# Gravity Anomalies And Regional Geological Studies Between Slamet Volcano, Buaran and Bantarkawung Areas For Geothermal Energy Exploration and Development

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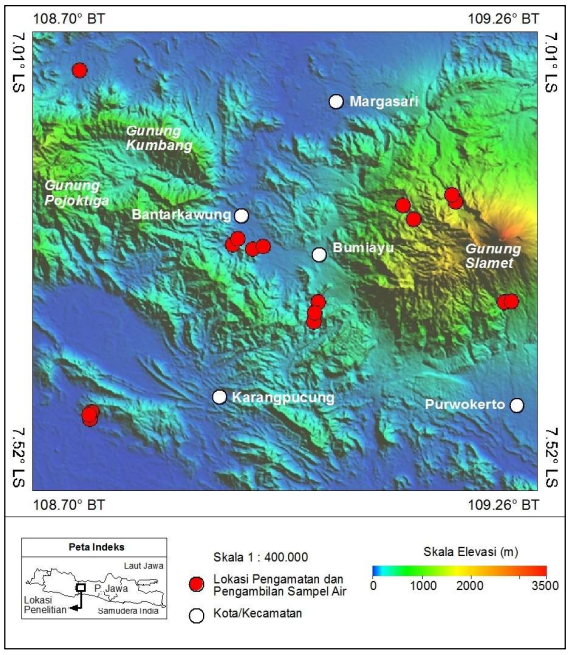
## 1. INTRODUCTION

1. The presence of several hot springs are indication of a hydrothermal system
2. Some hotsprings are still not yet clear whether it is part or not of the Slamet volcano hydrothermal system

# 2. RESEARCH SITE



## 3. LITERATURE REVIEW

a. van Bemmelen (1949) : Book of Geology of Indonesia
b. Kastowo and Suwarna (1996): Geological Map of the Majenang Sheet, scale of 1:100,000
c. Lano Adhitya Permana and Eddy Mulyadi (2014): Geochemical Studies of Geothermal Fluids in the Southern Central Java Region

## 3. LITERATURE REVIEW

e. Sukmaji Anom Raharjo, and Sehah (2015): research on the interpretation of the location of oil seepage source rock in Cipari village, based on a magnetic survey

f. The Directorate General of EBTKE and the Geological Agency, Ministry of Energy and Mineral Resources (2017): research on geothermal in Cipari area based on geochemistry

## 4. RESEARCH METHODS

a. Obtain topographic and gravity data on the Scripps Institution of Oceanography site https://topex.ucsd.edu/cgi-bin/get_data.cgi
b. Obtain regional anomaly maps
c. Obtain residual anomaly maps
d. Make analyses of the geological map and gravity anomalies

# 4. RESULT AND DISCUSSION

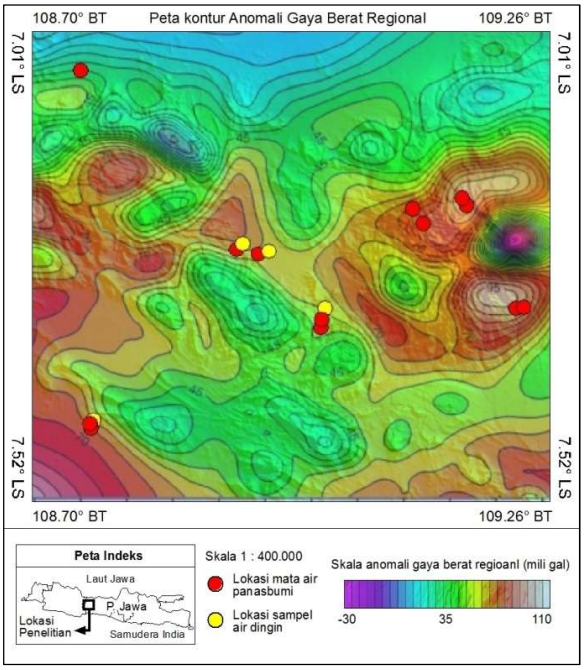
a. Regional Gravity Anomalies
   - High anomalies ( >65 milligal)
   - Moderate anomalies (50 - 65 milligal)
   - Low anomalies (<50milligal)

b. Residual Gravity Anomalies
   - High anomalies (2-14 milligal)
   - Moderate anomalies (0-2 milligal)
   - Low anomalies (-28-0 milligal)

## 4. Regional Gravity Anomalies

a. High ( >65 milligal)
   Around Mount Slamet (Pancuran-7 and 3)
b. Moderate (50-65 milligal)
   The Bantarkawung, Paguyangan, Buaran, Cipari
c. Low (<50milligal)
   The Ciangir area

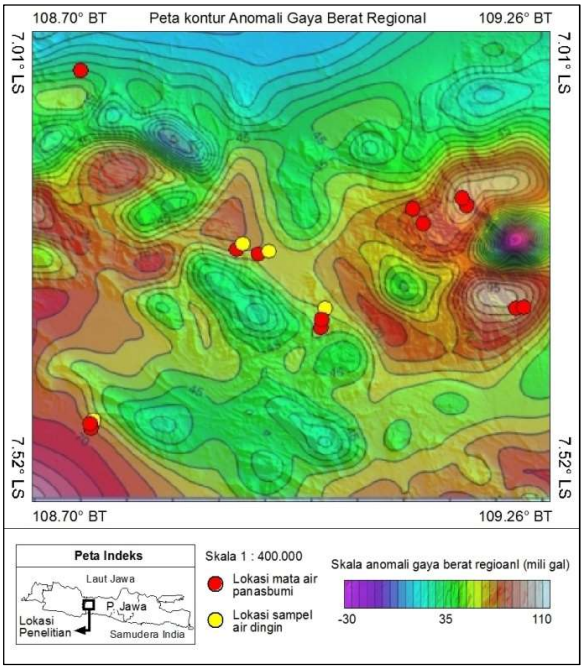
# 4. Regional Gravity Anomalies



## 4. Residual Gravity Anomalies

a. High (2-14 milligal)
   Around Mount Slamet (Cahaya, Sigedong, Pancuran 13, Saket, Pancuran 7 and 3.)
b. Moderate (0-2 milligal)
   The Bantarkawung, Paguyangan, Buaran, Cipari
c. Low (-28 - 0 milligal)
   The other areas

# 4. Residual Gravity Anomalies



## 4. Regional Geological Analysis

Rocks are composed of:

a. Quaternary volcanic lithologies
   as a result of Slamet Volcano eruption products series
b. Tertiary rocks (Rambatan Formation)
   The Bantarkawung, Paguyangan, Buaran, Cipari
c. Several hot springs appear on the two different-aged rocks

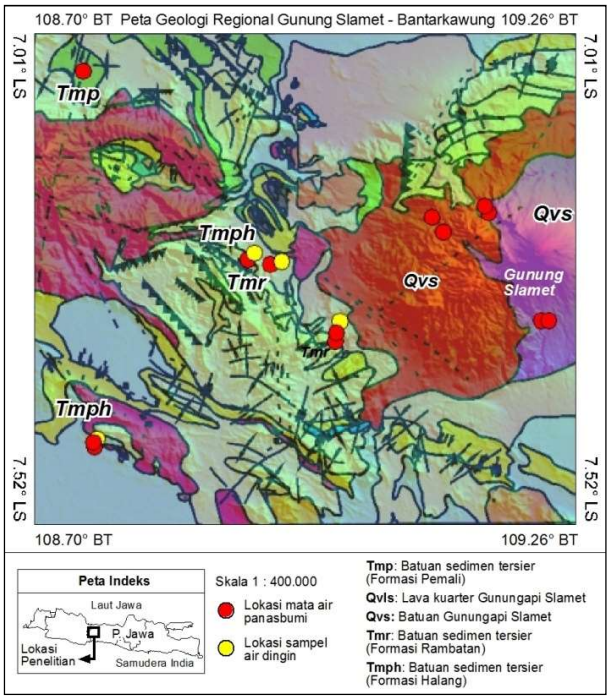
## 4. Regional Geological Analysis

a. Folded and broken in tertiary sedimentary rocks are thought to be factors that allow geothermal waters reach to the surface as hotsprings (and meteorik water go to the reservoir from surface

## 4. Regional Geological Analysis

b. The appearance of several hot springs in quaternary volcanic rocks is also thought to be controlled by subsurface geological structures covered by Slamet volcanic eruptions.

# 4. GEOLOGICAL MAP OF THE STUDY AREA




Kastowo, 1975 (modification)

# CONCLUSSION

- Gravity anomalies can be used to analyze subsurface conditions related to geothermal reservoirs or heat sources.
- High gravity anomaly values indicate the presence of permeability pathways that allow heat from the reservoir or heat source of magma to reach the surface or near the surface.
- There is a positive correlation of high gravity anomaly values with the presence of several hot springs at the study site.
- The emergence of hot springs around Slamet Volcano, Pakujati (or Paguyangan), Buaran, Bantarkawung, Cipari and Ciangir are interpreted to be controlled by the presence of weak zones in dense rock or magma in the form of fractured or faults geological structures which are permeability pathways for the emergence of hot springs from below the surface

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