

New and conventional mark-recapture techniques combined to provide comprehensive information on the habitat preferences and migration of saithe/pollock (*Pollachius virens*) in Icelandic waters

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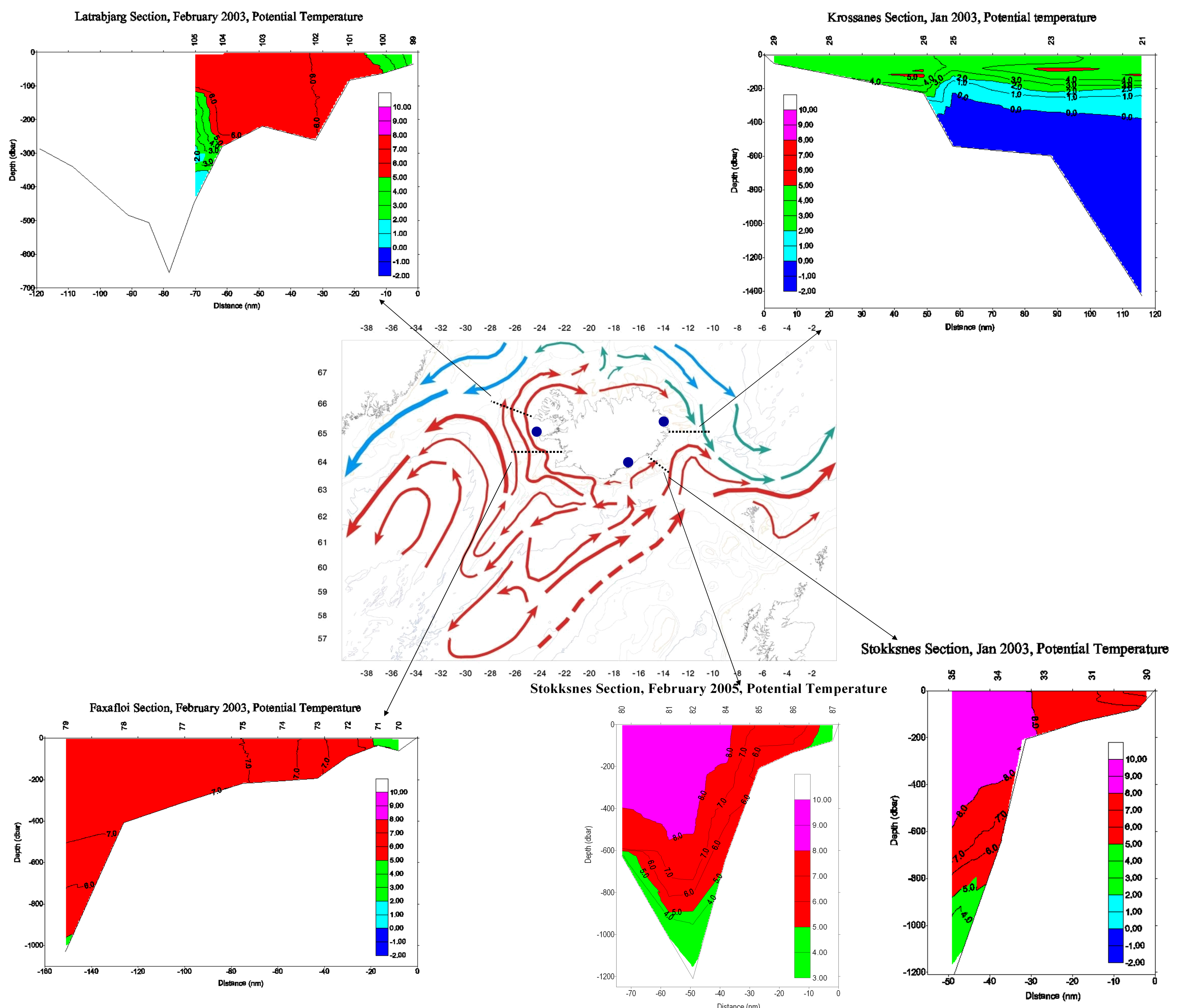
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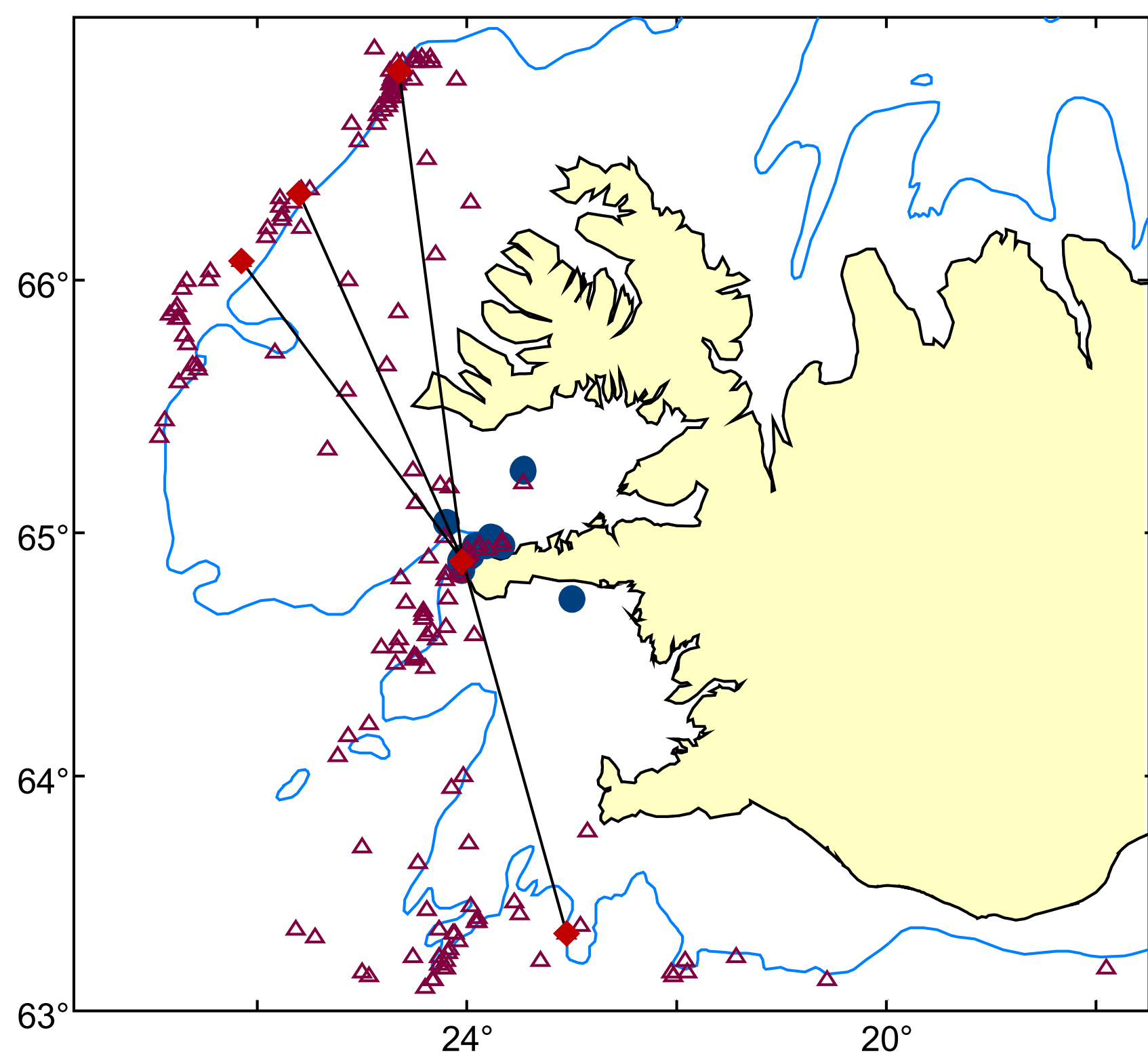
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Abstract

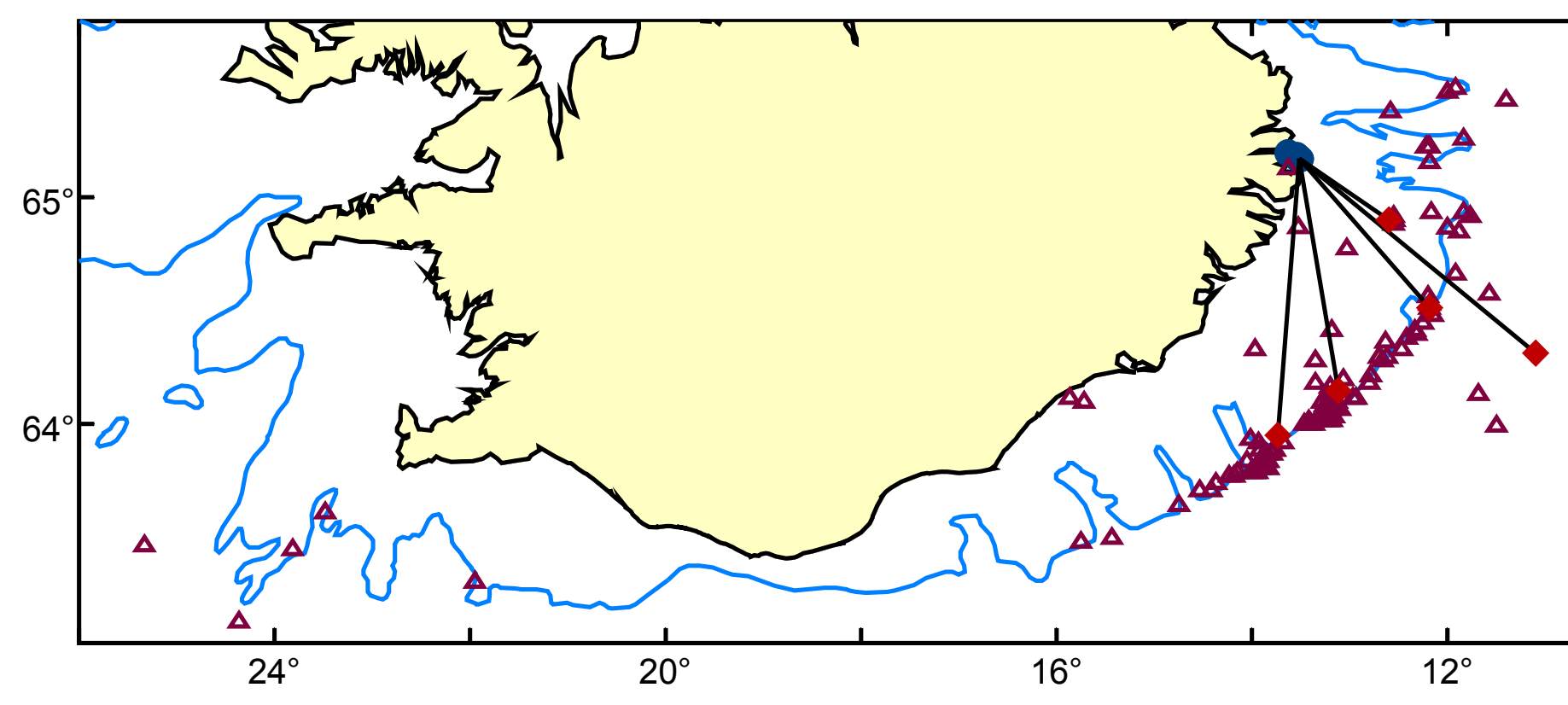
Knowledge about distribution, migration and other life history traits of fish populations is necessary to be able to identify and conserve stock components and thus genetic variability. Compared to other gadoid species, little is known about life history traits of saithe (*Pollachius virens*, pollock in the NW-Atlantic), or its stock components in the NE-Atlantic. In 2000-2004, nearly 16000 saithe (mostly juvenile) were tagged and released at various locations around Iceland (including 133 data storage tags). With information from traditional tagging we can get information about distribution patterns and length of migration while data gained with DST allows us to examine habitat preferences on individual fish level. Here we compare data from three different release sites around Iceland. These sites differ considerably in terms of bottom topography and hydrography of surrounding water masses. By comparing hydrographic measurements with depth and temperature profiles of recaptured saithe we were able to obtain a broad view of migration patterns of saithe in Icelandic waters. The object of this research was to explore if saithe tagged at different locations around Iceland showed variable behaviour or distribution pattern.



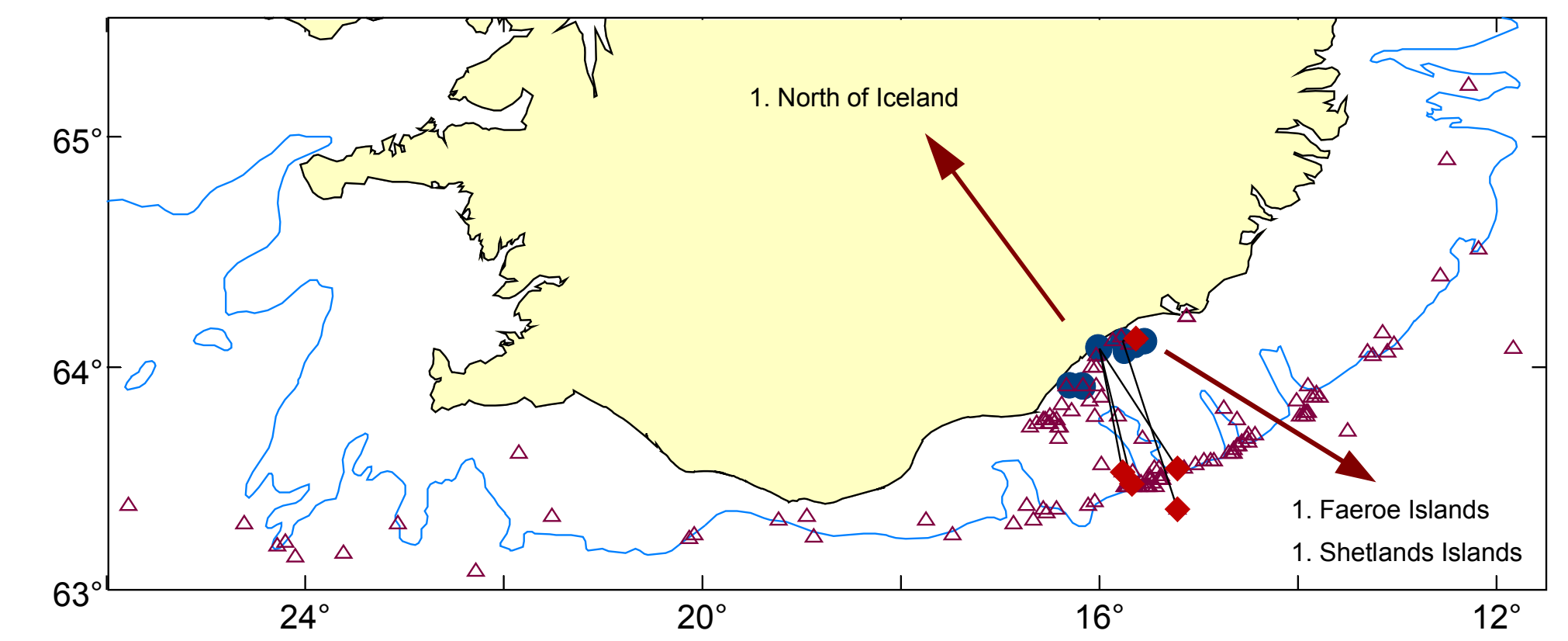
Main currents around Iceland (red = warm Atlantic current, blue = cold Arctic current and green coolish current¹) and potential temperature on four standard hydrographic sections around Iceland in January 2003 and Stokksnes 2005². Blue dots represents tagging locations.



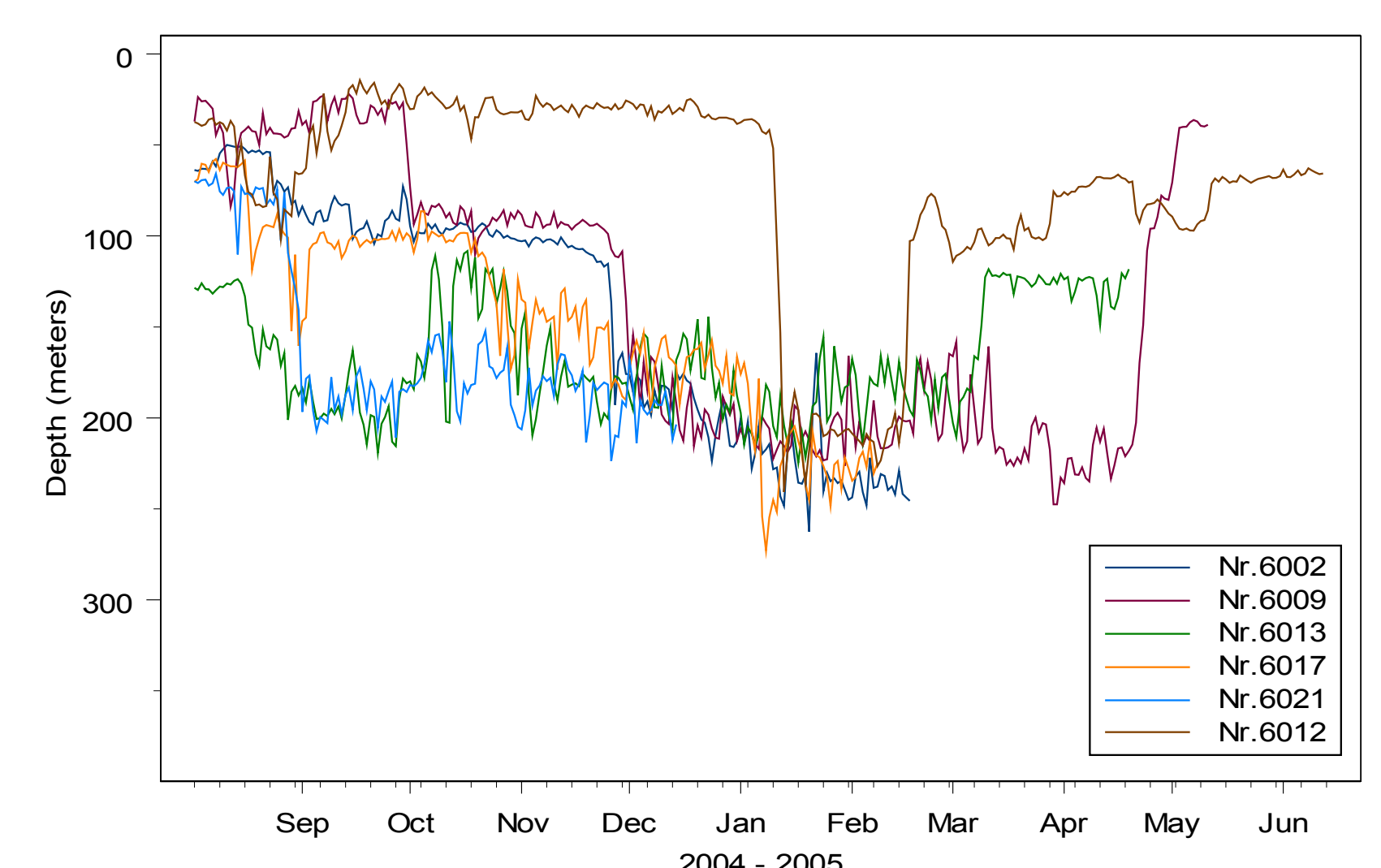
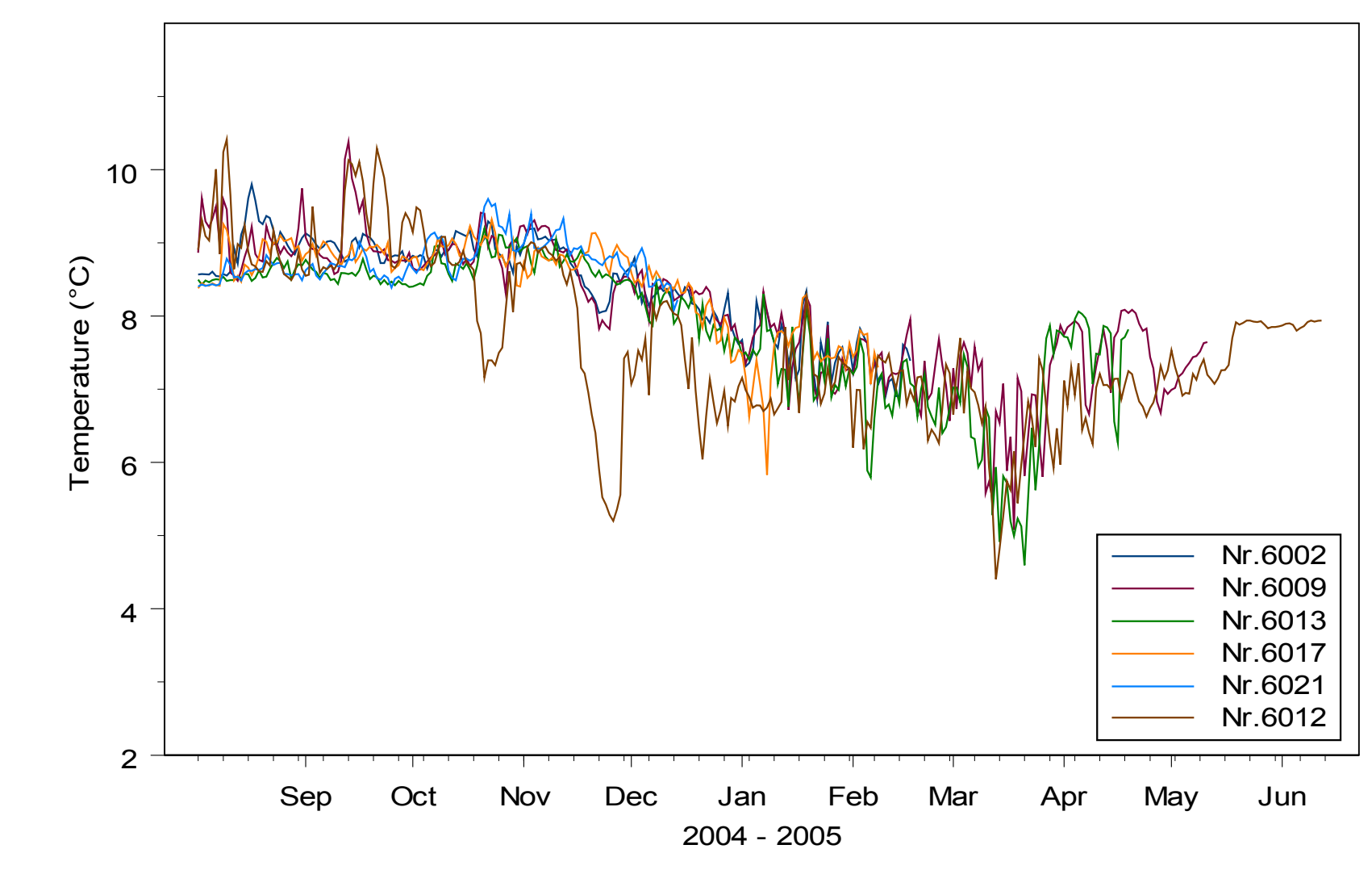
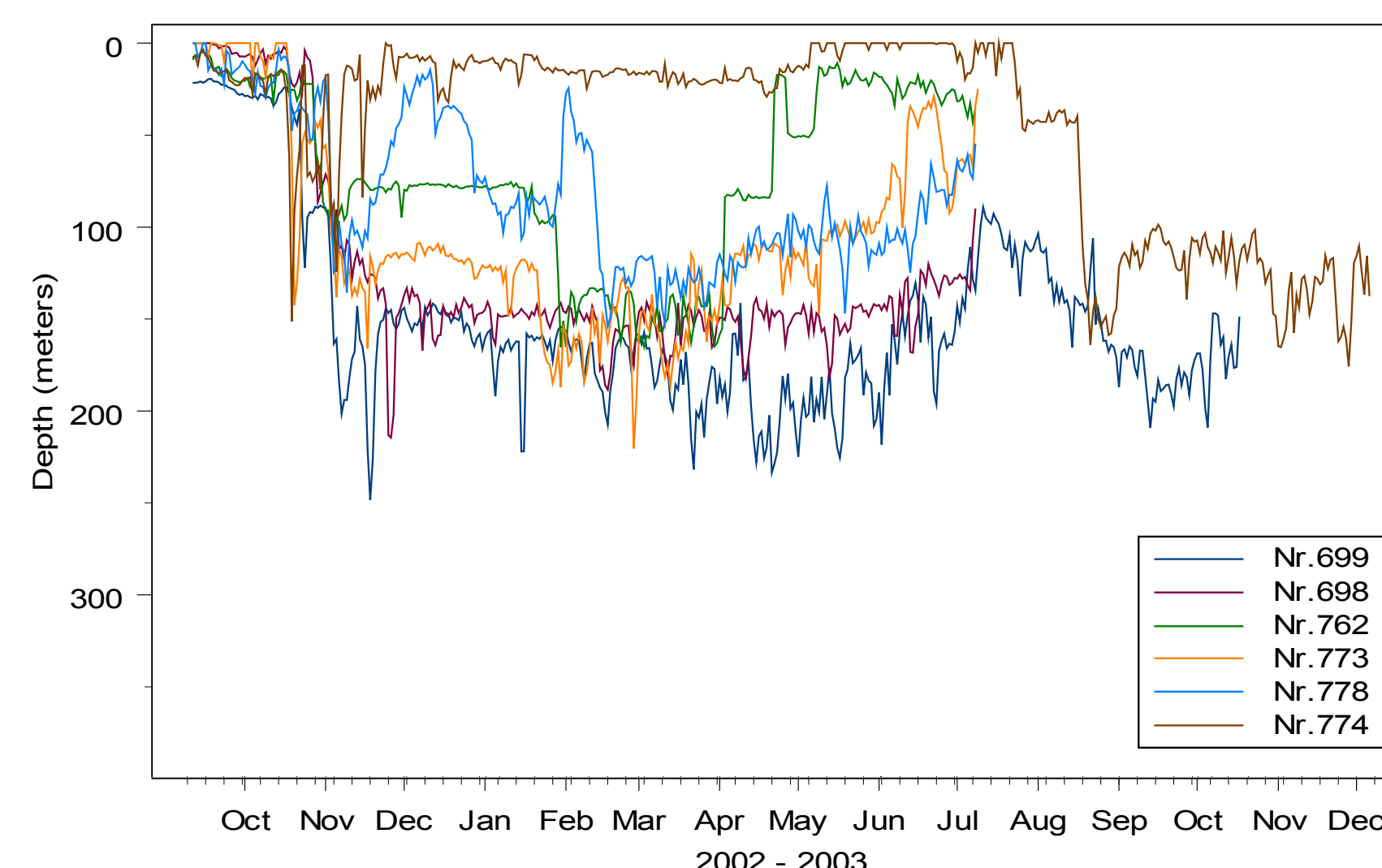
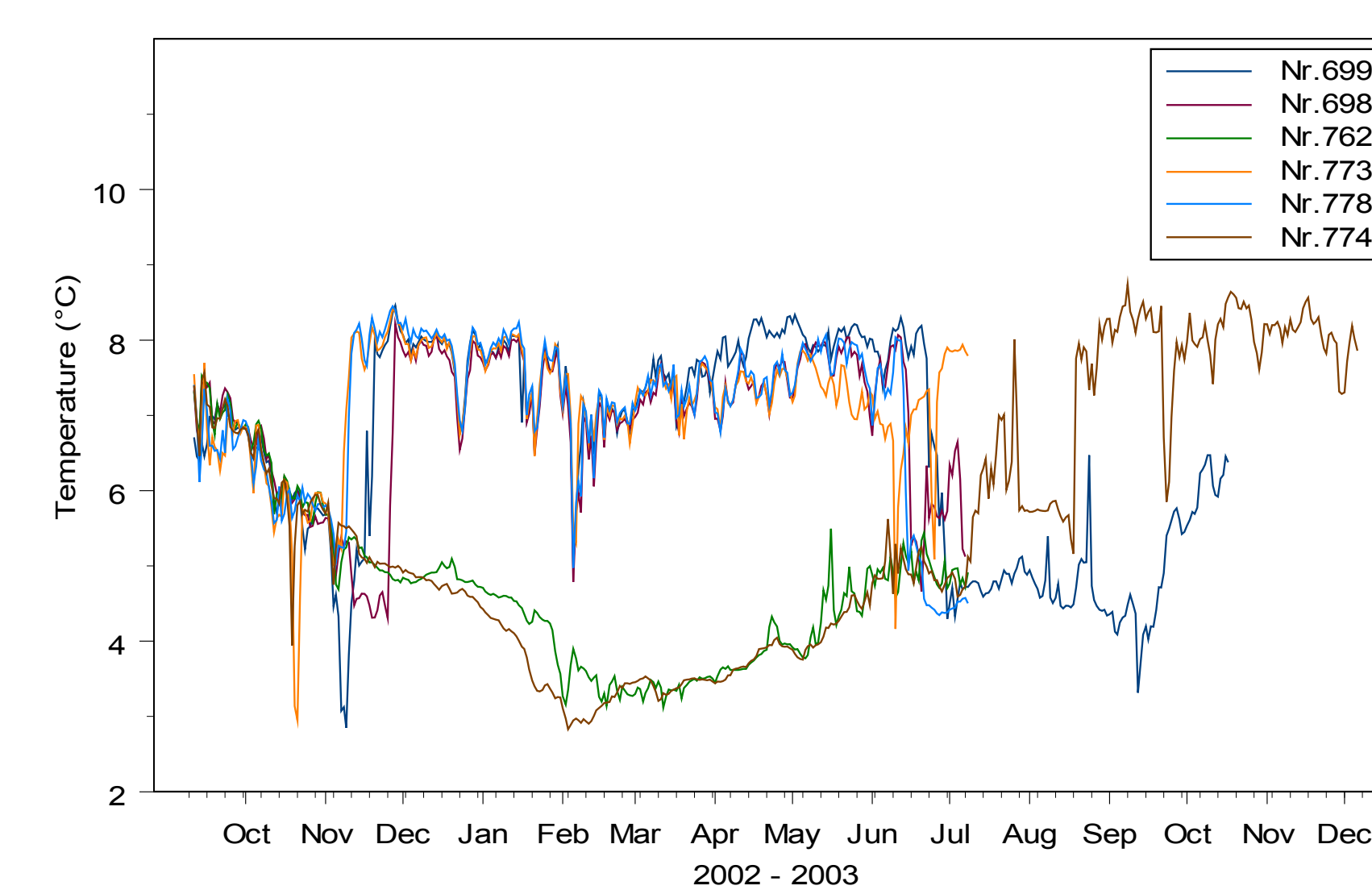
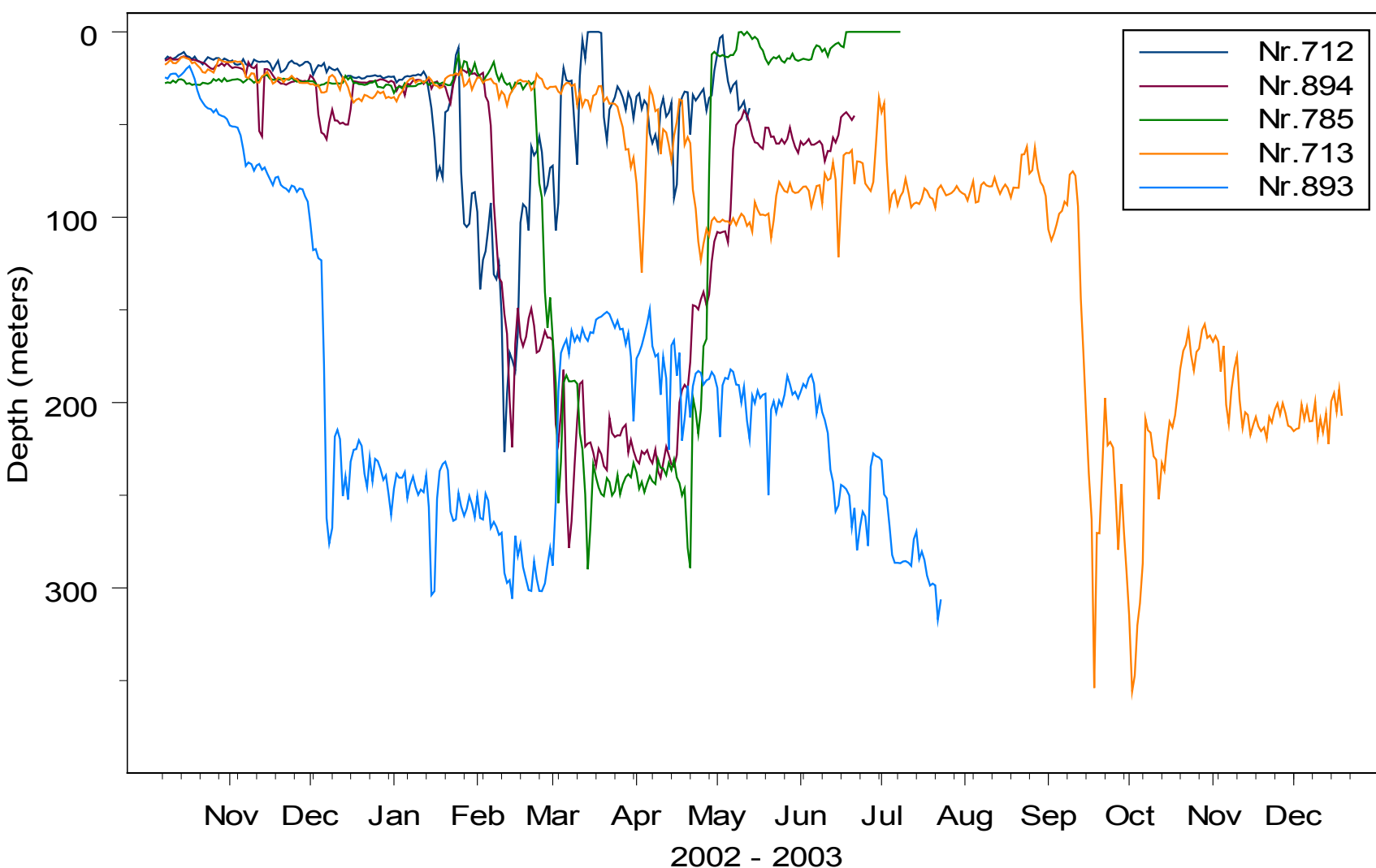
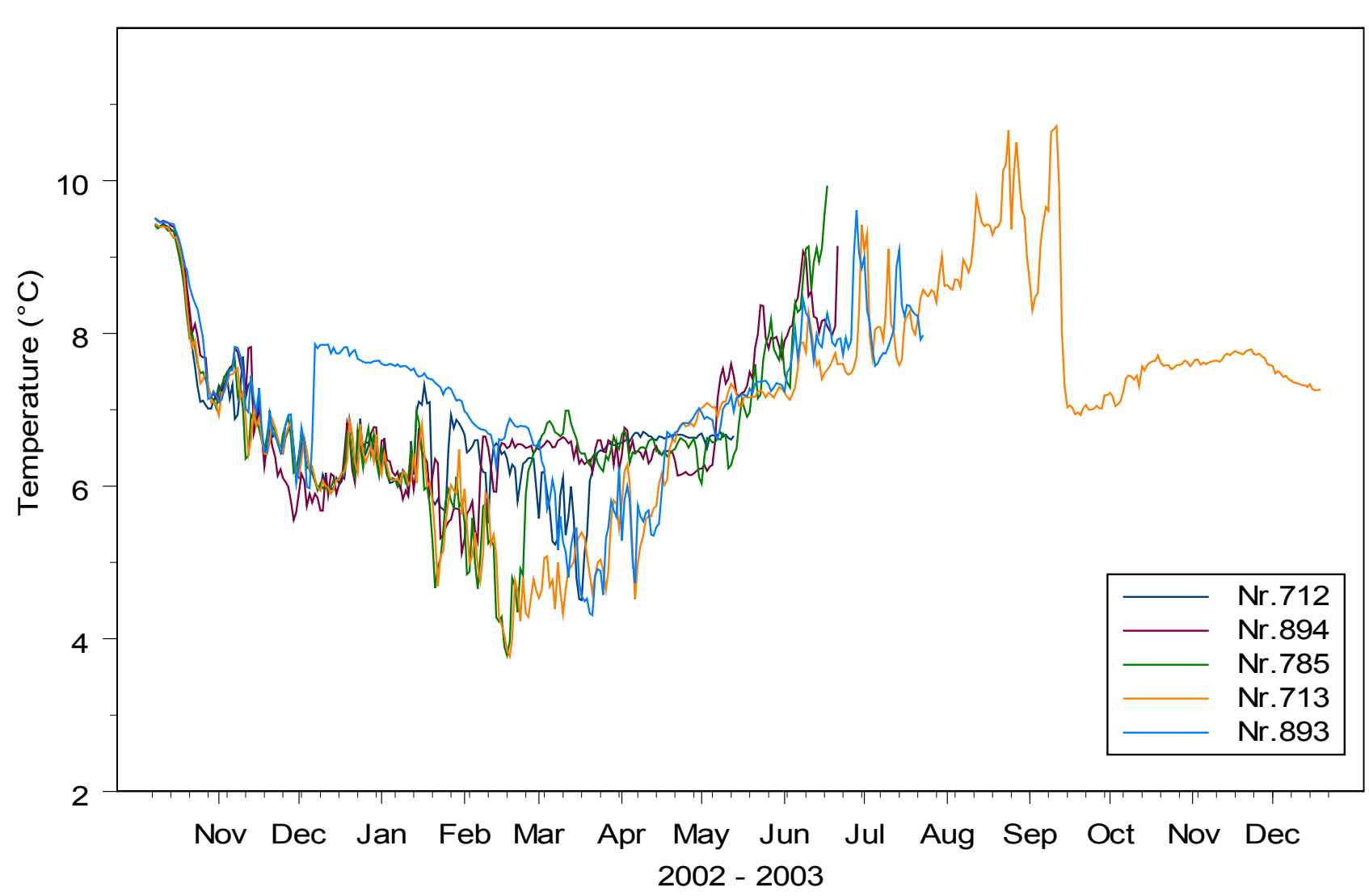
Ondverdamnes: Date of tagging: September 24 2002, 5 DSTs recaptured from 20 releases, 4 fish, 47-48 cm length (age group 3) and 1 fish, 63 cm (age group 5) at tagging. ● = tagging location, ▲ = recapture traditional tag and ◆ = recapture DST-tag



Nordfjardarfloi: Date of tagging: September 9 2002, 8 DSTs recaptured from 20 releases (2 short records omitted). Fish length 45-52 cm at tagging (age group 3). ● = tagging location, ▲ = recapture traditional tag and ◆ = recapture DST-tag



Halsasvaedi: Date of tagging: July 19 2004, 6 DSTs recaptured from 16 releases. Fish length 57-83 cm at tagging (age groups 4-6). ● = tagging location, ▲ = recapture traditional tag and ◆ = recapture DST-tag



Summary

- Recaptures from saithe tagged off Ondverdamnesi showed a broader distribution compared with saithe tagged at the other two release sites and data from DST indicated different strategies of individual saithe with regards to depth and temperature.
- DST-data from saithe tagged off Nordfjardarhorn indicated two different strategies. Some migrated south to the boundary between the warm and cold current off SE-Iceland and spent the winter there, while others spent the winter in the colder water East of Iceland. Recaptures of traditional tags supported this view with high recapture rate off SE-Iceland and relatively many recaptures around the tagging areas compared with fishing effort³.
- The DST-data from Halsasvaedi showed a general trend of saithe gradually migrating to deeper water as the winter passed. Spawning of saithe around Iceland is thought to last from late January to middle of March⁴. Because saithe tagged at Halsasvaedi were largest at tagging, it is likely that the depth and temperature profiles in January-March represent favourable condition for spawning activity. Three of the six recaptured saithe were reported to be in spawning condition (the condition of the other three being unknown). Traditional recaptures indicated high affinities of saithe tagged at Halsasvaedi to the vicinity of their tagging areas.
- We thus conclude that individual saithe shows variation in their habitat preferences, both among and within certain sites. This plasticity is significant and may provide an adaptive advantage for fish living in variable environments.

References

- ¹Valdimarsson, H. and Malmberg, S.A. 1999. Near surface circulation in Icelandic waters derived from satellite tracked drifters. Rit fiskideildar, 16: 23-39.
- ² <http://www.hafro.is/Sjora/>
- ³Anon 2006. Njytjastofnar sjavar 2005/2006 Aflahorfur fiskveiðiarid 2006/2007 (State of Marine Stocks in Icelandic Waters 2005/2006. Prospects for the Quota Year 2006/2007). Hafrannsóknastofnunin Fjölrit, 126. 190pp. (in Icelandic with English summary).
- ⁴Jonsson, G. 1992. Islenskir fiskar, 2nd edition, Ufsi, pp. 289-291. Fjólva utgafa, Reykjavik. 525pp. (in Icelandic)