

# Economic and Environmental Implications of Dairy Industry Growth and Increasing Concentration in Southern Idaho

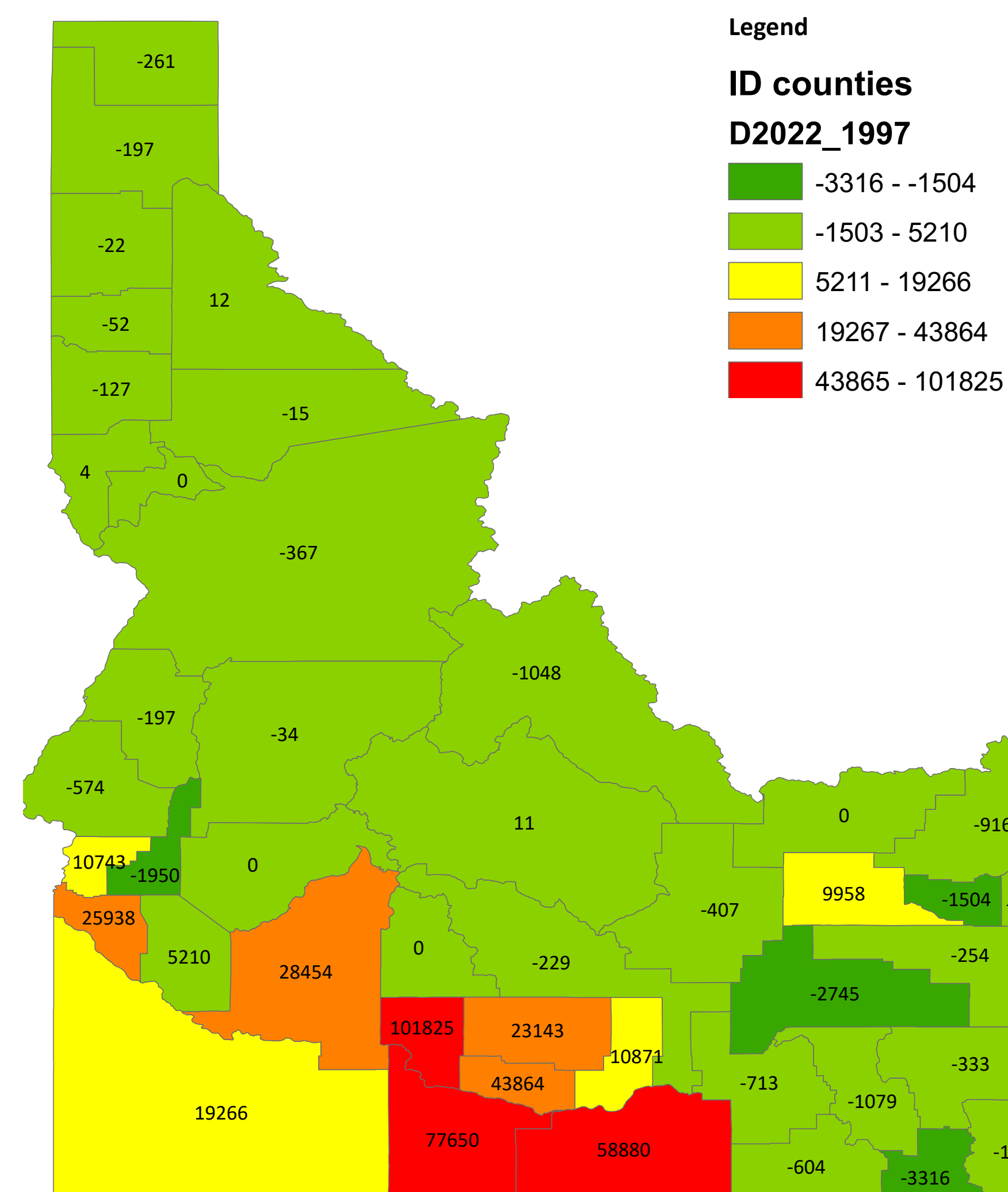
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## ID Dairy Industry from 1997 - 2022

### Growth and concentration

The dairy industry in Idaho (ID) has grown substantially over the past few decades. USDA Census estimates for statewide year end inventory of dairy cows show that there were 265,000 in 1997 and 664,000 in 2022. The USDA Economic Research Service estimated that, as of 2022, ID had the 3<sup>rd</sup> largest dairy industry in the US as measured by milk cash receipts (up from 5<sup>th</sup> in 2008). While the number of dairy cows has increased, the number of dairies has declined from about 800 in 2008 (BSU, n.d.) to 340 in 2023 (Bohnert, 2024).

### Spatial concentration



Sources: USDA NASS and DIVA-GIS.

Fig. 1. Change in the number of dairy cows between 1997 and 2022 for ID counties

In addition to industry concentration such that there are fewer, larger dairies, there has also been a shift toward regional concentration. Most ID counties have seen a decline in the number of dairy cows, while several in Southcentral and Southwestern ID have had increases.

References are available in the notes of the PPT version. Email: [phatzenbuehler@uidaho.edu](mailto:phatzenbuehler@uidaho.edu) to request.

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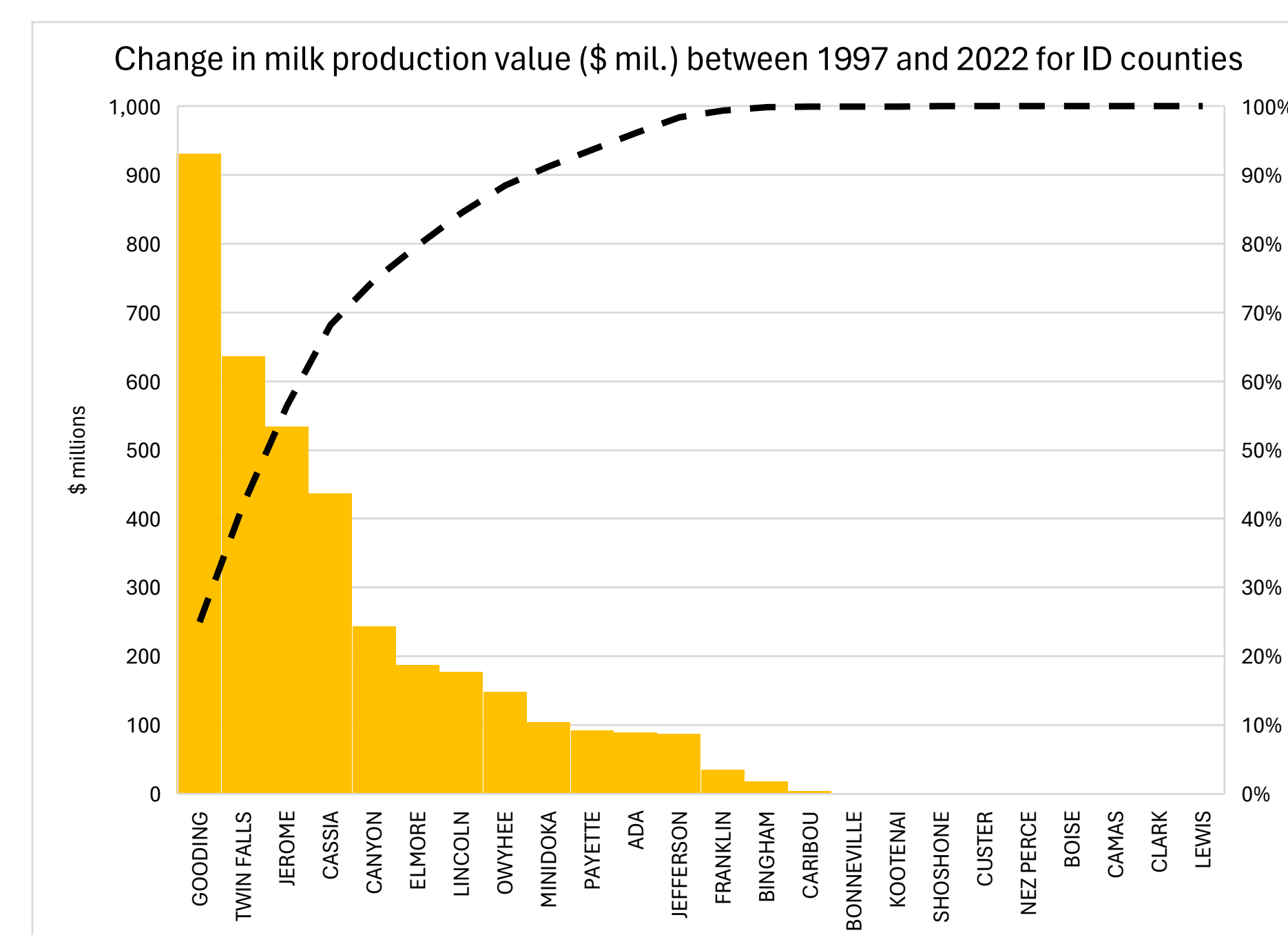
## Herfindahl-Hirschman Index (HHI) for the ID Dairy Industry

The HHI is a statistical measure of industry concentration, which ranges from 0 (perfect competition) to 10,000 (pure monopoly) (Rhoades, 1993). It is used here to measure the extent to which ID county dairy industries have become more concentrated. We define county share for county  $i$  as  $CS_i$ .

$$HHI = \sum_{i=1}^{44} (CS_i)^2$$

- ID dairy industry HHI by county in 1997: 1,367
- ID dairy industry HHI by county in 2022: 1,378
- Other measures of concentration:
  - Number of counties with 0 dairies in 1997: 7; in 2022: 14
  - Number of counties with >10% shares in 1997: 3; in 2022: 4

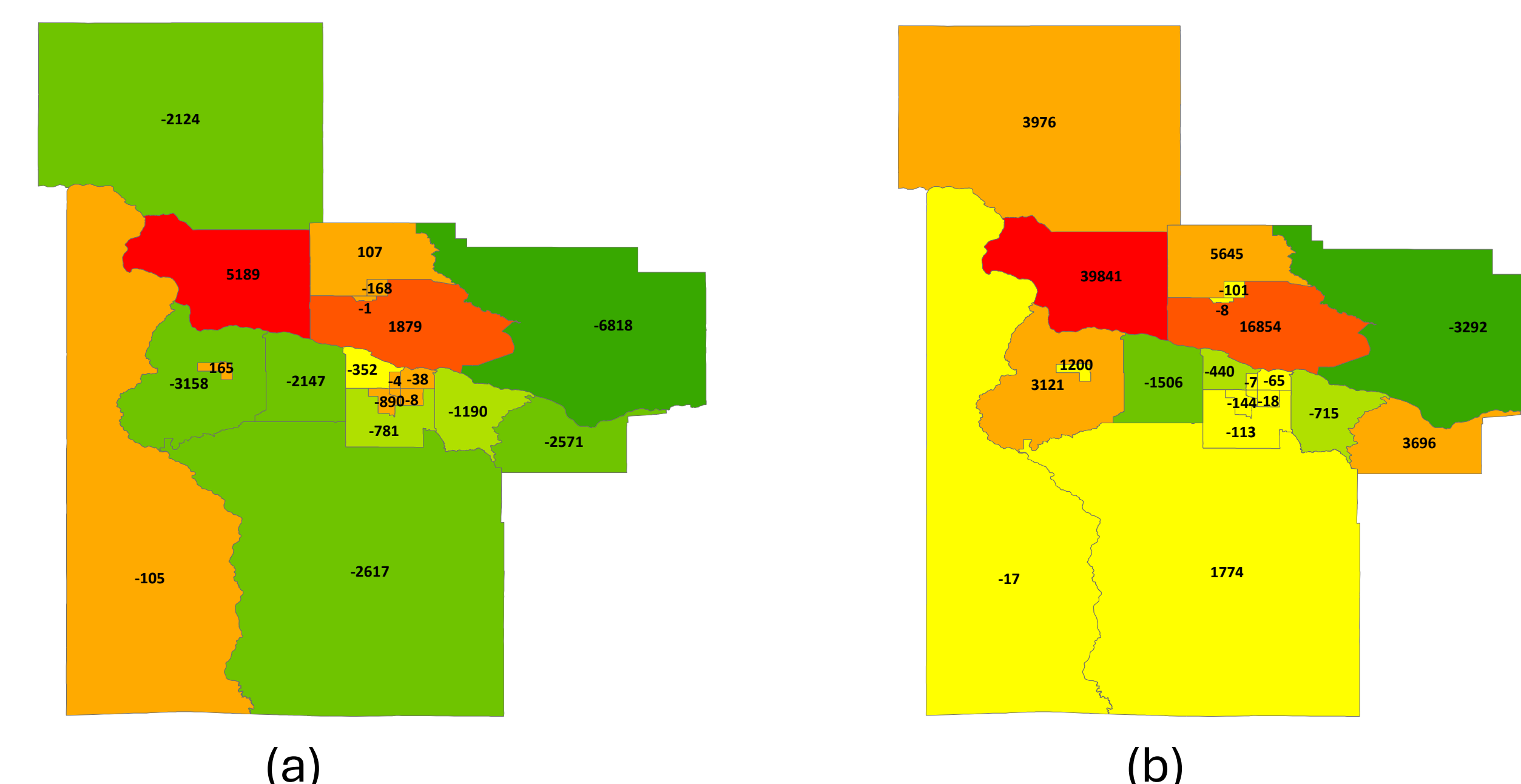
### Value of production changes



Source: USDA NASS.

Fig. 2. Change in milk production value between 1997 and 2022 for ID counties

### Nutrient Imbalances

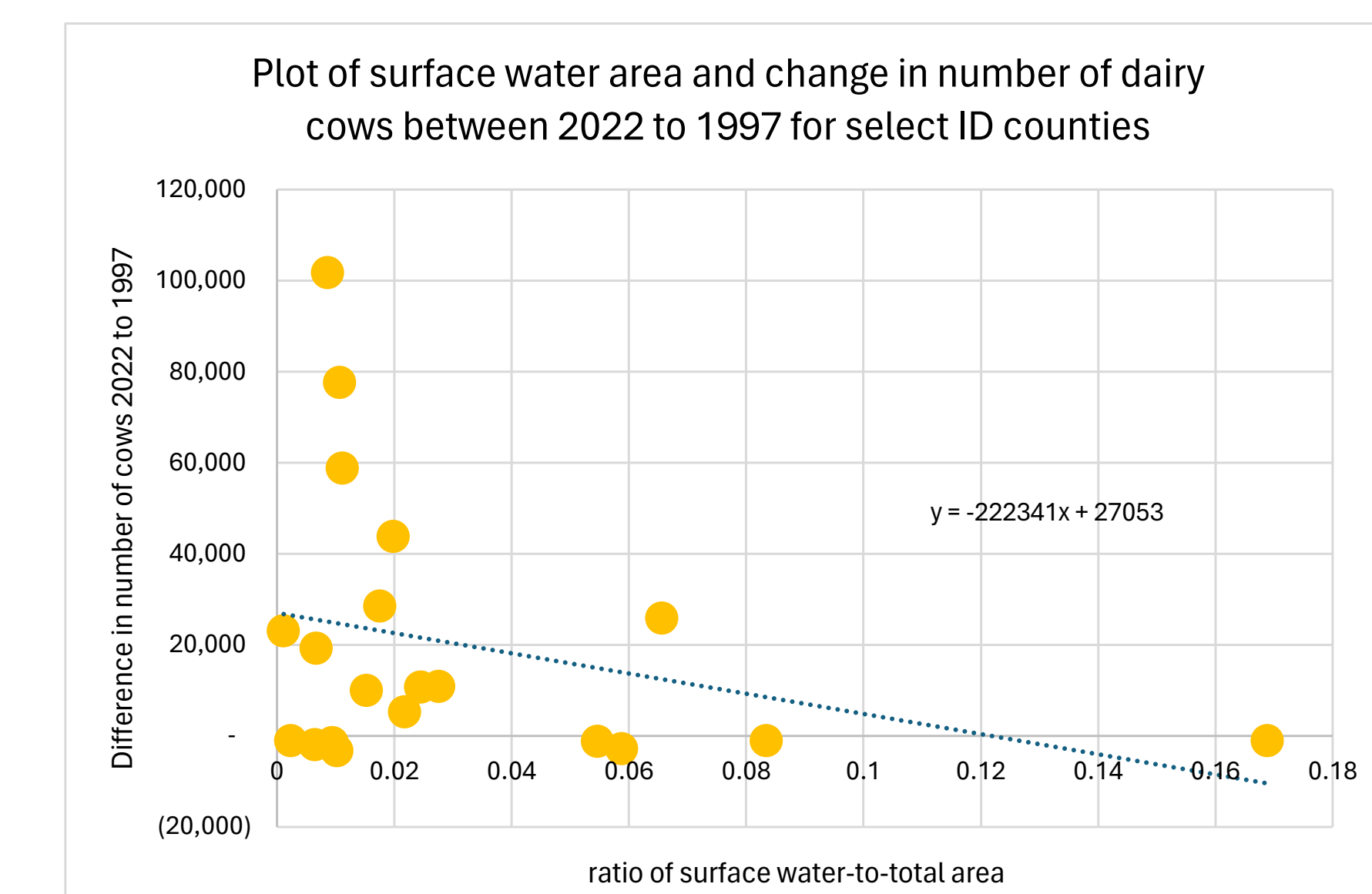


Source: Wang (2023).

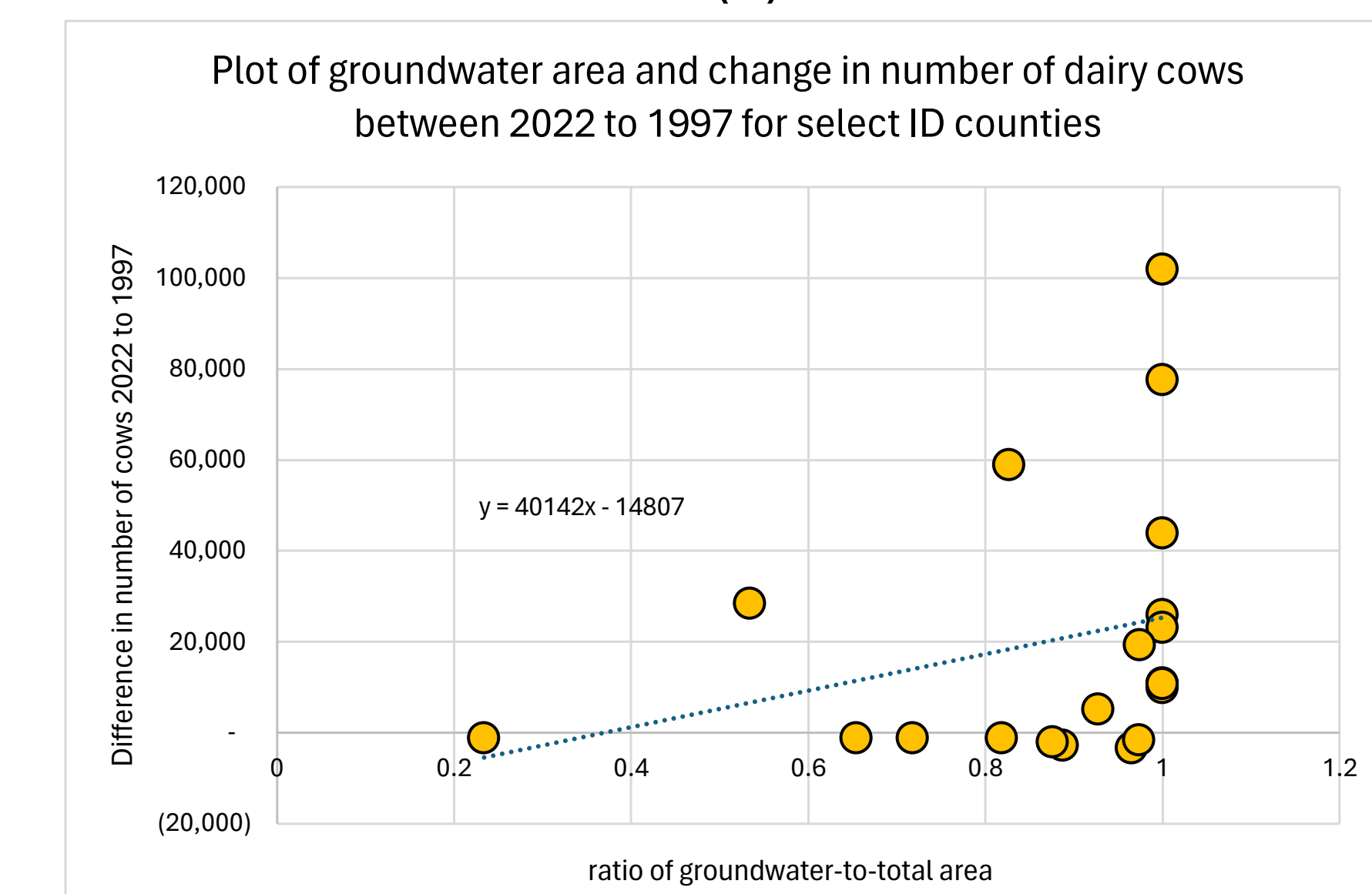
Fig. 3. Estimated supply-demand balances for Phosphorous in 2007 (panel a) and 2022 (panel b) for select counties in Southern Idaho

## Water usage implications

The changes in dairy facility locations and sizes have implications for water usage for both growing feed crops, dairy cattle consumption, and facility operations. We next estimate the relationships between the change in dairy cows and the presence of water area (both surface and ground water) as a ratio to total land area by county. The results show that, as of 2022, dairies are in counties with lower surface water but higher ground water coverage.



(a)



(b)

Sources: USDA NASS, US Census Bureau, Esri, and USGS.

Fig. 4. Relationships between the changes in number of dairy cows between 2022 and 1997 and ratios of surface (panel a) and ground (panel b) water area to total area for ID counties

## Conclusions

The growth and change in structure of the ID dairy market over the past few decades have had substantial effects on the economy and environment in the Southern ID region. Environmental concerns regarding nutrient leakage into water bodies exist. Changes in locations of dairies from counties with relatively more surface water area to those with more ground water area has implications for water supply and quality that deserve further research.



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