The authors would like to thank Referee # 1 for carefully examining our paper and providing us a number of important comments. We would like to respond to the first reviewer comments on some points.

1. General comments:

The purpose of this study was to evaluate the performance of existing empirical models with intensively observed data for prediction salt intrusion in the Sumjin River estuary, Korea. In the revised paper, we shall add some important information in the introduction to avoid some confusion. Now for clarification, we shall provide some important points. The Sumjin river water supply system consists of 2 medium multipurpose dams and 4 small water supply dams with a pumping station. Due to seasonal fluctuations in precipitation and runoff (decreasing trend in winter and spring; increasing trend in summer), dams in the Sumjin basin plays a vital role in supplying water to Donjin AC (Agricultural cooperative) for irrigation purpose of the nation leading rice fields. Therefore, the salinity limit 1 was used to define the salt intrusion length. Aerts et al. (2000) also recommend the salinity 1 for agriculture. We cited the reference in introduction but did not mention the value. Parsa et al. (2007) also used this value. We also cited this in reference chapter. The information of ground water abstraction was cited from research project report (Lee, 2005) where it was identified as probable cause for salt intrusion. But the dominant cause was not reported. The study on the mechanism of salt intrusion is beyond the scope of this paper. The mechanism will be our next study subject.

2. Specific comments:

2.1 *page - 1880*
Abstract-the significance of the study of salt intrusion is missing from the abstract.

The purpose of this study was to evaluate the performance of existing empirical models with intensively observed data for prediction salt intrusion in the Sumjin River estuary, Korea. In the revised paper, we shall address this issue.

Line 14 and line 16 – the terms 'most satisfactory results' and 'reasonable results' are used. The question that remains unanswered here is, satisfactory in terms of what? :

Previously the model was applied to the partially and well mixed estuary, but not applied to highly stratified estuary. This estuary shows highly stratified conditions during neap tide and partially- to well-mixed characteristics during spring tide. Therefore, we made correlation separately to examine the level of performance during spring and neap tide. We used the terms based on correlation coefficient for spring and neap tides. The following statistical variable is also tested for examining the degrees of error between model and field data after getting the first reviewer comment.

$$\text{Relative error } (RE) = \frac{\frac{1}{N}\sum_{n=1}^{N}\left|O^n - P^n\right|}{\frac{1}{N}\sum_{n=1}^{N}O^n} \times 100$$

where, N is the number of observation-prediction pairs, O^n the value of nth observed data, P^n the value of nth predicted data. The Nguyen and Savenije (2006) model developed under both partially- and well-mixed estuaries yielded the least relative error of 4.57% among of all the models studied for computing the salt intrusion length in the Sumjin River estuary. The model shows a relative error of 4.04% during spring tide and 5.20% during neap tide. We shall definitely explain this in revised paper. This analysis will be added in the result session as section "4.3 Evaluation of model performance".

Line 26 – is water withdrawn from the River Sumjin for drinking?

Water is not withdrawn from the Sumjin for drinking purpose. This was cited from Aerts et al. (2000). We shall merge this sentence to avoid confusion.

2.2 page 1881
Lines 6 to 8 – which of these mechanisms is dominant?

These are the identified probable causes reported by Lee (2005). But the dominant cause was not reported. The study on the mechanism of salt intrusion is beyond the scope of this paper. The mechanism will be our next study subject.

Line 23 – add a reference after the words salt intrusion
Parsa et al. (2007)

2.3 page – 1882
Line 17- How deep is the upper estuary at its deepest point?
The upper estuary is 2 m deep at its deepest point.

Line 28: how about the duration of the seasons in months? Plus add the river discharge rate in cms (m^3s^{-1}).

Each season includes the following months:
Winter (December, January, February); Spring (March, April, May), Summer (June, July, August); Autumn (September, October, November).

The maximum monthly median river discharge appeared to be higher (370 m^3 s^{-1}) during July 2006 and lower (11 m^3 s^{-1}) during January 2005.

2.4 Page – 1883
Line -20 – please give a reference for 'easy-to-use' or delete this.

This will be deleted in the revised paper.

2.5 Results - Page 1885 - potential issues for extrapolating field data.

The intrusion length was defined as the salinity 1. On 26 October 2005 during neap tide and 6 November 2006 during spring tide, the salinity 1 was not appeared in the last CTD station. Therefore, the data was extrapolated to get the salinity 1.

2.6 Page-1886 'related to the river discharge and tide' – this seems obvious – could anything else be controlling salt intrusion?

The word "obviously" will be added.

2.7 Page 1887: Line 1-'The intrusion length was a little bit high'- imprecise- give exact measurement.

The length was increased during neap tide by 2.47 and 2.01 km in summer and autumn 2006 compared to the same period in 2005.

2.8 Section 4.3- Lines 21-28: why it is important to examine which external force is dominant.

There are 2 medium multipurpose and 4 small water supply dams upstream and large tide in the bay. Therefore, authors are interested to figure out which one is dominant force. Although Eq. (4) shows exact relationship between salt intrusion and external force, it could show which external force is dominant. The section "4.3 Dominating factor for controlling salt intrusion length" will be moved from results to discussion session as section "5.1" for more clarification with more information.

2.9 *Summary: the summary does not tie-in with the introduction.*

To evaluate the performance of existing empirical models with intensively observed data for prediction salt intrusion in the Sumjin River estuary, Korea, intensive field measurements were carried out for three years to observe the salt intrusion at high and low waters during both spring and neap tides. Three purposes addressed in the introduction were to: (i) compare the performance of different existing empirical models with three years observation data obtained at high water during both spring and neap tides for each season from August 2004 to April 2007, (ii) determine the most suitable model for predicting salt intrusion in the Sumjin River estuary, and (iii) examine whether the model developed by Nguyen and Savenije (2006) for partially- and well-mixed estuaries was applicable to the stratified Sumjin River estuary. In the summary, we gave the answer to each objective. Moreover, we will add the result of statistical analysis of model performance for more clarification.

3. Technical corrections:

In the revised manuscript, two technical corrections will be done.