



**Stats** **NZ**

Tatauranga Aotearoa

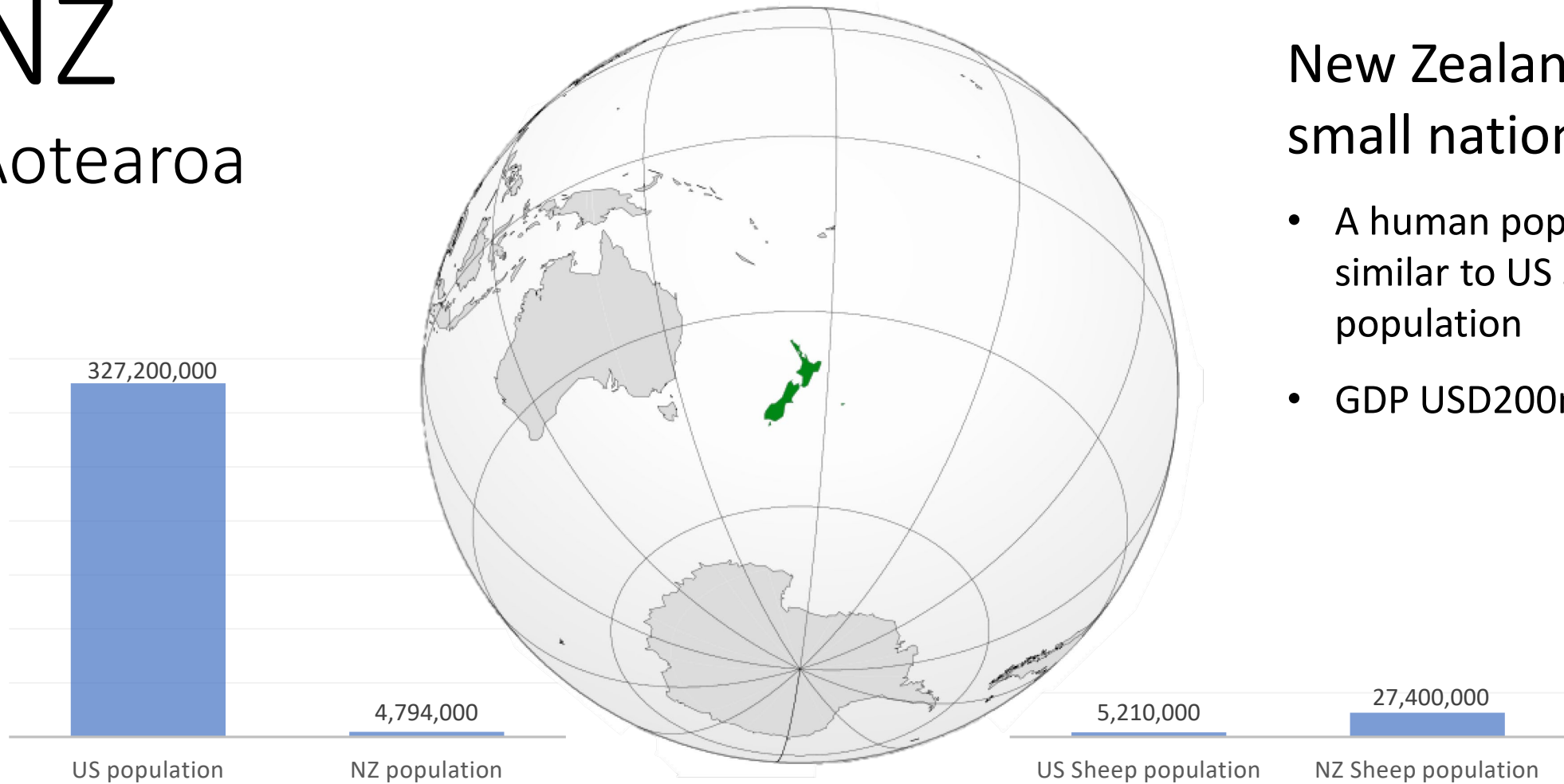
# Seasonal Adjustment in Statistics New Zealand

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Mansell



# NZ

## Aotearoa



New Zealand is a small nation

- A human population similar to US sheep population
- GDP USD200million



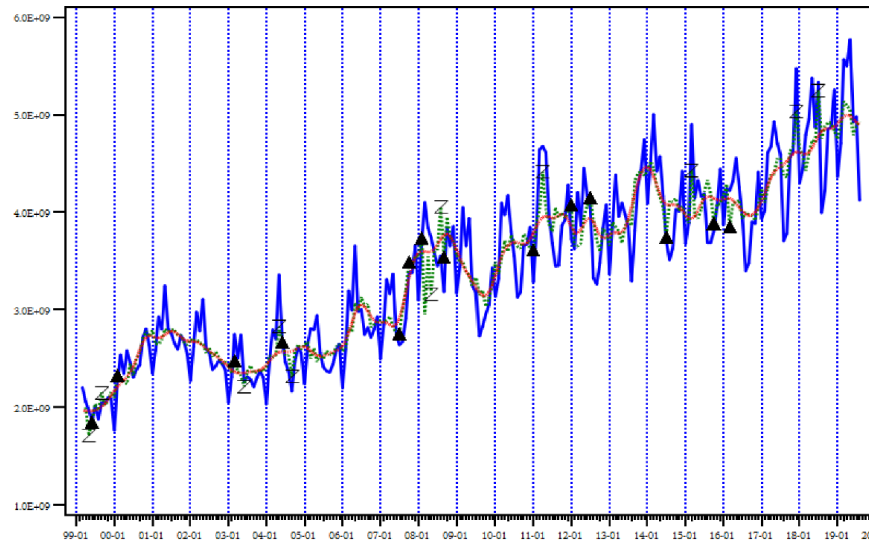


# Many Time Series Agriculture and Tourism Driven

- Major seasonal variation
- A lot of noise and often significant changes in components
- Calendar seasonality different from climate seasonality
  - Temporal aggregation issues



Total exports  
Actual, Trend and Seasonally Adjusted



She'll be right





# Time series at Stats NZ

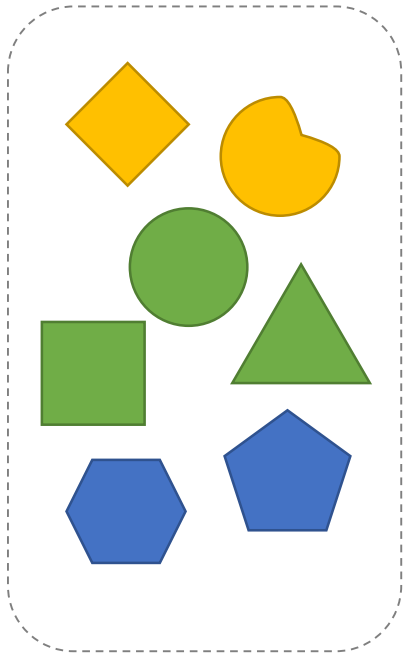
- 40 years of seasonal adjustment
  - Variants of Census Method II
  - Currently X-13
- ~5000 series seasonally adjusted each quarter
- Most are for analytical purposes, i.e. not published



# Time series at StatsNZ

- StatsNZ is small (~800 FTE)
- No one works solely on time series

- In two offices in separate cities

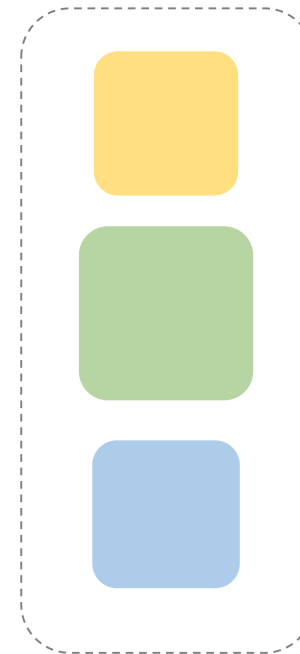


## SMA

Subject Matter Areas, *e.g.*  
*National Accounts, Overseas Trade*

Responsible for analysing and publishing outputs

Request and utilise seasonal adjustment



## SM

Statistical Methods teams – broadly economic and social split

Provide methodological support to groups of SMA

Implement, manage and review seasonal adjustments



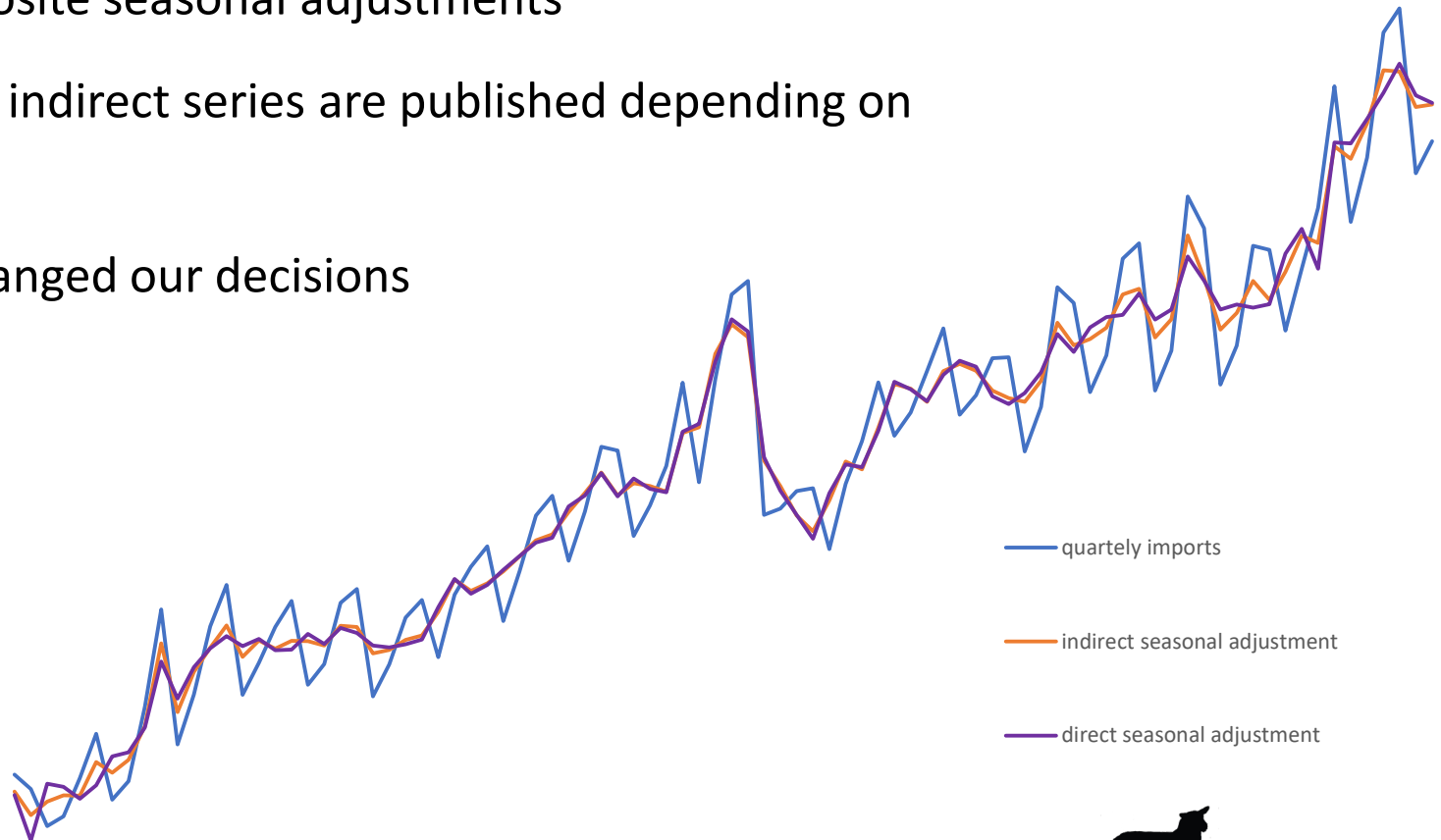
# Working in StatsNZ issues

- Best way to train Statistical Methods newcomers?
  - Presently by one-on-one when required training
  - Difficulties in consistency across offices
- Best way to train Subject Matter Area newcomers?
  - As above but may be SM newcomer doing training
- Efficiently identifying problems in outputs
  - SM get involved when asked, so how do we get SMA to properly identify problems – we have many Type I and II errors
  - When does SM newcomer involve experienced SM persons?



# Aggregate series

- We do a lot of composite seasonal adjustments
- Either the direct and indirect series are published depending on which seems best
  - And we have changed our decisions



# Aggregation Issues

- Measuring quality for alternatives?
  - There is theory and there is practice
  - We use R1 and R2 from StatCan X11-ARIMA
- Composites for balances?
  - Different models
- Handling components that are non-seasonal?
  - Heavy use of type=summary



# Ensuring Quality

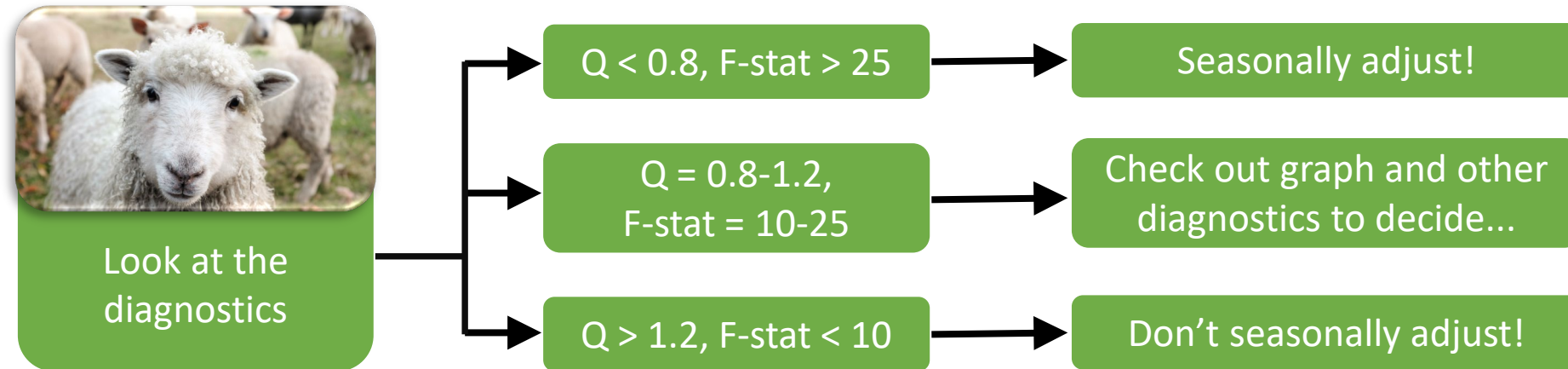
- Three general areas
  1. Setting up series
  2. Periodic reviews
  3. Ad hoc problems
- Much has not been documented, including why quality measures were chosen
- Reminder: staff, both in SM and SMA, with limited t.s. knowledge
- Balance between checklists, rules and knowledge of where to look and what to do to get information



# Seasonal Adjustment Reviews

Series are reviewed often. How often is best?

Broadly, series are evaluated by the following method:



What problems might be encountered with this method?

# Some recent issues

## Scenario 1

An established series not currently adjusted (type = summary) has  $Q = 1.25$ . Should a reviewer take a closer look?

Probably not. This series shouldn't be adjusted. The quality is bad.

Suppose they tried removing type = summary

Suddenly,  $Q = 0.65$ !

How long has the actual seasonal adjustment quality been this good and gone unnoticed?

What do type = summary or type = trend actually mean?



# Some methodological issues

## Scenario 2

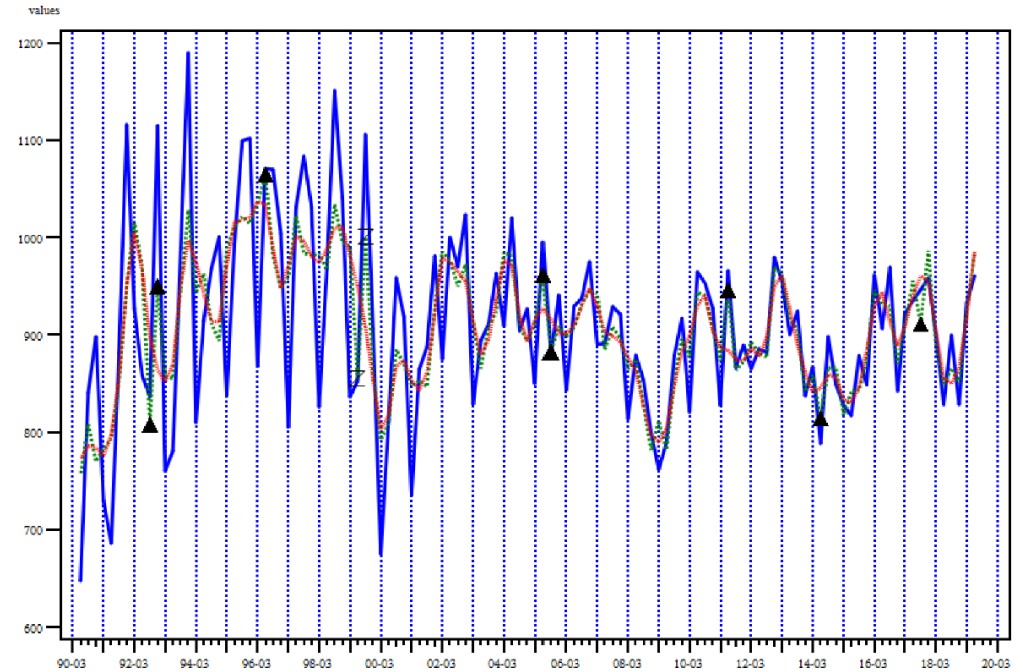
A series currently adjusted has  $Q = 0.73$ .  
Should they take a closer look? Maybe.

Suppose, they did, they'd discover this:

Something happened in 2001, from then on  $Q = 1.34$ .

Why hasn't the seasonal break been noticed for 18 years?

Why does the series go back almost 30 years anyway?



Is there a maximum ideal series length?







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*Thank You*

