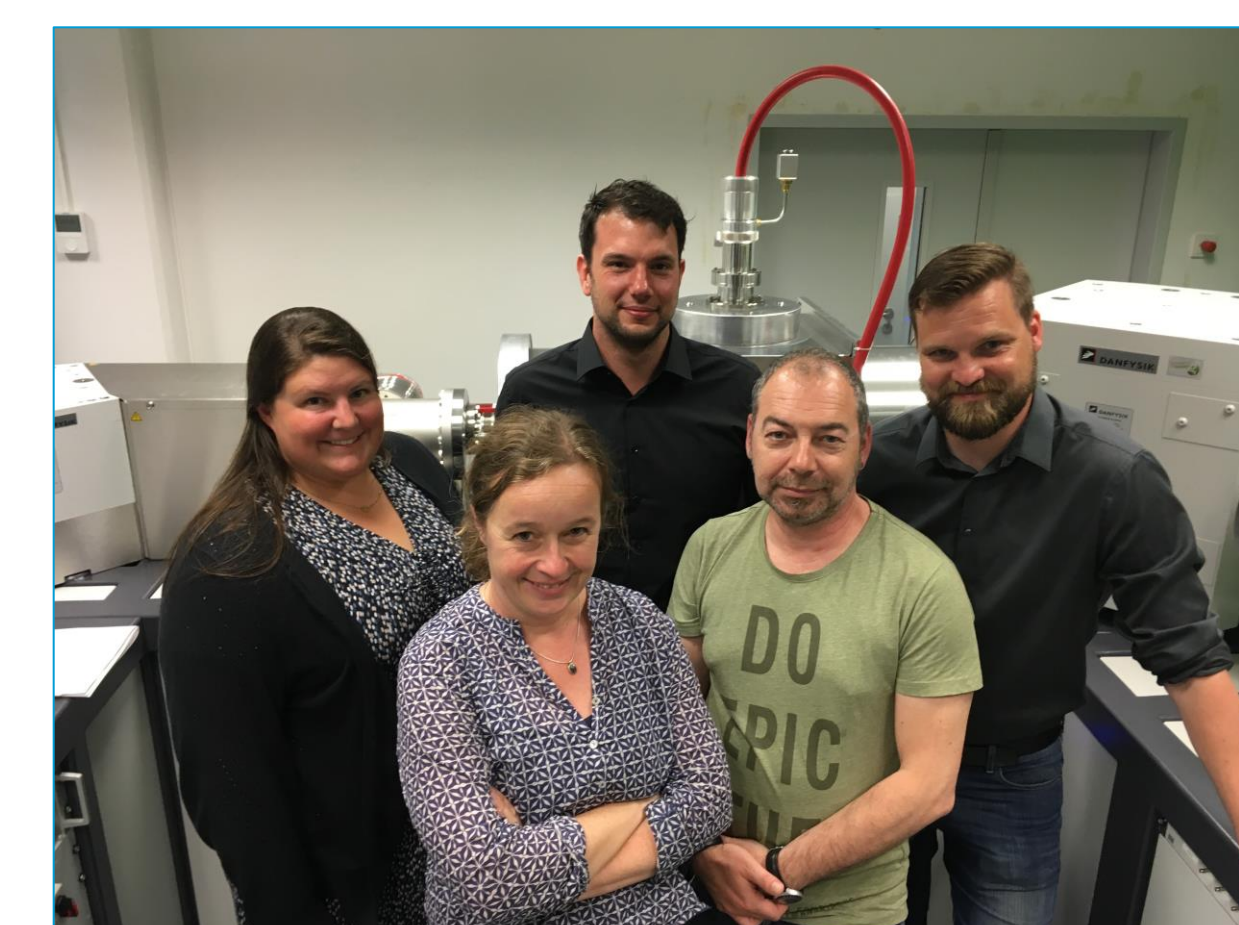


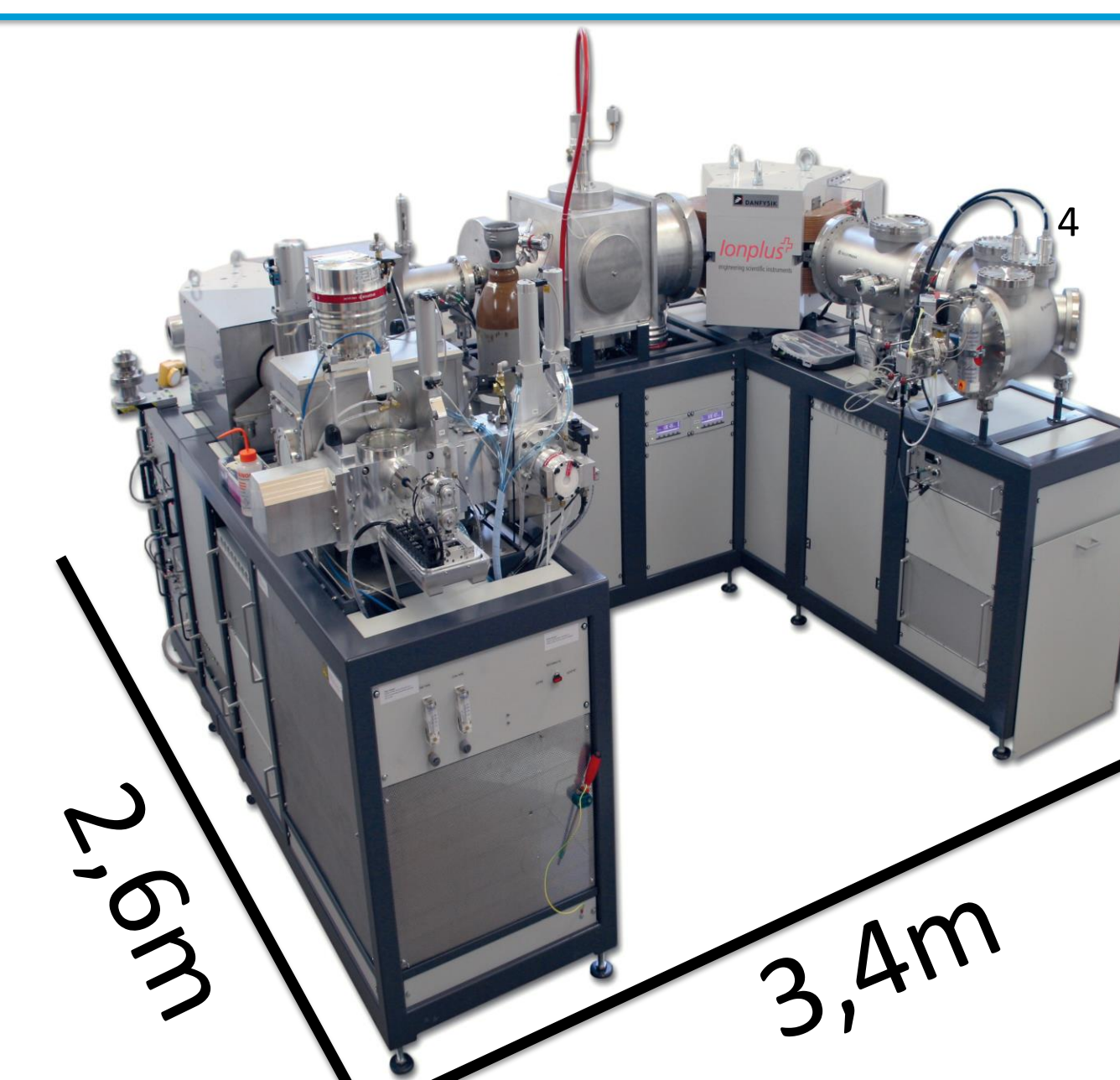
Establishment of routine sample preparation protocols at the newly installed MICADAS ¹⁴C dating facility at AWI



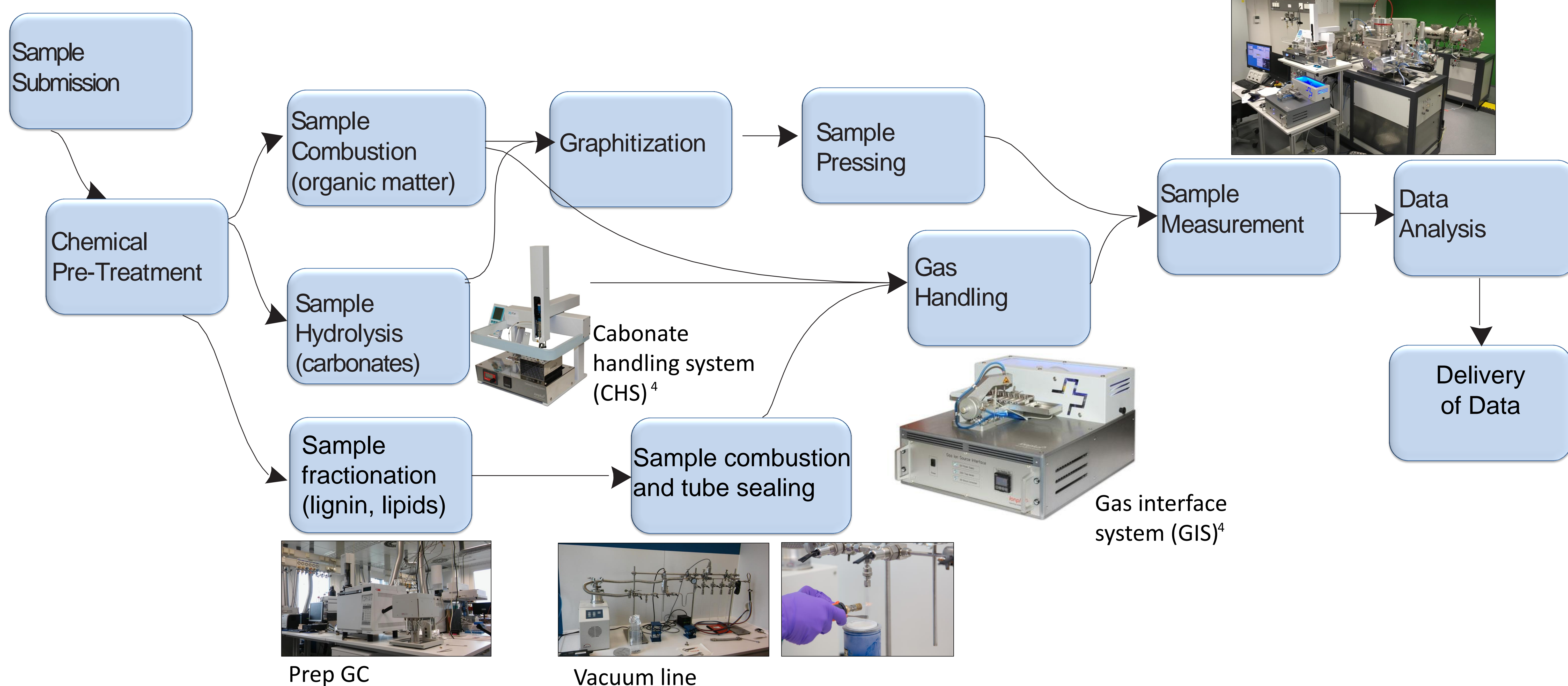
Introduction

In November 2016, the first Mini-Carbon-Dating-System (MICADAS) manufactured by Ionplus AG was delivered and installed at the Alfred-Wegener-Institute (AWI), Germany.

The **main goal** for the facility at AWI is the precise and independent dating of carbonaceous materials in **marine sediments, sea-ice, and water**. A wide range of in-house research topics address various processes of **global carbon cycling**. A particular focus will be on sediments from high latitude oceans, in which radiocarbon-based age models are often difficult to obtain due to the scarcity of carbonate microfossils. The wide range of applications encompassing gas analyses of **small-sized samples of foraminifera and compound-specific analysis as well as analyses of graphite targets from samples of ~1mg to 250µg carbon** requires establishing routine protocols of various sample preparation techniques utilizing state of the art peripheral prepping systems.

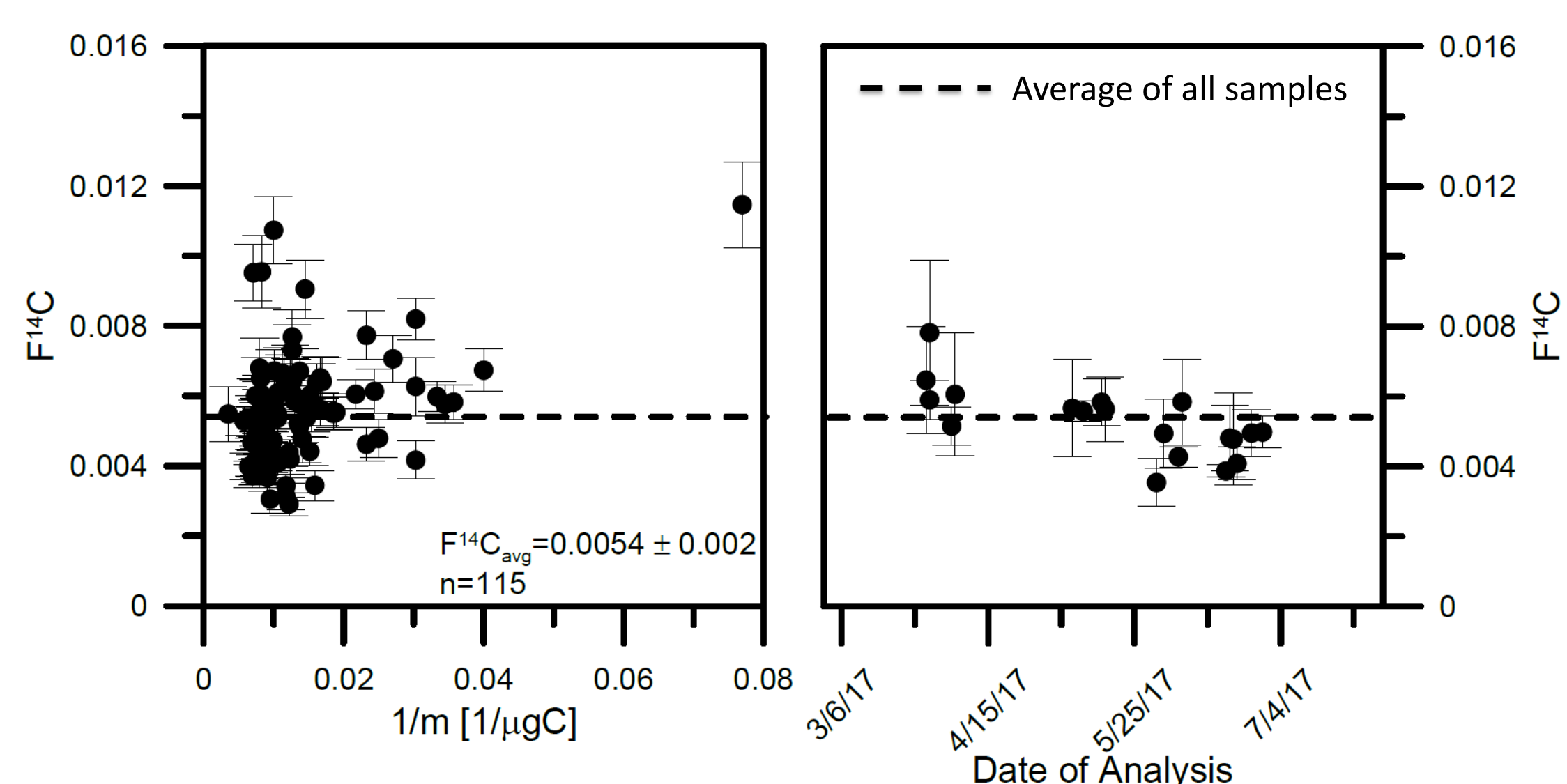


Pathways of samples submitted to the MICADAS-laboratory.

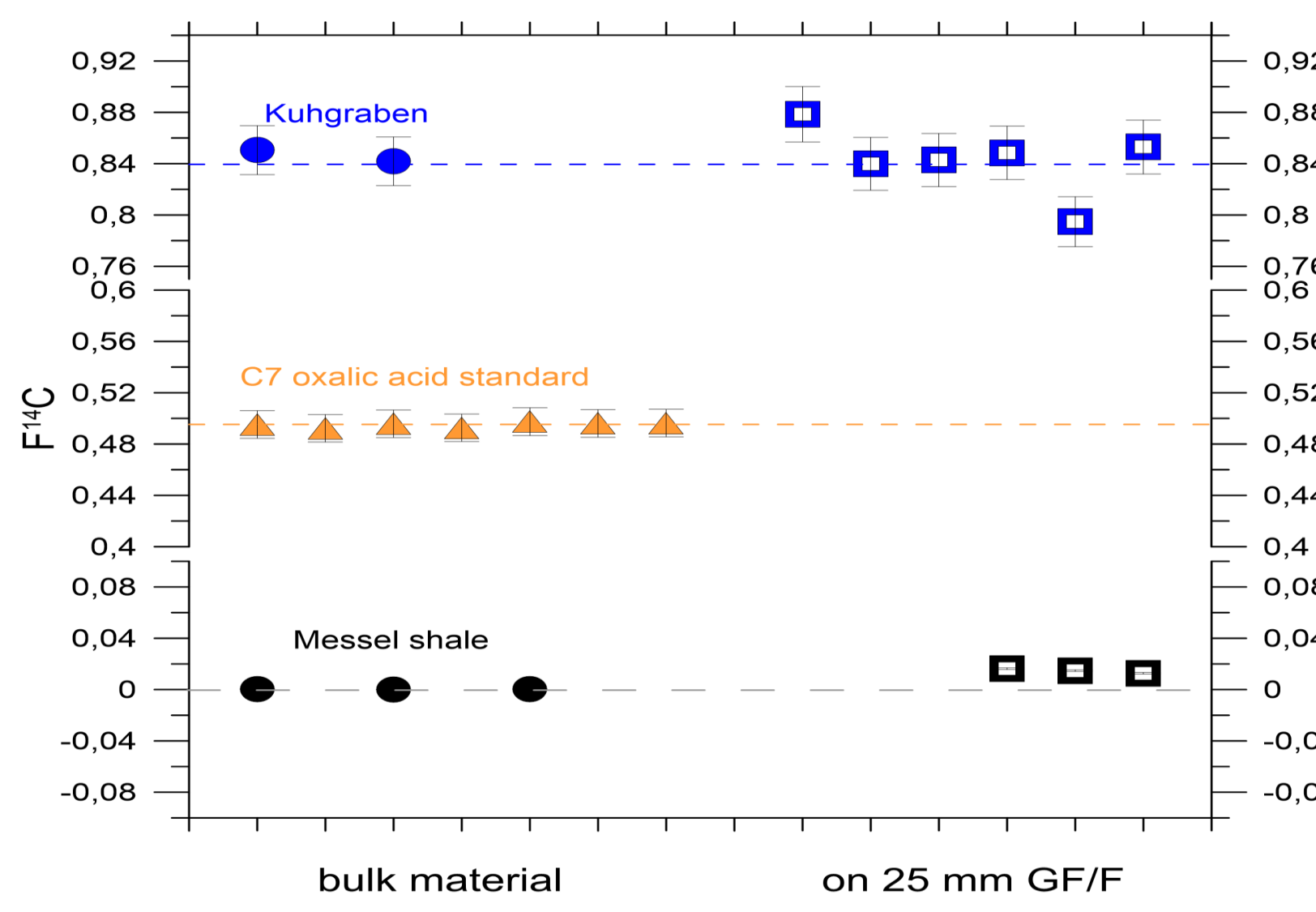


Results

Determination of the blank for foraminifera and acidified samples

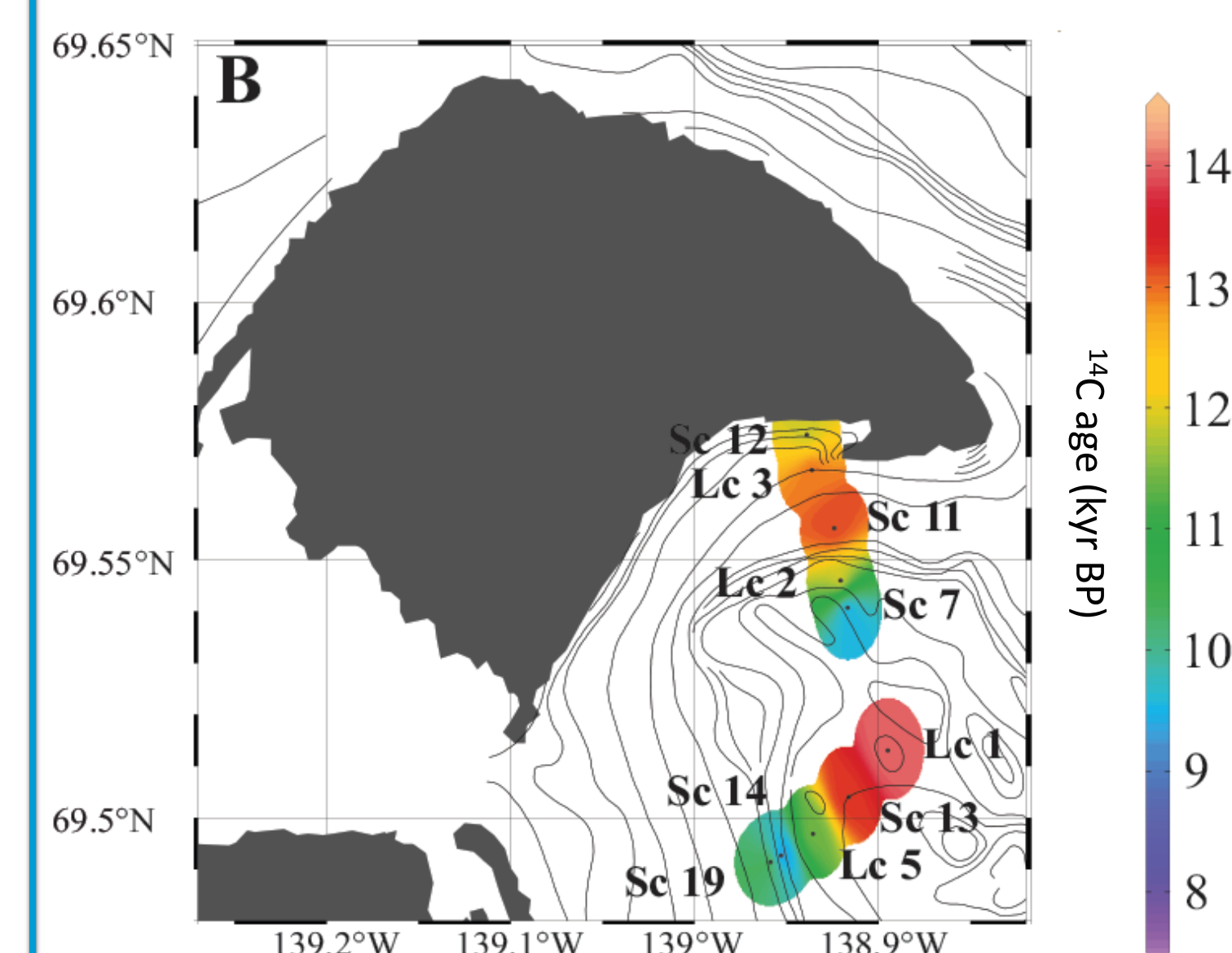


- Old (> 50.000a) foraminifera used as processing blank; material was flushed with He (15 min), dissolved in 200 µl H₃PO₄ and evolved CO₂ was analyzed via direct injection into the ion source (12 min).
- **Due to an optimized sample preparation and MICADAS performance the amount of incorporated processing blank decreased.**



- Internal standard sediment (modern=Kuhgraben and fossil=Messel shale) used as processing blank as well as C7 of IAEA measured as acidified bulk material (left) and on filters (right).
- Standards were burned in the EA, graphitized in the AGE 3 and measured as targets in the MICADAS.

¹⁴C age in Arctic surface sediments



- First „real samples“ for scientific purpose from sediment cores taken near Herschel Island (Beaufort Sea), to determine the sediment input in Herschel Basin.

Riedel, MSc Thesis, 2017