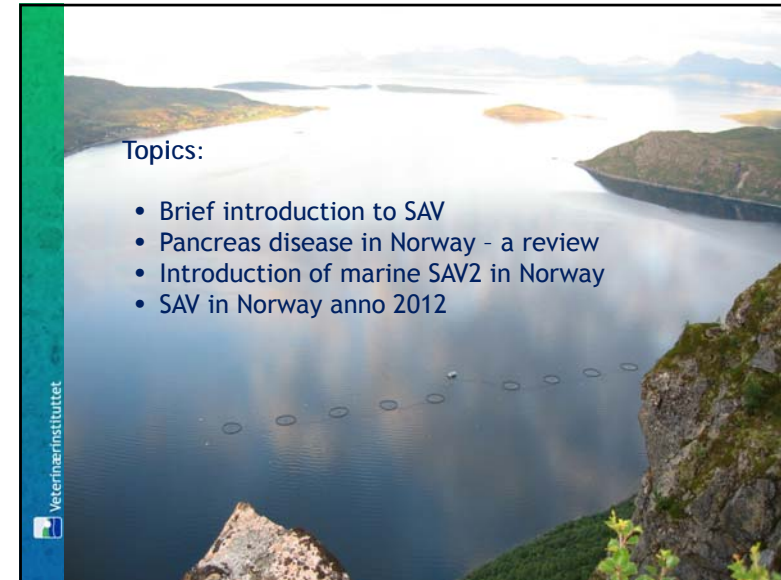


17th Annual Meeting of the National Reference Laboratories for Fish Diseases  
29-30 May 2013, Copenhagen

## Geographical distribution of salmonid alphavirus (SAV) in Norway

Monika J. Hjortaas, Irene Ørpetveit and Hilde Sindre

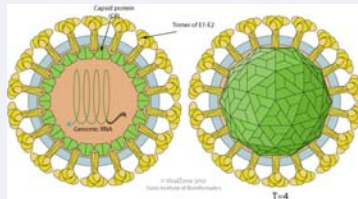


### Topics:

- Brief introduction to SAV
- Pancreas disease in Norway - a review
- Introduction of marine SAV2 in Norway
- SAV in Norway anno 2012

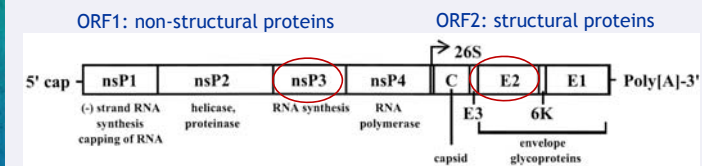
## Salmonid alphavirus (SAV)

- Taxonomy: Family *Togaviridae*, genus *Alphavirus*
- Morphology: Enveloped, icosahedral, ~65 nm
- Sleeping disease in rainbow trout in freshwater and Pancreas disease in salmonids in sea water
- Horizontal transmission

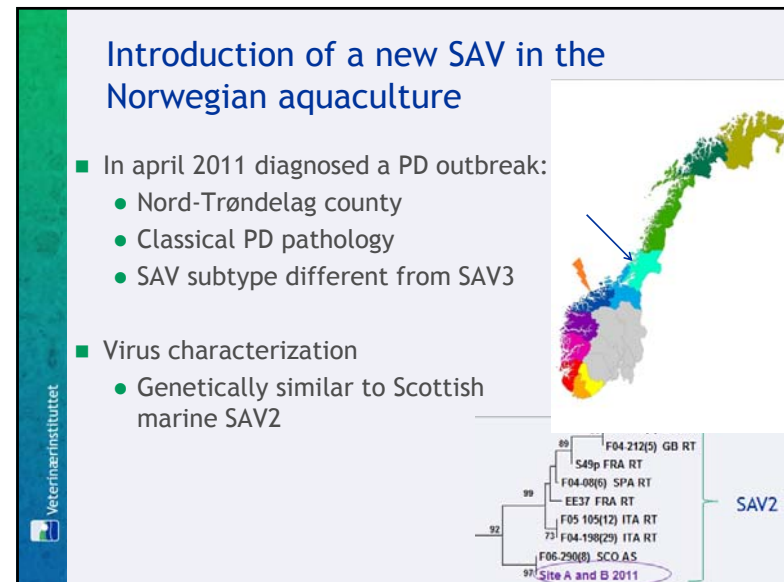
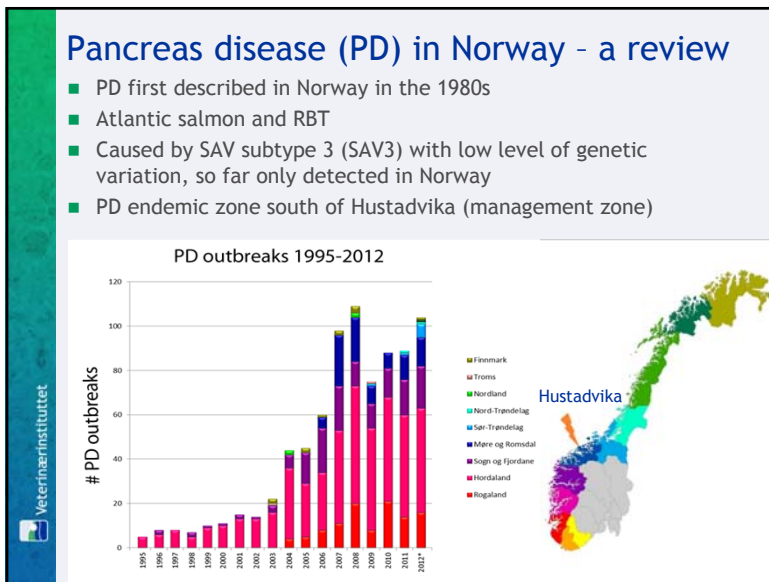
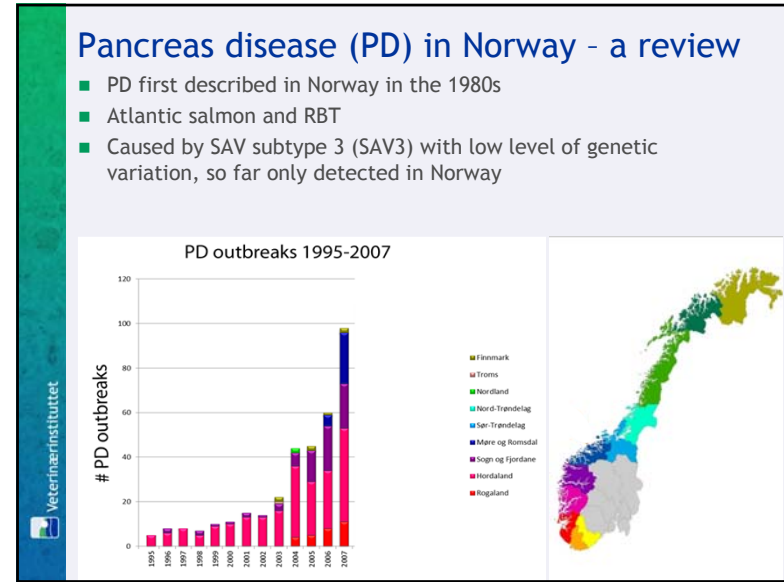
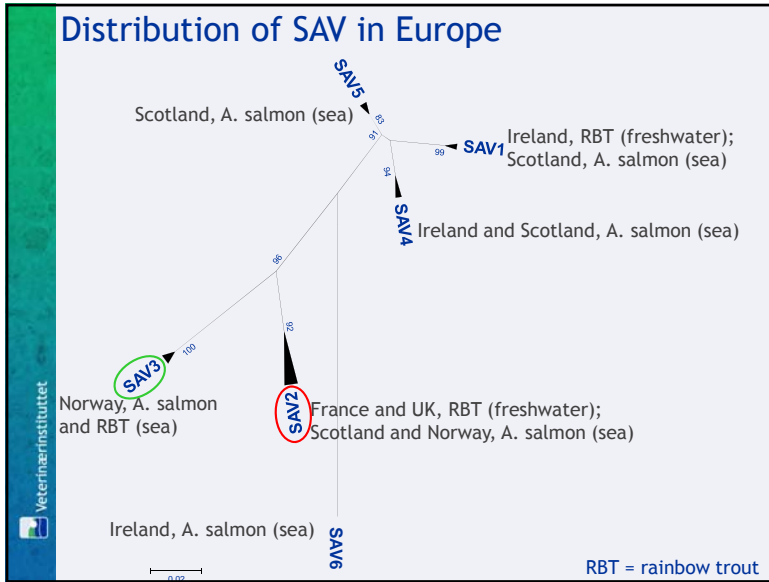


## Salmonid alphavirus (SAV) (cont.)

- Genome: non-segmented, single-stranded (+)RNA, ~12 kb, 2 ORFs
- Genetic analyses of the E2 og nsP3 genes: 6 subtypes (*Fringuelli 2008*)



From Powers et al. *J Virol* 2001;75:10118-10131

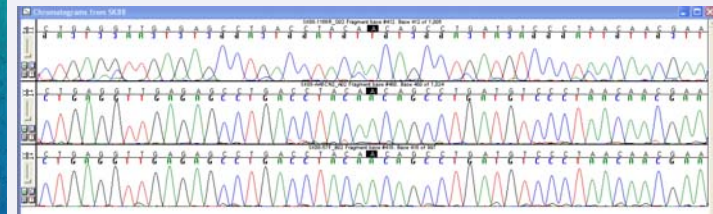


## Initiation of research project

- One-year project
- Financed by The Norwegian Seafood Research Fund (FHF 900799)
- Project partners
  - Norwegian Veterinary Institute
  - PatoGen AS
  - MSD Norway
  - Marine Harvest
- Cooperation with Agri-Food and Biosciences Institute (AFBI) (Dr. E. Fringuelli) on WP1

## WP3 - Geographical distribution of SAV2

- Virus characterization of isolates from
  - all PD outbreaks outside the endemic zone as far back as 2008
  - selected PD outbreaks within the endemic zone

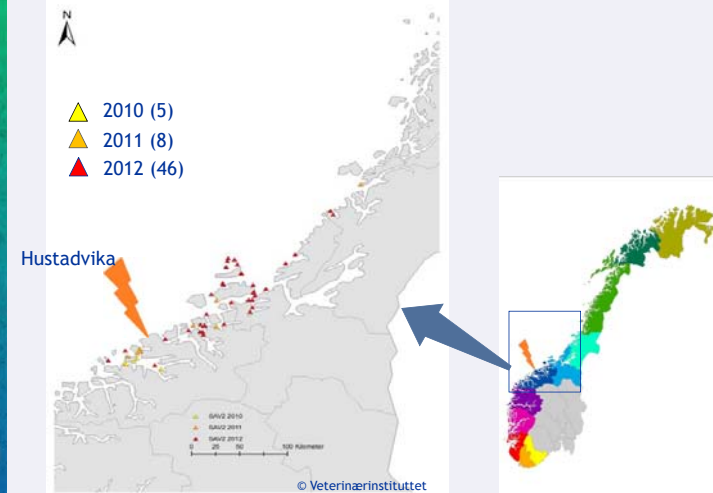


## WP3 - Geographical distribution of SAV2 - Conclusions

- Earliest detection of SAV2 in **June 2010** in the Midsund area
  - within the endemic zone
  - PD outbreak with SAV3 in 2009, but slaughter of fish in March 2010
  - 5 PD outbreaks in 2010 caused by SAV2
- Following the SAV2 detection in Midsund
  - no SAV3 detected
  - SAV2 spread rapidly further north



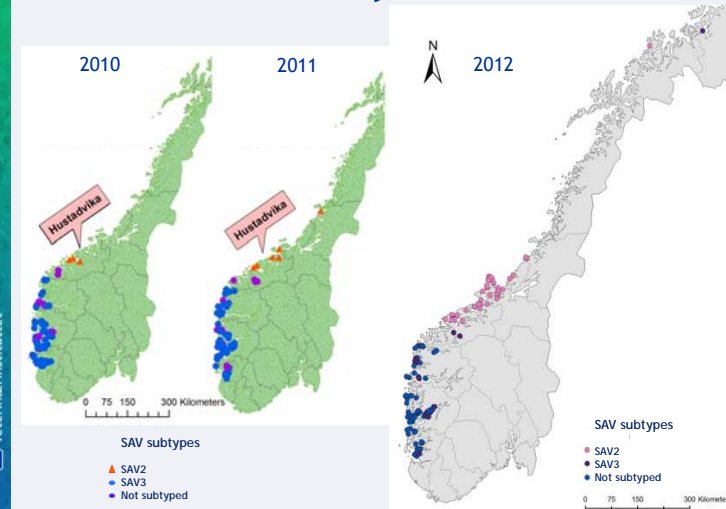
## Detections of marine SAV2 2010-12



## Understanding the spread of the marine SAV-2 in Norwegian aquaculture

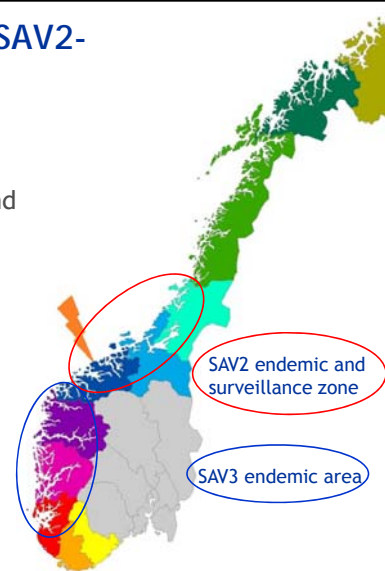
- No stamping out at any stage
  - Outbreaks in 2010 thought to be SAV3
  - Harvestable fish in 2011 and 2012
- Horizontal transmission
  - between farms in close proximity
  - well-boat traffic
  - other marine traffic
- Lower mortality and sub-clinical infections with SAV2?

## PD outbreaks in Norway 2010-2012



## Implications of the SAV2-introduction

- Two SAV endemic zones
- Monthly screening of fish farms in SAV2 endemic and surveillance zone
- Focus: prevent spreading further north
- SAV screening part of the surveillance program
- Goal: PD free area in the north



## Summary

- SAV causes disease in freshwater and marine aquaculture in the UK, Ireland, Norway and France
- Norway: SAV3 for more than 20 years
- Marine SAV2 introduced in Romsdal in 2010 from unknown source
- SAV2 spreads rapidly to the north
- A SAV2 management zone introduced in Møre og Romsdal and Sør-Trøndelag counties
- SAV3 still contained south of Hustadvika
- Goal: PD free status in the north of Norway

Thank you for your attention!



Acknowledgements:

- At the NVI: Monika J. Hjortaas, Hanne Skjelstad, Torunn Taksdal, Britt Bang Jensen, Anne Berit Olsen, Renate Johansen og Hilde Sindre
- The Norwegian Seafood Research Fund
- Norwegian food safety authorities
- The fish health services in Norway

