

2014 California Exports of Recyclable Materials



California Department of Resources Recycling and Recovery

September 2015

STATE OF CALIFORNIA

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Publication # DRRR-2015-1539



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Executive Summary

This report provides information about recyclables exported from California's ports in 2014, the amount shipped, and their value. It focuses on recyclable seaborne exports because the available data is more reliable and detailed than what is available for other types of transportation. However, limited data on recyclables exported by truck, rail, and air from California has been obtained and is included in this year's report.

The report's data comes mainly from WISERTrade information unless otherwise noted. WISERTrade is a company that aggregates U.S. Census Bureau and other sources of information into its data systems.

For convenience, this report combines recyclables into several groups. These include: High-Grade Paper; Mixed Paper; Plastics 1, 2, and 4; Other Plastics; Glass; Tire and Rubber Scrap; Used Oil and Grease; Batteries; Copper Wire; Ferrous Metals; and Non-Ferrous Metals. Information for Aluminum Cans is provided separately, though the weight and value are also included in the data for Non-Ferrous Metals.

Twenty-four percent of the total vessel weight of commodities exported from California ports was recyclable materials. Recyclables accounted for nearly 7 percent of the total value of all exports shipped from California. China continues to be the largest market for recyclable materials and received more than half of the total weight shipped from California by sea.

Other key findings:

- Seaborne exports of all commodities shipped from California totaled more than 74.3 million tons, with a value of almost \$105 billion.
- Recyclable materials made up nearly 18 million tons (24 percent of all export tons), with a value of nearly \$6.9 billion (7 percent of all export value).
- The Mixed Paper category, which includes mixed paper, cardboard, and paperboard, made up more than half of the tonnage of recyclable material exported from California by sea.
- Ferrous and Non-Ferrous Metals combined made up about 72 percent of the dollar value of all shipped recyclable materials.
- China, Taiwan, and Korea accounted for 83 percent by weight and 80 percent by value of the seaborne recyclable export market from California.
- Recyclable exports dropped about 3 percent from 2013 to 2014.
- Recyclable exports to China dropped almost 6 percent from 2013 to 2014.
- Data received in the first four months of 2015 shows recyclable exports are down by more than 6 percent compared to the first four months of 2014.
- California's ports accounted for 46 percent of the country's seaborne recyclable exports by weight in 2014 and 40 percent of the country's seaborne recyclable exports by dollar value.
- Mexico received California recyclable exports by truck and rail with a value of at least \$43 million.

- Japan and Germany received California recyclable exports by air with a combined value of nearly \$28 million.

Introduction

AB 341 (Chapter 476, Statutes of 2011) established a statewide goal of 75 percent recycling, composting, or source reduction of solid waste by 2020 for California. Recycling will be a key part of our efforts to reach this goal. However, measuring recycling in California is a challenge because currently there are no comprehensive means to do this.

The examination of recyclable exports helps us gain a better understanding of where our recyclables go and of their relative importance. Recyclable material export information is combined with other recycling data in CalRecycle's State of Recycling reports to provide an overview of recycling amounts, types, facilities, and material flows as they relate to the recycling infrastructure in California.

In 2014, California exported a total value of about \$174 billion for all commodities in all shipping methods (vessel, air, truck, and rail) based on data obtained from the U.S. Census Bureau. Exports to Mexico and Canada made up 25 percent of the total value.¹ However, this report focuses mainly on seaborne exports of recyclables from California's ports (also referred to as vessel weight and vessel value) to their respective destinations.

The report's data comes mainly from WISERTrade information unless otherwise noted. WISERTrade is a company that aggregates U.S. Census Bureau and other sources of information into its data systems. CalRecycle staff mainly use vessel shipment data because it is more detailed. WISERTrade does provide some Air weight and value data, but not much recyclable material is moved in this manner. "Other Value" categories provide truck, rail, and pipeline value information but does not give weight and does not separate truck data from rail data. However, this report includes the limited data for rail and truck dollar values for Mexico, and air dollar values for Japan and Germany. Exports to Canada are not included in the report at this time due to material not entering Canada directly from California.

Harmonized System codes are an international system of names and numbers assigned to traded commodities. These codes are used within the WISERTrade database to identify recyclable waste commodities. For convenience, these commodities were combined into several custom groups in this report to represent categories of common recyclables by type or particular interest, such as Ferrous Metals and Mixed Paper. Throughout this report, weight is shown in tons, and a conversion factor of 0.00110231 tons per kilogram was used to calculate the totals from WISERTrade database reports.

It is not always possible to definitively determine how much waste and scrap material that California exported actually originated in California. Anecdotally, estimates usually range from about 60 percent to about 80 percent by weight for some selected materials.

This paper helps to answer these questions:

- How many tons of recyclable materials were exported by sea in 2014 through California ports?
- What types of recyclable materials were exported by sea in 2014 through California ports?
- What was the value and tonnage of these exported recyclable materials?
- Where did the exported materials go, and what are their historic export trends?

Results

2014 California Ports Recyclables Exports by Weight (Figures 1a and 1b)

- Approximately 74.3 million tons of materials (recyclables and other commodities) were exported from California ports in 2014.
- Since 2011, the total amount of all materials exported from California ports has been more than 70 million tons annually.
- Recyclables made up about 18 million tons (24 percent by weight) of all California’s seaborne exports in 2014.
- The amount of recyclables exported from California ports has decreased annually since the peak of 22 million tons in 2011.

Figure 1a: 2014 Seaborne California Exports by Weight (Total ~ 74.3 Million Tons)

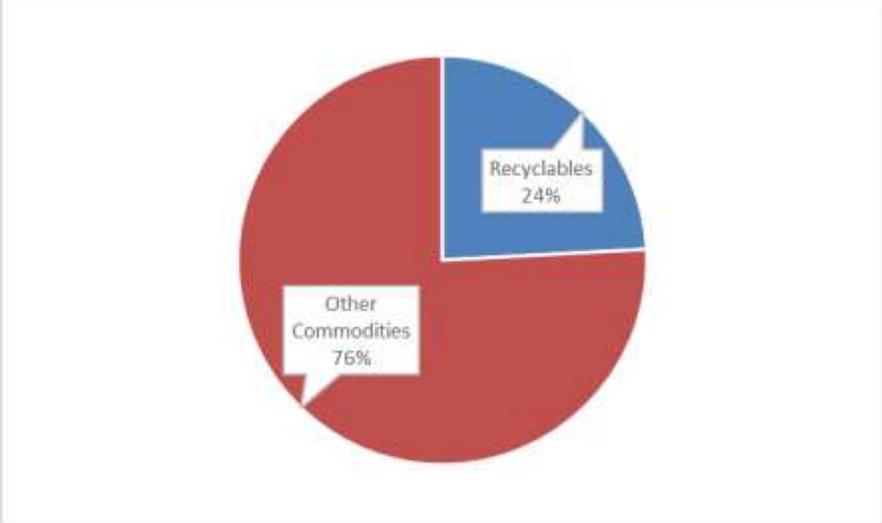
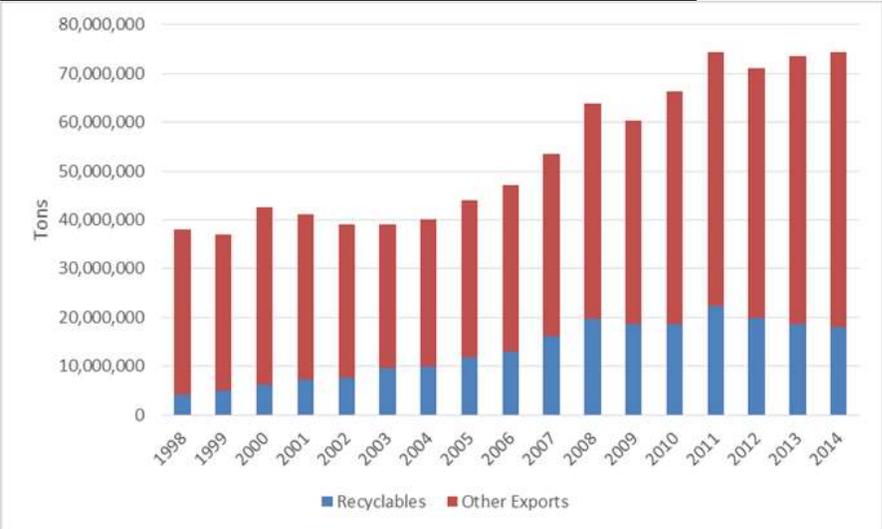


Figure 1b: California Seaborne Exports Trends (Tons)



2014 California Ports Recyclables Exports by Vessel Value (Figures 1c and 1d)

- Exports of all materials (recyclables and other commodities) from California ports had a value of \$105 billion in 2014.
- Since 2011, the value of all exports from California ports has been greater than \$100 billion annually.
- Recyclables made up about \$6.8 billion (7 percent by dollar value) of all California's seaborne exports in 2014.
- The dollar amount for recyclables exported from California has decreased annually since the peak in 2011 of \$9.9 billion.

Figure 1c: 2014 Seaborne California Exports by Vessel Value (Total Value: ~\$105 Billion)

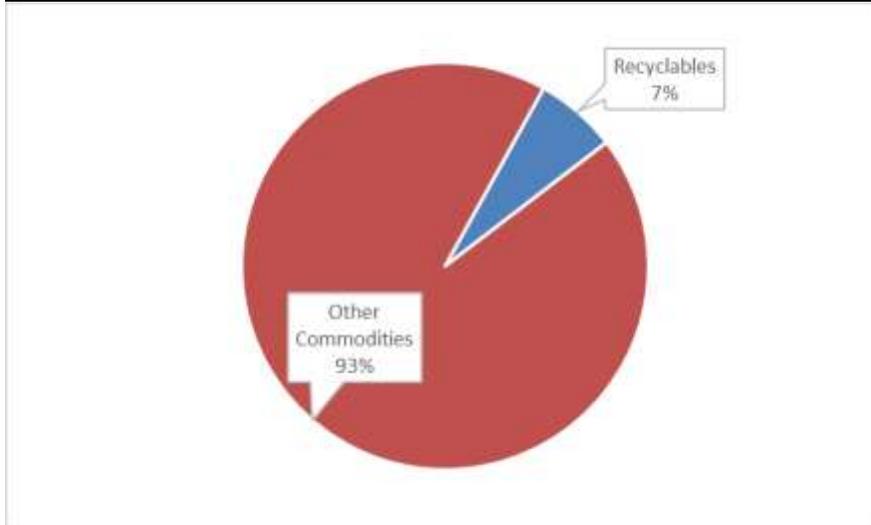
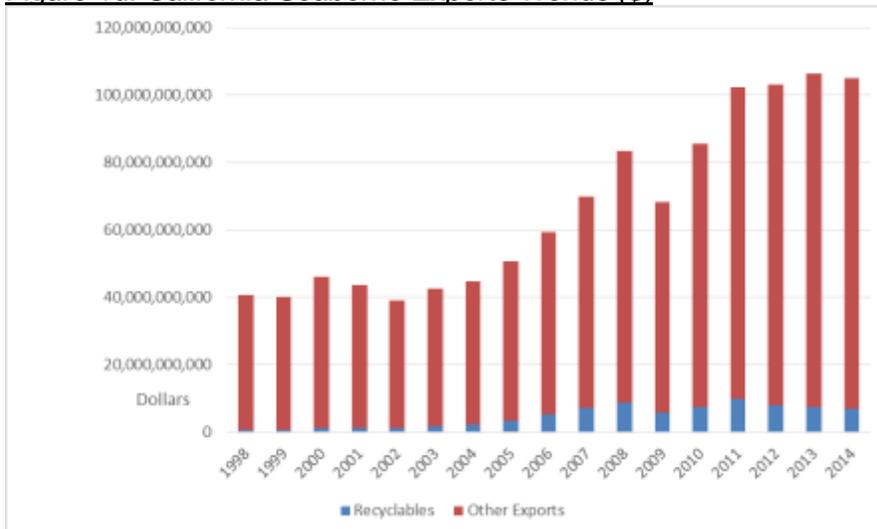


Figure 1d: California Seaborne Exports Trends (\$)



2014 California Ports Recyclables Exports by Category (Figures 1e and 1f)

- The Mixed Paper category includes mixed paper, cardboard, and paperboard.
- The single largest category by weight was Mixed Paper, which accounted for 53 percent of recyclable exports.
- Non-Ferrous Metals, though only 7 percent of exports by weight, made up 39 percent of the recyclables export value.
- Ferrous Metals made up 33 percent of the value, and combined with Non-Ferrous Metals accounted for 72 percent of the value of exported recyclables by sea.

Figure 1e: 2014 California Seaborne Exported Recyclables by Weight (Total: ~18 Million Tons)

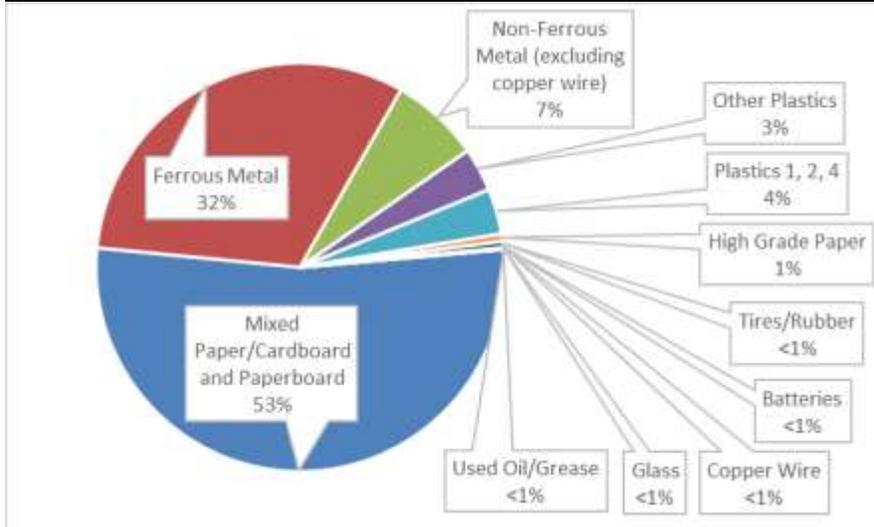
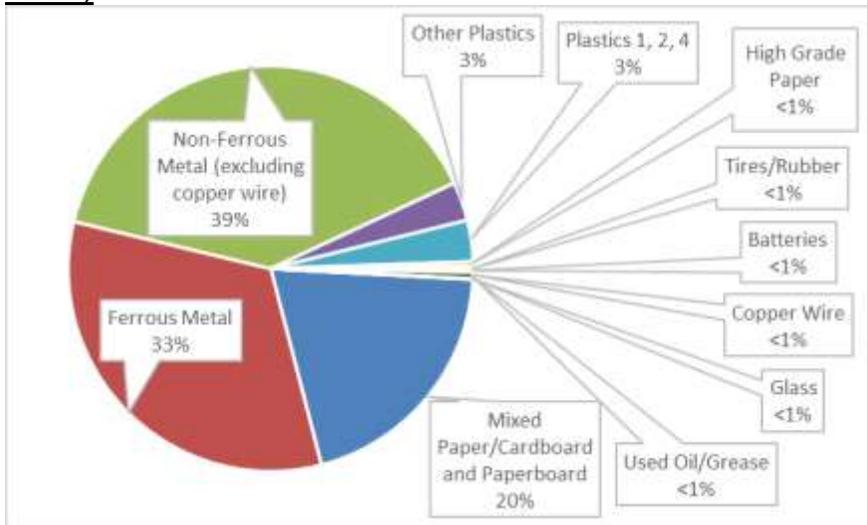


Figure 1f: 2014 California Seaborne Exported Recyclables in Dollar Value (Total Value: ~\$6.9 Billion)



Seaborne Exports of Recyclables by Destination Country (Figures 2a through 2c)

- About 18 million tons of recyclables were exported from California ports in 2014.
- The following three countries received 83 percent by vessel weight of those exports:
 - China: 57 percent (10.3 million tons)
 - Taiwan: 14 percent (2.6 million tons)
 - Korea: 12 percent (2.1 million tons)
- Compared to 2013, exports of recyclables were down about 3 percent by weight.
- China continues to be the largest importer of seaborne recyclables from California, but it imported about 616,000 tons less in 2014 compared to 2013. This is a decrease of approximately 6 percent, mostly as a result of a drop in Ferrous Metal (down almost 500,000 tons).
- Recyclables tonnages have been decreasing since 2011.

Figure 2a: Recyclable Exports by Sea from California by Country in 2014 (Total: ~18 Million Tons)

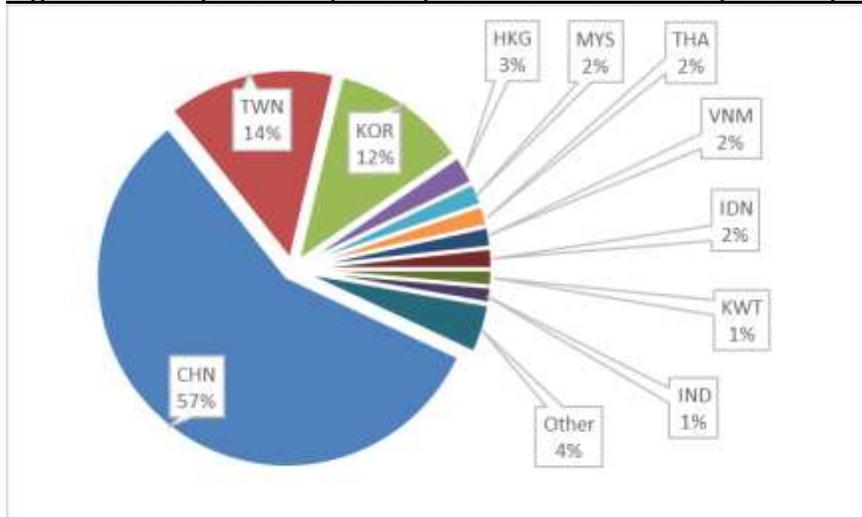
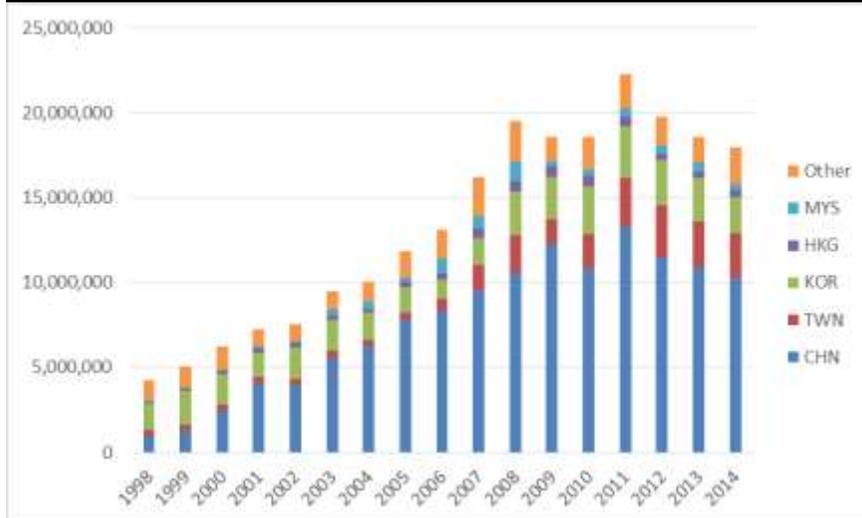


Figure 2b: Recyclable Exports by Sea from California by Country (Tons)



- Exports for all trade partner countries declined 3 percent in 2014.
- Exports to China, the largest trade partner, declined 6 percent in 2014

Figure 2c: Percent Change of Recyclable Exports from California Ports (by Country)

Country	Percent Change Annual Total 2013 to 2014	Tonnage Change 2013 to 2014
Total All Countries (includes all trade partners)	-3	-592,000
China	-6	-616,000
Taiwan	-2	-44,000
Korea, Republic of	-18	-461,000
Hong Kong	12	47,000
Malaysia	-40	-229,000
Thailand	69	128,000
Vietnam	-23	-93,000
Indonesia	38	86,000
Kuwait	413	202,000
India	119	134,000

Recyclables from California Ports (Vessel Value) (Figures 2d and 2e)

- About \$6.9 billion worth of recyclables were exported from California ports in 2014.
- The following three countries received 80 percent, by vessel value, of those exports.
 - China: 54 percent (\$3.7 billion)
 - Taiwan: 14 percent (\$ 950 million)
 - Korea: 12 percent (\$835 million)
- Compared to 2013, vessel value of recyclables exported from California ports was down about 8 percent.
- Total dollar amounts have been decreasing since 2011.

Figure 2d: Recyclable Exports by Sea from California to Countries in 2014 (Vessel Value)

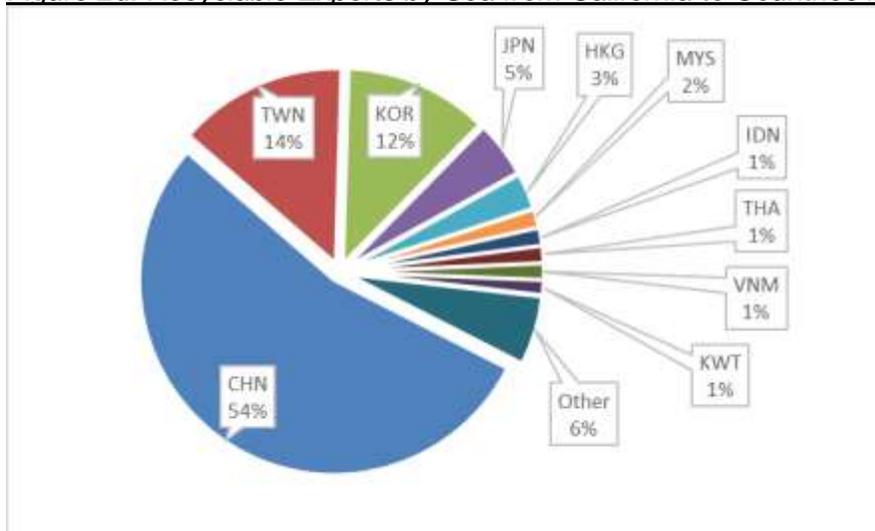
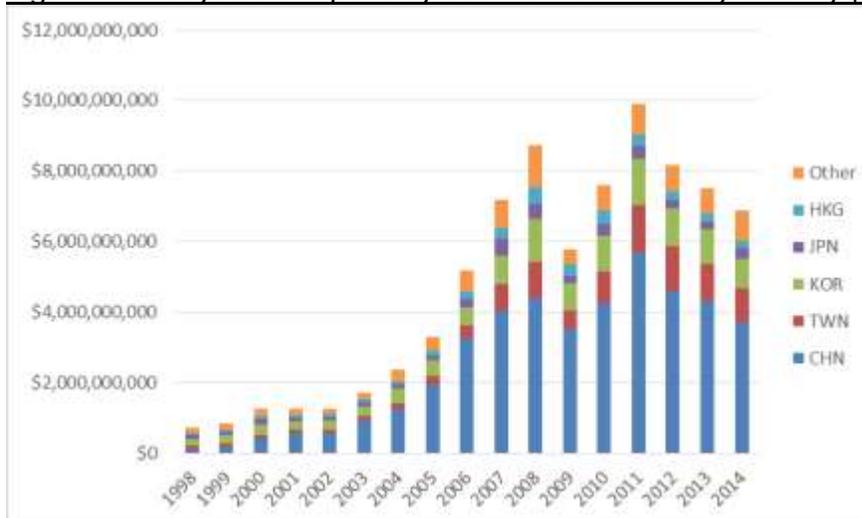


Figure 2e: Recyclable Exports by Sea from California by Country (Vessel Value)



Recyclables from All U.S. Ports (Vessel Weight) (Figures 2f and 2g)

- About 39.4 million tons of recyclables were exported by sea from all U.S. ports in 2014.
- The top four destination countries made up 72 percent by vessel weight of those exports:
 - China: 46 percent (18 million tons)
 - Turkey: 10 percent (4 million tons)
 - Taiwan: 8 percent (3.3 million tons)
 - Korea: 8 percent (3.2 million tons)
- Compared to 2013, exports of recyclables from all U.S. ports were down nearly 8 percent by weight.
- Similar to California, the United States as a whole exports more seaborne recyclables to China than any other country. However, non-Asian countries play a larger role in United States seaborne exports.
- Tonnages have been decreasing since 2011.

Figure 2f: Recyclable Exports by Sea from U.S. to Countries in 2014 (Vessel Weight)

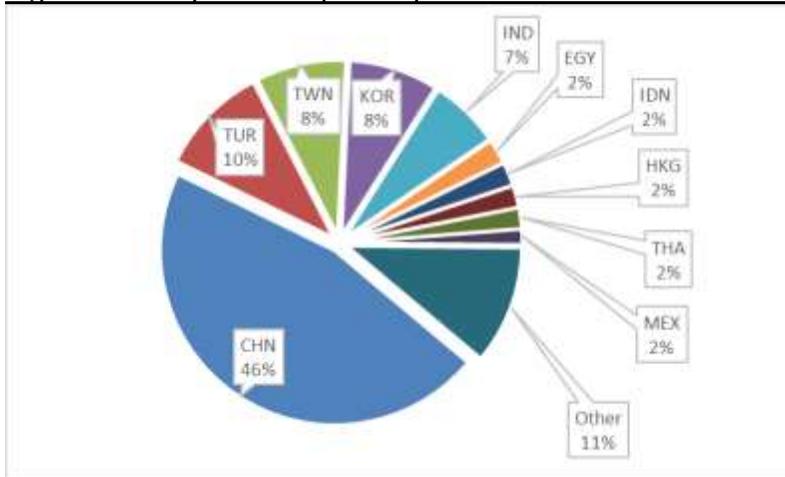
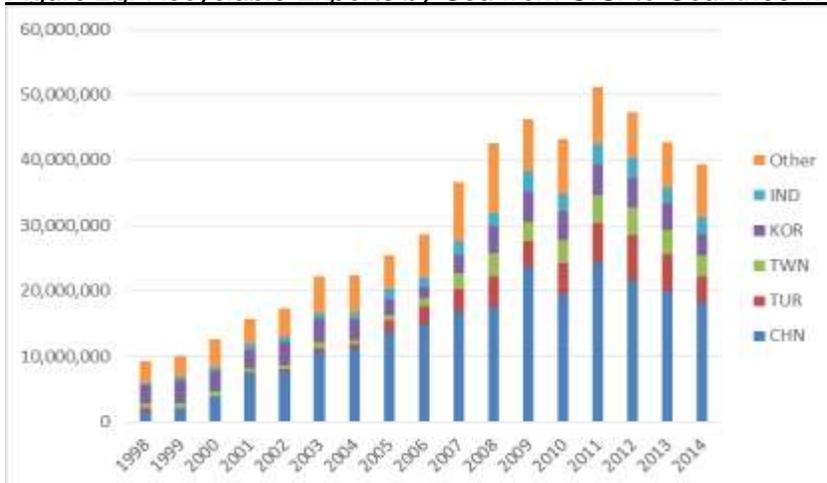


Figure 2g: Recyclable Exports by Sea from U.S. to Countries in 2014 (Tons)



Recyclables from All U.S. Ports (Vessel Value) (Figures 2h and 2i)

- About \$17.2 billion of recyclables were exported from all U.S. ports in 2014.
- The top three destination countries made up 56 percent by vessel value of those exports:
 - China – 41 percent (\$7.1 billion)
 - Korea – 8 percent (\$1.3 billion)
 - Turkey – 7 percent (\$1.3 billion)
- Compared to 2013, vessel value of recyclables exported from all U.S. ports was down more than 12 percent.
- Some European countries appear on the value pie chart below but not on the weight pie chart above. This is due to the higher value of metals exported to those countries.
- Total dollar amounts have been decreasing since 2011.

Figure 2h: Recyclable Exports by Sea from U.S. to Countries in 2014 (Vessel Value)

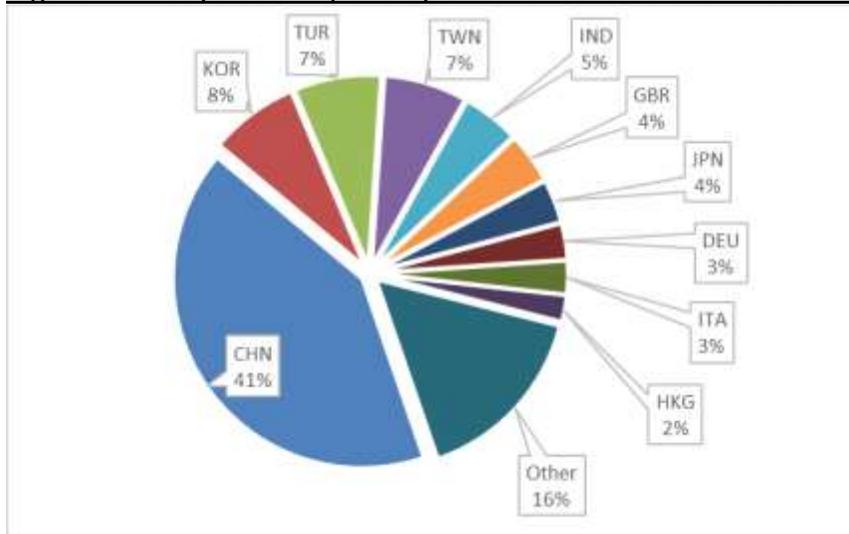
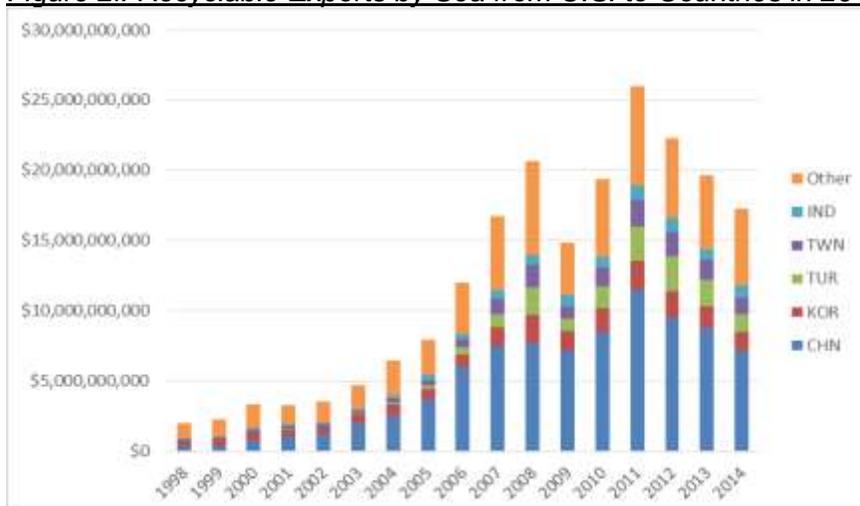


Figure 2i: Recyclable Exports by Sea from U.S. to Countries in 2014 (Vessel Value)



U.S. Recyclable Exports (Figures 3a and 3b)

- The United States exported approximately 39.4 million tons of recyclables by sea worth almost \$17.2 billion in 2014.
- Forty-six percent of the country's recyclable exports by weight passed through California's ports in 2014, surpassing that of the entire U.S. East Coast.
- By value, California accounted for 40 percent of the nation's recyclable exports, 7 percent less than the East Coast at 47 percent.

Figure 3a: U.S. Recyclable Exports in 2014 by Region (Weight)

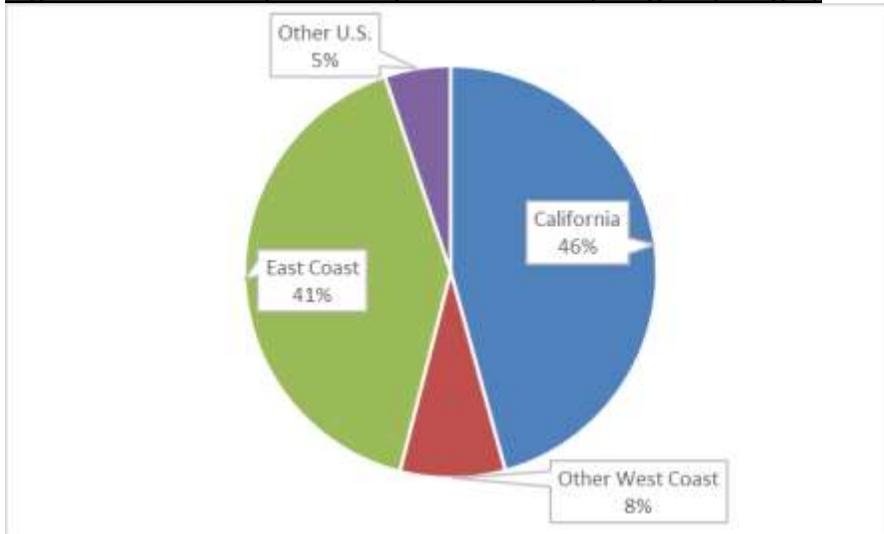
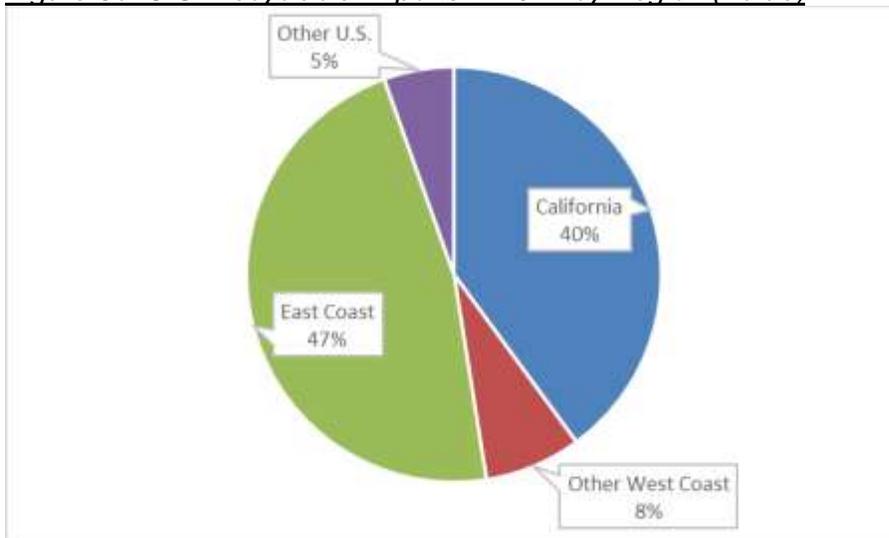


Figure 3b: U.S. Recyclable Exports in 2014 by Region (Value)



Individual Commodities

High-Grade Paper (Figures 4a and 4b)

- The total seaborne weight exported from California was nearly 110,000 tons. Compared to 2013, exports of High-Grade Paper was up nearly 14 percent in 2014.
- High-Grade Paper made up less than 1 percent of recyclable seaborne exports by weight.
- The value of High-Grade Paper seaborne exports from California was about \$25 million.
- High-Grade Paper made up less than 1 percent of the value of recyclable seaborne exports.
- The following four countries received 74 percent of the seaborne High-Grade Paper exports from California: China, El Salvador, Korea, and Peru.
- High-Grade Paper tonnage has fluctuated since a peak high amount in 2001.

Figure 4a: High-Grade Paper Exports from California by Country in 2014 (Weight)

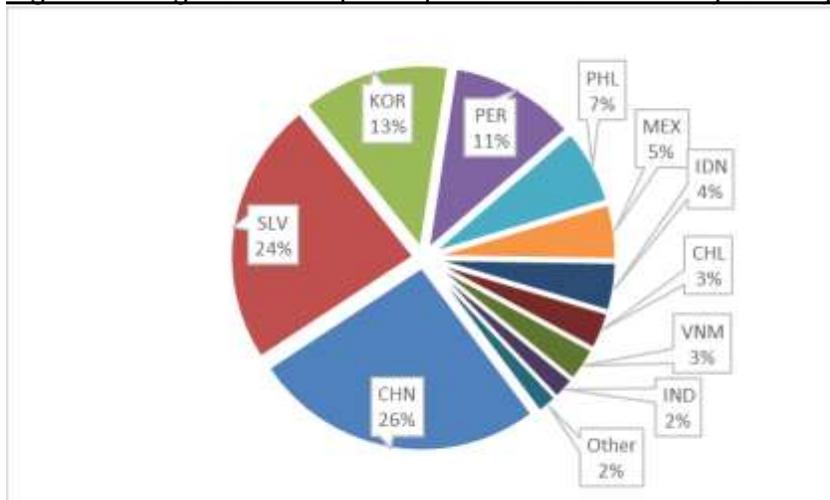
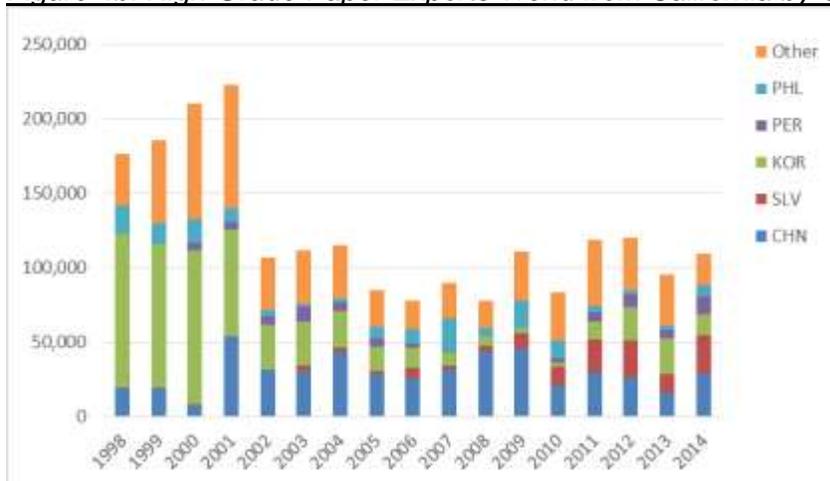


Figure 4b: High-Grade Paper Exports Trend from California by Country in 2014 (Tons)



Mixed Paper (Figures 5a and 5b)

- The Mixed Paper category includes mixed paper, cardboard, and paperboard.
- The total seaborne weight exported from California was more than 9.5 million tons. Compared to 2013, exports of Mixed Paper were down less than 1 percent in 2014.
- Mixed Paper made up 53 percent of recyclable seaborne exports. This represents the largest category by weight.
- The value of Mixed Paper seaborne exports from California was nearly \$1.4 billion.
- Mixed Paper made up about 20 percent of the value of recyclable seaborne exports.
- Two countries received 94 percent of the seaborne Mixed Paper exports from California: China and Korea.
- Mixed Paper export tonnages have been decreasing since 2011.

Figure 5a: Mixed Paper Exports from California by Country in 2014 (Weight)

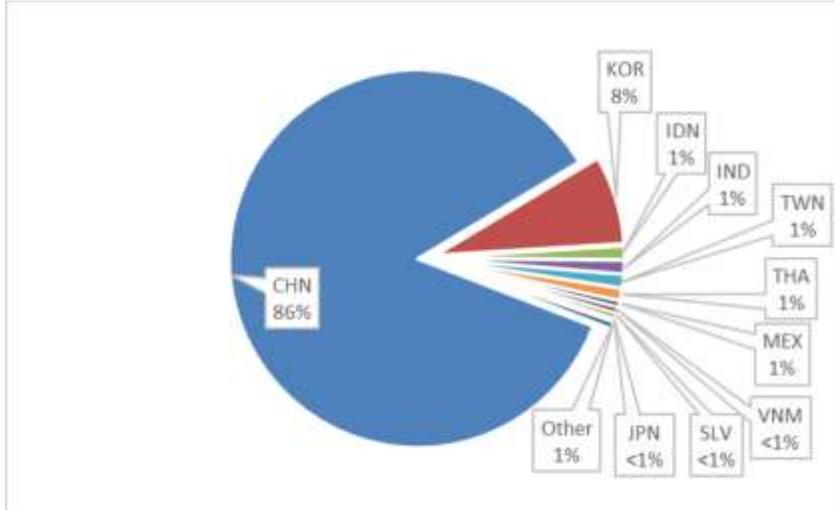
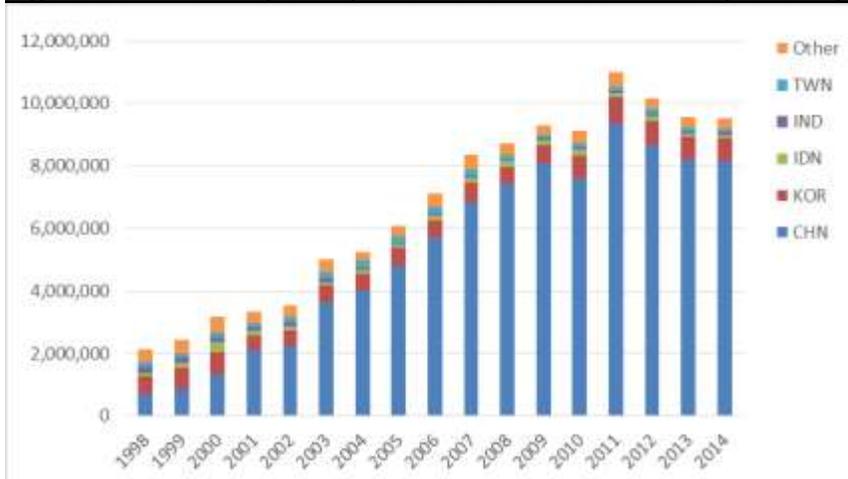


Figure 5b: Mixed Paper Exports Trend from California by Country (Tons)



Plastics 1, 2, and 4 (PET, HDPE, LDPE) (Figures 6a and 6b)

- The total seaborne weight exported from California was more than 645,000 tons. Compared to 2013, exports of Plastics 1, 2, and 4 were up 28 percent in 2014.
- Plastics 1, 2, and 4 made up 4 percent of recyclable seaborne exports by weight.
- The value of Plastics 1, 2, and 4 seaborne exports from California was more than \$226 million.
- Plastics 1, 2, and 4 (High-Grade Plastics) made up 3 percent of the value of recyclable seaborne exports.
- Three countries received 92 percent of the seaborne Plastics 1, 2, and 4 exports from California: China, Hong Kong, and Indonesia.
- High-Grade Plastics exports increased in 2014 after stable years from 2009 to 2013.

Figure 6a: Plastics 1, 2, and 4 Exports from California by Country in 2014 (Weight)

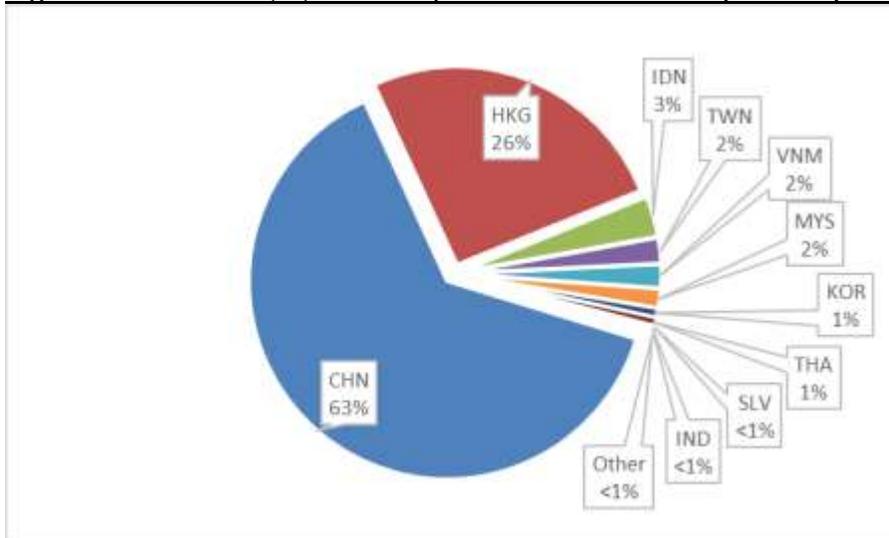
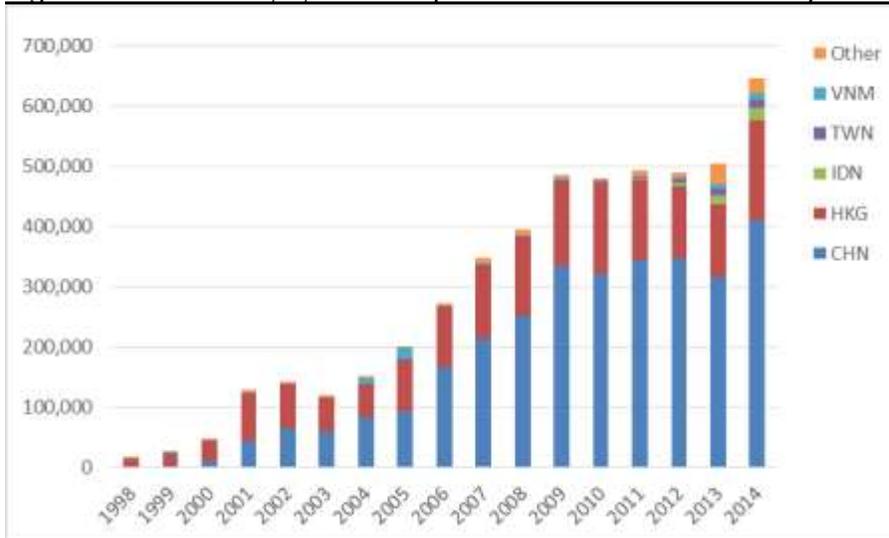


Figure 6b: Plastics 1, 2, and 4 Exports Trend from California by Country (Tons)



Other Plastics 3, 5, 6, and 7 (PVC, Polystyrene, Other) (Figures 7a and 7b)

- The total seaborne weight exported from California was about 625,000 tons. Compared to 2013, exports of Other Plastics were up nearly 3 percent in 2014.
- Other Plastics made up 3 percent of recyclable seaborne exports by weight.
- The value of seaborne exports from California was more than \$213 million.
- Other Plastics made up 3 percent of the value of recyclable seaborne exports.
- Indonesia increased 18 percent in 2014 when compared to 2013.
- Three countries received 94 percent of the seaborne Plastics 3, 5, 6, and 7 exports from California: China, Hong Kong, and Indonesia.
- Other Plastics tonnages have been decreasing since 2011, with the exception of a small increase in 2014.

Figure 7a: Other Plastics Exports from California by Country in 2014 (Weight)

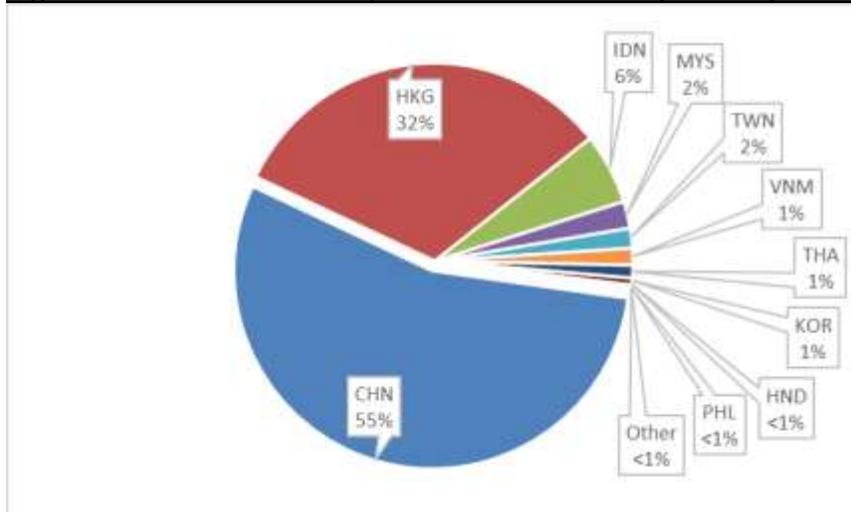
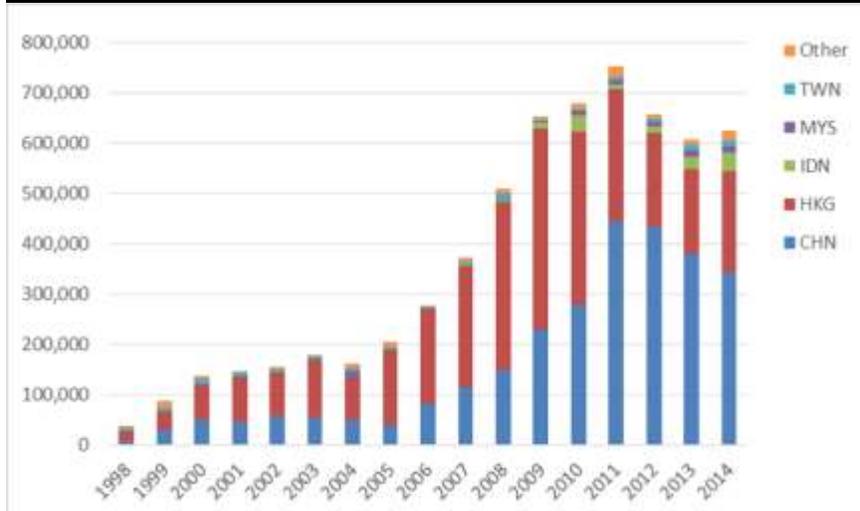


Figure 7b: Other Plastics Exports Trends from California by Country (Tons)



Glass (Figures 8a and 8b)

- The total seaborne weight exported from California was almost 1,925 tons. Compared to 2013, exports of Glass were down about 42 percent in 2014.
- Glass made up less than 1 percent of recyclable seaborne exports by weight.
- The vessel value of seaborne exports from California was almost \$1.5 million.
- Glass made up less than 1 percent of the value of recyclable seaborne exports.
- Three countries received 93 percent of the seaborne Glass exports from California: India, Japan, and Australia.
- After the large increase in 2008, the steady rise in global demand for flat glass came to a halt, primarily due to the worldwide recession.²

Figure 8a: Glass Exports from California by Country in 2014 (Weight)

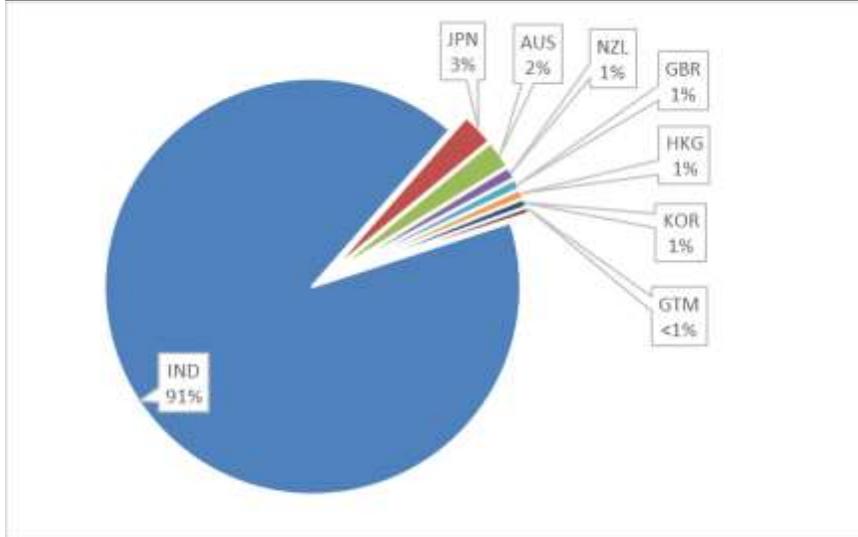
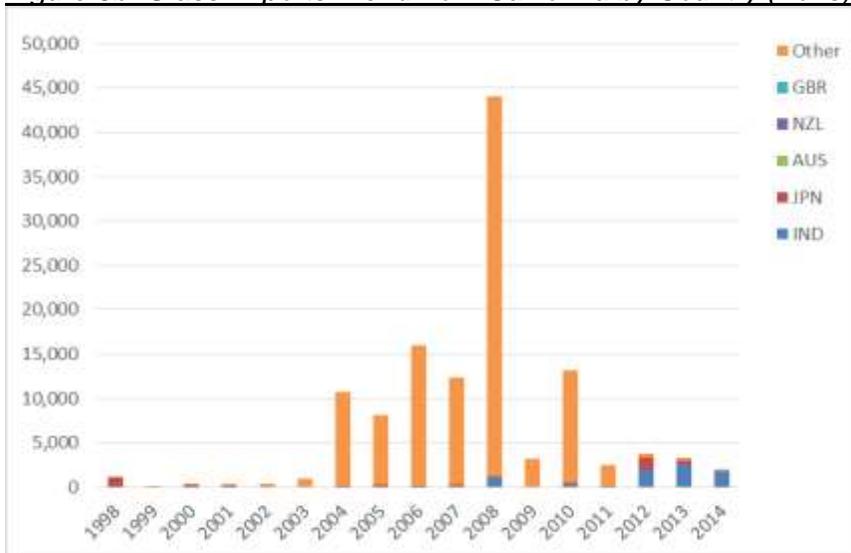


Figure 8b: Glass Exports Trend from California by Country (Tons)



Tires and Rubber Scrap (Figures 9a and 9b)

- The total seaborne weight exported from California was more than 89,000 tons. Compared to 2013, exports of Tires and Rubber Scrap were up 72 percent in 2014.
- Tires and Rubber Scrap made up less than 1 percent of recyclable seaborne exports by weight.
- The value of seaborne exports from California was more than \$14 million.
- Tires and Rubber Scrap made up less than 1 percent of the value of recyclable seaborne exports.
- Four countries received 86 percent of the seaborne Tires and Rubber Scrap exports from California: Korea, Vietnam, China, and Hong Kong.
- Tires and Rubber Scrap tonnages have fluctuated since 2008.

Figure 9a: Tires/Rubber Scrap Exports from California by Country in 2014 (Weight)

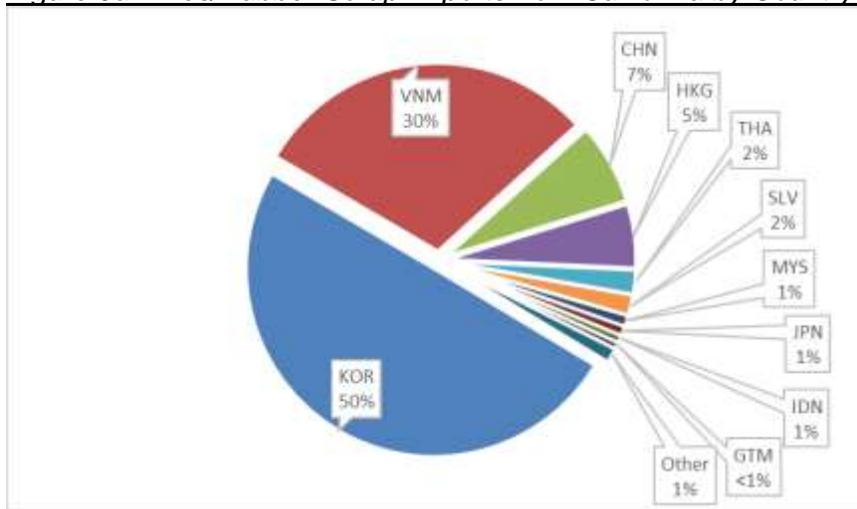
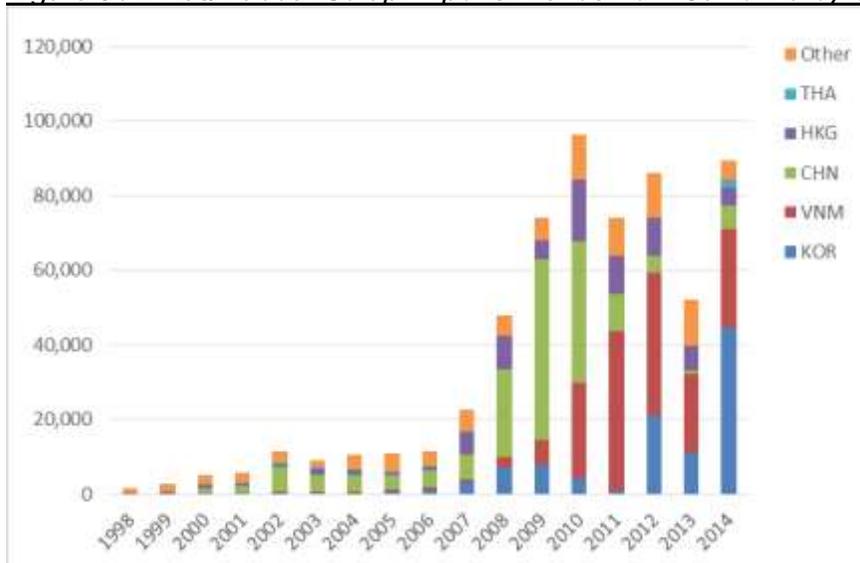


Figure 9b: Tires/Rubber Scrap Exports Trends from California by Country (Tons)



Used Oil and Grease (Figures 10a and 10b)

- The total seaborne weight exported from California was about 291 tons.
- Compared to 2013, exports of Used Oil and Grease were down 67 percent in 2014.
- Used Oil and Grease made up less than 1 percent of recyclable seaborne exports by weight.
- The value of seaborne exports from California was about \$155,000.
- Used Oil and Grease made up less than 1 percent of the value of recyclable seaborne exports.
- Three countries received 91 percent of the seaborne Used Oil and Grease exports from California: Japan, Vietnam, and Federated States of Micronesia.
- Used Oil and Grease tonnages have decreased dramatically since 2007.

Figure 10a: Used Oil/Grease Exports from California by Country in 2014 (Weight)

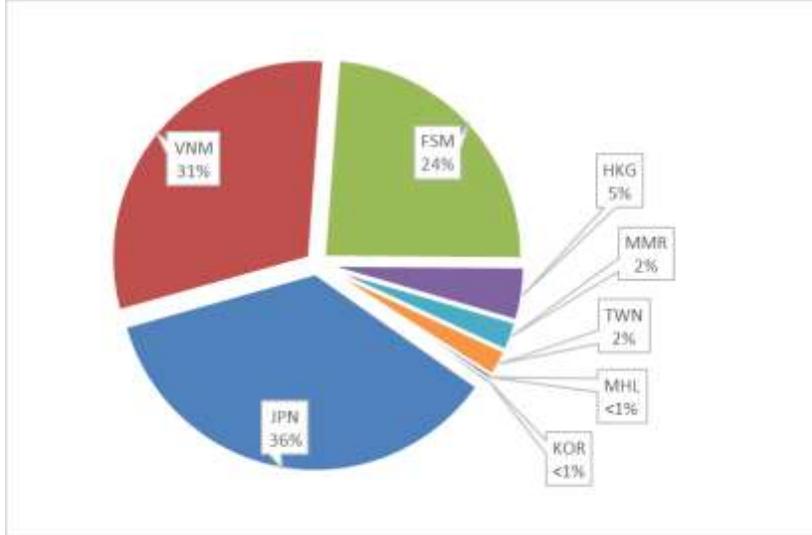
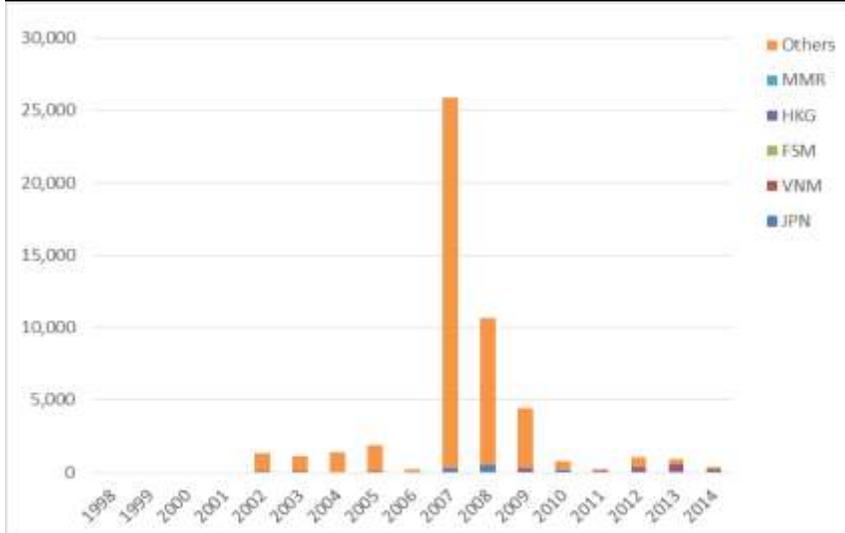


Figure 10b: Used Oil/Grease Exports Trend from California by Country (Tons)



Batteries (Figures 11a and 11b)

- The total seaborne weight exported from California was about 15,500 tons. Compared to 2013, exports of Batteries were down more than 8 percent in 2014.
- Batteries made up less than 1 percent of recyclable seaborne exports by weight.
- The vessel value of seaborne exports from California was about \$18 million.
- Batteries made up less than 1 percent of the value of recyclable seaborne exports.
- Three countries received 94 percent of the seaborne Batteries exports from California: Korea, India, and Ecuador.
- Battery tonnages varied greatly throughout the years.

Figure 11a: Batteries Exports from California by Country in 2014 (Weight)

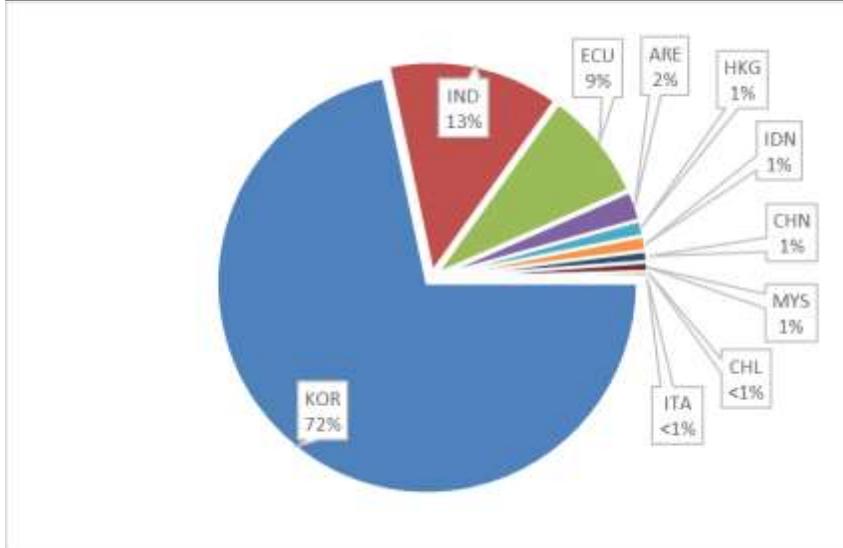
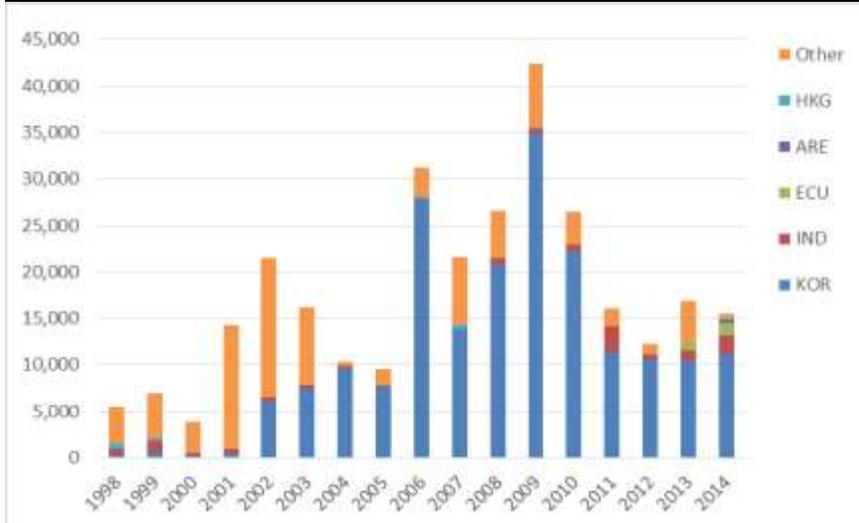


Figure 11b: Batteries Exports Trend from California by Country (Tons)



Copper Wire (Figures 12a and 12b)

- The total seaborne weight exported from California was about 6,000 tons.
- Compared to 2013, exports of Copper Wire were down 1 percent in 2014.
- Copper Wire made up less than 1 percent of recyclable seaborne exports by weight.
- The value of seaborne exports from California was about \$37 million.
- Copper Wire made up less than 1 percent of the value of recyclable seaborne exports.
- The following three countries received 92 percent of the seaborne Copper Wire from California: Korea, China, and Netherlands.
- Copper Wire tonnages have decreased since 2011.

Figure 12a: Copper Wire Exports from California by Country in 2014 (Weight)

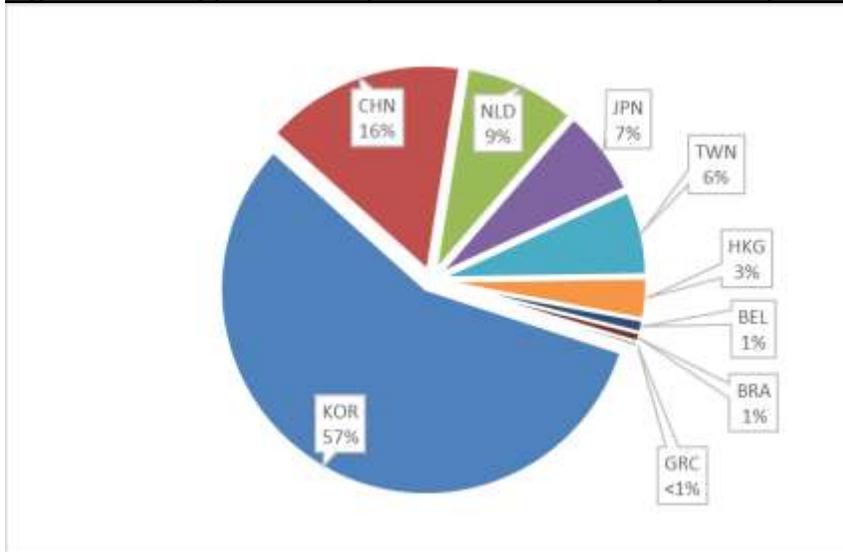
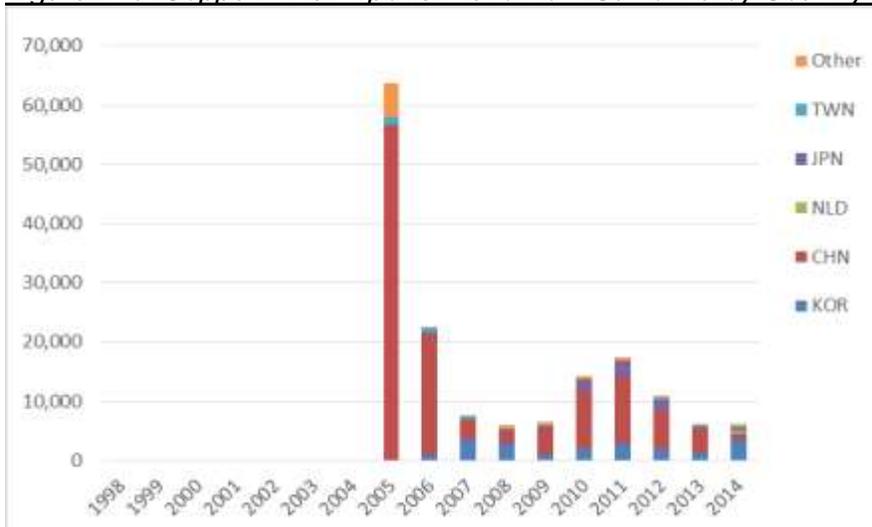


Figure 12b: Copper Wire Exports Trend from California by Country (Tons)



Ferrous Metals (Figures 13a and 13b)

- The total seaborne weight exported from California was about 5.7 million tons.
- Compared to 2013, exports of Ferrous Metals were down 9 percent in 2014.
- Ferrous Metals made up 32 percent of recyclable seaborne exports by weight.
- The value of seaborne exports from California was about \$2.3 billion.
- Ferrous Metals made up 33 percent of the value of recyclable seaborne exports.
- The following three countries received 71 percent of the seaborne Ferrous Metal exports from California: Taiwan, Korea, and China.
- Ferrous Metal tonnages have decreased since 2011.

Figure 13a: Ferrous Metal Exports from California by Country in 2014 (Weight)

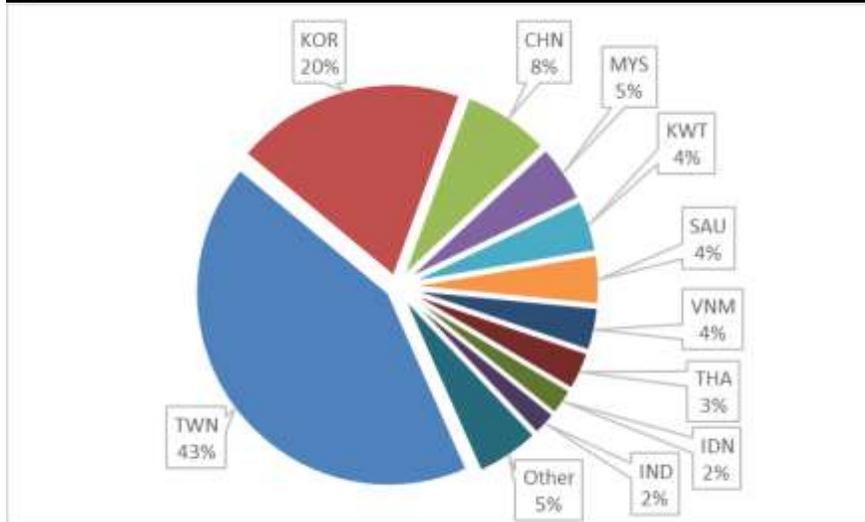
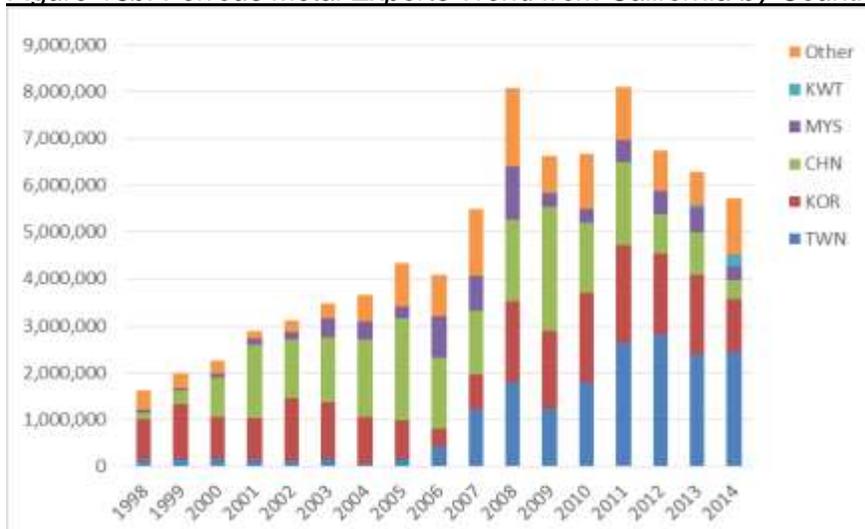


Figure 13b: Ferrous Metal Exports Trend from California by Country (Tons)



Non-Ferrous Metals (Figures 14a and 14b)

- The total seaborne weight exported from California was nearly 1.3 million tons.
- Compared to 2013, exports of Non-Ferrous Metals were down 11 percent in 2014.
- Non-Ferrous Metals made up 7 percent of recyclable seaborne exports by weight.
- The value of seaborne exports from California was about \$2.7 billion.
- Non-Ferrous Metals made up 39 percent of the value of recyclable seaborne exports.
- Non-Ferrous Metals was the third-highest recyclable export category by weight but was the top category in value due to its relatively high dollar-to-ton ratio.
- Three countries received 90 percent of the seaborne Non-Ferrous Metals exports from California: China, Korea, and Taiwan.
- Non-Ferrous Metals tonnages have decreased since 2011.

Figure 14a: Non-Ferrous Metals (Excluding Copper Wire) Exports from California by Country in 2014 (Tons)

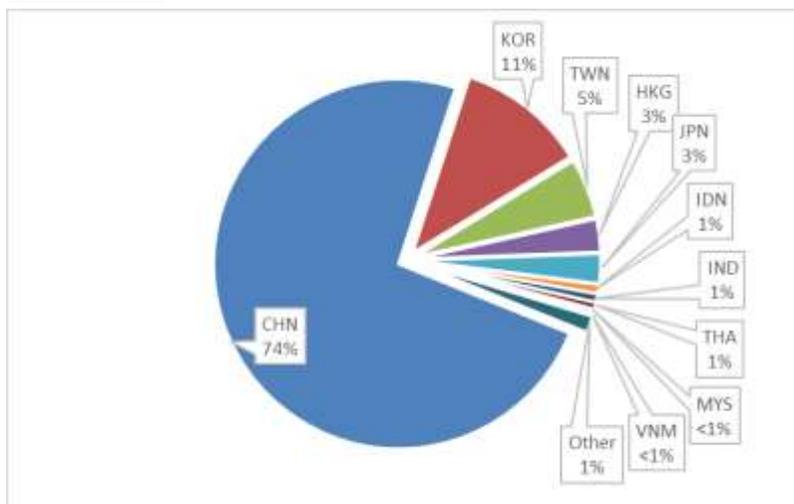
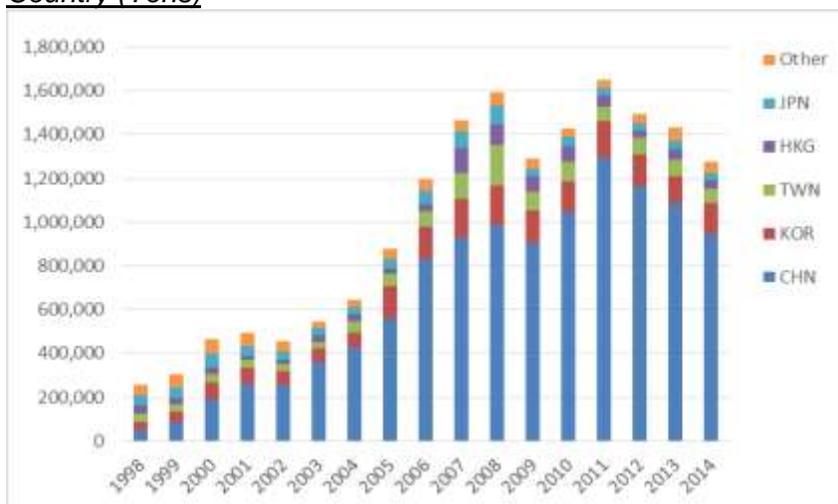


Figure 14b: Non-Ferrous Metals (Excluding Copper Wire) Exports Trend from California by Country (Tons)



Aluminum Cans (Figures 15a and 15b)

Note: Aluminum Cans are also included as part of the total weight and value of Non-Ferrous Metals.

- The total seaborne weight exported from California was slightly more than 850 tons. Compared to 2013, exports of Aluminum Cans were down 66 percent in 2014.
- Aluminum Cans made up less than 1 percent of recyclable seaborne exports by weight.
- The value of seaborne exports from California was about \$1.3 million.
- Aluminum Cans made up less than 1 percent of the value of recyclable seaborne exports.
- Three countries received 100 percent of the seaborne Aluminum Cans exports from California: Korea, China, and Taiwan.
- Reports indicate that since 2013, Korea has increased purchases of scrap aluminum from Japan, which helps to explain the sudden drop in Aluminum Cans exports from California ports.³

Figure 15a: Aluminum Cans Exports from California by Country in 2014 (Weight)

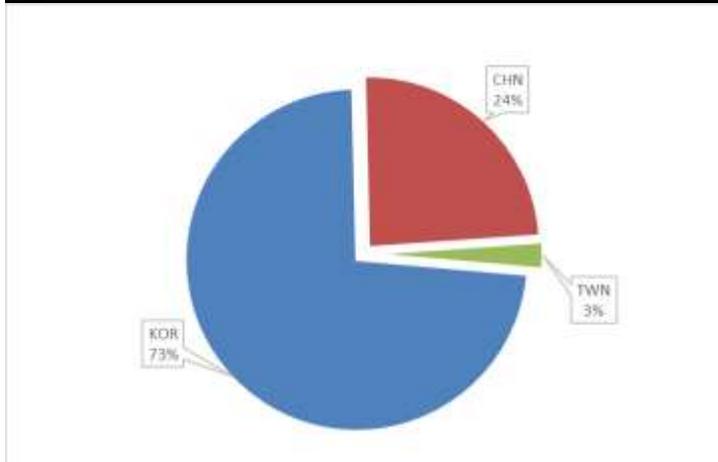
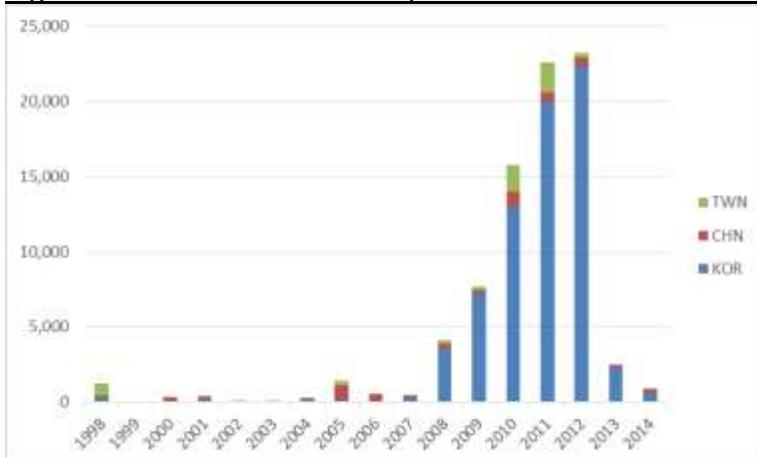


Figure 15b: Aluminum Cans Exports Trend from California by Country (Tons)



Truck, Rail, and Air Shipments

Information on recyclables shipped by truck and rail from California is available but is limited to the value of the shipment. Additionally, shipments of commodities valued less than \$2,500 can be exempted from reporting, and there is no way to tell how much recyclable material falls under this exemption. Exports to Canada are not included in the report at this time due to material not entering Canada directly from California.

In 2014, the values of recyclables in defined commodity groups exported to other countries by truck, rail, and air from California was at least \$72 million, a small amount when compared to the \$6.9 billion shipped out by vessels from California's ports. Mexico, Japan, and Germany were the largest export partners and accounted for about \$70 million of that total, with the remaining \$2 million worth going to other countries. More than 95 percent of the value of air shipments to Japan and Germany consisted of Non-Ferrous Metals, which is a more valuable commodity group compared to other recyclables.

For consistency with the rest of this report, the numbers in this section represent recyclables that left California by truck, rail, and air, but were not necessarily generated in California. Conversely, materials generated in California may have left the United States from other states, and their values would not be represented here. Also not shown are amounts for recyclables that left California destined for final use in other states.

Figure 16a: Truck and Rail Exports of Recyclables to Mexico from California

High-Grade Paper	\$ 3,900,000
Mixed Paper	\$ 77,000
Plastics 1,2,4 (PET, HDPE, LDPE)	\$ 670,000
Other Plastics (PVC, Polystyrene, Other)	\$ 2,400,000
Glass	\$ 9,300
Tires/Rubber Scrap	\$ 10,800,000
Used Oil/Grease	\$ 131,000
Batteries	\$ 6,400
Copper Wire	\$ 14,000
Ferrous Metals	\$ 16,100,
Non-Ferrous Metals (excludes Copper Wire)	\$ 8,300,000
Aluminum Cans	\$ 70,000
Total	\$ 42,400,000

Figure 16b: Air Exports of Recyclables to Japan from California

High-Grade Paper	\$ -
Mixed Paper	\$ -
Plastics 1,2,4 (PET, HDPE, LDPE)	\$ -
Other Plastics (PVC, Polystyrene, Other)	\$ -
Glass	\$ 51,000
Tires/Rubber Scrap	\$ 19,000
Used Oil/Grease	\$ -
Batteries	\$ 1,100,000
Copper Wire	\$ -
Ferrous Metals	\$ -
Non-Ferrous Metals (excludes Copper Wire)	\$ 13,400,000
Aluminum Cans	\$ -
Total	\$ 14,600,00

Figure 16c: Air Exports of Recyclables to Germany from California

High-Grade Paper	\$ -
Mixed Paper	\$ 23,000
Plastics 1,2,4 (PET, HDPE, LDPE)	\$ -
Other Plastics (PVC, Polystyrene, Other)	\$ -
Glass	\$ -
Tires/Rubber Scrap	\$ -
Used Oil/Grease	\$ -
Batteries	\$ -
Copper Wire	\$ -
Ferrous Metals	\$ -
Non-Ferrous Metals (excludes Copper Wire)	\$ 13,200,000
Aluminum Cans	\$ -
Total	\$ 13,300,000

Possible Reasons for 2014 Exports Decline

Exports markets are very complicated. Here are a few factors that could have contributed to the continuing decline in 2014:

- **Green Fence Policy**
 - China's Green Fence policy ran from February through November of 2013 but may have affected 2014 recyclable exports to China. The policy caused Chinese customs to strictly enforce environmental laws governing the import of contaminated recyclable bales of material.
 - Many small-volume Chinese recyclers left the recycling industry due to the Green Fence policy.⁴
 - U.S. domestic recycling companies enforced similar contamination standards associated with the Green Fence policy. Companies and MRFs added extra staff and machinery to improve material quality.⁵
 - Domestic buyers found bales that were cleaner due to the Green Fence policy more attractive. Therefore, more recyclables may have stayed in the United States instead of being exported.⁶
- **Effect of the West Coast Port Dispute**
 - A West Coast port labor dispute lasted from late 2014 to early 2015. The dispute created a drop in recyclable exports from California ports because the extended contract negotiations resulted in major delays in overseas cargo shipments.⁷
- **The Strength of the U.S. Dollar vs. Other Currency**
 - The stronger U.S. dollar possibly contributed to lower amounts of exported recyclable materials. Our trade partners could purchase recyclable materials from other countries at a lower price due to their lower currency value compared to the strong dollar.
 - According to the New York Times, "The dollar is now the strongest it has been against more than two dozen other currencies in more than 10 years," and "some American manufacturers have said they are losing orders or seeing their profits decline as they are forced to cut prices to compete with the lower prices offered by European and Japanese businesses."⁸
- **China's Economic Slowdown**
 - China's economy slowed in the latter months of 2014 and into the early months of 2015.⁹
 - The Chinese economic slowdown may have caused a decline in recyclable exports to China from California ports.¹⁰
 - The slowing economy may be affecting China's demand for scrap materials.¹¹

- **Falling Oil Prices**
 - Recyclable plastics exports in late 2014 and early 2015 may also have declined due to lower oil prices, as plastic product manufacturers could purchase virgin plastic resins at a lower cost than resin from recycled materials.¹²
- **Recycling Difficulties in Other States¹³**
 - Falling commodity prices may have made disposal more cost-effective than recycling for some U.S. cities. According to the Washington Post, “more than 2,000 municipalities are paying to dispose of their recyclables instead of the other way around.”¹⁴
 - Recyclables leaving California ports include materials from other states. Reductions in recyclable collection in other states may result in lower amounts of exported recyclables sent from California ports.

First Four Months of 2015 Comparison (Figures 17a and 17b)

Figure 17a provides a glimpse of 2015 numbers and shows the percent change of seaborne recyclable export tonnages for the top 10 export countries. The chart shows the first four months of 2014 compared to the first four months of 2015 year-to-date.

- There was a decrease of approximately 6 percent for Total All Countries, April 2014 (YTD) compared to April 2015 (YTD).
- There was no measurable overall percentage change for China for April 2014 (YTD) compared to April 2015 (YTD).

Figure 17a: Percent Change of Recyclable Exports from California Ports by Country

Country	% Change Apr 2014 YTD compared to Apr 2015 YTD	Tonnage Change Apr 2014 YTD to 2015 YTD
Total All Countries (includes all trade partners)	-6	-384,000
China	0	-3,000
Taiwan	2	16,000
Korea, Republic of	-38	-318,000
Hong Kong	22	27,000
Malaysia	-90	-85,000
Thailand	14	12,000
Vietnam	-57	-52,000
Indonesia	-45	-44,000
Kuwait	-76	-155,000
India	260	122,000

Figure 17b: Percent Change of Recyclable Exports from California Ports, April 2014 YTD to April 2015 YTD

Commodity Group	%Change April 2014 YTD to April 2015 YTD	
	All Partner Countries	China Percent Change
Mixed Paper	1	2
High-Grade Paper	14	66
Ferrous Metal	-16	0
Non-Ferrous Metals	-17	-13
Other Plastics (PVC, Polystyrene, Other)	-5	-15
Plastics 1,2,4 (PET, HDPE, LDPE)	-5	-19

Figure 17b shows the percent change of exports by commodity group from California ports from April 2014 (YTD) compared to April 2015 (YTD) for all partner countries, and separately for China.

Data Limitations, Questions, and Future Research

The data in this report provides a look at seaborne exports of recyclables, but there are still key unanswered questions. We are exploring the different ways to account for how much of the exports truly originated in California as opposed to being collected, consolidated, and then shipped from other states for transit through California ports. Some anecdotal estimates say 60 percent to 80 percent of some materials may originate in California. This is a rough estimate and covers a large range. We have included some data on shipments of recyclables by rail and truck to Mexico, and by air to Japan and Germany. However, low-value shipments of less than \$2,500 are not necessarily included in those numbers, and we have no way of telling how much tonnage those shipments could represent. As data becomes available, we will look to enhance future reports, such as including information about exports to Canada. Additionally, we are exploring how to reliably determine the end uses of the recyclables that were exported. We will continue to look for answers to these and other questions. Please contact us if you have information that could help.

Conclusions

In 2014, California exported almost 18 million tons of recyclables worth nearly \$7 billion. By weight, Mixed Paper (which includes mixed paper, cardboard, and paperboard) made up more than half of the recyclables exported from California. Combined, Ferrous and Non-Ferrous Metals made up almost three-quarters of the dollar value of the recyclables exported from California. Mixed Paper has been the largest material category by weight, and Metals has been the largest material category by value since CalRecycle began reporting on exported recyclables in 2012.

In 2014, California exported about 57 percent of recyclables to China. Just three countries (China, Taiwan, and Korea) accepted 82 percent by vessel weight and 80 percent by vessel value. Most recyclable Mixed Paper, High-Grade Paper, Plastics, and Non-Ferrous Metals flow to China. Other recyclable materials have different top market countries: Glass (India); Used Oil and Grease (Japan and Vietnam); Ferrous Metals (Taiwan); and Copper, Tires and Rubber Scrap, Batteries, and Aluminum Cans (Korea).

Recyclables exports have been declining since 2011. From 2013 to 2014, the decline continued with a decrease of 3 percent overall and a 6 percent drop in recyclables going to China. Exports may continue to decline: Data shows an overall 6 percent decrease for the first quarter of 2015. Based on work by others in the field and on related media reports, this report summarizes some of the possible reasons for this decline, such as the Green Fence policy of China, the West Coast port dispute, a strengthening dollar relative to other currencies, the slowdown in China's economy, the drop in oil prices, and the decline in some U.S. recycling efforts.

California continues to be very dependent on export markets to absorb the majority of the recyclables collected and processed in the state. As a result, California is vulnerable to fluctuations in the strength of these export markets. If export markets continue to decline for recyclable materials, then either more recyclables will be disposed, or more California domestic markets will need to be found for them. Currently, there is not enough capacity at California manufacturing facilities to use all these recyclables to produce new products.¹⁵

Recyclable exports fell by about 600,000 tons in 2014. With the implementation of mandatory commercial recycling requirements, recyclable collection should be increasing. Landfill disposal increased in 2014 by about 1 million tons despite continued program implementation by jurisdictions and additional statewide programs. Due to a lack of tracking of recyclable materials, CalRecycle can only note a correlation between these two trends. However, this correlation highlights the need for additional in-state recycled-content manufacturing capacity to absorb these recyclables and turn them into new products. Additional in-state recycled-content manufacturing would also result in more green jobs, less greenhouse gases, and more resources staying in California's material stream and economy.¹⁶ Without additional in-state capacity, California may find it very difficult to reach our 75 percent statewide recycling goal established in AB 341

(Chapter 476, Statutes of 2011). This will be exacerbated further if export markets continue to drop.

Appendices

Appendix 1: California Recyclables Vessel Weight in Tons Exported by Sea in 2014 (Top 10 Partner Countries and All Others)

	China	Taiwan	Korea, Republic of	Hong Kong	Malaysia	Indonesia	Vietnam	Thailand	Kuwait	India	All Others	Total Tons
High-Grade Paper	28,422	1,056	14,362	43	0	4,705	3,332	0	0	2,149	55,199	109,268
Mixed Paper	8,155,536	108,410	721,853	4,738	14,902	109,910	47,946	98,992	343	109,075	155,240	9,526,945
Plastics 1, 2, 4	409,119	13,213	4,605	166,161	9,943	21,275	12,212	4,177	0	1,490	2,949	645,147
Other Plastics	342,358	10,066	3,520	202,321	13,773	36,102	8,673	6,518	0	135	1,649	625,115
Glass	0	0	13	14	0	0	0	0	0	1,760	137	1,925
Tires/Rubber	6,251	270	44,496	4,884	818	568	26,695	1,825	0	12	3,543	89,360
Used Oil/Grease	0	6	1	13	0	0	89	0	0	0	182	291
Batteries	127	0	11,106	183	113	173	0	0	0	2,050	1,744	15,496
Copper Wire	974	407	3,481	197	0	0	0	0	0	0	1,083	6,142
Ferrous Metal	427,067	2,394,963	1,157,246	22,407	300,729	128,512	209,027	195,466	251,271	120,305	477,875	5,684,868
Non-Ferrous (excluding copper wire)	942,071	66,511	144,071	36,644	3,854	9,797	3,419	7,226	0	8,949	51,427	1,273,968
Aluminum Cans (included in Non- Ferrous)	207	21	626	0	0	0	0	0	0	0	0	855
Total All Selected Materials	10,311,926	2,594,902	2,104,754	437,605	344,132	311,042	311,392	314,205	251,614	245,927	751,028	17,978,525
Total All Exports (Recycled and Not)	23,483,349	5,652,265	5,257,506	1,633,438	915,047	1,762,816	1,539,996	1,219,577	272,884	1,526,149	31,072,043	74,335,068

**Appendix 2: Market Share of California Recyclables Vessel Weight in Tons Exported by Sea in 2014
(Top 10 Partner Countries and All Others)**

	China	Taiwan	Korea, Republic of	Hong Kong	Malaysia	Indonesia	Vietnam	Thailand	Kuwait	India	All Others	Total
High-Grade Paper	26%	1%	13%	<1%	0%	4%	3%	0%	0%	2%	51%	100%
Mixed Paper	86%	1%	8%	<1%	<1%	1%	1%	1%	<1%	1%	2%	100%
Plastics 1, 2, 4	63%	2%	1%	26%	2%	3%	2%	1%	0%	<1%	<1%	99%
Other Plastics	55%	2%	1%	32%	2%	6%	1%	1%	0%	<1%	<1%	100%
Glass	0%	0%	1%	1%	0%	0%	0%	0%	0%	91%	7%	100%
Tires/Rubber	7%	<1%	50%	5%	1%	1%	30%	2%	0%	<1%	4%	100%
Used Oil/Grease	0%	2%	<1%	4%	0%	0%	31%	0%	0%	0%	63%	100%
Batteries	1%	0%	72%	1%	1%	1%	0%	0%	0%	13%	11%	100%
Copper Wire	16%	7%	57%	3%	0%	0%	0%	0%	0%	0%	18%	100%
Ferrous Metal	8%	42%	20%	<1%	5%	2%	4%	3%	4%	2%	8%	100%
Non-Ferrous (excluding copper wire)	74%	5%	11%	3%	<1%	1%	<1%	1%	0%	1%	4%	99%
Aluminum Cans (included in Non-Ferrous)	24%	2%	73%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Total All Selected Materials	57%	14%	12%	2%	2%	2%	2%	2%	1%	1%	4%	100%
Total All Exports (Recycled and Not)	32%	8%	7%	2%	1%	2%	2%	2%	<1%	2%	42%	100%

Appendix 3: California Recyclables Vessel Value Exported by Sea in 2014 (Top 10 Partner Countries and All Others, in Thousands of Dollars)

x \$1000	China	Taiwan	Korea, Republic of	Japan	Hong Kong	Malaysia	Indonesia	Thailand	Vietnam	Kuwait	All Others	Total Dollars
High-Grade Paper	\$5,626	\$147	\$2,919	\$0	\$12	\$0	\$1,265	\$0	\$1,083	\$0	\$14,437	\$25,489
Mixed Paper	\$1,158,459	\$19,445	\$114,032	\$8,082	\$912	\$2,615	\$16,986	\$12,749	\$8,966	\$30	\$43,629	\$1,385,904
Plastics 1, 2, 4	\$142,304	\$3,796	\$3,437	\$47	\$57,997	\$2,221	\$6,496	\$1,121	\$3,175	\$0	\$5,802	\$226,395
Other Plastics	\$116,907	\$3,242	\$2,222	\$240	\$66,898	\$3,659	\$13,816	\$2,238	\$2,457	\$0	\$1,535	\$213,213
Glass	\$0	\$0	\$53	\$526	\$136	\$0	\$0	\$0	\$0	\$0	\$790	\$1,505
Tires/Rubber	\$1,767	\$251	\$2,518	\$798	\$1,561	\$363	\$162	\$360	\$4,225	\$0	\$2,062	\$14,068
Used Oil/Grease	\$0	\$5	\$3	\$31	\$10	\$0	\$0	\$0	\$58	\$0	\$48	\$155
Batteries	\$141	\$0	\$12,995	\$0	\$107	\$177	\$247	\$0	\$0	\$0	\$4,325	\$17,992
Copper Wire	\$4,828	\$2,499	\$21,757	\$2,533	\$1,246	\$0	\$0	\$0	\$0	\$0	\$3,819	\$36,682
Ferrous Metal	\$373,851	\$840,711	\$398,762	\$70,789	\$17,514	\$95,947	\$43,186	\$64,458	\$66,346	\$81,624	\$196,041	\$2,249,230
Non-Ferrous (excluding copper wire)	\$1,904,594	\$80,582	\$275,848	\$236,994	\$58,185	\$5,191	\$14,691	\$15,744	\$3,564	\$0	\$105,467	\$2,700,859
Aluminum Cans (included in Non-Ferrous)	\$363	\$38	\$857	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,258
Total All Selected Materials	\$3,708,477	\$950,678	\$834,545	\$320,040	\$204,578	\$110,172	\$96,849	\$96,670	\$89,873	\$81,654	\$377,955	\$6,871,491
Total All Exports (Recycled and Not)	\$25,416,223	\$7,012,465	\$10,202,459	\$14,796,896	\$5,324,330	\$1,568,591	\$1,924,823	\$1,980,409	\$1,945,155	\$171,056	\$34,499,177	\$104,841,584

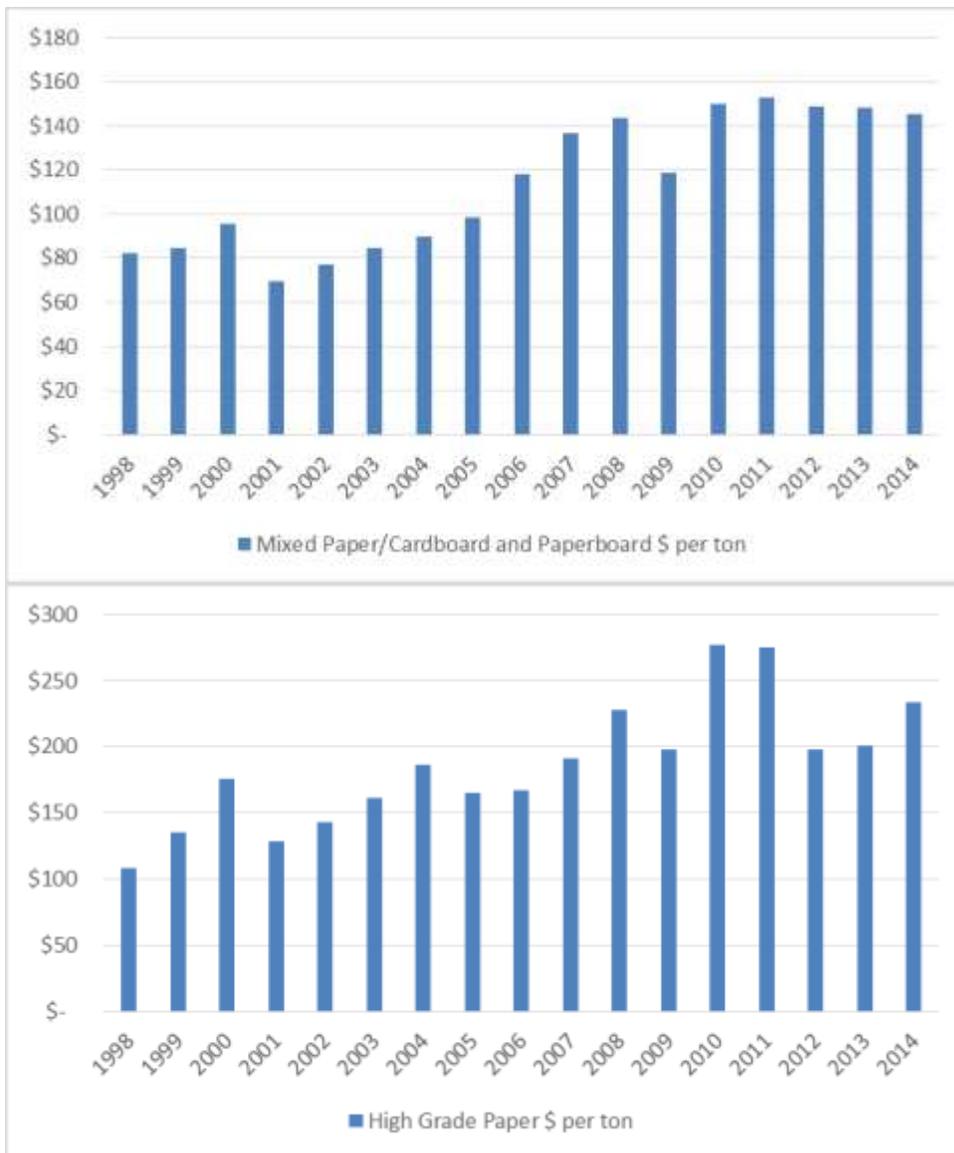
Appendix 4: Market Share of California Recyclables Vessel Value Exported by Sea in 2014 (Top 10 Partner Countries and All Others)

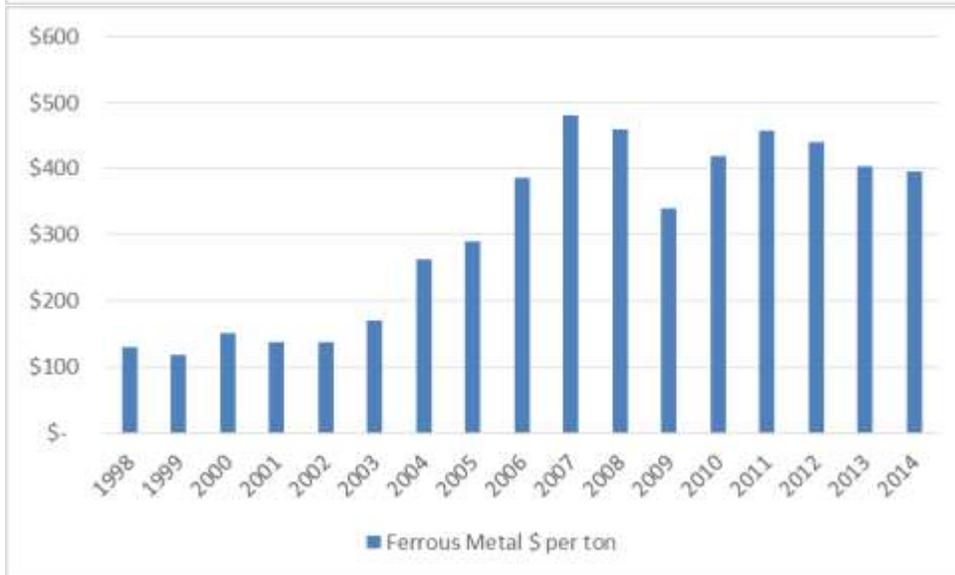
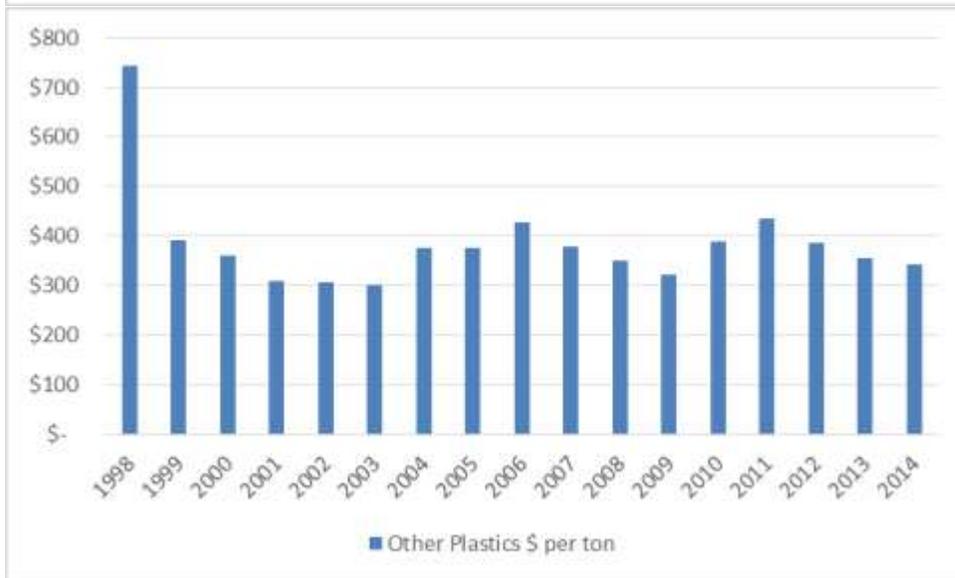
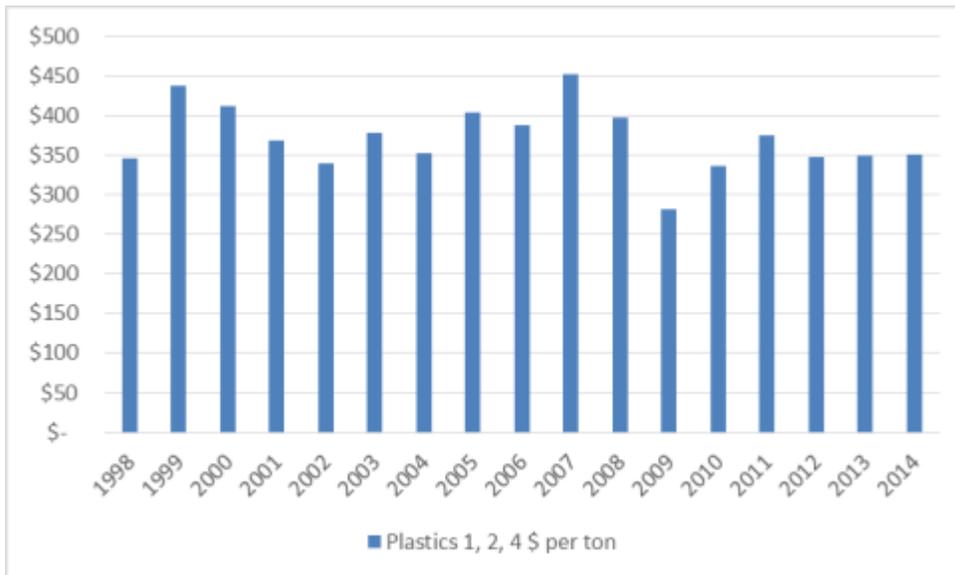
	China	Taiwan	Korea, Republic of	Japan	Hong Kong	Malaysia	Indonesia	Thailand	Vietnam	Kuwait	All Others	Total
High-Grade Paper	22%	1%	11%	0%	<1%	0%	5%	0%	4%	0%	57%	100%
Mixed Paper	84%	1%	8%	1%	<1%	<1%	1%	1%	1%	<1%	3%	100%
Plastics 1, 2, 4	63%	2%	2%	<1%	26%	1%	3%	<1%	1%	0%	3%	99%
Other Plastics	55%	2%	1%	<1%	31%	2%	6%	1%	1%	0%	1%	100%
Glass	0%	0%	4%	35%	9%	0%	0%	0%	0%	0%	52%	100%
Tires/Rubber	13%	2%	18%	6%	11%	3%	1%	3%	30%	0%	15%	100%
Used Oil/Grease	0%	3%	2%	20%	7%	0%	0%	0%	37%	0%	31%	100%
Batteries	1%	0%	72%	0%	1%	1%	1%	0%	0%	0%	24%	100%
Copper Wire	13%	7%	59%	7%	3%	0%	0%	0%	0%	0%	10%	100%
Ferrous Metal	17%	37%	18%	3%	1%	4%	2%	3%	3%	4%	9%	100%
Non-Ferrous (excluding copper wire)	71%	3%	10%	9%	2%	<1%	1%	1%	<1%	0%	4%	100%
Aluminum Cans (included in Non-Ferrous)	29%	3%	68%	0%	0%	0%	0%	0%	0%	0%	0%	100%
Total All Selected Materials	54%	14%	12%	5%	3%	2%	1%	1%	1%	1%	6%	100%
Total All Exports (Recycled and Not)	24%	7%	10%	14%	5%	1%	2%	2%	2%	<1%	33%	100%

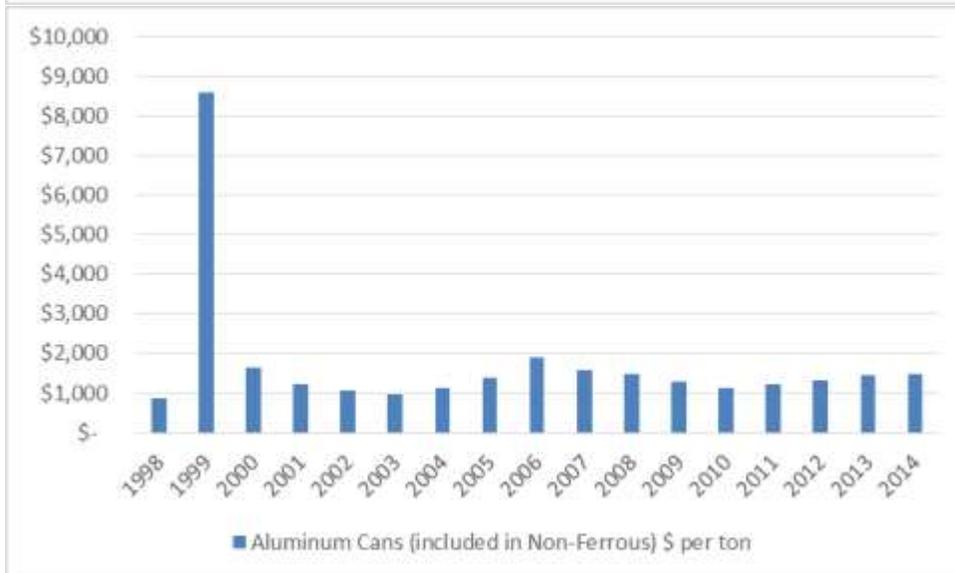
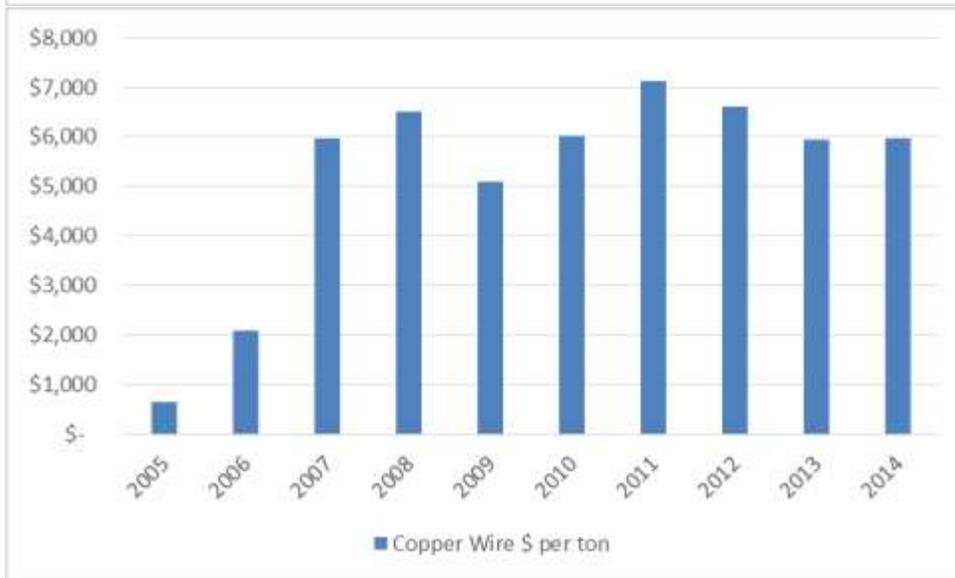
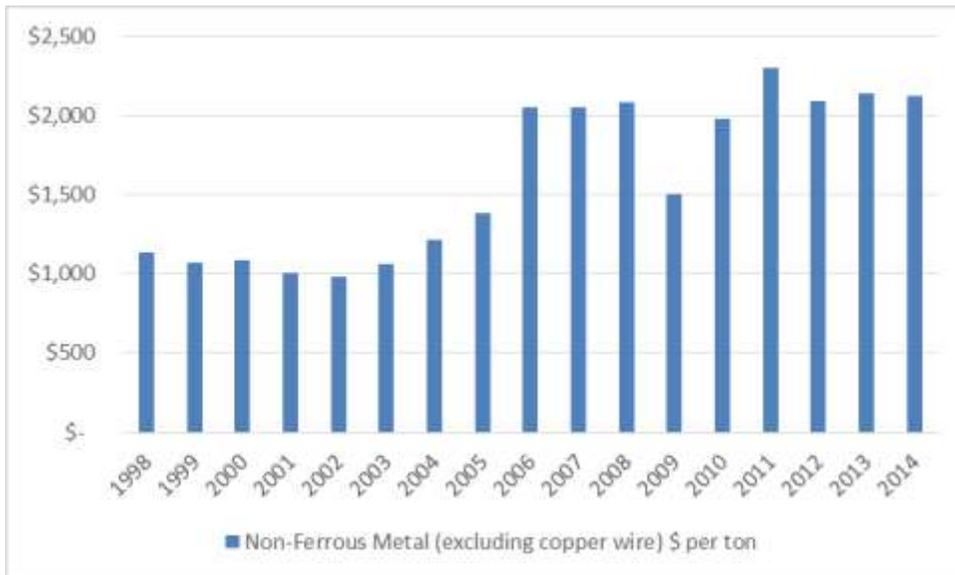
Appendix 5: Summary of California Port Exports of Recyclables in 2014 (By Weight, Value, and Market Share)

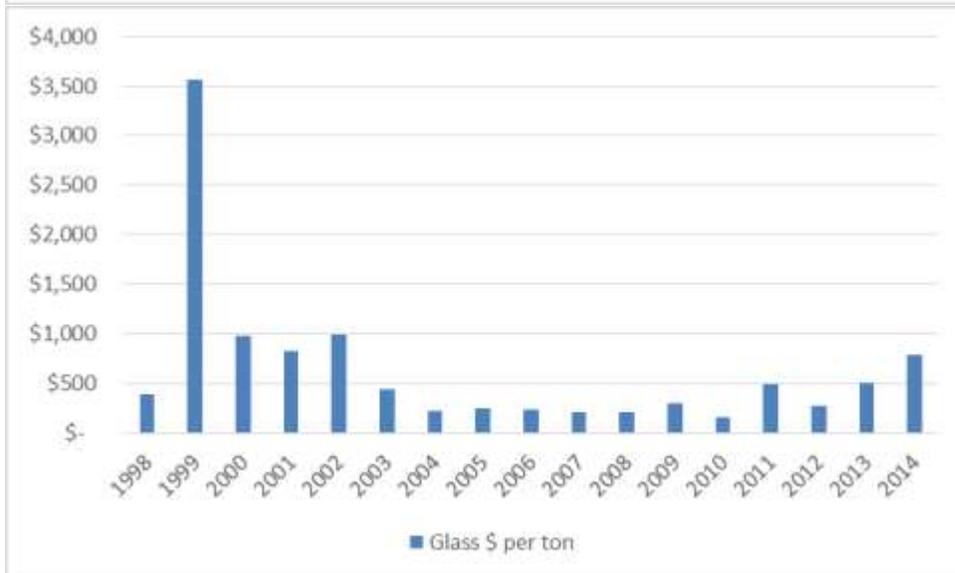
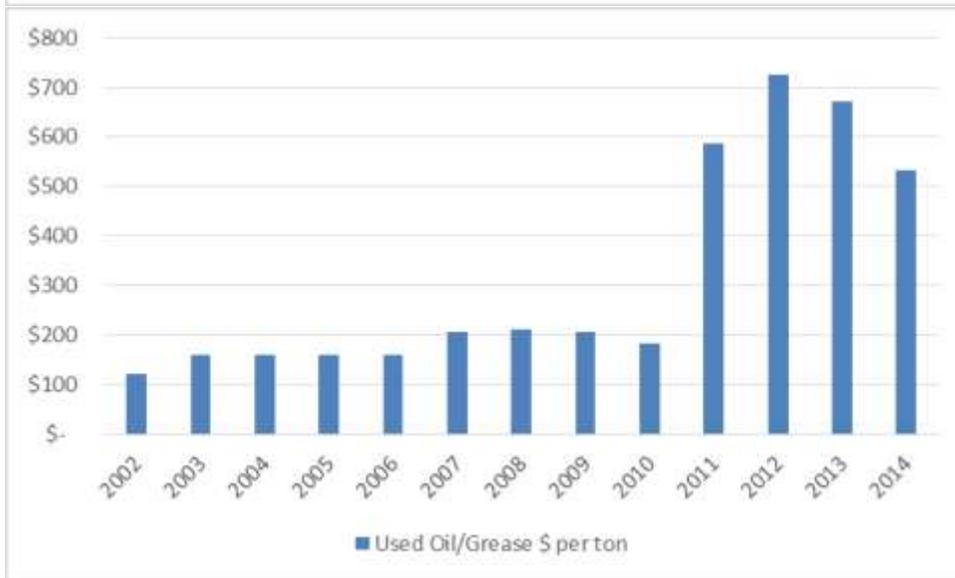
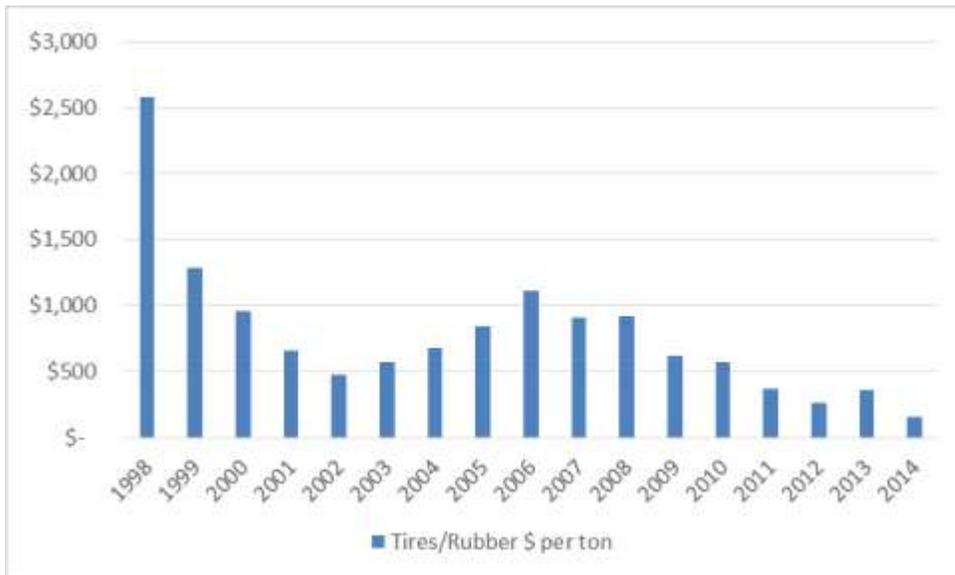
Material	Vessel Weight (Tons)	% All Recycle Exports (tons)	% Annual Exports (tons)	Vessel Value (Dollars)	% All Recycle Exports	% Annual Exports	Vessel Value/Vessel Weight
Mixed Paper	9,526,945	53%	13%	\$1,385,904,363	20%	1%	\$145
Ferrous Metal	5,684,868	32%	8%	\$2,249,230,136	33%	2%	\$396
Non-Ferrous Metals (excluding copper wire)	1,273,968	7%	2%	\$2,700,858,963	39%	3%	\$2,120
Other Plastics	625,115	3%	1%	\$213,212,735	3%	<1%	\$341
Plastics 1, 2, 4	645,147	4%	1%	\$226,394,731	3%	<1%	\$351
High-Grade Paper	109,268	1%	<1%	\$25,488,823	<1%	<1%	\$233
Tires/Rubber	89,360	<1%	<1%	\$14,067,901	<1%	<1%	\$157
Batteries	15,496	<1%	<1%	\$17,992,368	<1%	<1%	\$1,161
Copper Wire	6,142	<1%	<1%	\$36,681,522	<1%	<1%	\$5,972
Glass	1,925	<1%	<1%	\$1,504,653	<1%	<1%	\$782
Used Oil/Grease	291	<1%	<1%	\$155,250	<1%	<1%	\$534
Aluminum Cans (included in Non-Ferrous)	855	<1%	<1%	\$1,258,399	<1%	<1%	\$1,472
Total All Selected Materials	17,978,525	100%	24%	\$6,871,491,445	100%	7%	\$382
Total All Exports (Recycled and Not)	74,335,068	N/A	100%	\$104,841,583,981		100%	\$1,410

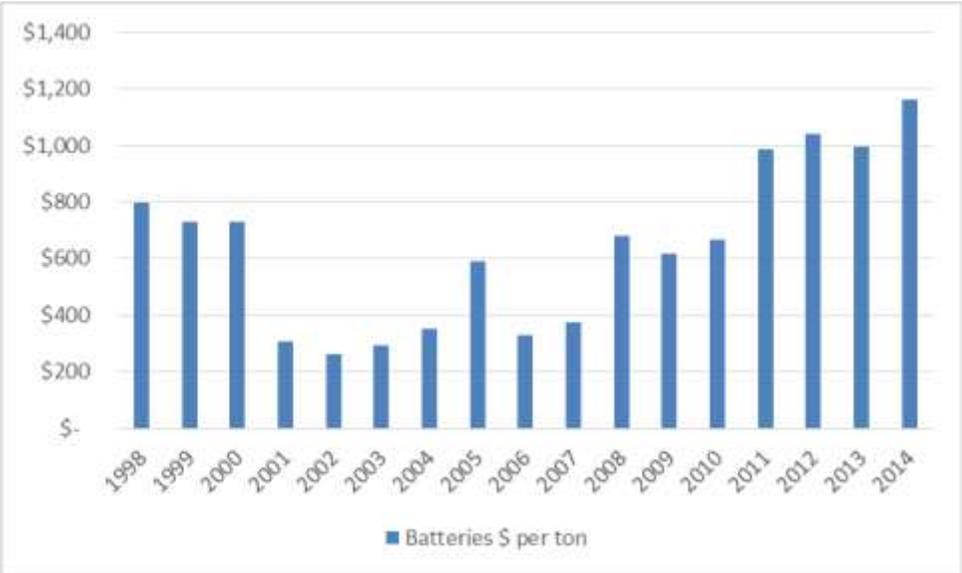
Appendix 6: Price per Ton Over Time by Commodity Group (Vessel Value/Vessel Weight)











Appendix 7: Country Code Abbreviations by Rank

CHN	China
TWN	Taiwan
KOR	Korea, Republic Of
HKG	Hong Kong
MYS	Malaysia
IDN	Indonesia
VNM	Vietnam
THA	Thailand
KWT	Kuwait
IND	India
SAU	Saudi Arabia
PAK	Pakistan
JPN	Japan
SLV	El Salvador
TUR	Turkey
ECU	Ecuador
MEX	Mexico
PHL	Philippines
PER	Peru
GTM	Guatemala
CHL	Chile
BGD	Bangladesh
SGP	Singapore
AUS	Australia
ARE	United Arab Emirates
GRC	Greece

ARG	Argentina
GBR	United Kingdom
BEL	Belgium
NLD	Netherlands
COL	Colombia
VEN	Venezuela
ESP	Spain
LAO	Laos
PAN	Panama
NZL	New Zealand
HND	Honduras
ITA	Italy
DEU	Germany
VAT	Vatican City
ZAF	South Africa
DOM	Dominican Republic
TCD	Chad
CRI	Costa Rica
CAF	Central African Republic
CYM	Cayman Islands
PNG	Papua New Guinea
URY	Uruguay
NIC	Nicaragua
LUX	Luxembourg
POL	Poland
BOL	Bolivia

BRA	Brazil
SWE	Sweden
ISR	Israel
MDV	Maldiv Islands
GHA	Ghana
AND	Andorra
FRA	France
FSM	Federated States Of Micronesia
DMA	Dominica
HMD	Heard And McDonald Islands
MAC	Macao
LTU	Lithuania
WSM	Western Samoa
CXR	Christmas Island
RUS	Russia
KHM	Cambodia
CMR	Cameroon
KIR	Kiribati
LKA	Sri Lanka
SVK	Slovakia
HUN	Hungary
BHS	Bahamas
MMR	Burma (Myanmar)
NCL	New Caledonia
MHL	Marshall Islands

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