river (AR) landfalling in Galicia (NW Spain) on 5th January 2001”.**

We are going to rewrite as proposed.

**Figure 4: Please replace “(ONDJFM)” with “(ONDJFM)”.**

We are going to rewrite as proposed.

**Figure 5: Please rewrite as follows: “Same as Figure 4 but with precipitation ratio.**

We are going to rewrite as proposed.

**Table A1: Please replace “A1” with “A2”.**

The order of the tables is going to be fixed in the final version of the manuscript.

**Please replace “07/09/99” with “03/07/99”. Table A2: Please replace “A2” with “A3”.**

The order of the tables is going to be fixed in the final version of the manuscript.

**Missing data in the last event. Old tables A1 and A2: Dates must follow English style mm/dd/yy. Some events take more than a month, is it correct? For instance, 4th, 6th and 7th events in old Table A1; 14th in old Table A2. I do not think that a rainfall event can take longer than a week. If this is the case, please justify what you consider for a precipitation event in the Data and Methods section.**

We are going to follow the advices regarding the english style of dates. Regarding the length of the flood events, the reviewer should consider that the authors took the flood events directly from the emergency system service database. The final version of the manuscript is going to include a discussion about this in Data and Methods section.

**Table A3: Please replace “A3” with “A1”. Geographic coordinates are in decimal degrees in Santiago, please replace it with degrees, minutes and seconds. Please replace “Coast” and**

**“Miño-Sil” with “COSTA” and “SIL”, respectively, in the last column. Figure A1: Please rewrite as follows: “(...) of the weather types (WTs)”.**

We are going to rewrite as proposed.