Reply to Reviewer 2 – C7961

We want to thank Reviewer 2 for his/her comments on our manuscript that tackle an important point, the length. We tried to improve it according to the given specific comments that we address on a point-by-point manner in the following:

Specific comments

Reviewer comment

The overall style would need some attention; while the paper is in general well written and well organised there are a number of sections which are hard to understand. A perfect example is the first half of the abstract. This is true throughout and the authors need to give careful attention to editing the paper for style. The abstract needs to be completely rewritten.

Answer

We followed the given suggestion and rewrote the abstract with the intention to shorten it and to give a clear and precise overview on pursued tasks and obtained results.

Reviewer comment

The paper as a whole is very long and wordy and there are numerous sections that are not needed. In particular the introduction should be shortened by 50% at least.

Answer

We agree, the manuscript is in parts very wordy. We read over it, and strictly tried to reduce the content to actual facts. As a result the introduction is shortened from 3 pages in the first submission to 2 in the revised version. Even though we did not achieve the mentioned 50% we are convinced that now it directly points at those issues the manuscripts deals with. We furthermore shortened, reworked and partly restructured the following sections: “Data and Pre-processing", "Groundwater-surface water influx separation" (with sub-sections) and at least the first part of "Multi-temporal SST approach amplifying groundwater caused thermal anomalies". (Note that during restructuring, some headings were adapted). Specific changes are given in the “technical comments” section below.

Reviewer comment

The first 3 tables should be merged into one.

Answer

The content of all three tables is quite specific and allows no appropriate merge. Instead, we removed table 2 and 3 into the appendix and added a link to it in the text.

Reviewer comment

Do you really need Fig5? Can you include it in another figure?

Answer

Yes, we need Fig. 5, as it clearly shows locations of SR ad CAT and facilitates an understanding of the text passage given in section 4.1.

Reviewer comment

The objectives section in the intro should be better targeted at the content of the paper and written in a simple style. State the objectives clearly not in a complex sentence style but more of a simple style and then follow with the explanation of the objective if required. You could also start with the explanation and finish with the clear statement of the objective.

Answer

We changed that paragraph with the intention to provide a better targeting. We would be glad if reviewer 2 could again read it over to tell us whether or not we appropriately changed it.

Reviewer comment

I do understand that the paper is based on a much bigger report which is good; however, some of the content may be better for the report and perhaps the report could be added as supplementary material.

Answer

We agree, the style was sometimes report-like and likewise are some parts more appropriate for the supplementary material. We selected sections with less relevance that artificially blew up the manuscript and moved it to the appendix. Specific changes are given in the “technical comments” section below.

Reviewer comment

The broader application of the work in other areas and locations should be included

Answer

We added a section in which we point at a broader application based on two recently published papers that are based the same approach and raised several influential aspects that need to be considered as it is the intention to transfer the presented approach to other areas. The added section comprises the following passage:

“These aspects need to be considered if it is intended to transfer the presented approach to other areas and environments However, the general suitability has already been proven for the entire coastline of the Dead Sea (Mallast et al., 2013), but also for a rather humid karst environment at Cabbé at the Mediterranean Sea (Schubert et al., 2014). Particularity the latter points at further improvement possibilities regarding the influence of geological-background constrained discharge behaviour that may result in low- to high flow stages.

Based upon this aspect the investigation periods might need to be restricted to high-stage flow periods during which the groundwater-caused SST anomaly is maximal developed. Other effects such as wind-induced currents and its spatial distribution, local upwelling phenomena or tidal influence did not play a role for the presented nor mentioned investigation areas. However, all have a spatio-temporally effect on the SST distribution and likewise on the applicability of the presented approach. Hence, if investigation areas comprise these influential factors further investigation and possible adaptions is most likely required."

Technical comments (P=page, L=line)

Abstract	completely changed with emphasis on a concise but informing structure
1. Introduction	
P4902L23-P4903L11.	Mostly removed, or reworked in terms of a straightforward description and introduction to the topic
P4904L03-P4905L25.	Mostly removed, or reworked in terms of a straightforward description and introduction to the topic
P4905L26ff.	Objectives rewritten in a simple and straightforward manner
3. Data and Pre-Processing	
P4907L22-P4909L20.	Largely reworded and partly shortened, changed the resulting term from "T(°C)2 to "SST(°C)" in Eq. 3:
4. How to separate […]	
P4910L9	Changed heading from "How to separate groundwater from surface-runoff" to "Groundwater-surface water influx separation"
P4910L10-L19	Shortened and reduced to relevant introduction of that section, removed Fig. 3 as the additional benefit was too low compared to a short description of the results in the text
P4910L20	Sub-heading deleted
P4910L21-P4913L22	Almost completely rewritten and restructured to maintain a straightforward concept – theory is shortened and leads directly to "methodical preprocessing" section that is also restructured to fit in sequence to Fig. 4 (Flowchart), all previously included methodical subsections are grouped and logically rewritten, Eq. 6 was too general and was rewritten
P4913L22	Changed heading from "Surface-runoff influence inference through IF" to "Evaluation of surface runoff influence"
P4917L10	added the following bullet point: "iii) For the present study 7 SST images are excluded that statistically exhibit a surface runoff influence.
5. How to amplify […]	
P4913L22	Changed heading from "How to amplify groundwater signals" to "Multi-temporal SST approach amplifying groundwater caused thermal anomalies"
P4917L12-P4919L25	Largely reworded and shortened, specifically for the description of travel time of submarine spring water, moved Fig. 8 and parts of the explanation to supplemental material; introduced subsection for clarity reasons
5. Discussion […]	

P4922L1	Changed heading from “Discussion” to “Transferability and Uncertainty”, as the discussion was already included in the two result sections (1. Groundwater-Surface water separation and 2. Multi-temporal SST approach) before. However, this sequence unnecessarily doubled certain contents and was partly misleading as the actual content coped with the general transferability and improvements of certain aspects (Pre-processing, IF, Application in other environments).
P4922L2-P4927L29	We maintained the structure but removed any doubling to previous sections and focused strictly on uncertainty and transferability aspects. We also included a section that addresses the broader application in other areas.